



Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

AMENDED REPORT

Thursday, December 13, 2018

Stephanie Kranz

Tidewater Barge Lines

P.O. Box 1210 6305 NW Old Lower River Rd

Vancouver, WA 98666

RE: A8K0860 - Stormwater-Permit Renewal - 11/28/18

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A8K0860, which was received by the laboratory on 11/28/2018 at 12:25:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: jwoodcock@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of final reporting, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1

4.9 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



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Jason Woodcock, RG, CEG, Project Manager



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Project: Stormwater-Permit Renewal

Project Number: 11/28/18

Project Manager: Stephanie Kranz

Report ID:

A8K0860 - 12 13 18 1452

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW001-11282018	A8K0860-01	Water	11/28/18 08:30	11/28/18 12:25

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ANALYTICAL CASE NARRATIVE

Work Order: A8K0860

Amended Report Revision 1:

This report supersedes all previous reports.

A partial final report was previously sent to the client on 12/13/18. This report includes all data for the samples received and logged in under work order A8K0860. In addition, this report is not complete without the attached subcontract laboratory report from ALS-Kelso.

Jason Woodcock
Project Manager
12/13/2018

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ANALYTICAL REPORT FOR SAMPLES

FIELD DATA (Provided by Sampler)

Lab Number	Sample Name	pH	@Temp(C)	Flow (gal/min)	Residual Cl (mg/L)	Turbidity
A8K0860-01	SW001-11282018	6.88	---	---	---	1.34

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ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 200.8 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SW001-11282018 (A8K0860-01)				Matrix: Water				
Batch: 8120541								
Aluminum	342	---	50.0	ug/L	1	12/10/18	EPA 200.8	
Antimony	ND	---	1.00	ug/L	1	12/10/18	EPA 200.8	
Arsenic	ND	---	1.00	ug/L	1	12/10/18	EPA 200.8	
Barium	11.4	---	1.00	ug/L	1	12/10/18	EPA 200.8	
Cadmium	ND	---	0.200	ug/L	1	12/10/18	EPA 200.8	
Chromium	ND	---	1.00	ug/L	1	12/10/18	EPA 200.8	
Copper	2.70	---	1.00	ug/L	1	12/10/18	EPA 200.8	
Iron	ND	---	50.0	ug/L	1	12/10/18	EPA 200.8	
Lead	ND	---	0.200	ug/L	1	12/10/18	EPA 200.8	
Manganese	29.1	---	1.00	ug/L	1	12/10/18	EPA 200.8	
Molybdenum	ND	---	1.00	ug/L	1	12/10/18	EPA 200.8	
Nickel	ND	---	2.00	ug/L	1	12/10/18	EPA 200.8	
Selenium	ND	---	1.00	ug/L	1	12/10/18	EPA 200.8	
Zinc	4.53	---	4.00	ug/L	1	12/10/18	EPA 200.8	

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ANALYTICAL SAMPLE RESULTS

HEM (Oil and Grease) and SGT-HEM by EPA 1664A

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SW001-11282018 (A8K0860-01)				Matrix: Water		Batch: 8120615		
HEM (Oil and Grease)	ND	---	4.76	mg/L	1	12/12/18	EPA 1664A	

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ANALYTICAL SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SW001-11282018 (A8K0860-01)				Matrix: Water		Batch: 8111256		
Ammonia as N	0.106	---	0.0200	mg/L	1	11/29/18	SM 4500-NH3 G	

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ANALYTICAL SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SW001-11282018 (A8K0860-01)				Matrix: Water				
Batch: 8120526								
Fluoride	ND	---	1.00	mg/L	1	12/07/18	EPA 300.0	
Sulfate	16.8	---	1.00	mg/L	1	12/07/18	EPA 300.0	

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ANALYTICAL SAMPLE RESULTS

Nitrate + Nitrite by EPA 353.2

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SW001-11282018 (A8K0860-01RE1)				Matrix: Water		Batch: 8120620		
Nitrate+Nitrite Nitrogen	0.302	---	0.0400	mg/L	2	12/11/18	EPA 353.2	

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ANALYTICAL SAMPLE RESULTS

Demand Parameters

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SW001-11282018 (A8K0860-01)				Matrix: Water				
Batch: 8111266								
Biochemical Oxygen Demand	3.28	---	2.03	mg/L	1	12/04/18	SM 5210 B	
Batch: 8111273								
Total Organic Carbon	4.62	---	1.00	mg/L	1	11/29/18	SM 5310 C	
Batch: 8120302								
Chemical Oxygen Demand	17.0	---	10.0	mg/L	1	12/01/18	SM 5220 D	

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ANALYTICAL SAMPLE RESULTS

Solid and Moisture Determinations

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
SW001-11282018 (A8K0860-01)				Matrix: Water				
Batch: 8120372								
Total Suspended Solids	ND	---	5.00	mg/L	1	12/04/18	SM 2540 D	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 200.8 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8120541 - EPA 3015A						Water						
Blank (8120541-BLK1)		Prepared: 12/10/18 09:00 Analyzed: 12/10/18 15:31										
EPA 200.8												
Aluminum	ND	---	50.0	ug/L	1	---	---	---	---	---	---	
Antimony	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Arsenic	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Barium	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Cadmium	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Chromium	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Copper	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Iron	ND	---	50.0	ug/L	1	---	---	---	---	---	---	
Lead	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Manganese	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Molybdenum	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Nickel	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Selenium	ND	---	1.00	ug/L	1	---	---	---	---	---	---	
Zinc	ND	---	4.00	ug/L	1	---	---	---	---	---	---	
LCS (8120541-BS1)		Prepared: 12/10/18 09:00 Analyzed: 12/10/18 15:35										
EPA 200.8												
Aluminum	2850	---	50.0	ug/L	1	2780	---	102	85-115%	---	---	
Antimony	28.5	---	1.00	ug/L	1	27.8	---	103	85-115%	---	---	
Arsenic	56.1	---	1.00	ug/L	1	55.6	---	101	85-115%	---	---	
Barium	56.3	---	1.00	ug/L	1	55.6	---	101	85-115%	---	---	
Cadmium	53.6	---	0.200	ug/L	1	55.6	---	97	85-115%	---	---	
Chromium	54.3	---	1.00	ug/L	1	55.6	---	98	85-115%	---	---	
Copper	58.3	---	1.00	ug/L	1	55.6	---	105	85-115%	---	---	
Iron	2880	---	50.0	ug/L	1	2780	---	104	85-115%	---	---	
Lead	57.1	---	0.200	ug/L	1	55.6	---	103	85-115%	---	---	
Manganese	55.7	---	1.00	ug/L	1	55.6	---	100	85-115%	---	---	
Molybdenum	27.8	---	1.00	ug/L	1	27.8	---	100	85-115%	---	---	
Nickel	56.1	---	2.00	ug/L	1	55.6	---	101	85-115%	---	---	
Selenium	27.5	---	1.00	ug/L	1	27.8	---	99	85-115%	---	---	
Zinc	57.3	---	4.00	ug/L	1	55.6	---	103	85-115%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

HEM (Oil and Grease) and SGT-HEM by EPA 1664A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8120615 - EPA 1664							Water					
Blank (8120615-BLK1)		Prepared: 12/11/18 07:24 Analyzed: 12/12/18 12:14										
EPA 1664A												
HEM (Oil and Grease)	ND	---	4.55	mg/L	1	---	---	---	---	---	---	
LCS (8120615-BS1)		Prepared: 12/11/18 07:24 Analyzed: 12/12/18 12:14										
EPA 1664A												
HEM (Oil and Grease)	32.9	---		mg/L	1	40.0	---	82	78-114%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Ammonia by Gas Diffusion and Colorimetric Detection

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8111256 - Method Prep: Aq							Water					
Blank (8111256-BLK1)		Prepared: 11/29/18 10:46 Analyzed: 11/29/18 16:17										
SM 4500-NH3 G												
Ammonia as N	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (8111256-BS1)		Prepared: 11/29/18 10:46 Analyzed: 11/29/18 16:18										
SM 4500-NH3 G												
Ammonia as N	2.13	---	0.0200	mg/L	1	2.00	---	106	90-110%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Anions by Ion Chromatography

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8120526 - Method Prep: Aq							Water					
Blank (8120526-BLK1)		Prepared: 12/07/18 12:32		Analyzed: 12/07/18 15:19								
EPA 300.0												
Fluoride	ND	---	1.00	mg/L	1	---	---	---	---	---	---	
Sulfate	ND	---	1.00	mg/L	1	---	---	---	---	---	---	
LCS (8120526-BS1)		Prepared: 12/07/18 12:32		Analyzed: 12/07/18 15:40								
EPA 300.0												
Fluoride	8.22	---	1.00	mg/L	1	8.00	---	103	90-110%	---	---	
Sulfate	8.14	---	1.00	mg/L	1	8.00	---	102	90-110%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Nitrate + Nitrite by EPA 353.2

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8120620 - Method Prep: Aq							Water					
Blank (8120620-BLK1)		Prepared: 12/11/18 09:01		Analyzed: 12/11/18 10:37								
EPA 353.2												
Nitrate+Nitrite Nitrogen	ND	---	0.0200	mg/L	1	---	---	---	---	---	---	
LCS (8120620-BS1)		Prepared: 12/11/18 09:01		Analyzed: 12/11/18 10:38								
EPA 353.2												
Nitrate+Nitrite Nitrogen	0.364	---	0.0200	mg/L	1	0.375	---	97	90-110%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Demand Parameters

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8111266 - Method Prep: Aq							Water					
Blank (8111266-BLK1)		Prepared: 11/29/18 16:47 Analyzed: 12/04/18 17:52										
SM 5210 B												
Biochemical Oxygen Demand	ND	---	4.00	mg/L	1	---	---	---	---	---	---	
Duplicate (8111266-DUP1)		Prepared: 11/29/18 16:47 Analyzed: 12/04/18 17:52										
QC Source Sample: SW001-11282018 (A8K0860-01)												
SM 5210 B												
Biochemical Oxygen Demand	3.32	---	2.03	mg/L	1	---	3.28	---	---	1	15%	
Reference (8111266-SRM1)		Prepared: 11/29/18 16:47 Analyzed: 12/04/18 17:52										
SM 5210 B												
Biochemical Oxygen Demand	208	---		mg/L	1	198		105	84.6-115.4%	---	---	

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Demand Parameters

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8111273 - Method Prep: Aq							Water					
Blank (8111273-BLK1)		Prepared: 11/29/18 12:49 Analyzed: 11/29/18 16:07										
SM 5310 C												
Total Organic Carbon	ND	---	1.00	mg/L	1	---	---	---	---	---	---	
LCS (8111273-BS1)		Prepared: 11/29/18 12:49 Analyzed: 11/29/18 16:36										
SM 5310 C												
Total Organic Carbon	9.80	---	1.00	mg/L	1	10.0	---	98	85-115%	---	---	
LCS (8111273-BS2)		Prepared: 11/29/18 12:49 Analyzed: 11/29/18 17:05										
SM 5310 C												
Total Organic Carbon	ND	---	1.00	mg/L	1	0.00	---		85-115%	---	---	TOC_I

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Jason Woodcock, RG, CEG, Project Manager



Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

AMENDED REPORT

Tidewater Barge Lines

P.O. Box 1210 6305 NW Old Lower River Rd
Vancouver, WA 98666

Project: **Stormwater-Permit Renewal**

Project Number: 11/28/18

Project Manager: Stephanie Kranz

Report ID:

A8K0860 - 12 13 18 1452

QUALITY CONTROL (QC) SAMPLE RESULTS

Demand Parameters

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8120302 - Method Prep: Aq							Water					
Blank (8120302-BLK1)		Prepared: 12/01/18 08:47 Analyzed: 12/01/18 13:46										
SM 5220 D												
Chemical Oxygen Demand	ND	---	10.0	mg/L	1	---	---	---	---	---	---	
LCS (8120302-BS1)		Prepared: 12/01/18 08:47 Analyzed: 12/01/18 13:46										
SM 5220 D												
Chemical Oxygen Demand	49.0	---	10.0	mg/L	1	50.0	---	98	90-110%	---	---	

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P.O. Box 1210 6305 NW Old Lower River Rd
Vancouver, WA 98666

Project: **Stormwater-Permit Renewal**

Project Number: **11/28/18**

Project Manager: **Stephanie Kranz**

Report ID:

A8K0860 - 12 13 18 1452

QUALITY CONTROL (QC) SAMPLE RESULTS

Solid and Moisture Determinations

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8120372 - Total Suspended Solids							Water					
Blank (8120372-BLK1)		Prepared: 12/04/18 12:48		Analyzed: 12/04/18 16:15								
SM 2540 D												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	---	---	---	---	---	
Duplicate (8120372-DUP1)		Prepared: 12/04/18 12:48		Analyzed: 12/04/18 16:15								
QC Source Sample: SW001-11282018 (A8K0860-01)												
SM 2540 D												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	ND	---	---	---	10%	
Reference (8120372-SRM1)		Prepared: 12/04/18 12:48		Analyzed: 12/04/18 16:15								
SM 2540 D												
Total Suspended Solids	99.0	---		mg/L	1	100		99	77.1-110%	---	---	

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AMENDED REPORT

Tidewater Barge LinesP.O. Box 1210 6305 NW Old Lower River Rd
Vancouver, WA 98666Project: **Stormwater-Permit Renewal**

Project Number: 11/28/18

Project Manager: Stephanie Kranz

Report ID:

A8K0860 - 12 13 18 1452

SAMPLE PREPARATION INFORMATION

Total Metals by EPA 200.8 (ICPMS)

Prep: EPA 3015A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8120541							
A8K0860-01	Water	EPA 200.8	11/28/18 08:30	12/10/18 09:00	45mL/50mL	45mL/50mL	1.00

HEM (Oil and Grease) and SGT-HEM by EPA 1664A

Prep: EPA 1664

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8120615							
A8K0860-01	Water	EPA 1664A	11/28/18 08:30	12/11/18 07:24			NA

Ammonia by Gas Diffusion and Colorimetric Detection

Prep: Method Prep: Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8111256							
A8K0860-01	Water	SM 4500-NH3 G	11/28/18 08:30	11/29/18 10:46	10mL/10mL	10mL/10mL	1.00

Anions by Ion Chromatography

Prep: Method Prep: Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8120526							
A8K0860-01	Water	EPA 300.0	11/28/18 08:30	12/07/18 12:32	5mL/5mL	5mL/5mL	1.00

Nitrate + Nitrite by EPA 353.2

Prep: Method Prep: Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8120620							
A8K0860-01RE1	Water	EPA 353.2	11/28/18 08:30	12/11/18 09:01	4mL/4mL	4mL/4mL	1.00

Demand Parameters

Prep: Method Prep: Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8111266							
A8K0860-01	Water	SM 5210 B	11/28/18 08:30	11/29/18 16:47	150mL/300mL	150mL/300mL	NA

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Project: **Stormwater-Permit Renewal**

Project Number: 11/28/18

Project Manager: Stephanie Kranz

Report ID:

A8K0860 - 12 13 18 1452

SAMPLE PREPARATION INFORMATION

Demand Parameters

Prep: Method Prep: Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8111273							
A8K0860-01	Water	SM 5310 C	11/28/18 08:30	11/29/18 12:49	40mL/40mL	40mL/40mL	1.00
Batch: 8120302							
A8K0860-01	Water	SM 5220 D	11/28/18 08:30	12/01/18 08:47	2mL/2mL	2mL/2mL	1.00

Solid and Moisture Determinations

Prep: Total Suspended Solids

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8120372							
A8K0860-01	Water	SM 2540 D	11/28/18 08:30	12/04/18 12:48			NA

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A8K0860 - 12 13 18 1452

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

TOC_I Inorganic Carbon Spike Check. Results are valid if Non Detect (No Inorganic Carbon detected.)

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REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.
ND Analyte NOT DETECTED at or above the detection or reporting limit.
NR Result Not Reported
RPD Relative Percent Difference

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.
"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.
"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.
" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories

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REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the blank results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

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LABORATORY ACCREDITATION INFORMATION**TNI Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039**

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
--------	----------	--------	---------	--------	---------------

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

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APEX LABS COOLER RECEIPT FORM

Client: Tidewater Barge Element WO#: A8 K0860

Project/Project #: Stormwater

Delivery Info:

Date/time received: 11-28-18 @ 1225 By: JP

Delivered by: Apex ☒ Client ☐ ESS ☐ FedEx ☐ UPS ☐ Swift ☐ Senvoy ☐ SDS ☐ Other ☐

Cooler Inspection Date/time inspected: 11-28-18 @ 1550 By: JP

Chain of Custody included? Yes ☒ No ☐ Custody seals? Yes ☐ No ☒

Signed/dated by client? Yes ☒ No ☐

Signed/dated by Apex? Yes ☒ No ☐

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>4.9</u>						

Received on ice? (Y/N) Y

Temp. blanks? (Y/N) N

Ice type: (Gel/Real/Other) Gel

Condition: Good

Cooler out of temp? (Y/N) ☒ Possible reason why:

If some coolers are in temp and some out, were green dots applied to out of temperature samples? Yes/No/NA NA

Out of temperature samples form initiated? Yes/No/NA NA

Samples Inspection: Date/time inspected: 11/28/18 @ 1600 By: JP

All samples intact? Yes ☒ No ☐ Comments:

Bottle labels/COCs agree? Yes ☒ No ☐ Comments:

COC/container discrepancies form initiated? Yes ☐ No ☐ NA ☒

Containers/volumes received appropriate for analysis? Yes ☒ No ☐ Comments:

Do VOA vials have visible headspace? Yes ☐ No ☐ NA ☒

Comments:

Water samples: pH checked: Yes ☒ No ☐ NA ☐ pH appropriate? Yes ☒ No ☐ NA ☐

Comments:

Additional information:

Labeled by: JP Witness: JP Cooler Inspected by: JP See Project Contact Form: Y

Apex Laboratories

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Jason Woodcock, RG, CEG, Project Manager



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ALS Group USA, Corp
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F : +1 360 636 1068
www.alsglobal.com

December 11, 2018

Analytical Report for Service Request No: K1811520

Jason Woodcock
Apex Laboratories
12232 SW Garden Place
Tigard, OR 97223

RE: Stormwater / A8K0860

Dear Jason,

Enclosed are the results of the sample(s) submitted to our laboratory November 28, 2018
For your reference, these analyses have been assigned our service request number **K1811520**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager



ALS Environmental
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Table of Contents

Acronyms

Qualifiers

State Certifications, Accreditations, And Licenses

Chain of Custody

General Chemistry

Metals

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdwlabservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



Chain of Custody

ALS Environmental—Kelso Laboratory
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[illegible]

PC H2

Cooler Receipt and Preservation Form

Client TIDEWATER BARGE LINES Service Request K18 11520
Received: 11-28-18 Opened: 11-28-18 By: ISP Unloaded: 11-28-18 By: ISP

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
<u>-2.4</u>	<u>-2.5</u>	<u>5.7</u>	<u>5.6</u>	<u>-0.1</u>	<u>394</u>	<u>NA</u>		<u>NA</u>	

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Were samples received in good condition (temperature, unbroken)? NA Y N
If applicable, tissue samples were received: Frozen Partially Thawed Thawed
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? NA Y N
11. Were VOA vials received without headspace? NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

SHORT HOLD TIME



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water
Analysis Method: SM 2120 B
Prep Method: None

Service Request: K1811520
Date Collected: 11/28/18
Date Received: 11/28/18
Units: ColorUnits
Basis: NA

Color

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
SW001-11282018	K1811520-001	5.0	5.0	1	11/28/18 12:22	
Method Blank	K1811520-MB	ND U	5.0	1	11/28/18 12:00	

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QA/QC Report

Client: Apex Laboratories
Project Stormwater/A8K0860
Sample Matrix: Water

Service Request: K1811520
Date Collected: 11/28/18
Date Received: 11/28/18
Date Analyzed: 11/28/18

Replicate Sample Summary
General Chemistry Parameters

Sample Name: SW001-11282018
Lab Code: K1811520-001

Units: ColorUnits
Basis: NA

				Duplicate Sample K1811520- 001DUP			
Analyte Name	Analysis Method	MRL	Sample Result	Result	Average	RPD	RPD Limit
Color	SM 2120 B	5.0	5.0	5.0	5.00	<1	20

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ALS Group USA, Corp.
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QA/QC Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water

Service Request: K1811520
Date Analyzed: 11/28/18
Date Extracted: NA

Lab Control Sample Summary
Color

Analysis Method: SM 2120 B
Prep Method: None

Units: ColorUnits
Basis: NA
Analysis Lot: 616658

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1811520-LCS	15.0	15.0	100	85-115

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Analytical Report

Client: Apex Laboratories
Project: Stormwater
Sample Matrix: Water
Analysis Method: SM 5540 C
Prep Method: None

Service Request: K1811520
Date Collected: 11/28/18
Date Received: 11/28/18
Units: mg/L
Basis: NA

Methylene Blue Active Substances

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
SW001-11282018	K1811520-001	ND U	0.050	1	11/28/18 12:44	
Method Blank	K1811520-MB	ND U	0.050	1	11/28/18 12:44	

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QA/QC Report

Client: Apex Laboratories
Project: Stormwater
Sample Matrix: Water

Service Request: K1811520
Date Analyzed: 11/28/18
Date Extracted: NA

Lab Control Sample Summary
Methylene Blue Active Substances

Analysis Method: SM 5540 C
Prep Method: None

Units: mg/L
Basis: NA
Analysis Lot: 616690

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1811520-LCS	0.214	0.200	107	70-130

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Analytical Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water
Analysis Method: SM 9221 E
Prep Method: None

Service Request: K1811520
Date Collected: 11/28/18
Date Received: 11/28/18
Units: MPN/100mL
Basis: NA

Coliform, Fecal

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
SW001-11282018	K1811520-001	49.0	1.8	1	11/28/18 13:12	



Metals

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ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water

Service Request: K1811520
Date Collected: 11/28/18
Date Received: 11/28/18

Mercury, Total

Prep Method: METHOD
Analysis Method: 1631E
Test Notes:

Units: ng/L
Basis: NA

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
SW001-11282018	K1811520-001	0.5	1	12/03/18	12/04/18	ND	
Method Blank 1	K1811520-MB1	0.5	1	12/03/18	12/04/18	ND	
Method Blank 2	K1811520-MB2	0.5	1	12/03/18	12/04/18	ND	
Method Blank 3	K1811520-MB3	0.5	1	12/03/18	12/04/18	ND	

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QA/QC Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
LCS Matrix: Water

Service Request: K1811520
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 12/04/18

Ongoing Precision and Recovery (OPR) Sample Summary
Total Metals

Sample Name: Ongoing Precision and Recovery (Initial) Units: ng/L
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS	Result Notes
						Percent Recovery Acceptance Limits	
Mercury	METHOD	1631E	5.00	4.86	97	77-123	

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QA/QC Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
LCS Matrix: Water

Service Request: K1811520
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 12/04/18

Ongoing Precision and Recovery (OPR) Sample Summary
Total Metals

Sample Name: Ongoing Precision and Recovery (Final) Units: ng/L
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS	Result Notes
						Percent Recovery Acceptance Limits	
Mercury	METHOD	1631E	5.00	4.83	97	77-123	

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QA/QC Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
LCS Matrix: Water

Service Request: K1811520
Date Collected: NA
Date Received: NA
Date Extracted: 12/03/18
Date Analyzed: 12/04/18

Quality Control Sample (QCS) Summary
Total Metals

Sample Name: Quality Control Sample

Units: ng/L

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS	Result Notes
						Percent Recovery Acceptance Limits	
Mercury	METHOD	1631E	5.00	4.40	88	77-123	

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Analytical Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water

Sample Name: SW001-11282018
Lab Code: K1811520-001

Service Request: K1811520
Date Collected: 11/28/18 08:30
Date Received: 11/28/18 10:25

Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Beryllium	200.8	ND U	ug/L	0.020	1	12/03/18 12:07	11/30/18	
Magnesium	200.7	2460	ug/L	5.3	1	12/07/18 11:34	11/30/18	
Silver	200.8	ND U	ug/L	0.020	1	12/03/18 12:07	11/30/18	
Thallium	200.8	ND U	ug/L	0.020	1	12/03/18 12:07	11/30/18	

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Analytical Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water

Sample Name: Method Blank
Lab Code: KQ1817522-01

Service Request: K1811520
Date Collected: NA
Date Received: NA

Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Magnesium	200.7	ND U	ug/L	5.3	1	12/07/18 11:24	11/30/18	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water

Sample Name: Method Blank
Lab Code: KQ1817523-01

Service Request: K1811520
Date Collected: NA
Date Received: NA

Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Beryllium	200.8	ND U	ug/L	0.020	1	12/03/18 11:48	11/30/18	
Silver	200.8	ND U	ug/L	0.020	1	12/03/18 11:48	11/30/18	
Thallium	200.8	ND U	ug/L	0.020	1	12/03/18 11:48	11/30/18	

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QA/QC Report

Client: Apex Laboratories
Project Stormwater/A8K0860
Sample Matrix: Water

Service Request: K1811520
Date Collected: 11/28/18
Date Received: 11/28/18
Date Analyzed: 12/07/18

Replicate Sample Summary**Total Metals**

Sample Name: SW001-11282018
Lab Code: K1811520-001

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample KQ1817522-05		Average	RPD	RPD Limit
				Result	Result			
Magnesium	200.7	5.3	2460	2460	2460	2460	<1	20

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QA/QC Report

Client: Apex Laboratories
Project Stormwater/A8K0860
Sample Matrix: Water

Service Request: K1811520
Date Collected: 11/28/18
Date Received: 11/28/18
Date Analyzed: 12/03/18

Replicate Sample Summary**Total Metals**

Sample Name: SW001-11282018
Lab Code: K1811520-001

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	Sample Result	Duplicate Sample KQ1817523-03		Average	RPD	RPD Limit
				Result	Result			
Beryllium	200.8	0.020	ND U	ND U	ND	-	-	20
Silver	200.8	0.020	ND U	ND U	ND	-	-	20
Thallium	200.8	0.020	ND U	ND U	ND	-	-	20

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dba ALS Environmental

QA/QC Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water

Service Request: K1811520
Date Collected: 11/28/18
Date Received: 11/28/18
Date Analyzed: 12/7/18
Date Extracted: 11/30/18

Matrix Spike Summary
Total Metals

Sample Name: SW001-11282018
Lab Code: K1811520-001
Analysis Method: 200.7
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ1817522-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Magnesium	2460	11500	10000	90	70-130

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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water

Service Request: K1811520
Date Collected: 11/28/18
Date Received: 11/28/18
Date Analyzed: 12/3/18
Date Extracted: 11/30/18

Matrix Spike Summary
Total Metals

Sample Name: SW001-11282018
Lab Code: K1811520-001
Analysis Method: 200.8
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ1817523-04

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Beryllium	ND U	2.37	2.50	95	70-130
Silver	ND U	10.6	12.5	85	70-130
Thallium	ND U	42.0	50.0	84	70-130

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dba ALS Environmental

QA/QC Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water

Service Request: K1811520
Date Analyzed: 12/07/18

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ1817522-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Magnesium	200.7	11500	12500	92	85-115

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Apex Laboratories
Project: Stormwater/A8K0860
Sample Matrix: Water

Service Request: K1811520
Date Analyzed: 12/03/18

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ1817523-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Beryllium	200.8	2.39	2.50	96	85-115
Silver	200.8	11.3	12.5	90	85-115
Thallium	200.8	44.9	50.0	90	85-115