Chemical Analysis Report

TLH-ROC-2020-10-12-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Run 5**
Request ID: **RQ-2020-08-24-40**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

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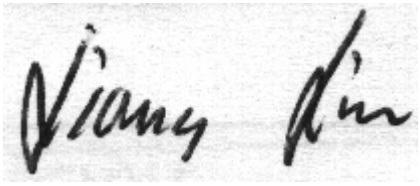
Certified by: Liang Lin, Environmental Administrator

Date Certified: 29-OCT-2020 09:15



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Flat Creek @ Gainer Rd **Collection Date/Time: 10/12/2020 11:05**

Field ID: G3TLHR0008 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2201238	EPA 180.1 Rev. 2.0	Turbidity	12		NTU	P388594	
	EPA 300.0 Rev. 2.1	Chloride	4.3		mg Cl/L	P388999	
		Sulfate	0.56		mg SO4/L	P389001	
	SM 2120 B-2011	Color (true)	160		PCU	P388683	
	SM 2320 B-2011	Total Alkalinity	7.0		mg CaCO3/L	P388940	
	SM 2540 C-2011	TDS	46		mg/L	P389264	
	SM 2540 D-2011	TSS	4	I	mg/L	P389159	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P388954	
2201239	EPA 350.1 Rev. 2.0	Ammonia-N	0.029		mg N/L	P388833	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P388661	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.069		mg N/L	P388560	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P388639	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P388725	
2201240	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.016		mg P/L	P388601	
2201244	EPA 200.7 Rev. 4.4	Barium	19.9		ug/L	P388584	
		Calcium	2.89		mg/L	P388584	
		Iron	1.76E+03		ug/L	P388584	
		Magnesium	1.32		mg/L	P388584	
		Potassium	1.6		mg/L	P388584	
		Sodium	1.8	I	mg/L	P388584	
		Zinc	7.1	I	ug/L	P388584	
	EPA 200.8 Rev. 5.4	Aluminum	564		ug/L	P388584	
		Antimony	0.050	U	ug/L	P388584	
		Arsenic	0.84		ug/L	P388584	
		Beryllium	0.037	I	ug/L	P388584	
		Boron**	13.8		ug/L	P388584	
		Cadmium	0.020	U	ug/L	P388584	
		Chromium	0.62	I	ug/L	P388584	
		Copper	1.07		ug/L	P388584	
		Lead	0.60		ug/L	P388584	
		Nickel	0.68	I	ug/L	P388584	
		Selenium	0.20	U	ug/L	P388584	
		Silver	0.010	U	ug/L	P388584	
		Thallium	0.10	U	ug/L	P388584	
	SM 2340B	Hardness	12.6		mg/L	P388584	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 10/18/2020.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P388594

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388584

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388584

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388999

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389001

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388833

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388661

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388560

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388639

Component	Result	Code	Units
Total-P	0.005	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388601

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B-2011
Batch ID: P388683

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P388940

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 C-2011
Batch ID: P389264

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P389159

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P388954

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P388725

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388584

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	103		P	85 - 115
Iron	104		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	100		P	85 - 115
Sodium	103		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388584

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	106		P	85 - 115
Antimony	96.6		P	85 - 115
Arsenic	98.1		P	85 - 115
Beryllium	99.8		P	85 - 115
Boron	92.4		P	85 - 115
Cadmium	93.4		P	85 - 115
Chromium	99.3		P	85 - 115
Copper	105		P	85 - 115
Lead	93.7		P	85 - 115
Nickel	105		P	85 - 115
Selenium	97.3		P	85 - 115
Silver	105		P	85 - 115
Thallium	109		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388999

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389001

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388833

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	102		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388661

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	102		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388560

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	101		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388639

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388601

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.9		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P388683

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.3		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P388940

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P388954

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	92.8		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P388725

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388584

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200690	Barium	103	100	P/P	80 - 120
2200690	Calcium	91.8		P	80 - 120
2200690	Iron	108	102	P/P	80 - 120
2200690	Magnesium	109	102	P/P	80 - 120
2200690	Potassium	108	101	P/P	80 - 120
2200690	Sodium	110	102	P/P	80 - 120
2200690	Zinc	99.7	98.6	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388584

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2200690	Aluminum	102	104	P/P	80 - 120
2200690	Antimony	97.5	99.3	P/P	80 - 120
2200690	Arsenic	97.2	98.6	P/P	80 - 120
2200690	Beryllium	101	103	P/P	80 - 120
2200690	Boron	92.8	94.1	P/P	80 - 120
2200690	Cadmium	95.7	97.5	P/P	80 - 120
2200690	Chromium	100	101	P/P	80 - 120
2200690	Copper	103	104	P/P	80 - 120
2200690	Lead	91.9	93.9	P/P	80 - 120
2200690	Nickel	105	104	P/P	80 - 120
2200690	Selenium	95.2	94.8	P/P	80 - 120
2200690	Silver	105	105	P/P	80 - 120
2200690	Thallium	108	111	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388999

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201191	Chloride	98.2		P	90 - 110
2201344	Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389001

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201191	Sulfate	97.2		P	90 - 110
2201344	Sulfate	94.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388833

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201180	Ammonia-N	97.4	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388661

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201192	Kjeldahl Nitrogen	108	114	P/F	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201184	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388639

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201058	Total-P	106	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388601

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201185	O-Phosphate-P	100	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P388954

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201247	Fluoride	95.4	97.7	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P388725

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201026	Organic Carbon	105		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P388594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201412	Turbidity	3.00	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388584

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200690	Barium	2.42	Spike	P	0 - 20
2200690	Calcium	2.90	Spike	P	0 - 20
2200690	Iron	6.13	Spike	P	0 - 20
2200690	Magnesium	5.38	Spike	P	0 - 20
2200690	Potassium	6.84	Spike	P	0 - 20
2200690	Sodium	4.72	Spike	P	0 - 20
2200690	Zinc	0.950	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388584

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2200690	Aluminum	2.00	Spike	P	0 - 20
2200690	Antimony	1.86	Spike	P	0 - 20
2200690	Arsenic	1.37	Spike	P	0 - 20
2200690	Beryllium	1.74	Spike	P	0 - 20
2200690	Boron	1.25	Spike	P	0 - 20
2200690	Cadmium	1.89	Spike	P	0 - 20
2200690	Chromium	1.02	Spike	P	0 - 20
2200690	Copper	0.489	Spike	P	0 - 20
2200690	Lead	2.09	Spike	P	0 - 20
2200690	Nickel	1.11	Spike	P	0 - 20
2200690	Selenium	0.398	Spike	P	0 - 20
2200690	Silver	0.116	Spike	P	0 - 20
2200690	Thallium	2.84	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388999

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201191	Chloride	0.317	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389001

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201191	Sulfate	0.602	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388833

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201180	Ammonia-N	2.57	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201192	Kjeldahl Nitrogen	4.03	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201184	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388639

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201058	Total-P	1.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388601

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201185	O-Phosphate-P	1.29	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P388683

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201247	Color (true)	0.271	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P388940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201247	Total Alkalinity	1.94	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P389264

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201248	TDS	5.93	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P388954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201247	Fluoride	1.47	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P388725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201026	Organic Carbon	0.540	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A101481
Included Lab Sample IDs: 2201239

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A101491
Included Lab Sample IDs: 2201238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	102	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A101494
Included Lab Sample IDs: 2201240

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.5	100	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A101521
Included Lab Sample IDs: 2201238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	105	P/P	90 - 115

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A101528
Included Lab Sample IDs: 2201244

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	99.8	P/P	90 - 110
Calcium	102	99.0	P/P	90 - 110
Iron	102	100	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	101	98.8	P/P	90 - 110
Sodium	101	99.1	P/P	90 - 110
Zinc	103	101	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A101541
Included Lab Sample IDs: 2201239

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101547
Included Lab Sample IDs: 2201239

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	105	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101552
Included Lab Sample IDs: 2201239

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	95.9	95.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A101572
Included Lab Sample IDs: 2201239

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	98.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101573
Included Lab Sample IDs: 2201244

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	93.8	93.3	P/P	90 - 110
Arsenic	92.7	92.0	P/P	90 - 110
Boron	91.6	94.6	P/P	90 - 110
Cadmium	92.0	91.9	P/P	90 - 110
Chromium	94.4	94.1	P/P	90 - 110
Lead	91.2	91.5	P/P	90 - 110
Selenium	90.4	91.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101576
Included Lab Sample IDs: 2201244

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.6	97.8	P/P	90 - 110
Beryllium	94.6	93.1	P/P	90 - 110
Copper	97.4	96.6	P/P	90 - 110
Nickel	97.5	96.6	P/P	90 - 110
Silver	104	103	P/P	90 - 110
Thallium	97.9	96.8	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A101630
Included Lab Sample IDs: 2201238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.8	104	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A101630
Included Lab Sample IDs: 2201238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A101649
Included Lab Sample IDs: 2201238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.6	P/P	90 - 110
Sulfate	99.9	98.5	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					3.00	
EPA 200.7 Rev. 4.4	Barium	102	103	100			2.42
	Calcium	103	91.8				2.90
	Iron	104	108	102			6.13
	Magnesium	104	109	102			5.38
	Potassium	100	108	101			6.84
	Sodium	103	110	102			4.72
	Zinc	101	99.7	98.6			0.950
EPA 200.8 Rev. 5.4	Aluminum	106	102	104			2.00
	Antimony	96.6	97.5	99.3			1.86
	Arsenic	98.1	97.2	98.6			1.37
	Beryllium	99.8	101	103			1.74
	Boron	92.4	92.8	94.1			1.25
	Cadmium	93.4	95.7	97.5			1.89
	Chromium	99.3	100	101			1.02
	Copper	105	103	104			0.489
	Lead	93.7	91.9	93.9			2.09
	Nickel	105	105	104			1.11
	Selenium	97.3	95.2	94.8			0.398
	Silver	105	105	105			0.116
	Thallium	109	108	111			2.84
EPA 300.0 Rev. 2.1	Chloride	100	98.2	99.3		0.317	
	Sulfate	97.9	97.2	94.3		0.602	
EPA 350.1 Rev. 2.0	Ammonia-N	102	97.4	101			2.57
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	108	114			4.03
EPA 353.2 Rev. 2.0	NO2NO3-N	101	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	104	106	108			1.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.9	100	102			1.29
SM 2120 B-2011	Color (true)	98.3				0.271	
SM 2320 B-2011	Total Alkalinity	101				1.94	
SM 2540 C-2011	TDS					5.93	
SM 4500 F-C-2011	Fluoride	92.8	95.4	97.7			1.47
SM 5310 B-2011	Organic Carbon	99.6	105				0.540

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2201238
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2201244
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2201244
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2201238
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2201238
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2201239
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2201239
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2201239
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2201239
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2201240
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2201238
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2201238
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2201244

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2201238
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2201238
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2201238
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2201239

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	10/12/2020			10/13/2020 15:29	Yen Ta	2201238
EPA 200.7 Rev. 4.4	10/12/2020	10/13/2020 13:50	Elliott D. Healy	10/14/2020 18:58	Betina Topolski	2201244
EPA 200.8 Rev. 5.4	10/12/2020	10/13/2020 13:50	Elliott D. Healy	10/16/2020 19:01	Alexander Thompson	2201244
	10/12/2020	10/13/2020 13:50	Elliott D. Healy	10/18/2020 15:45	Alexander Thompson	2201244
EPA 300.0 Rev. 2.1	10/12/2020			10/20/2020 18:57	Lipi Saha	2201238
EPA 350.1 Rev. 2.0	10/12/2020			10/17/2020 15:06	Ping Hua	2201239
EPA 351.2 Rev. 2.0	10/12/2020	10/14/2020 12:30	David Boose	10/15/2020 17:37	Julia Storbeck	2201239
EPA 353.2 Rev. 2.0	10/12/2020			10/13/2020 10:11	Beverly Y. Sanders	2201239
EPA 365.1 Rev. 2.0	10/12/2020	10/14/2020 12:45	Yen Ta	10/15/2020 15:59	Lipi Saha	2201239
EPA 365.1 Rev. 2.0 dissolved	10/12/2020			10/13/2020 15:41	Blanca Fach	2201240
SM 2120 B-2011	10/12/2020			10/13/2020 17:49	Madeline Gruver	2201238
SM 2320 B-2011	10/12/2020			10/19/2020 20:10	Samantha Davila	2201238
SM 2340B	10/12/2020			10/14/2020 18:58	Betina Topolski	2201244
SM 2540 C-2011	10/12/2020			10/15/2020 15:25	Yijie Li	2201238
SM 2540 D-2011	10/12/2020			10/15/2020 15:25	Yijie Li	2201238
SM 4500 F-C-2011	10/12/2020			10/19/2020 20:10	Samantha Davila	2201238
SM 5310 B-2011	10/12/2020			10/15/2020 04:43	Madeline Gruver	2201239