

Chemical Analysis Report

CEN-DIST-2020-12-09-02

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

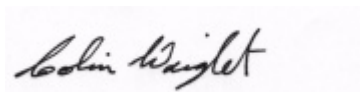
Event Description: **Spruce Creek**
Request ID: **RQ-2020-09-21-57**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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Orlando, FL 32803-3767
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Certified by: Colin Wright, Program Administrator

Date Certified: 29-DEC-2020 16:03

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular background.

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: Spruce Creek @ 120m DS of Spruce Creek Blvd Collection Date/Time: 12/08/2020 12:20

Field ID: G5CE0129

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2211720	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P390933	
	EPA 300.0 Rev. 2.1	Chloride	30		mg Cl/L	P391016	
		Sulfate	4.1		mg SO4/L	P391017	
		Color (true)	500		PCU	P390946	
	SM 2320 B-2011	Total Alkalinity	58		mg CaCO3/L	P391137	
	SM 2540 C-2011	TDS	171	A	mg/L	P391518	
	SM 2540 D-2011	TSS	3	IA	mg/L	P391523	
	SM 4500 F-C-2011	Fluoride	0.060	I	mg F/L	P391030	
2211721	EPA 350.1 Rev. 2.0	Ammonia-N	0.072		mg N/L	P391082	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P391117	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.055		mg N/L	P390962	
	EPA 365.1 Rev. 2.0	Total-P	0.058		mg P/L	P391616	
	SM 5310 B-2011	Organic Carbon	37		mg C/L	P391061	
2211722	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.042		mg P/L	P390931	
2211724	EPA 200.7 Rev. 4.4	Barium	14.7		ug/L	P390978	
		Calcium	27.4		mg/L	P390978	
		Iron	1.24E+03		ug/L	P390978	
		Magnesium	3.09		mg/L	P390978	
		Potassium	1.4		mg/L	P390978	
		Sodium	16.8		mg/L	P390978	
		Zinc	5.0	U	ug/L	P390978	
	EPA 200.8 Rev. 5.4	Aluminum	399		ug/L	P390978	
		Antimony	0.060	I	ug/L	P390978	
		Arsenic	0.63		ug/L	P390978	
		Beryllium	0.030	I	ug/L	P390978	
		Boron**	30.6		ug/L	P390978	
		Cadmium	0.020	U	ug/L	P390978	
		Chromium	0.85	I	ug/L	P390978	
		Copper	0.46	I	ug/L	P390978	
		Lead	0.48		ug/L	P390978	
		Nickel	0.52	I	ug/L	P390978	
		Selenium	0.20	U	ug/L	P390978	
		Silver	0.010	U	ug/L	P390978	
		Thallium	0.10	U	ug/L	P390978	
	SM 2340B	Hardness	81.1		mg/L	P390978	

Ref. Method and Comment:

SM 2120 B-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P390933

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390978

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: P390978

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: P391016

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391017

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391082

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: P391117

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390962

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391616

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390931

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

Reference Method: SM 2120 B-2011
Batch ID: P390946

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P391137

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

Reference Method: SM 2540 C-2011
Batch ID: P391518

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P391523

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P391030

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: P391061

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: P390978

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	93.0		P	85 - 115
Calcium	93.4		P	85 - 115
Iron	95.0		P	85 - 115
Magnesium	91.7		P	85 - 115
Potassium	90.8		P	85 - 115
Sodium	91.7		P	85 - 115
Zinc	91.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390978

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	97.6		P	85 - 115
Beryllium	102		P	85 - 115
Boron	95.6		P	85 - 115
Cadmium	94.2		P	85 - 115
Chromium	100		P	85 - 115
Copper	93.1		P	85 - 115
Lead	99.7		P	85 - 115
Nickel	92.6		P	85 - 115
Selenium	95.5		P	85 - 115
Silver	107		P	85 - 115
Thallium	98.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391016

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391017

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391082

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391117

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390962

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: P391616

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390931

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

Reference Method: SM 2120 B-2011
Batch ID: P390946

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P391137

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P391030

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.6		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P391061

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390978

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211689	Barium	100		P	80 - 120
2211689	Calcium	102		P	80 - 120
2211689	Iron	106		P	80 - 120
2211689	Magnesium	104		P	80 - 120
2211689	Potassium	106		P	80 - 120
2211689	Sodium	106		P	80 - 120
2211689	Zinc	98.2		P	80 - 120
2211748	Barium	97.6	97.7	P/P	80 - 120
2211748	Calcium	98.9		P	80 - 120
2211748	Iron	101	101	P/P	80 - 120
2211748	Magnesium	96.9		P	80 - 120
2211748	Potassium	95.0	95.8	P/P	80 - 120
2211748	Sodium	98.6		P	80 - 120
2211748	Zinc	93.3	92.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390978

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211689	Aluminum	99.2		P	80 - 120
2211689	Antimony	106		P	80 - 120
2211689	Arsenic	98.3		P	80 - 120
2211689	Beryllium	103		P	80 - 120
2211689	Boron	95.3		P	80 - 120
2211689	Cadmium	98.1		P	80 - 120
2211689	Chromium	101		P	80 - 120
2211689	Copper	91.3		P	80 - 120
2211689	Lead	103		P	80 - 120
2211689	Nickel	92.8		P	80 - 120
2211689	Selenium	93.3		P	80 - 120
2211689	Silver	107		P	80 - 120
2211689	Thallium	102		P	80 - 120
2211748	Aluminum	102	101	P/P	80 - 120
2211748	Antimony	105	105	P/P	80 - 120
2211748	Arsenic	97.8	97.5	P/P	80 - 120
2211748	Beryllium	103	103	P/P	80 - 120
2211748	Boron	95.9	97.9	P/P	80 - 120
2211748	Cadmium	95.6	95.6	P/P	80 - 120
2211748	Chromium	100	101	P/P	80 - 120
2211748	Copper	93.2	93.4	P/P	80 - 120
2211748	Lead	102	102	P/P	80 - 120
2211748	Nickel	93.4	93.3	P/P	80 - 120
2211748	Selenium	95.2	93.5	P/P	80 - 120
2211748	Silver	108	108	P/P	80 - 120
2211748	Thallium	102	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391016

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211305	Chloride	99.0		P	90 - 110
2211680	Chloride	97.7		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391017

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211305	Sulfate	99.6		P	90 - 110
2211680	Sulfate	98.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391082

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211323	Ammonia-N	96.6	96.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211705	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391616

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2213256	Total-P	106	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211955	O-Phosphate-P	102	104	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P391030

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211963	Fluoride	98.4	96.4	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P391061

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211954	Organic Carbon	99.5	99.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P390933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211680	Turbidity	6.04	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390978

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211748	Barium	0.0413	Spike	P	0 - 20
2211748	Calcium	0.315	Spike	P	0 - 20
2211748	Iron	0.123	Spike	P	0 - 20
2211748	Magnesium	0.406	Spike	P	0 - 20
2211748	Potassium	0.616	Spike	P	0 - 20
2211748	Sodium	1.51	Spike	P	0 - 20
2211748	Zinc	0.682	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390978

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211748	Aluminum	1.02	Spike	P	0 - 20
2211748	Antimony	0.161	Spike	P	0 - 20
2211748	Arsenic	0.333	Spike	P	0 - 20
2211748	Beryllium	0.386	Spike	P	0 - 20
2211748	Boron	1.69	Spike	P	0 - 20
2211748	Cadmium	0.00906	Spike	P	0 - 20
2211748	Chromium	0.837	Spike	P	0 - 20
2211748	Copper	0.263	Spike	P	0 - 20
2211748	Lead	0.105	Spike	P	0 - 20
2211748	Nickel	0.136	Spike	P	0 - 20
2211748	Selenium	1.84	Spike	P	0 - 20
2211748	Silver	0.111	Spike	P	0 - 20
2211748	Thallium	0.288	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391016

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211680	Chloride	0.649	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391017

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211680	Sulfate	0.178	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391082

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211323	Ammonia-N	0.207	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391117

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210786	Kjeldahl Nitrogen	1.50	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211705	NO2NO3-N	0.499	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391616

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2213256	Total-P	2.20	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211955	O-Phosphate-P	1.17	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P391137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2212395	Total Alkalinity	1.88	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P391518

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211720	TDS	2.34	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P391030

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211963	Fluoride	1.43	Spike	P	0 - 2.8

Quality Assurance Report Precision

Reference Method: SM 5310 B-2011
Batch ID: P391061

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211954	Organic Carbon	0.0	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A102455

Included Lab Sample IDs: 2211720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.6	100	P/P	90 - 110
Sulfate	99.1	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A102499

Included Lab Sample IDs: 2211722

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A102500

Included Lab Sample IDs: 2211720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	104	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A102508

Included Lab Sample IDs: 2211720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	104	P/P	85 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A102515

Included Lab Sample IDs: 2211721

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

Reference Method: SM 4500 F-C-2011

Run ID: A102541

Included Lab Sample IDs: 2211720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	99.5	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A102548

Included Lab Sample IDs: 2211721

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.1	98.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A102553

Included Lab Sample IDs: 2211721

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	95.8	93.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A102556

Included Lab Sample IDs: 2211724

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.9	98.2	P/P	90 - 110
Calcium	98.6	97.5	P/P	90 - 110
Iron	98.0	97.7	P/P	90 - 110
Magnesium	96.0	95.9	P/P	90 - 110
Potassium	93.9	94.3	P/P	90 - 110
Sodium	97.6	96.3	P/P	90 - 110
Zinc	100	98.2	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A102580

Included Lab Sample IDs: 2211720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A102598

Included Lab Sample IDs: 2211721

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.1	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102629

Included Lab Sample IDs: 2211724

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	99.2	100	P/P	90 - 110
Arsenic	96.3	96.1	P/P	90 - 110
Beryllium	105	104	P/P	90 - 110
Boron	100	101	P/P	90 - 110
Cadmium	95.6	96.4	P/P	90 - 110
Chromium	101	101	P/P	90 - 110
Copper	92.2	91.6	P/P	90 - 110
Lead	98.9	98.3	P/P	90 - 110
Nickel	91.6	91.0	P/P	90 - 110
Selenium	95.5	95.6	P/P	90 - 110
Silver	102	103	P/P	90 - 110
Thallium	102	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102654

Included Lab Sample IDs: 2211724

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.7	97.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A102758

Included Lab Sample IDs: 2211721

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	101	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			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						6.04	
EPA 200.7 Rev. 4.4	Barium	93.0	100	97.6	97.7			0.0413
	Calcium	93.4	102	98.9				0.315
	Iron	95.0	106	101	101			0.123
	Magnesium	91.7	104	96.9				0.406
	Potassium	90.8	106	95.0	95.8			0.616
	Sodium	91.7	106	98.6				1.51
	Zinc	91.5	98.2	93.3	92.7			0.682
EPA 200.8 Rev. 5.4	Aluminum	100	102	101	99.2			1.02
	Antimony	103	105	105	106			0.161
	Arsenic	97.6	97.8	97.5	98.3			0.333
	Beryllium	102	103	103	103			0.386
	Boron	95.6	95.9	97.9	95.3			1.69
	Cadmium	94.2	95.6	95.6	98.1			0.0090
	Chromium	100	100	101	101			0.837
	Copper	93.1	93.2	93.4	91.3			0.263
	Lead	99.7	102	102	103			0.105
	Nickel	92.6	93.4	93.3	92.8			0.136
	Selenium	95.5	95.2	93.5	93.3			1.84
	Silver	107	108	108	107			0.111
	Thallium	98.7	102	102	102			0.288
EPA 300.0 Rev. 2.1	Chloride	98.3	97.7	99.0			0.649	
	Sulfate	99.1	98.0	99.6			0.178	
EPA 350.1 Rev. 2.0	Ammonia-N	97.2	96.6	96.8				0.207
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106						1.50
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	100	100				0.499
EPA 365.1 Rev. 2.0	Total-P	101	106	103				2.20
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	102	104				1.17
SM 2120 B-2011	Color (true)	101						
SM 2320 B-2011	Total Alkalinity	103					1.88	
SM 2540 C-2011	TDS						2.34	
SM 4500 F-C-2011	Fluoride	95.6	98.4	96.4				1.43
SM 5310 B-2011	Organic Carbon	99.2	99.5	99.5				0.0

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2211720
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2211724
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2211724
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2211720
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2211720
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2211721
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2211721
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2211721
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2211721
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2211722
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2211720
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2211720
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2211724

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2211720
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2211720
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2211720
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2211721

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	12/09/2020			12/09/2020 15:09	Yen Ta	2211720
EPA 200.7 Rev. 4.4	12/09/2020	12/10/2020 15:00	Elliott D. Healy	12/11/2020 17:42	Betina Topolski	2211724
EPA 200.8 Rev. 5.4	12/09/2020	12/10/2020 15:00	Elliott D. Healy	12/16/2020 19:56	Alexander Thompson	2211724
	12/09/2020	12/10/2020 15:00	Elliott D. Healy	12/17/2020 18:34	Alexander Thompson	2211724
EPA 300.0 Rev. 2.1	12/09/2020			12/10/2020 21:05	Lipi Saha	2211720
EPA 350.1 Rev. 2.0	12/09/2020			12/13/2020 16:40	Ping Hua	2211721
EPA 351.2 Rev. 2.0	12/09/2020	12/14/2020 13:26	Yen Ta	12/15/2020 14:32	Julia Storbeck	2211721
EPA 353.2 Rev. 2.0	12/09/2020			12/10/2020 10:30	Beverly Y. Sanders	2211721
EPA 365.1 Rev. 2.0	12/09/2020	12/22/2020 13:26	Yen Ta	12/23/2020 12:50	Benjamin T. Nordmann	2211721
EPA 365.1 Rev. 2.0 dissolved	12/09/2020			12/09/2020 14:42	Blanca Fach	2211722
SM 2120 B-2011	12/09/2020			12/09/2020 17:35	Benjamin T. Nordmann	2211720
SM 2320 B-2011	12/09/2020			12/15/2020 00:21	Dale L. Simmons	2211720
SM 2340B	12/09/2020			12/11/2020 17:42	Betina Topolski	2211724
SM 2540 C-2011	12/09/2020			12/14/2020 14:56	Yijie Li	2211720
SM 2540 D-2011	12/09/2020			12/14/2020 15:56	Yijie Li	2211720
SM 4500 F-C-2011	12/09/2020			12/10/2020 18:41	Dale L. Simmons	2211720
SM 5310 B-2011	12/09/2020			12/10/2020 23:48	Madeline Gruver	2211721