Chemical Analysis Report

CEN-DIST-2020-10-15-02

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

Event Description: **Puzzle Lake Drain/Ruth/Florence**
Request ID: **RQ-2020-09-14-38**
Customer: **CEN-DIST**
Project ID: **SMP**

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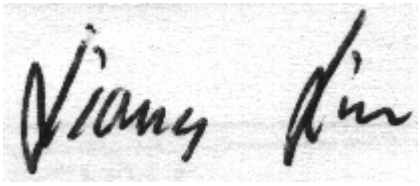
Date Certified: 05-NOV-2020 09:30



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: Saint Johns River @ 200m Downstream of Hatbill Park Ramp

Collection Date/Time: 10/14/2020 12:10

Field ID: G3CE0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2202378	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P388742	
	EPA 300.0 Rev. 2.1	Chloride	160		mg Cl/L	P389332	
		Sulfate	16		mg SO4/L	P389335	
	SM 2120 B-2011	Color (true)	330		PCU	P388749	
	SM 2320 B-2011	Total Alkalinity	58		mg CaCO3/L	P388942	
	SM 2540 C-2011	TDS	441		mg/L	P389038	
	SM 2540 D-2011	TSS	2	I	mg/L	P388971	
	SM 4500 F-C-2011	Fluoride	0.088	I	mg F/L	P388956	
2202379	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P388844	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P389044	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388887	
	EPA 365.1 Rev. 2.0	Total-P	0.073		mg P/L	P388791	
	SM 5310 B-2011	Organic Carbon	28		mg C/L	P388946	
2202380	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.037		mg P/L	P388745	
2202387	EPA 200.7 Rev. 4.4	Barium	20.2		ug/L	P388890	
		Calcium	32.5		mg/L	P388890	
		Iron	780		ug/L	P388890	
		Magnesium	10.6		mg/L	P388890	
		Potassium	3.6		mg/L	P388890	
		Sodium	84.3		mg/L	P388890	
		Zinc	5.0	U	ug/L	P388890	
	EPA 200.8 Rev. 5.4	Aluminum	49		ug/L	P388890	
		Antimony	0.054	I	ug/L	P388890	
		Arsenic	0.70		ug/L	P388890	
		Beryllium	0.012	I	ug/L	P388890	
		Boron**	45.8		ug/L	P388890	
		Cadmium	0.020	U	ug/L	P388890	
		Chromium	0.40	U	ug/L	P388890	
		Copper	0.40	U	ug/L	P388890	
		Lead	0.20	U	ug/L	P388890	
		Nickel	0.50	U	ug/L	P388890	
		Selenium	0.20	U	ug/L	P388890	
		Silver	0.010	U	ug/L	P388890	
		Thallium	0.10	U	ug/L	P388890	
	SM 2340B	Hardness	125		mg/L	P388890	

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

Sample Location: Ruth Lake @ Center **Collection Date/Time: 10/14/2020 12:30**

Field ID: G3CE0021 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2202381	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P388742	
	EPA 300.0 Rev. 2.1	Chloride	190		mg Cl/L	P389332	
		Sulfate	19		mg SO4/L	P389335	
	SM 2120 B-2011	Color (true)	330		PCU	P388749	
	SM 2320 B-2011	Total Alkalinity	55		mg CaCO3/L	P388942	
	SM 2540 C-2011	TDS	495		mg/L	P389038	
	SM 2540 D-2011	TSS	2	U	mg/L	P388971	
	SM 4500 F-C-2011	Fluoride	0.080	I	mg F/L	P388956	
2202382	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P388844	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P389044	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388887	
	EPA 365.1 Rev. 2.0	Total-P	0.047		mg P/L	P388791	
	SM 5310 B-2011	Organic Carbon	27		mg C/L	P388946	
2202383	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.017		mg P/L	P388745	

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P388742

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388890

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: P388890

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: P389332

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389335

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388844

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: P389044

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388887

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388791

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388745

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

Reference Method: SM 2120 B-2011
Batch ID: P388749

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P388942

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

Reference Method: SM 2540 C-2011
Batch ID: P389038

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P388971

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P388956

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: P388946

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: P388890

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	103		P	85 - 115
Calcium	105		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	101		P	85 - 115
Sodium	105		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388890

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	106		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	102		P	85 - 115
Boron	102		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	97.9		P	85 - 115
Copper	97.3		P	85 - 115
Lead	96.3		P	85 - 115
Nickel	98.8		P	85 - 115
Selenium	96.7		P	85 - 115
Silver	96.9		P	85 - 115
Thallium	98.2		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389332

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389335

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388844

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389044

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388887

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388791

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	109		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388745

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.7		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P388749

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P388942

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.4		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P388956

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P388946

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388890

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2202129	Barium	102	99.6	P/P	80 - 120
2202129	Calcium	105		P	80 - 120
2202129	Iron	106	103	P/P	80 - 120
2202129	Magnesium	105	101	P/P	80 - 120
2202129	Potassium	102	97.4	P/P	80 - 120
2202129	Sodium	104	98.0	P/P	80 - 120
2202129	Zinc	102	98.2	P/P	80 - 120
2203019	Barium	102		P	80 - 120
2203019	Calcium	105		P	80 - 120
2203019	Iron	106		P	80 - 120
2203019	Magnesium	105		P	80 - 120
2203019	Potassium	100		P	80 - 120
2203019	Sodium	99.8		P	80 - 120
2203019	Zinc	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388890

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2202129	Aluminum	106	103	P/P	80 - 120
2202129	Antimony	104	103	P/P	80 - 120
2202129	Arsenic	103	101	P/P	80 - 120
2202129	Beryllium	105	102	P/P	80 - 120
2202129	Boron	101	101	P/P	80 - 120
2202129	Cadmium	105	103	P/P	80 - 120
2202129	Chromium	102	99.7	P/P	80 - 120
2202129	Copper	98.6	96.5	P/P	80 - 120
2202129	Lead	97.4	95.6	P/P	80 - 120
2202129	Nickel	99.8	98.1	P/P	80 - 120
2202129	Selenium	99.2	97.6	P/P	80 - 120
2202129	Silver	98.5	98.2	P/P	80 - 120
2202129	Thallium	99.8	98.8	P/P	80 - 120
2203019	Aluminum	105		P	80 - 120
2203019	Antimony	105		P	80 - 120
2203019	Arsenic	103		P	80 - 120
2203019	Beryllium	109		P	80 - 120
2203019	Boron	104		P	80 - 120
2203019	Cadmium	104		P	80 - 120
2203019	Chromium	99.4		P	80 - 120
2203019	Copper	96.1		P	80 - 120
2203019	Lead	97.2		P	80 - 120
2203019	Nickel	98.1		P	80 - 120
2203019	Selenium	97.5		P	80 - 120
2203019	Silver	97.2		P	80 - 120
2203019	Thallium	99.6		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389332

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201843	Chloride	101		P	90 - 110
2202392	Chloride	103		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389335

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2201843	Sulfate	102		P	90 - 110
2202392	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388844

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2202309	Ammonia-N	101	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2202400	Kjeldahl Nitrogen	106	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388887

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2202308	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2202379	Total-P	109	110	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388745

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2202128	O-Phosphate-P	97.5	98.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P388956

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2202126	Fluoride	103	104	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P388946

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2202003	Organic Carbon	101		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P388742

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202390	Turbidity	1.34	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388890

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202129	Barium	2.69	Spike	P	0 - 20
2202129	Calcium	2.03	Spike	P	0 - 20
2202129	Iron	2.66	Spike	P	0 - 20
2202129	Magnesium	2.18	Spike	P	0 - 20
2202129	Potassium	3.81	Spike	P	0 - 20
2202129	Sodium	4.49	Spike	P	0 - 20
2202129	Zinc	4.03	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388890

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202129	Aluminum	2.60	Spike	P	0 - 20
2202129	Antimony	1.09	Spike	P	0 - 20
2202129	Arsenic	1.65	Spike	P	0 - 20
2202129	Beryllium	2.75	Spike	P	0 - 20
2202129	Boron	0.0210	Spike	P	0 - 20
2202129	Cadmium	2.31	Spike	P	0 - 20
2202129	Chromium	2.02	Spike	P	0 - 20
2202129	Copper	2.22	Spike	P	0 - 20
2202129	Lead	1.93	Spike	P	0 - 20
2202129	Nickel	1.67	Spike	P	0 - 20
2202129	Selenium	1.67	Spike	P	0 - 20
2202129	Silver	0.288	Spike	P	0 - 20
2202129	Thallium	1.02	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389332

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201843	Chloride	0.549	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389335

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2201843	Sulfate	0.477	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388844

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202309	Ammonia-N	0.0671	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202400	Kjeldahl Nitrogen	0.658	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388887

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202308	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202379	Total-P	1.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388745

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202128	O-Phosphate-P	0.637	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P388749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202393	Color (true)	1.01	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P388942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202126	Total Alkalinity	7.08	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P389038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202306	TDS	0.0	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P388956

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202126	Fluoride	0.479	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P388946

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2202003	Organic Carbon	0.0998	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A101544
Included Lab Sample IDs: 2202378, 2202381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A101545
Included Lab Sample IDs: 2202380, 2202383

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.5	99.2	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A101546
Included Lab Sample IDs: 2202378, 2202381

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A101575
Included Lab Sample IDs: 2202379, 2202382

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A101590
Included Lab Sample IDs: 2202379, 2202382

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101602
Included Lab Sample IDs: 2202379

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

Reference Method: SM 2320 B-2011
Run ID: A101630
Included Lab Sample IDs: 2202378, 2202381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.5	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A101630
Included Lab Sample IDs: 2202378, 2202381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	97.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2011
Run ID: A101631
Included Lab Sample IDs: 2202379, 2202382

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.4	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101633
Included Lab Sample IDs: 2202382

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	92.5	93.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A101646
Included Lab Sample IDs: 2202387

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	102	P/P	90 - 110
Calcium	104	105	P/P	90 - 110
Iron	102	104	P/P	90 - 110
Magnesium	102	104	P/P	90 - 110
Potassium	100	102	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Zinc	105	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101691
Included Lab Sample IDs: 2202379, 2202382

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101777
Included Lab Sample IDs: 2202387

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	99.5	101	P/P	90 - 110
Arsenic	101	99.3	P/P	90 - 110
Beryllium	105	102	P/P	90 - 110
Boron	101	102	P/P	90 - 110
Cadmium	100	99.5	P/P	90 - 110
Chromium	94.6	95.1	P/P	90 - 110
Copper	94.9	94.6	P/P	90 - 110
Lead	96.8	95.4	P/P	90 - 110
Nickel	96.2	95.5	P/P	90 - 110
Selenium	99.2	98.5	P/P	90 - 110
Silver	99.9	99.8	P/P	90 - 110
Thallium	92.6	92.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A101798
Included Lab Sample IDs: 2202378, 2202381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Sulfate	102	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101828
Included Lab Sample IDs: 2202387

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	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			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						1.34	
EPA 200.7 Rev. 4.4	Barium	103	102	99.6	102			2.69
	Calcium	105	105	105				2.03
	Iron	105	106	103	106			2.66
	Magnesium	105	105	101	105			2.18
	Potassium	101	102	97.4	100			3.81
	Sodium	105	104	98.0	99.8			4.49
	Zinc	102	102	98.2	100			4.03
EPA 200.8 Rev. 5.4	Aluminum	106	106	103	105			2.60
	Antimony	103	104	103	105			1.09
	Arsenic	102	103	101	103			1.65
	Beryllium	102	105	102	109			2.75
	Boron	102	101	101	104			0.0210
	Cadmium	103	105	103	104			2.31
	Chromium	97.9	102	99.7	99.4			2.02
	Copper	97.3	96.1	98.6	96.5			2.22
	Lead	96.3	97.4	95.6	97.2			1.93
	Nickel	98.8	99.8	98.1	98.1			1.67
	Selenium	96.7	99.2	97.6	97.5			1.67
	Silver	96.9	98.5	98.2	97.2			0.288
	Thallium	98.2	99.8	98.8	99.6			1.02
EPA 300.0 Rev. 2.1	Chloride	101	101	103			0.549	
	Sulfate	102	102	104			0.477	
EPA 350.1 Rev. 2.0	Ammonia-N	99.9	101	101				0.0671
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	106	107				0.658
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	100				0.0
EPA 365.1 Rev. 2.0	Total-P	109	109	110				1.02
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.7	97.5	98.2				0.637
SM 2120 B-2011	Color (true)	101					1.01	
SM 2320 B-2011	Total Alkalinity	99.4					7.08	
SM 2540 C-2011	TDS						0.0	
SM 4500 F-C-2011	Fluoride	96.1	103	104				0.479
SM 5310 B-2011	Organic Carbon	95.6	101					0.0998

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2202378, 2202381
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2202387
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2202387
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2202378, 2202381
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2202378, 2202381
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2202379, 2202382
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2202379, 2202382
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2202379, 2202382
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2202379, 2202382
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2202380, 2202383
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2202378, 2202381
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2202378, 2202381
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2202387

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2202378, 2202381
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2202378, 2202381
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2202378, 2202381
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2202379, 2202382

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	10/15/2020			10/15/2020 15:36	Yen Ta	2202378, 2202381
EPA 200.7 Rev. 4.4	10/15/2020	10/19/2020 13:20	Elliott D. Healy	10/20/2020 16:11	Betina Topolski	2202387
EPA 200.8 Rev. 5.4	10/15/2020	10/19/2020 13:20	Elliott D. Healy	10/26/2020 20:07	Alexander Thompson	2202387
	10/15/2020	10/19/2020 13:20	Elliott D. Healy	10/28/2020 17:19	Alexander Thompson	2202387
EPA 300.0 Rev. 2.1	10/15/2020			10/27/2020 03:28	Lipi Saha	2202378
	10/15/2020			10/27/2020 03:41	Lipi Saha	2202381
EPA 350.1 Rev. 2.0	10/15/2020			10/18/2020 11:32	Ping Hua	2202379
	10/15/2020			10/18/2020 11:34	Ping Hua	2202382
EPA 351.2 Rev. 2.0	10/15/2020	10/21/2020 13:55	David Boose	10/22/2020 13:23	Elliott Rodriguez	2202379
	10/15/2020	10/21/2020 13:55	David Boose	10/22/2020 13:24	Elliott Rodriguez	2202382
EPA 353.2 Rev. 2.0	10/15/2020			10/19/2020 11:32	Beverly Y. Sanders	2202379
	10/15/2020			10/19/2020 11:33	Beverly Y. Sanders	2202382
EPA 365.1 Rev. 2.0	10/15/2020	10/16/2020 14:57	Yen Ta	10/19/2020 15:15	Lipi Saha	2202379
	10/15/2020	10/16/2020 14:57	Yen Ta	10/20/2020 12:08	Shengyu Wang	2202382
EPA 365.1 Rev. 2.0 dissolved	10/15/2020			10/15/2020 15:37	Virginia P. Brown	2202380
	10/15/2020			10/15/2020 15:38	Virginia P. Brown	2202383
SM 2120 B-2011	10/15/2020			10/15/2020 15:29	Blanca Fach	2202378
	10/15/2020			10/15/2020 15:30	Blanca Fach	2202381
SM 2320 B-2011	10/15/2020			10/20/2020 03:49	Samantha Davila	2202378
	10/15/2020			10/20/2020 04:02	Samantha Davila	2202381
SM 2340B	10/15/2020			10/20/2020 16:11	Betina Topolski	2202387
SM 2540 C-2011	10/15/2020			10/16/2020 19:04	Madeline Gruver	2202378, 2202381
SM 2540 D-2011	10/15/2020			10/16/2020 20:07	Madeline Gruver	2202378, 2202381
SM 4500 F-C-2011	10/15/2020			10/20/2020 03:49	Samantha Davila	2202378
	10/15/2020			10/20/2020 04:02	Samantha Davila	2202381
SM 5310 B-2011	10/15/2020			10/19/2020 21:37	Lauren Lees	2202379
	10/15/2020			10/19/2020 21:49	Lauren Lees	2202382