

Chemical Analysis Report

CEN-DIST-2020-09-30-01

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

Event Description: **Lake Marshall + Blank**
Request ID: **RQ-2020-08-24-38**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Kalina Warren

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 19-OCT-2020 13:19



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: Lake Farrar @ Center

Collection Date/Time: 09/29/2020 11:58

Field ID: G4CE0200

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2198888	EPA 180.1 Rev. 2.0	Turbidity	2.9	A	NTU	P388056	
	EPA 300.0 Rev. 2.1	Chloride	24		mg Cl/L	P388095	
		Sulfate	28		mg SO4/L	P388098	
	SM 2120 B-2011	Color (true)	6.5		PCU	P388066	
	SM 2320 B-2011	Total Alkalinity	25	A	mg CaCO3/L	P388140	
	SM 2540 C-2011	TDS	101		mg/L	P388478	
	SM 2540 D-2011	TSS	3	I	mg/L	P388467	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P388143	
2198889	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P388173	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.55		mg N/L	P388117	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.27		mg N/L	P388081	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P388099	
	SM 5310 B-2011	Organic Carbon	4.3		mg C/L	P388190	
2198890	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P388018	

Ref. Method and Comment:

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.

Sample Location: Lake Daisy @ Center

Collection Date/Time: 09/29/2020 13:48

Field ID: G3CE0035

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2198885	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P388056	
	EPA 300.0 Rev. 2.1	Chloride	24		mg Cl/L	P388095	
		Sulfate	26		mg SO4/L	P388098	
	SM 2120 B-2011	Color (true)	18		PCU	P388066	
	SM 2320 B-2011	Total Alkalinity	9.5		mg CaCO3/L	P388139	
	SM 2540 C-2011	TDS	84		mg/L	P388478	
	SM 2540 D-2011	TSS	2	U	mg/L	P388467	
	SM 4500 F-C-2011	Fluoride	0.14		mg F/L	P388142	
2198886	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P388173	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.40		mg N/L	P388116	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388081	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P388099	
	SM 5310 B-2011	Organic Carbon	5.1		mg C/L	P388190	
2198887	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P388018	

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: Twin Lakes @ Center of W Lobe

Collection Date/Time: 09/29/2020 11:30

Field ID: G3CE0037

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2198882	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P388056	
	EPA 300.0 Rev. 2.1	Chloride	3.0		mg Cl/L	P388095	
		Sulfate	0.20	U	mg SO4/L	P388098	
	SM 2120 B-2011	Color (true)	37	A	PCU	P388017	
	SM 2320 B-2011	Total Alkalinity	29		mg CaCO3/L	P388139	
	SM 2540 C-2011	TDS	37		mg/L	P388478	
	SM 2540 D-2011	TSS	2	I	mg/L	P388467	
	SM 4500 F-C-2011	Fluoride	0.082	I	mg F/L	P388142	
2198883	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P388173	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P388116	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388081	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P388099	
	SM 5310 B-2011	Organic Carbon	6.2		mg C/L	P388190	
2198884	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P388018	
2198900	EPA 200.7 Rev. 4.4	Barium	6.3		ug/L	P388048	
		Calcium	11.2		mg/L	P388048	
		Iron	59	I	ug/L	P388048	
		Magnesium	0.75		mg/L	P388048	
		Potassium	1.3		mg/L	P388048	
		Sodium	1.9	I	mg/L	P388048	
		Zinc	5.0	U	ug/L	P388048	
	EPA 200.8 Rev. 5.4	Aluminum	6.4	I	ug/L	P388048	
		Antimony	0.050	U	ug/L	P388048	
		Arsenic	0.41		ug/L	P388048	
		Boron**	11.6		ug/L	P388048	
		Cadmium	0.020	U	ug/L	P388048	
		Chromium	0.40	U	ug/L	P388048	
		Copper	0.40	U	ug/L	P388048	
		Lead	0.20	U	ug/L	P388048	
		Nickel	0.50	U	ug/L	P388048	
		Selenium	0.20	U	ug/L	P388048	
		Silver	0.010	U	ug/L	P388048	
		Thallium	0.10	U	ug/L	P388048	
	SM 2340B	Hardness	31.0		mg/L	P388048	

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: P388056

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388048

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: P388048

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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: P388095

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388098

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388173

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: P388116

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388117

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388081

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388099

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388018

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

Reference Method: SM 2120 B-2011
Batch ID: P388017

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P388066

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P388139

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

Reference Method: SM 2320 B-2011
Batch ID: P388140

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P388478

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P388467

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P388142

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-2011
Batch ID: P388143

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P388190

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: P388048

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	98.8		P	85 - 115
Calcium	105		P	85 - 115
Iron	105		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	102		P	85 - 115
Sodium	105		P	85 - 115
Zinc	94.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P388048

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	101		P	85 - 115
Boron	97.0		P	85 - 115
Cadmium	98.8		P	85 - 115
Chromium	101		P	85 - 115
Copper	102		P	85 - 115
Lead	97.1		P	85 - 115
Nickel	102		P	85 - 115
Selenium	101		P	85 - 115
Silver	96.7		P	85 - 115
Thallium	98.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P388095

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P388098

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P388173

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P388116

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	103		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388117

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	103		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388081

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: P388099

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: P388018

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.5		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P388017

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	95.4		P	85 - 115

Reference Method: SM 2120 B-2011
Batch ID: P388066

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.1		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P388139

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.9		P	93 - 104

Reference Method: SM 2320 B-2011
Batch ID: P388140

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P388142

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.9		P	90 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P388143

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.9		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P388190

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388048

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198834	Barium	106	107	P/P	80 - 120
2198834	Calcium	108	110	P/P	80 - 120
2198834	Iron	108	110	P/P	80 - 120
2198834	Magnesium	107	109	P/P	80 - 120
2198834	Potassium	107	109	P/P	80 - 120
2198834	Sodium	102	105	P/P	80 - 120
2198834	Zinc	100	102	P/P	80 - 120
2198880	Barium	108		P	80 - 120
2198880	Calcium	110		P	80 - 120
2198880	Iron	110		P	80 - 120
2198880	Magnesium	108		P	80 - 120
2198880	Potassium	107		P	80 - 120
2198880	Sodium	108		P	80 - 120
2198880	Zinc	103		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388048

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198834	Aluminum	101	99.2	P/P	80 - 120
2198834	Antimony	103	101	P/P	80 - 120
2198834	Arsenic	103	101	P/P	80 - 120
2198834	Boron	96.3	96.9	P/P	80 - 120
2198834	Cadmium	102	100	P/P	80 - 120
2198834	Chromium	103	101	P/P	80 - 120
2198834	Copper	105	103	P/P	80 - 120
2198834	Lead	99.7	98.3	P/P	80 - 120
2198834	Nickel	106	103	P/P	80 - 120
2198834	Selenium	103	101	P/P	80 - 120
2198834	Silver	99.1	96.2	P/P	80 - 120
2198834	Thallium	102	102	P/P	80 - 120
2198880	Aluminum	100		P	80 - 120
2198880	Antimony	102		P	80 - 120
2198880	Arsenic	100		P	80 - 120
2198880	Boron	100		P	80 - 120
2198880	Cadmium	100		P	80 - 120
2198880	Chromium	101		P	80 - 120
2198880	Copper	100		P	80 - 120
2198880	Lead	97.8		P	80 - 120
2198880	Nickel	99.8		P	80 - 120
2198880	Selenium	98.0		P	80 - 120
2198880	Silver	97.1		P	80 - 120
2198880	Thallium	101		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388095

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198849	Chloride	107	103	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198849	Sulfate	104	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388173

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198889	Ammonia-N	102	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388116

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198883	Kjeldahl Nitrogen	107	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388081

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198877	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388099

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198828	Total-P	103	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388018

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198899	O-Phosphate-P	97.0	97.3	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P388142

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2199001	Fluoride	97.4	96.7	P/P	94 - 107

Reference Method: SM 4500 F-C-2011
Batch ID: P388143

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198888	Fluoride	99.8	99.8	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P388190

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198842	Organic Carbon	104	107	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P388056

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198888	Turbidity	5.22	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P388048

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198834	Barium	0.648	Spike	P	0 - 20
2198834	Calcium	1.71	Spike	P	0 - 20
2198834	Iron	2.09	Spike	P	0 - 20
2198834	Magnesium	2.19	Spike	P	0 - 20
2198834	Potassium	1.62	Spike	P	0 - 20
2198834	Sodium	2.26	Spike	P	0 - 20
2198834	Zinc	1.23	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P388048

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198834	Aluminum	1.09	Spike	P	0 - 20
2198834	Antimony	2.42	Spike	P	0 - 20
2198834	Arsenic	1.50	Spike	P	0 - 20
2198834	Boron	0.516	Spike	P	0 - 20
2198834	Cadmium	1.68	Spike	P	0 - 20
2198834	Chromium	2.42	Spike	P	0 - 20
2198834	Copper	1.75	Spike	P	0 - 20
2198834	Lead	1.38	Spike	P	0 - 20
2198834	Nickel	2.17	Spike	P	0 - 20
2198834	Selenium	1.31	Spike	P	0 - 20
2198834	Silver	3.04	Spike	P	0 - 20
2198834	Thallium	0.0750	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P388095

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198849	Chloride	2.36	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P388098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198849	Sulfate	2.94	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388173

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198889	Ammonia-N	1.50	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388116

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198883	Kjeldahl Nitrogen	1.32	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388117

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2199002	Kjeldahl Nitrogen	8.42	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388081

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198877	NO2NO3-N	0.491	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388099

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198828	Total-P	3.18	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P388018

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198899	O-Phosphate-P	0.309	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P388017

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198882	Color (true)	7.73	Sample	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P388066

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198876	Color (true)	0.486	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
 Batch ID: P388139

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2199001	Total Alkalinity	0.650	Sample	P	0 - 8.1

Reference Method: SM 2320 B-2011
 Batch ID: P388140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198888	Total Alkalinity	0.265	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
 Batch ID: P388478

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198773	TDS	2.55	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
 Batch ID: P388142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2199001	Fluoride	0.470	Spike	P	0 - 2.8

Reference Method: SM 4500 F-C-2011
 Batch ID: P388143

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198888	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
 Batch ID: P388190

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198842	Organic Carbon	1.66	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B-2011

Run ID: A101277

Included Lab Sample IDs: 2198882

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.8	98.1	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A101278

Included Lab Sample IDs: 2198884, 2198887, 2198890

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.3	97.6	P/P	90 - 110
O-Phosphate-P	99.8	98.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A101281

Included Lab Sample IDs: 2198882, 2198885, 2198888

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	107	108	P/P	90 - 110
Sulfate	105	106	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A101292

Included Lab Sample IDs: 2198882, 2198885, 2198888

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.0	99.5	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A101294

Included Lab Sample IDs: 2198885, 2198888

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.2	97.7	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101305

Included Lab Sample IDs: 2198883, 2198886, 2198889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A101330

Included Lab Sample IDs: 2198882, 2198885, 2198888

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	97.8	P/P	90 - 110
Total Alkalinity	98.9	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-2011

Run ID: A101330

Included Lab Sample IDs: 2198882, 2198885, 2198888

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	99.1	P/P	90 - 110
Fluoride	99.1	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101338

Included Lab Sample IDs: 2198883, 2198886, 2198889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.4	99.3	P/P	90 - 110
Kjeldahl Nitrogen	92.7	96.6	P/P	90 - 110
Kjeldahl Nitrogen	99.3	92.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101343

Included Lab Sample IDs: 2198883, 2198886, 2198889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	98.9	P/P	90 - 110
Ammonia-N	98.9	99.1	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A101348

Included Lab Sample IDs: 2198883, 2198886, 2198889

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101366

Included Lab Sample IDs: 2198883, 2198886, 2198889

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	98.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A101368

Included Lab Sample IDs: 2198900

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.5	98.4	P/P	90 - 110
Antimony	102	102	P/P	90 - 110
Arsenic	95.7	96.3	P/P	90 - 110
Boron	99.1	98.3	P/P	90 - 110
Cadmium	96.3	96.2	P/P	90 - 110
Chromium	97.3	95.4	P/P	90 - 110
Copper	95.3	98.6	P/P	90 - 110
Lead	96.1	95.7	P/P	90 - 110
Nickel	95.5	98.1	P/P	90 - 110
Selenium	95.9	96.5	P/P	90 - 110
Silver	96.4	94.7	P/P	90 - 110
Thallium	93.9	92.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A101466

Included Lab Sample IDs: 2198900

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	104	P/P	90 - 110
Calcium	101	104	P/P	90 - 110
Iron	103	105	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	102	103	P/P	90 - 110
Zinc	101	103	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						5.22
EPA 200.7 Rev. 4.4	Barium	98.8	106	107	108		0.648
	Calcium	105	108	110	110		1.71
	Iron	105	108	110	110		2.09
	Magnesium	104	107	109	108		2.19
	Potassium	102	107	109	107		1.62
	Sodium	105	102	105	108		2.26
	Zinc	94.0	100	102	103		1.23
EPA 200.8 Rev. 5.4	Aluminum	101	101	99.2	100		1.09
	Antimony	102	103	101	102		2.42
	Arsenic	101	103	101	100		1.50
	Boron	97.0	96.3	96.9	100		0.516
	Cadmium	98.8	102	100	100		1.68
	Chromium	101	103	101	101		2.42
	Copper	102	105	103	100		1.75
	Lead	97.1	99.7	98.3	97.8		1.38
	Nickel	102	106	103	99.8		2.17
	Selenium	101	103	101	98.0		1.31
	Silver	96.7	99.1	96.2	97.1		3.04
	Thallium	98.8	102	102	101		0.0750
EPA 300.0 Rev. 2.1	Chloride	105	107	103			2.36
	Sulfate	102	104	101			2.94
EPA 350.1 Rev. 2.0	Ammonia-N	101	102	99.5			1.50
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	107	105			1.32
	Kjeldahl Nitrogen	103					8.42
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	102	102			0.491
EPA 365.1 Rev. 2.0	Total-P	109	103	106			3.18
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	97.0	97.3			0.309
SM 2120 B-2011	Color (true)	95.4				7.73	
	Color (true)	97.1				0.486	
SM 2320 B-2011	Total Alkalinity	99.9				0.650	
	Total Alkalinity	100				0.265	
SM 2540 C-2011	TDS					2.55	
SM 4500 F-C-2011	Fluoride	96.9	97.4	96.7			0.470
	Fluoride	96.9	99.8	99.8			0.0
SM 5310 B-2011	Organic Carbon	101	104	107			1.66

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2198882, 2198885, 2198888
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2198900
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2198900
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2198882, 2198885, 2198888
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2198882, 2198885, 2198888
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2198883, 2198886, 2198889
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2198883, 2198886, 2198889
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2198883, 2198886, 2198889
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2198883, 2198886, 2198889
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2198884, 2198887, 2198890

Reference Method Descriptions

Method	Description	Associated Samples
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2198882, 2198885, 2198888
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2198882, 2198885, 2198888
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2198900
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2198882, 2198885, 2198888
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2198882, 2198885, 2198888
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2198882, 2198885, 2198888
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2198883, 2198886, 2198889

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	09/30/2020			09/30/2020 15:18	Yen Ta	2198882, 2198885, 2198888
EPA 200.7 Rev. 4.4	09/30/2020	09/30/2020 15:30	Elliott D. Healy	10/09/2020 14:58	Betina Topolski	2198900
EPA 200.8 Rev. 5.4	09/30/2020	09/30/2020 15:30	Elliott D. Healy	10/05/2020 21:01	Alexander Thompson	2198900
EPA 300.0 Rev. 2.1	09/30/2020			10/01/2020 08:56	Lipi Saha	2198882
	09/30/2020			10/01/2020 09:09	Lipi Saha	2198885
	09/30/2020			10/01/2020 09:22	Lipi Saha	2198888
EPA 350.1 Rev. 2.0	09/30/2020			10/03/2020 13:52	Ping Hua	2198889
	09/30/2020			10/03/2020 14:07	Ping Hua	2198883
	09/30/2020			10/03/2020 14:09	Ping Hua	2198886
EPA 351.2 Rev. 2.0	09/30/2020	10/01/2020 14:05	David Boose	10/02/2020 13:09	Elliott Rodriguez	2198883
	09/30/2020	10/01/2020 14:05	David Boose	10/02/2020 13:31	Elliott Rodriguez	2198886
	09/30/2020	10/01/2020 14:05	David Boose	10/02/2020 13:44	Elliott Rodriguez	2198889
EPA 353.2 Rev. 2.0	09/30/2020			10/01/2020 09:33	Beverly Y. Sanders	2198883
	09/30/2020			10/01/2020 09:34	Beverly Y. Sanders	2198886
	09/30/2020			10/01/2020 09:35	Beverly Y. Sanders	2198889
EPA 365.1 Rev. 2.0	09/30/2020	10/01/2020 12:32	Yen Ta	10/05/2020 14:05	Lipi Saha	2198883
	09/30/2020	10/01/2020 12:32	Yen Ta	10/05/2020 14:06	Lipi Saha	2198886
	09/30/2020	10/01/2020 12:32	Yen Ta	10/05/2020 14:07	Lipi Saha	2198889
EPA 365.1 Rev. 2.0 dissolved	09/30/2020			09/30/2020 11:45	Samantha Davila	2198884
	09/30/2020			09/30/2020 11:46	Samantha Davila	2198887
	09/30/2020			09/30/2020 11:57	Samantha Davila	2198890
SM 2120 B-2011	09/30/2020			09/30/2020 12:05	Madeline Gruver	2198882
	09/30/2020			09/30/2020 16:13	Benjamin T. Nordmann	2198885
	09/30/2020			09/30/2020 16:14	Benjamin T. Nordmann	2198888
SM 2320 B-2011	09/30/2020			10/01/2020 17:21	Dale L. Simmons	2198882
	09/30/2020			10/01/2020 17:34	Dale L. Simmons	2198885
	09/30/2020			10/01/2020 20:54	Dale L. Simmons	2198888
SM 2340B	09/30/2020			10/09/2020 14:58	Betina Topolski	2198900
SM 2540 C-2011	09/30/2020			10/01/2020 15:15	Yijie Li	2198882, 2198885, 2198888
SM 2540 D-2011	09/30/2020			10/01/2020 15:15	Yijie Li	2198882, 2198885, 2198888
SM 4500 F-C-2011	09/30/2020			10/01/2020 17:21	Dale L. Simmons	2198882
	09/30/2020			10/01/2020 17:34	Dale L. Simmons	2198885
	09/30/2020			10/01/2020 20:44	Dale L. Simmons	2198888
SM 5310 B-2011	09/30/2020			10/02/2020 16:43	Lauren Lees	2198883
	09/30/2020			10/02/2020 16:55	Lauren Lees	2198886
	09/30/2020			10/02/2020 17:07	Lauren Lees	2198889