

Chemical Analysis Report

NE-DIST-2020-09-15-01

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

Event Description: **Nassauwannee Lakes**
Request ID: **RQ-2020-08-31-34**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 02-OCT-2020 13:13

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored 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: Palestine Lake Center

Collection Date/Time: 09/14/2020 11:00

Field ID: 19010044

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2196072	EPA 180.1 Rev. 2.0	Turbidity	5.3	A	NTU	P387389	
	EPA 300.0 Rev. 2.1	Chloride	8.2		mg Cl/L	P387638	
		Sulfate	3.8		mg SO4/L	P387640	
	SM 2120 B-2011	Color (true)	65	A	PCU	P387395	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P387504	
	SM 2540 C-2011	TDS	35		mg/L	P387785	
	SM 2540 D-2011	TSS	5	I	mg/L	P387632	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P387505	
2196074	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P387577	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.55		mg N/L	P387486	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P387470	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P387810	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P387676	
2196076	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P387400	
2196083	EPA 200.7 Rev. 4.4	Barium	9.1		ug/L	P387388	
		Calcium	1.69		mg/L	P387388	
		Iron	170		ug/L	P387388	
		Magnesium	1.23		mg/L	P387388	
		Potassium	0.42	I	mg/L	P387388	
		Sodium	4.9		mg/L	P387388	
		Zinc	5.0	U	ug/L	P387388	
	EPA 200.8 Rev. 5.4	Aluminum	127		ug/L	P387388	
		Antimony	0.11	I	ug/L	P387388	
		Arsenic	0.42		ug/L	P387388	
		Boron**	23.2		ug/L	P387388	
		Cadmium	0.020	U	ug/L	P387388	
		Chromium	0.40	U	ug/L	P387388	
		Copper	0.40	U	ug/L	P387388	
		Lead	0.41		ug/L	P387388	
		Nickel	0.50	U	ug/L	P387388	
		Selenium	0.20	U	ug/L	P387388	
		Silver	0.010	U	ug/L	P387388	
		Thallium	0.10	U	ug/L	P387388	
	SM 2340B	Hardness	9.3		mg/L	P387388	

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: Ocean Pond Center

Collection Date/Time: 09/14/2020 12:45

Field ID: 21010011

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2196073	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P387389	
	EPA 300.0 Rev. 2.1	Chloride	7.2		mg Cl/L	P387638	
		Sulfate	1.6		mg SO4/L	P387640	
		Color (true)	110	A	PCU	P387396	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P387504	
	SM 2540 C-2011	TDS	29		mg/L	P387785	
	SM 2540 D-2011	TSS	3	I	mg/L	P387632	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P387505	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P387577	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.42		mg N/L	P387486	
2196075	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P387470	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P387810	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P387676	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	I	mg P/L	P387400	
	dissolved						
2196084	EPA 200.7 Rev. 4.4	Barium	7.6		ug/L	P387388	
		Calcium	1.34		mg/L	P387388	
		Iron	720		ug/L	P387388	
		Magnesium	0.74		mg/L	P387388	
		Potassium	0.30	U	mg/L	P387388	
		Sodium	4.2		mg/L	P387388	
		Zinc	5.0	U	ug/L	P387388	
		Aluminum	301		ug/L	P387388	
		Antimony	0.072	I	ug/L	P387388	
		Arsenic	0.64		ug/L	P387388	
	EPA 200.8 Rev. 5.4	Boron**	17.0		ug/L	P387388	
		Cadmium	0.020	U	ug/L	P387388	
		Chromium	0.40	U	ug/L	P387388	
		Copper	0.40	U	ug/L	P387388	
		Lead	0.71		ug/L	P387388	
		Nickel	0.50	U	ug/L	P387388	
		Selenium	0.20	U	ug/L	P387388	
		Silver	0.010	U	ug/L	P387388	
		Thallium	0.10	U	ug/L	P387388	
		Hardness	6.4		mg/L	P387388	
	SM 2340B						

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.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 09/18/2020.

Sample Location: FB09142020

Collection Date/Time: 09/14/2020 12:50

Field ID: FB09142020

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2196078	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P387389	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P387638	
		Sulfate	0.20	U	mg SO4/L	P387640	
		Color (true)	2.5	U	PCU	P387395	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P387504	
	SM 2540 C-2011	TDS	15	U	mg/L	P387784	
	SM 2540 D-2011	TSS	2	U	mg/L	P387631	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P387505	
2196079	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P387577	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P387486	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P387470	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P387810	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P387677	
2196080	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P387400	
2196085	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P387388	
		Calcium	0.075	U	mg/L	P387388	
		Iron	30	U	ug/L	P387388	
		Magnesium	0.040	U	mg/L	P387388	
		Potassium	0.30	U	mg/L	P387388	
		Sodium	0.50	U	mg/L	P387388	
		Zinc	5.0	U	ug/L	P387388	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P387388	
		Antimony	0.050	U	ug/L	P387388	
		Arsenic	0.050	U	ug/L	P387388	
		Boron**	2.0	U	ug/L	P387388	
		Cadmium	0.020	U	ug/L	P387388	
		Chromium	0.40	U	ug/L	P387388	
		Copper	0.40	U	ug/L	P387388	
		Lead	0.20	U	ug/L	P387388	
		Nickel	0.50	U	ug/L	P387388	
		Selenium	0.20	U	ug/L	P387388	
		Silver	0.010	U	ug/L	P387388	
		Thallium	0.10	U	ug/L	P387388	
		Hardness	0.35	U	mg/L	P387388	
	SM 2340B	Hardness	0.35	U	mg/L	P387388	

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.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P387389

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387388

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: P387388

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: P387638

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387640

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387577

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: P387486

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387470

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387810

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387400

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

Reference Method: SM 2120 B-2011
Batch ID: P387395

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P387396

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P387504

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

Reference Method: SM 2540 C-2011
Batch ID: P387784

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P387785

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P387631

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P387632

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P387505

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P387676

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

Reference Method: SM 5310 B-2011
Batch ID: P387677

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: P387388

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	99.6		P	85 - 115
Iron	102		P	85 - 115
Magnesium	99.1		P	85 - 115
Potassium	98.3		P	85 - 115
Sodium	97.8		P	85 - 115
Zinc	98.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387388

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.0		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	96.7		P	85 - 115
Boron	93.3		P	85 - 115
Cadmium	95.9		P	85 - 115
Chromium	95.8		P	85 - 115
Copper	94.9		P	85 - 115
Lead	96.4		P	85 - 115
Nickel	95.1		P	85 - 115
Selenium	94.1		P	85 - 115
Silver	97.0		P	85 - 115
Thallium	98.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387638

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387640

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387577

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: P387486

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.1		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387470

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: P387810

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387400

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

Reference Method: SM 2120 B-2011
Batch ID: P387395

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.1		P	85 - 115

Reference Method: SM 2120 B-2011
Batch ID: P387396

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	94.9		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P387504

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.0		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P387505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.8		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P387676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.4		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P387677

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387388

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195695	Barium	98.7		P	80 - 120
2195695	Calcium	98.9		P	80 - 120
2195695	Iron	102		P	80 - 120
2195695	Magnesium	95.9		P	80 - 120
2195695	Potassium	96.0		P	80 - 120
2195695	Sodium	95.6		P	80 - 120
2195695	Zinc	98.1		P	80 - 120
2195751	Barium	102	98.7	P/P	80 - 120
2195751	Calcium	97.3		P	80 - 120
2195751	Iron	103	102	P/P	80 - 120
2195751	Magnesium	97.7		P	80 - 120
2195751	Potassium	95.7		P	80 - 120
2195751	Sodium	96.5		P	80 - 120
2195751	Zinc	102	98.1	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387388

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195695	Aluminum	93.8		P	80 - 120
2195695	Antimony	102		P	80 - 120
2195695	Arsenic	96.2		P	80 - 120
2195695	Boron	93.0		P	80 - 120
2195695	Cadmium	97.0		P	80 - 120
2195695	Chromium	95.6		P	80 - 120
2195695	Copper	94.3		P	80 - 120
2195695	Lead	96.5		P	80 - 120
2195695	Nickel	94.9		P	80 - 120
2195695	Selenium	94.9		P	80 - 120
2195695	Silver	94.7		P	80 - 120
2195695	Thallium	99.8		P	80 - 120
2195751	Aluminum	94.0	95.3	P/P	80 - 120
2195751	Antimony	102	104	P/P	80 - 120
2195751	Arsenic	97.5	98.5	P/P	80 - 120
2195751	Boron	92.5	94.9	P/P	80 - 120
2195751	Cadmium	96.0	96.5	P/P	80 - 120
2195751	Chromium	96.7	97.2	P/P	80 - 120
2195751	Copper	95.4	95.7	P/P	80 - 120
2195751	Lead	96.8	98.3	P/P	80 - 120
2195751	Nickel	94.6	95.2	P/P	80 - 120
2195751	Selenium	96.0	95.2	P/P	80 - 120
2195751	Silver	96.2	97.8	P/P	80 - 120
2195751	Thallium	98.6	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387638

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195911	Chloride	95.8		P	90 - 110
2196098	Chloride	95.8		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387640

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195911	Sulfate	95.0		P	90 - 110
2196098	Sulfate	95.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196074	Ammonia-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387470

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195988	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387810

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195988	Total-P	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196006	O-Phosphate-P	99.0	98.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P387505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195911	Fluoride	98.7	98.7	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P387676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2195915	Organic Carbon	99.7	102	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P387677

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196342	Organic Carbon	102	103	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P387389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196072	Turbidity	1.89	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195751	Barium	3.51	Spike	P	0 - 20
2195751	Calcium	0.465	Spike	P	0 - 20
2195751	Iron	1.25	Spike	P	0 - 20
2195751	Magnesium	1.16	Spike	P	0 - 20
2195751	Potassium	0.310	Spike	P	0 - 20
2195751	Sodium	0.497	Spike	P	0 - 20
2195751	Zinc	4.22	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195751	Aluminum	1.40	Spike	P	0 - 20
2195751	Antimony	1.76	Spike	P	0 - 20
2195751	Arsenic	1.00	Spike	P	0 - 20
2195751	Boron	2.09	Spike	P	0 - 20
2195751	Cadmium	0.532	Spike	P	0 - 20
2195751	Chromium	0.565	Spike	P	0 - 20
2195751	Copper	0.343	Spike	P	0 - 20
2195751	Lead	1.50	Spike	P	0 - 20
2195751	Nickel	0.657	Spike	P	0 - 20
2195751	Selenium	0.929	Spike	P	0 - 20
2195751	Silver	1.71	Spike	P	0 - 20
2195751	Thallium	2.97	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387638

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195911	Chloride	0.0194	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387640

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195911	Sulfate	0.285	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196074	Ammonia-N	0.414	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196005	Kjeldahl Nitrogen	6.15	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387470

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195988	NO2NO3-N	0.343	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195988	Total-P	0.0903	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387400

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196006	O-Phosphate-P	0.187	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P387395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196072	Color (true)	2.58	Sample	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P387396

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196073	Color (true)	1.11	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P387504

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195911	Total Alkalinity	4.54	Sample	P	0 - 8.1

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
 Batch ID: P387784

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195676	TDS	8.61	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
 Batch ID: P387785

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195911	TDS	2.61	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
 Batch ID: P387505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195911	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
 Batch ID: P387676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2195915	Organic Carbon	2.06	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
 Batch ID: P387677

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196342	Organic Carbon	0.710	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: A100980

Included Lab Sample IDs: 2196072, 2196073, 2196078

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	100	P/P	90 - 110
Sulfate	99.8	99.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A100985

Included Lab Sample IDs: 2196072, 2196073, 2196078

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.5	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A100987

Included Lab Sample IDs: 2196072, 2196073, 2196078

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	95.5	98.7	P/P	90 - 115
Color (true)	97.7	95.5	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100988

Included Lab Sample IDs: 2196076, 2196077, 2196080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	99.0	P/P	90 - 110
O-Phosphate-P	99.6	98.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101029

Included Lab Sample IDs: 2196074, 2196075, 2196079

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A101037

Included Lab Sample IDs: 2196083, 2196084, 2196085

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	95.9	97.0	P/P	90 - 110
Barium	96.4	96.5	P/P	95 - 105
Calcium	98.9	97.4	P/P	90 - 110
Calcium	99.8	98.0	P/P	95 - 105
Iron	101	98.8	P/P	95 - 105
Iron	99.7	97.1	P/P	90 - 110
Magnesium	101	98.0	P/P	95 - 105
Magnesium	99.2	96.9	P/P	90 - 110
Potassium	101	96.8	P/P	95 - 105
Potassium	98.2	95.5	P/P	90 - 110
Sodium	101	96.4	P/P	95 - 105
Sodium	98.3	94.3	P/P	90 - 110
Zinc	96.8	97.1	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A101037

Included Lab Sample IDs: 2196083, 2196084, 2196085

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	97.4	98.7	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A101053

Included Lab Sample IDs: 2196072, 2196073, 2196078

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.8	99.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A101053

Included Lab Sample IDs: 2196072, 2196073, 2196078

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	97.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A101063

Included Lab Sample IDs: 2196083, 2196084, 2196085

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.2	94.2	P/P	90 - 110
Aluminum	94.6	94.2	P/P	90 - 110
Antimony	103	104	P/P	90 - 110
Antimony	104	103	P/P	90 - 110
Arsenic	94.2	94.5	P/P	90 - 110
Arsenic	94.3	94.2	P/P	90 - 110
Boron	93.5	93.6	P/P	90 - 110
Boron	93.6	93.5	P/P	90 - 110
Cadmium	93.8	94.2	P/P	90 - 110
Cadmium	94.2	94.7	P/P	90 - 110
Chromium	93.5	93.4	P/P	90 - 110
Chromium	93.6	93.5	P/P	90 - 110
Copper	92.2	92.6	P/P	90 - 110
Copper	93.3	92.2	P/P	90 - 110
Lead	94.8	95.6	P/P	90 - 110
Lead	95.5	94.8	P/P	90 - 110
Nickel	92.1	92.1	P/P	90 - 110
Nickel	92.7	92.1	P/P	90 - 110
Selenium	93.2	94.1	P/P	90 - 110
Selenium	94.1	93.7	P/P	90 - 110
Silver	95.6	96.2	P/P	90 - 110
Silver	96.4	95.6	P/P	90 - 110
Thallium	94.6	94.8	P/P	90 - 110
Thallium	94.8	94.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101073

Included Lab Sample IDs: 2196074, 2196075, 2196079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101073

Included Lab Sample IDs: 2196074, 2196075, 2196079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.5	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101085

Included Lab Sample IDs: 2196074, 2196075, 2196079

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

Reference Method: SM 5310 B-2011

Run ID: A101131

Included Lab Sample IDs: 2196074, 2196075, 2196079

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101251

Included Lab Sample IDs: 2196074, 2196075, 2196079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.0	95.2	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					1.89	
EPA 200.7 Rev. 4.4	Barium	101	98.7	102	98.7		3.51
	Calcium	99.6	98.9	97.3			0.465
	Iron	102	102	103	102		1.25
	Magnesium	99.1	95.9	97.7			1.16
	Potassium	98.3	96.0	95.7			0.310
	Sodium	97.8	95.6	96.5			0.497
	Zinc	98.8	98.1	102	98.1		4.22
EPA 200.8 Rev. 5.4	Aluminum	95.0	94.0	95.3	93.8		1.40
	Antimony	101	102	104	102		1.76
	Arsenic	96.7	97.5	98.5	96.2		1.00
	Boron	93.3	92.5	94.9	93.0		2.09
	Cadmium	95.9	96.0	96.5	97.0		0.532
	Chromium	95.8	96.7	97.2	95.6		0.565
	Copper	94.9	95.4	95.7	94.3		0.343
	Lead	96.4	96.8	98.3	96.5		1.50
	Nickel	95.1	94.6	95.2	94.9		0.657
	Selenium	94.1	96.0	95.2	94.9		0.929
	Silver	97.0	96.2	97.8	94.7		1.71
	Thallium	98.3	98.6	102	99.8		2.97
EPA 300.0 Rev. 2.1	Chloride	95.4	95.8	95.8		0.0194	
	Sulfate	94.6	95.0	95.5		0.285	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.0	99.5			0.414
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.1					6.15
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	101	100			0.343
EPA 365.1 Rev. 2.0	Total-P	105	101	101			0.0903
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	99.0	98.8			0.187
SM 2120 B-2011	Color (true)	96.1				2.58	
	Color (true)	94.9				1.11	
SM 2320 B-2011	Total Alkalinity	99.0				4.54	
SM 2540 C-2011	TDS					8.61	
	TDS					2.61	
SM 4500 F-C-2011	Fluoride	95.8	98.7	98.7			0.0
SM 5310 B-2011	Organic Carbon	98.4	99.7	102			2.06
	Organic Carbon	99.8	102	103			0.710

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2196072, 2196073, 2196078
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2196083, 2196084, 2196085
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2196083, 2196084, 2196085
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2196072, 2196073, 2196078
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2196072, 2196073, 2196078
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2196074, 2196075, 2196079
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2196074, 2196075, 2196079
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2196074, 2196075, 2196079
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2196074, 2196075, 2196079
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2196076, 2196077, 2196080
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2196072, 2196073, 2196078

Reference Method Descriptions

Method	Description	Associated Samples
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2196072, 2196073, 2196078
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2196083, 2196084, 2196085
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2196072, 2196073, 2196078
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2196072, 2196073, 2196078
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2196072, 2196073, 2196078
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2196074, 2196075, 2196079

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	09/15/2020			09/15/2020 14:32	Yen Ta	2196072, 2196073, 2196078
EPA 200.7 Rev. 4.4	09/15/2020	09/15/2020 15:15	Elliott D. Healy	09/16/2020 15:42	Betina Topolski	2196085
	09/15/2020	09/15/2020 15:15	Elliott D. Healy	09/16/2020 18:44	Betina Topolski	2196083
	09/15/2020	09/15/2020 15:15	Elliott D. Healy	09/16/2020 18:52	Betina Topolski	2196084
EPA 200.8 Rev. 5.4	09/15/2020	09/15/2020 15:15	Elliott D. Healy	09/17/2020 22:14	Alexander Thompson	2196085
	09/15/2020	09/15/2020 15:15	Elliott D. Healy	09/18/2020 00:15	Alexander Thompson	2196083
	09/15/2020	09/15/2020 15:15	Elliott D. Healy	09/18/2020 00:23	Alexander Thompson	2196084
EPA 300.0 Rev. 2.1	09/15/2020			09/18/2020 21:36	Lipi Saha	2196072
	09/15/2020			09/18/2020 21:50	Lipi Saha	2196073
	09/15/2020			09/18/2020 22:03	Lipi Saha	2196078
EPA 350.1 Rev. 2.0	09/15/2020			09/19/2020 12:28	Ping Hua	2196074
	09/15/2020			09/19/2020 12:35	Ping Hua	2196075
	09/15/2020			09/19/2020 12:38	Ping Hua	2196079
EPA 351.2 Rev. 2.0	09/15/2020	09/17/2020 10:50	Elliott Rodriguez	09/18/2020 10:17	Elliott Rodriguez	2196074
	09/15/2020	09/17/2020 10:50	Elliott Rodriguez	09/18/2020 10:18	Elliott Rodriguez	2196075
	09/15/2020	09/17/2020 10:50	Elliott Rodriguez	09/18/2020 10:20	Elliott Rodriguez	2196079
EPA 353.2 Rev. 2.0	09/15/2020			09/16/2020 12:08	Beverly Y. Sanders	2196074
	09/15/2020			09/16/2020 12:09	Beverly Y. Sanders	2196075
	09/15/2020			09/16/2020 12:10	Beverly Y. Sanders	2196079
EPA 365.1 Rev. 2.0	09/15/2020	09/24/2020 11:57	Yen Ta	09/29/2020 12:02	Lipi Saha	2196074
	09/15/2020	09/24/2020 11:57	Yen Ta	09/29/2020 12:03	Lipi Saha	2196075
	09/15/2020	09/24/2020 11:57	Yen Ta	09/29/2020 12:04	Lipi Saha	2196079
EPA 365.1 Rev. 2.0 dissolved	09/15/2020			09/15/2020 16:22	Virginia P. Brown	2196076
	09/15/2020			09/15/2020 16:23	Virginia P. Brown	2196077
	09/15/2020			09/15/2020 16:28	Virginia P. Brown	2196080
SM 2120 B-2011	09/15/2020			09/15/2020 15:49	Samantha Davila	2196072
	09/15/2020			09/15/2020 15:55	Samantha Davila	2196078
	09/15/2020			09/15/2020 16:00	Samantha Davila	2196073
SM 2320 B-2011	09/15/2020			09/16/2020 15:46	Dale L. Simmons	2196072
	09/15/2020			09/16/2020 15:55	Dale L. Simmons	2196073
	09/15/2020			09/16/2020 16:03	Dale L. Simmons	2196078
SM 2340B	09/15/2020			09/16/2020 15:42	Betina Topolski	2196085
	09/15/2020			09/16/2020 18:44	Betina Topolski	2196083
	09/15/2020			09/16/2020 18:52	Betina Topolski	2196084
SM 2540 C-2011	09/15/2020			09/16/2020 15:09	Yijie Li	2196072, 2196073, 2196078
SM 2540 D-2011	09/15/2020			09/16/2020 15:09	Yijie Li	2196072, 2196073, 2196078
SM 4500 F-C-2011	09/15/2020			09/16/2020 15:46	Dale L. Simmons	2196072
	09/15/2020			09/16/2020 15:55	Dale L. Simmons	2196073
	09/15/2020			09/16/2020 16:03	Dale L. Simmons	2196078
SM 5310 B-2011	09/15/2020			09/21/2020 23:30	David Boose	2196074

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-2011	09/15/2020			09/21/2020 23:42	David Boose	2196075
	09/15/2020			09/22/2020 01:31	David Boose	2196079