

Chemical Analysis Report

NW-DIST-2021-05-20-02

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

Event Description: **REFERENCE LAKE Porter Pond**
Request ID: **RQ-2021-05-10-69**
Customer: **NW-DIST**
Project ID: **LAKESREF**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Frank Butera

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 10-JUN-2021 16:11

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: Porter Lake .6mi E of Greenhead/5 min. of SR 20 **Collection Date/Time: 05/19/2021 13:30**

Field ID: 32030097

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2248907	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P398535	
	EPA 300.0 Rev. 2.1	Chloride	2.2		mg Cl/L	P398954	
		Sulfate	0.85		mg SO4/L	P398955	
	SM 2120 B-2011	Color (true)	21		PCU	P398548	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P398761	
	SM 2540 C-2011	TDS	15	U	mg/L	P399050	
	SM 2540 D-2011	TSS	2	U	mg/L	P398840	
2248908	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P398763	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P399166	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33		mg N/L	P398685	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P398653	
	EPA 365.1 Rev. 2.0	Total-P	0.008		mg P/L	P398734	
2248909	SM 5310 B-2011	Organic Carbon	5.3		mg C/L	P398807	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P398553	
2248912	EPA 200.7 Rev. 4.4	Barium	4.5		ug/L	P398686	
		Calcium	0.55		mg/L	P398686	
		Iron	74	I	ug/L	P399165	
		Magnesium	0.36		mg/L	P398686	
		Potassium	0.30	U	mg/L	P398686	
		Sodium	1.3	I	mg/L	P398686	
		Zinc	5.0	U	ug/L	P398686	
	EPA 200.8 Rev. 5.4	Aluminum	111		ug/L	P399080	
		Antimony	0.050	U	ug/L	P399080	
		Arsenic	0.37		ug/L	P399080	
		Boron**	7.7	I	ug/L	P399080	
		Cadmium	0.020	U	ug/L	P399080	
		Chromium	0.40	U	ug/L	P399080	
		Copper	0.40	U	ug/L	P399080	
		Lead	0.29	I	ug/L	P399080	
		Nickel	0.50	U	ug/L	P399080	
		Selenium	0.20	U	ug/L	P399080	
		Silver	0.010	U	ug/L	P398686	
		Thallium	0.10	U	ug/L	P399080	

Ref. Method and Comment:

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: P398535

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P398686

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/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 200.7 Rev. 4.4
Batch ID: P399165

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P398686

Component	Result	Code	Units
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P399080

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
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398954

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398955

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399166

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398685

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398653

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398734

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398553

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

Reference Method: SM 2120 B-2011
Batch ID: P398548

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P398761

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

Reference Method: SM 2540 C-2011
Batch ID: P399050

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P398840

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P398763

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P398807

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: P398686

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	96.9		P	85 - 115
Calcium	105		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	97.9		P	85 - 115
Sodium	103		P	85 - 115
Zinc	95.9		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P399165

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	106		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P398686

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Silver	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P399080

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.8		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	103		P	85 - 115
Boron	98.0		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	102		P	85 - 115
Copper	99.9		P	85 - 115
Lead	115		P	85 - 115
Nickel	99.1		P	85 - 115
Selenium	101		P	85 - 115
Thallium	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398954

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398955

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399166

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398685

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398653

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: P398734

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398553

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

Reference Method: SM 2120 B-2011
Batch ID: P398548

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.7		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P398761

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P398763

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.1		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P398807

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P398686

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248628	Barium	102		P	80 - 120
2248628	Calcium	106		P	80 - 120
2248628	Magnesium	105		P	80 - 120
2248628	Potassium	102		P	80 - 120
2248628	Sodium	104		P	80 - 120
2248628	Zinc	101		P	80 - 120
2248912	Barium	104	103	P/P	80 - 120
2248912	Calcium	112	112	P/P	80 - 120
2248912	Magnesium	109	109	P/P	80 - 120
2248912	Potassium	110	109	P/P	80 - 120
2248912	Sodium	108	108	P/P	80 - 120
2248912	Zinc	103	103	P/P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P399165

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248606	Iron	111		P	80 - 120
2248833	Iron	108	110	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P398686

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248628	Silver	103		P	80 - 120
2248912	Silver	105	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P399080

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248634	Aluminum	101	96.3	P/P	80 - 120
2248634	Antimony	101	101	P/P	80 - 120
2248634	Arsenic	102	102	P/P	80 - 120
2248634	Boron	99.2	100	P/P	80 - 120
2248634	Cadmium	102	103	P/P	80 - 120
2248634	Chromium	100	100	P/P	80 - 120
2248634	Copper	99.2	99.2	P/P	80 - 120
2248634	Lead	115	115	P/P	80 - 120
2248634	Nickel	98.2	98.3	P/P	80 - 120
2248634	Selenium	98.7	98.2	P/P	80 - 120
2248634	Thallium	109	110	P/P	80 - 120
2248846	Aluminum	96.1		P	80 - 120
2248846	Antimony	104		P	80 - 120
2248846	Arsenic	101		P	80 - 120
2248846	Boron	102		P	80 - 120
2248846	Cadmium	103		P	80 - 120
2248846	Chromium	100		P	80 - 120
2248846	Copper	95.6		P	80 - 120
2248846	Lead	115		P	80 - 120
2248846	Nickel	97.3		P	80 - 120
2248846	Selenium	97.1		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P399080

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248846	Thallium	111		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398954

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248868	Chloride	98.3		P	90 - 110
2249042	Chloride	97.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398955

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248868	Sulfate	98.9		P	90 - 110
2249042	Sulfate	96.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399166

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248146	Ammonia-N	96.8	95.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398653

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248869	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398734

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248908	Total-P	107	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248874	O-Phosphate-P	98.1	98.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P398763

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248946	Fluoride	100	99.6	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P398807

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2248786	Organic Carbon	97.5	96.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P398535

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248794	Turbidity	4.67	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P398686

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248912	Barium	0.554	Spike	P	0 - 20
2248912	Calcium	0.330	Spike	P	0 - 20
2248912	Magnesium	0.768	Spike	P	0 - 20
2248912	Potassium	0.567	Spike	P	0 - 20
2248912	Sodium	0.177	Spike	P	0 - 20
2248912	Zinc	0.203	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P399165

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248833	Iron	1.70	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P398686

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248912	Silver	1.71	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P399080

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248634	Aluminum	2.74	Spike	P	0 - 20
2248634	Antimony	0.0421	Spike	P	0 - 20
2248634	Arsenic	0.406	Spike	P	0 - 20
2248634	Boron	1.17	Spike	P	0 - 20
2248634	Cadmium	0.659	Spike	P	0 - 20
2248634	Chromium	0.00328	Spike	P	0 - 20
2248634	Copper	0.00168	Spike	P	0 - 20
2248634	Lead	0.00706	Spike	P	0 - 20
2248634	Nickel	0.107	Spike	P	0 - 20
2248634	Selenium	0.568	Spike	P	0 - 20
2248634	Thallium	1.41	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P398954

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248868	Chloride	0.198	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398955

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248868	Sulfate	0.451	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399166

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248146	Ammonia-N	0.867	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398685

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248871	Kjeldahl Nitrogen	2.74	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398653

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248869	NO2NO3-N	0.499	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398734

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248908	Total-P	1.67	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398553

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248874	O-Phosphate-P	0.407	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P398548

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248865	Color (true)	0.451	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P398761

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248946	Total Alkalinity	0.135	Sample	P	0 - 5.2

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P399050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248868	TDS	5.58	Sample	P	0 - 10

Reference Method: SM 2540 D-2011
Batch ID: P398840

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248868	TSS	7.14	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P398763

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248946	Fluoride	0.463	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P398807

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2248786	Organic Carbon	0.776	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: A105566

Included Lab Sample IDs: 2248907

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

Reference Method: SM 2120 B-2011

Run ID: A105570

Included Lab Sample IDs: 2248907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.3	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A105571

Included Lab Sample IDs: 2248909

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.7	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A105611

Included Lab Sample IDs: 2248908

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

Reference Method: SM 2320 B-2011

Run ID: A105656

Included Lab Sample IDs: 2248907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.6	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A105656

Included Lab Sample IDs: 2248907

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A105658

Included Lab Sample IDs: 2248907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	100	P/P	90 - 110
Sulfate	100	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A105668

Included Lab Sample IDs: 2248908

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A105673

Included Lab Sample IDs: 2248908

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105709

Included Lab Sample IDs: 2248912

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A105725

Included Lab Sample IDs: 2248908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.4	104	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A105828

Included Lab Sample IDs: 2248912

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A105849

Included Lab Sample IDs: 2248908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.3	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A105900

Included Lab Sample IDs: 2248912

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	98.5	108	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105905

Included Lab Sample IDs: 2248912

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.9	100	P/P	90 - 110
Arsenic	101	103	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Copper	96.5	99.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105905

Included Lab Sample IDs: 2248912

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	107	107	P/P	90 - 110
Nickel	97.7	100	P/P	90 - 110
Selenium	102	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105924

Included Lab Sample IDs: 2248912

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	97.5	95.7	P/P	90 - 110
Chromium	91.9	93.0	P/P	90 - 110
Thallium	90.7	90.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105943

Included Lab Sample IDs: 2248912

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	91.4	90.0	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					4.67	
EPA 200.7 Rev. 4.4	Barium	96.9	102	104	103		0.554
	Calcium	105	106	112	112		0.330
	Iron	106	108	111	110		1.70
	Magnesium	102	105	109	109		0.768
	Potassium	97.9	102	110	109		0.567
	Sodium	103	104	108	108		0.177
	Zinc	95.9	101	103	103		0.203
EPA 200.8 Rev. 5.4	Aluminum	96.8	101	96.3	96.1		2.74
	Antimony	105	101	101	104		0.0421
	Arsenic	103	102	102	101		0.406
	Boron	98.0	99.2	100	102		1.17
	Cadmium	103	102	103	103		0.659
	Chromium	102	100	100	100		0.0032
	Copper	99.9	99.2	99.2	95.6		0.0016
	Lead	115	115	115	115		0.0070
	Nickel	99.1	98.2	98.3	97.3		0.107
	Selenium	101	98.7	98.2	97.1		0.568
	Silver	104	103	105	103		1.71
	Thallium	107	109	110	111		1.41
EPA 300.0 Rev. 2.1	Chloride	95.0	98.3	97.1		0.198	
	Sulfate	99.6	98.9	96.1		0.451	
EPA 350.1 Rev. 2.0	Ammonia-N	101	96.8	95.8			0.867
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106					2.74
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	100	100			0.499
EPA 365.1 Rev. 2.0	Total-P	107	107	105			1.67
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	98.1	98.5			0.407
SM 2120 B-2011	Color (true)	99.7				0.451	
SM 2320 B-2011	Total Alkalinity	101				0.135	
SM 2540 C-2011	TDS					5.58	
SM 2540 D-2011	TSS					7.14	
SM 4500 F-C-2011	Fluoride	99.1	100	99.6			0.463
SM 5310 B-2011	Organic Carbon	99.2	97.5	96.5			0.776

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2248907
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2248912
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2248912
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2248907
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2248907
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2248908
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2248908
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2248908
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2248908
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2248909
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2248907
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2248907
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2248907

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2248907
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2248907
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2248908

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	05/20/2021			05/20/2021 16:01	Yen Ta	2248907
EPA 200.7 Rev. 4.4	05/20/2021	05/24/2021 17:20	Elliott D. Healy	06/02/2021 17:42	Betina Topolski	2248912
	05/20/2021	06/03/2021 16:00	Elliott D. Healy	06/04/2021 15:53	Betina Topolski	2248912
EPA 200.8 Rev. 5.4	05/20/2021	05/24/2021 17:20	Elliott D. Healy	05/26/2021 22:47	McKinley C Carter	2248912
	05/20/2021	06/02/2021 14:00	Elliott D. Healy	06/04/2021 21:12	McKinley C Carter	2248912
	05/20/2021	06/02/2021 14:00	Elliott D. Healy	06/07/2021 21:51	Alexander Thompson	2248912
	05/20/2021	06/02/2021 14:00	Elliott D. Healy	06/08/2021 14:35	Alexander Thompson	2248912
EPA 300.0 Rev. 2.1	05/20/2021			05/27/2021 13:56	Lipi Saha	2248907
EPA 350.1 Rev. 2.0	05/20/2021			06/03/2021 11:55	Roberta Tatti	2248908
EPA 351.2 Rev. 2.0	05/20/2021	05/24/2021 12:59	Benjamin T. Nordmann	05/26/2021 15:38	Virginia P. Brown	2248908
EPA 353.2 Rev. 2.0	05/20/2021			05/24/2021 10:27	Beverly Y. Sanders	2248908
EPA 365.1 Rev. 2.0	05/20/2021	05/25/2021 12:56	Yen Ta	05/26/2021 12:28	Shengyu Ding	2248908
EPA 365.1 Rev. 2.0 dissolved	05/20/2021			05/20/2021 16:44	Ping Hua	2248909
SM 2120 B-2011	05/20/2021			05/20/2021 16:22	Sarah A Nixon	2248907
SM 2320 B-2011	05/20/2021			05/25/2021 22:15	Patrick M. Roche	2248907
SM 2540 C-2011	05/20/2021			05/25/2021 15:06	Yijie Li	2248907
SM 2540 D-2011	05/20/2021			05/25/2021 15:06	Yijie Li	2248907
SM 4500 F-C-2011	05/20/2021			05/25/2021 22:15	Patrick M. Roche	2248907
SM 5310 B-2011	05/20/2021			05/25/2021 08:12	Madeline Gruver	2248908