

Chemical Analysis Report

CEN-DIST-2021-01-14-01

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

Event Description: **Ruth Lake**
Request ID: **RQ-2021-01-11-59**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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3319 Maguire Blvd., Suite 232
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 05-FEB-2021 11:44

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 group are included in this report: 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: Ruth Lake @ Center

Collection Date/Time: 01/13/2021 10:27

Field ID: G3CE0021

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2219020	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P392433	
	EPA 300.0 Rev. 2.1	Chloride	220		mg Cl/L	P392555	
		Sulfate	35		mg SO4/L	P392560	
		Color (true)	190		PCU	P392429	
	SM 2320 B-2011	Total Alkalinity	61		mg CaCO3/L	P392583	
	SM 2540 C-2011	TDS	520		mg/L	P392809	
	SM 2540 D-2011	TSS	3	I	mg/L	P392968	
	SM 4500 F-C-2011	Fluoride	0.12		mg F/L	P392585	
2219021	EPA 350.1 Rev. 2.0	Ammonia-N	0.032		mg N/L	P393172	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P392832	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.076		mg N/L	P392665	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P392646	
	SM 5310 B-2011	Organic Carbon	27		mg C/L	P392643	
2219022	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.020		mg P/L	P392426	

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: P392433

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392555

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392560

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393172

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392832

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392665

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392646

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392426

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

Reference Method: SM 2120 B-2011
Batch ID: P392429

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P392583

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-2011
Batch ID: P392809

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P392968

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P392585

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P392643

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392555

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392560

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393172

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392832

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392665

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392646

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392426

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

Reference Method: SM 2120 B-2011
Batch ID: P392429

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

Reference Method: SM 2320 B-2011
Batch ID: P392583

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.8		P	93 - 104

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P392585

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P392643

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392555

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218770	Chloride	101		P	90 - 110
2219059	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218770	Sulfate	105		P	90 - 110
2219059	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218911	Ammonia-N	96.2	97.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392832

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219067	Kjeldahl Nitrogen	103	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392665

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218879	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218945	Total-P	105	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219063	O-Phosphate-P	99.4	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P392585

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218606	Fluoride	98.6	99.3	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P392643

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218945	Organic Carbon	102	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218942	Turbidity	3.90	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392555

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218770	Chloride	0.357	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218770	Sulfate	0.499	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218911	Ammonia-N	1.03	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392832

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219067	Kjeldahl Nitrogen	1.57	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392665

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218879	NO2NO3-N	0.499	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218945	Total-P	3.49	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219063	O-Phosphate-P	1.31	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
Batch ID: P392429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218942	Color (true)	4.60	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P392583

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218606	Total Alkalinity	2.35	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P392809

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218942	TDS	3.31	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P392585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218606	Fluoride	0.467	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P392643

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218945	Organic Carbon	0.927	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A103069

Included Lab Sample IDs: 2219022

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

Reference Method: SM 2120 B-2011

Run ID: A103071

Included Lab Sample IDs: 2219020

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A103072

Included Lab Sample IDs: 2219020

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A103125

Included Lab Sample IDs: 2219020

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

Reference Method: SM 2320 B-2011

Run ID: A103129

Included Lab Sample IDs: 2219020

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	93.4	97.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A103129

Included Lab Sample IDs: 2219020

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

Reference Method: SM 5310 B-2011

Run ID: A103143

Included Lab Sample IDs: 2219021

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	104	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A103152

Included Lab Sample IDs: 2219021

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A103199

Included Lab Sample IDs: 2219021

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.8	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A103247

Included Lab Sample IDs: 2219021

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A103329

Included Lab Sample IDs: 2219021

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.4	97.8	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					3.90	
EPA 300.0 Rev. 2.1	Chloride	103	101	103		0.357	
	Sulfate	104	105	104		0.499	
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	96.2	97.4			1.03
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	103	100			1.57
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	100	100			0.499
EPA 365.1 Rev. 2.0	Total-P	104	105	101			3.49
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	99.4	98.0			1.31
SM 2120 B-2011	Color (true)	101				4.60	
SM 2320 B-2011	Total Alkalinity	97.8				2.35	
SM 2540 C-2011	TDS					3.31	
SM 4500 F-C-2011	Fluoride	98.8	98.6	99.3			0.467
SM 5310 B-2011	Organic Carbon	98.8	102	101			0.927

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2219020
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2219020
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2219020
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2219021
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2219021
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2219021
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2219021
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2219022
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2219020
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2219020
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2219020
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2219020
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2219020
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2219021

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	01/14/2021			01/14/2021 14:53	Yen Ta	2219020
EPA 300.0 Rev. 2.1	01/14/2021			01/16/2021 09:26	Julia Storbeck	2219020
EPA 350.1 Rev. 2.0	01/14/2021			01/31/2021 14:04	Ping Hua	2219021
EPA 351.2 Rev. 2.0	01/14/2021	01/25/2021 12:37	Yen Ta	01/26/2021 15:29	Julia Storbeck	2219021
EPA 353.2 Rev. 2.0	01/14/2021			01/21/2021 09:25	Beverly Y. Sanders	2219021
EPA 365.1 Rev. 2.0	01/14/2021	01/20/2021 18:21	Madeline Gruver	01/22/2021 16:19	Shengyu Wang	2219021
EPA 365.1 Rev. 2.0 dissolved	01/14/2021			01/14/2021 14:43	Blanca Fach	2219022
SM 2120 B-2011	01/14/2021			01/14/2021 16:42	Benjamin T. Nordmann	2219020
SM 2320 B-2011	01/14/2021			01/15/2021 21:18	Dale L. Simmons	2219020
SM 2540 C-2011	01/14/2021			01/19/2021 14:52	Yijie Li	2219020
SM 2540 D-2011	01/14/2021			01/19/2021 14:52	Yijie Li	2219020
SM 4500 F-C-2011	01/14/2021			01/15/2021 21:18	Dale L. Simmons	2219020
SM 5310 B-2011	01/14/2021			01/19/2021 23:35	Touraj Touran	2219021