

Chemical Analysis Report

CEN-DIST-2021-05-14-01

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

Event Description: **Livingston Creek (West segment)**
Request ID: **RQ-2021-04-26-02**
Customer: **CEN-DIST**
Project ID: **SMP**

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Date Certified: 02-JUN-2021 11:08



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: Fox Lake Near Center

Collection Date/Time: 05/13/2021 12:39

Field ID: G3CE0041

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2247506	EPA 180.1 Rev. 2.0	Turbidity	4.1		NTU	P398230	
	EPA 300.0 Rev. 2.1	Chloride	230		mg Cl/L	P398766	
		Sulfate	32		mg SO4/L	P398768	
		Color (true)	190		PCU	P398236	
	SM 2320 B-2011	Total Alkalinity	40		mg CaCO3/L	P398523	
	SM 2540 C-2011	TDS	564		mg/L	P398795	
	SM 2540 D-2011	TSS	6	I	mg/L	P398434	
	SM 4500 F-C-2011	Fluoride	0.041	I	mg F/L	P398527	
2247507	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P398929	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P398425	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P398342	
	EPA 365.1 Rev. 2.0	Total-P	0.089		mg P/L	P398542	
	SM 5310 B-2011	Organic Carbon	25		mg C/L	P398320	
2247508	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.019		mg P/L	P398220	

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: P398230

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398766

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398768

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398929

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398425

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398342

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398542

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398220

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

Reference Method: SM 2120 B-2011
Batch ID: P398236

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P398523

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

Reference Method: SM 2540 C-2011
Batch ID: P398795

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P398434

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P398527

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P398320

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: P398766

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398768

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398929

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398425

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	108		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398342

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: P398542

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398220

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

Reference Method: SM 2120 B-2011
Batch ID: P398236

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P398523

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	94 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P398527

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.1		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P398320

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398766

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247514	Chloride	97.3		P	90 - 110
2247847	Chloride	99.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398768

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247514	Sulfate	98.7		P	90 - 110
2247847	Sulfate	99.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398929

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247507	Ammonia-N	98.2	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398425

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247412	Kjeldahl Nitrogen	107	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398342

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247464	NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398542

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247507	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398220

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247417	O-Phosphate-P	95.2	94.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P398527

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247550	Fluoride	102	102	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P398320

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2247190	Organic Carbon	95.8	97.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P398230

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247461	Turbidity	0.478	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398766

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247514	Chloride	0.583	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398768

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247514	Sulfate	0.970	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398929

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247507	Ammonia-N	0.487	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247412	Kjeldahl Nitrogen	1.22	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398342

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247464	NO2NO3-N	0.320	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398542

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247507	Total-P	1.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247417	O-Phosphate-P	0.558	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
 Batch ID: P398236

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247461	Color (true)	2.23	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
 Batch ID: P398523

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247550	Total Alkalinity	1.36	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
 Batch ID: P398795

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247409	TDS	8.33	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
 Batch ID: P398527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247550	Fluoride	0.477	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
 Batch ID: P398320

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2247190	Organic Carbon	1.04	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: A105435

Included Lab Sample IDs: 2247508

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	98.3	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A105441

Included Lab Sample IDs: 2247506

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: A105444

Included Lab Sample IDs: 2247506

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	101	P/P	90 - 115

Reference Method: SM 5310 B-2011

Run ID: A105479

Included Lab Sample IDs: 2247507

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	95.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A105490

Included Lab Sample IDs: 2247507

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

Reference Method: SM 2320 B-2011

Run ID: A105567

Included Lab Sample IDs: 2247506

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

Reference Method: SM 4500 F-C-2011

Run ID: A105567

Included Lab Sample IDs: 2247506

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A105588

Included Lab Sample IDs: 2247507

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A105623

Included Lab Sample IDs: 2247507

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A105658

Included Lab Sample IDs: 2247506

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A105732

Included Lab Sample IDs: 2247507

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	98.5	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	MS
EPA 180.1 Rev. 2.0	Turbidity				0.478	
EPA 300.0 Rev. 2.1	Chloride	102	97.3	99.9	0.583	
	Sulfate	100	98.7	99.9	0.970	
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	98.2	98.8		0.487
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	107	105		1.22
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	98.5	99.0		0.320
EPA 365.1 Rev. 2.0	Total-P	106	106	105		1.02
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	95.2	94.5		0.558
SM 2120 B-2011	Color (true)	100			2.23	
SM 2320 B-2011	Total Alkalinity	100			1.36	
SM 2540 C-2011	TDS				8.33	
SM 4500 F-C-2011	Fluoride	98.1	102	102		0.477
SM 5310 B-2011	Organic Carbon	97.0	95.8	97.1		1.04

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2247506
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2247506
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2247506
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2247507
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2247507
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2247507
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2247507
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2247508
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2247506
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2247506
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2247506
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2247506
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2247506
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2247507

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	05/14/2021			05/14/2021 15:01	Yen Ta	2247506
EPA 300.0 Rev. 2.1	05/14/2021			05/24/2021 21:26	Lipi Saha	2247506
EPA 350.1 Rev. 2.0	05/14/2021			05/27/2021 14:00	Ping Hua	2247507
EPA 351.2 Rev. 2.0	05/14/2021	05/19/2021 14:18	Benjamin T. Nordmann	05/24/2021 15:00	Virginia P. Brown	2247507
EPA 353.2 Rev. 2.0	05/14/2021			05/18/2021 10:31	Beverly Y. Sanders	2247507
EPA 365.1 Rev. 2.0	05/14/2021	05/20/2021 14:05	Yen Ta	05/21/2021 11:03	Shengyu Ding	2247507
EPA 365.1 Rev. 2.0 dissolved	05/14/2021			05/14/2021 14:33	Lipi Saha	2247508
SM 2120 B-2011	05/14/2021			05/14/2021 15:11	Sarah A Nixon	2247506
SM 2320 B-2011	05/14/2021			05/20/2021 00:36	Dale L. Simmons	2247506
SM 2540 C-2011	05/14/2021			05/18/2021 14:02	Yijie Li	2247506
SM 2540 D-2011	05/14/2021			05/18/2021 14:02	Yijie Li	2247506
SM 4500 F-C-2011	05/14/2021			05/20/2021 00:36	Dale L. Simmons	2247506
SM 5310 B-2011	05/14/2021			05/18/2021 00:10	Lauren Lees	2247507