

Chemical Analysis Report

CEN-DIST-2021-02-26-02

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-2021-02-22-29**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Date Certified: 22-MAR-2021 10:00



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: Livingston Creek 2.6km E of Old Avon Park Rd Collection Date/Time: 02/25/2021 12:05

Field ID: G4CE0211

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2227896	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P394280	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P394554	
		Sulfate	8.0		mg SO4/L	P394555	
	SM 2120 B-2011	Color (true)	220		PCU	P394289	
	SM 2320 B-2011	Total Alkalinity	13		mg CaCO3/L	P394514	
	SM 2540 C-2011	TDS	95		mg/L	P394805	
	SM 2540 D-2011	TSS	2	I	mg/L	P394826	
	SM 4500 F-C-2011	Fluoride	0.076	I	mg F/L	P394517	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P394442	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.93		mg N/L	P394785	
2227897	EPA 353.2 Rev. 2.0	NO2NO3-N	0.086		mg N/L	P394457	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P394370	
	SM 5310 B-2011	Organic Carbon	21		mg C/L	P394896	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.11		mg P/L	P394287	
	dissolved						

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: 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: P394280

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394554

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394555

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394442

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394785

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394457

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394370

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394287

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

Reference Method: SM 2120 B-2011
Batch ID: P394289

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P394514

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

Reference Method: SM 2540 C-2011
Batch ID: P394805

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P394826

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P394517

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P394896

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: P394554

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394555

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394442

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394785

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394457

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: P394370

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: P394287

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

Reference Method: SM 2120 B-2011
Batch ID: P394289

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P394514

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.2		P	93 - 104

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P394517

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P394896

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394554

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227613	Chloride	99.5		P	90 - 110
2227994	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394555

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227613	Sulfate	96.1		P	90 - 110
2227994	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394442

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227874	Ammonia-N	99.6	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394785

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2229269	Kjeldahl Nitrogen	106	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394457

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227929	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394370

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227614	Total-P	108	107	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P394517

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227922	Fluoride	96.6	96.6	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P394896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227925	Organic Carbon	95.4	93.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P394280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227931	Turbidity	2.63	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394554

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227613	Chloride	1.11	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P394555

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227613	Sulfate	1.09	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394442

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227874	Ammonia-N	0.389	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394785

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2229269	Kjeldahl Nitrogen	1.95	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394457

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227929	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394370

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227614	Total-P	0.137	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394287

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227898	O-Phosphate-P	0.389	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
Batch ID: P394289

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227997	Color (true)	3.47	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P394514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227922	Total Alkalinity	1.30	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P394805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227923	TDS	4.35	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P394517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227922	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P394896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227925	Organic Carbon	0.939	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: A103799

Included Lab Sample IDs: 2227896

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	101	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A103803

Included Lab Sample IDs: 2227898

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.1	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A103804

Included Lab Sample IDs: 2227896

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A103842

Included Lab Sample IDs: 2227896

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A103861

Included Lab Sample IDs: 2227897

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	106	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A103867

Included Lab Sample IDs: 2227897

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A103879

Included Lab Sample IDs: 2227897

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: A103902

Included Lab Sample IDs: 2227896

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	91.5	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-2011

Run ID: A103902

Included Lab Sample IDs: 2227896

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

Reference Method: SM 5310 B-2011

Run ID: A104035

Included Lab Sample IDs: 2227897

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.7	95.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A104061

Included Lab Sample IDs: 2227897

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	107	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				2.63	
EPA 300.0 Rev. 2.1	Chloride	100	99.5	101	1.11	
	Sulfate	99.7	96.1	100	1.09	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	99.6	100		0.389
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	106	104		1.95
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	101	101		0.0
EPA 365.1 Rev. 2.0	Total-P	105	108	107		0.137
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100				0.389
SM 2120 B-2011	Color (true)	102			3.47	
SM 2320 B-2011	Total Alkalinity	95.2			1.30	
SM 2540 C-2011	TDS				4.35	
SM 4500 F-C-2011	Fluoride	97.5	96.6	96.6		0.0
SM 5310 B-2011	Organic Carbon	94.6	95.4	93.8		0.939

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2227896
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2227896
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2227896
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2227897
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2227897
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2227897
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2227897
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2227898
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2227896
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2227896
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2227896
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2227896
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2227896
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2227897

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	02/26/2021			02/26/2021 17:09	Yen Ta	2227896
EPA 300.0 Rev. 2.1	02/26/2021			03/03/2021 17:15	Lipi Saha	2227896
EPA 350.1 Rev. 2.0	02/26/2021			03/03/2021 17:03	Ping Hua	2227897
EPA 351.2 Rev. 2.0	02/26/2021	03/11/2021 12:20	Benjamin T. Nordmann	03/15/2021 10:16	Virginia P. Brown	2227897
EPA 353.2 Rev. 2.0	02/26/2021			03/04/2021 09:23	Beverly Y. Sanders	2227897
EPA 365.1 Rev. 2.0	02/26/2021	03/02/2021 12:03	Shengyu Ding	03/03/2021 11:09	Shengyu Ding	2227897
EPA 365.1 Rev. 2.0 dissolved	02/26/2021			02/26/2021 17:27	Samantha Davila	2227898
SM 2120 B-2011	02/26/2021			02/26/2021 18:13	Benjamin T. Nordmann	2227896
SM 2320 B-2011	02/26/2021			03/04/2021 05:37	Dale L. Simmons	2227896
SM 2540 C-2011	02/26/2021			03/03/2021 13:35	Yijie Li	2227896
SM 2540 D-2011	02/26/2021			03/03/2021 13:35	Yijie Li	2227896
SM 4500 F-C-2011	02/26/2021			03/04/2021 05:37	Dale L. Simmons	2227896
SM 5310 B-2011	02/26/2021			03/12/2021 00:01	Madeline Gruver	2227897