

Chemical Analysis Report

CEN-DIST-2018-12-18-02

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

Event Description: **Little Haw Creek**
Request ID: **RQ-2018-12-17-43**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 07-JAN-2019 14:53

A handwritten signature in black ink, appearing to read "Liang Lin", 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 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: Little Haw Creek @ 25m DS of SR40 (2630C)

Collection Date/Time: 12/17/2018 11:50

Field ID: G2CE0128

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2049454	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P356348	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P356554	
		Sulfate	0.65		mg SO4/L	P356556	
	SM 2120 B	Color (true)	370		PCU	P356331	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P356563	
	SM 2540 C-97	TDS	106		mg/L	P356677	
	SM 2540 D-97	TSS	2	U	mg/L	P356638	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P356664	
2049455	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P356442	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P356387	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P356402	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P356393	
	SM 5310 B-00	Organic Carbon	37		mg C/L	P356463	
2049456	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P356343	

Ref. Method and Comment:

SM 2540 D-97: 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: P356348

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356554

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356556

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356442

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356387

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356402

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356393

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356343

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

Reference Method: SM 2120 B
Batch ID: P356331

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P356563

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

Reference Method: SM 2540 C-97
Batch ID: P356677

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P356638

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P356664

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P356463

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: P356554

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356556

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356442

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: P356387

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356402

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: P356393

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: P356343

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

Reference Method: SM 2120 B
Batch ID: P356331

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.8		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P356563

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P356664

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.2		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356463

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	92.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356554

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049407	Chloride	98.0		P	90 - 110
2049454	Chloride	94.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356556

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049407	Sulfate	97.1		P	90 - 110
2049454	Sulfate	97.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356442

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049414	Ammonia-N	97.5	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356387

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049436	Kjeldahl Nitrogen	102	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356402

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049414	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356393

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049469	Total-P	99.5	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049528	O-Phosphate-P	92.0	94.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P356664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2050008	Fluoride	96.4	97.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P356463

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2049455	Organic Carbon	99.8		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P356348

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049431	Turbidity	17.9	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356554

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049407	Chloride	0.320	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P356556

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049407	Sulfate	0.177	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P356442

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049414	Ammonia-N	1.15	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P356387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049436	Kjeldahl Nitrogen	0.995	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P356402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049414	NO2NO3-N	0.443	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P356393

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049469	Total-P	2.20	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P356343

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049528	O-Phosphate-P	2.79	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P356331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049431	Color (true)	1.26	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P356563

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050008	Total Alkalinity	0.807	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P356677

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049413	TDS	0.985	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P356664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2050008	Fluoride	0.948	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P356463

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2049455	Organic Carbon	0.160	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A88413
Included Lab Sample IDs: 2049454

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A88415
Included Lab Sample IDs: 2049456

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A88418
Included Lab Sample IDs: 2049454

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A88433
Included Lab Sample IDs: 2049455

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A88458
Included Lab Sample IDs: 2049455

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

Reference Method: SM 5310 B-00
Run ID: A88466
Included Lab Sample IDs: 2049455

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.4	94.7	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A88481
Included Lab Sample IDs: 2049454

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	99.0	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88499
Included Lab Sample IDs: 2049455

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.2	97.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88511

Included Lab Sample IDs: 2049455

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.2	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A88515

Included Lab Sample IDs: 2049454

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A88542

Included Lab Sample IDs: 2049454

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	100	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				17.9	
EPA 300.0 Rev. 2.1	Chloride	99.1	98.0	94.9	0.320	
	Sulfate	96.6	97.1	97.1	0.177	
EPA 350.1 Rev. 2.0	Ammonia-N	101	97.5	99.5		1.15
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	102	101		0.995
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	101	102		0.443
EPA 365.1 Rev. 2.0	Total-P	104	99.5	102		2.20
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	92.0	94.6		2.79
SM 2120 B	Color (true)	99.8			1.26	
SM 2320 B-97	Total Alkalinity	101			0.807	
SM 2540 C-97	TDS				0.985	
SM 4500 F-C-97	Fluoride	99.2	96.4	97.4		0.948
SM 5310 B-00	Organic Carbon	92.1	99.8			0.160

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2049454
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2049454
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2049454
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2049455
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2049455
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2049455
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2049455
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2049456
SM 2120 B / E31780	True Color measured at 450 nm	2049454
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2049454
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2049454
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2049454
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2049454
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2049455

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	12/18/2018			12/18/2018 17:10	Megan Treadwell	2049454
EPA 300.0 Rev. 2.1	12/18/2018			12/21/2018 21:57	Lipi Saha	2049454
EPA 350.1 Rev. 2.0	12/18/2018			12/19/2018 12:24	Ping Hua	2049455
EPA 351.2 Rev. 2.0	12/18/2018	12/19/2018 11:00	Adrian Shelby	12/21/2018 14:05	Joseph Suarez	2049455
EPA 353.2 Rev. 2.0	12/18/2018			12/19/2018 13:42	Lauren Bottorf	2049455
EPA 365.1 Rev. 2.0	12/18/2018	12/19/2018 13:15	Sima Feizi	12/21/2018 15:21	Beverly Y. Sanders	2049455
EPA 365.1 Rev. 2.0 dissolved	12/18/2018			12/18/2018 15:14	Jhamieka S. Greenwood	2049456
SM 2120 B	12/18/2018			12/18/2018 15:09	Chelsea Hernandez	2049454
SM 2320 B-97	12/18/2018			12/22/2018 10:31	Dale L. Simmons	2049454
SM 2540 C-97	12/18/2018			12/20/2018 14:11	Yijie Li	2049454
SM 2540 D-97	12/18/2018			12/20/2018 14:11	Yijie Li	2049454
SM 4500 F-C-97	12/18/2018			12/28/2018 04:03	Dale L. Simmons	2049454
SM 5310 B-00	12/18/2018			12/19/2018 21:56	Megan Treadwell	2049455