Chemical Analysis Report

CEN-DIST-2018-08-22-01

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

Event Description: **Withlacoochee**
Request ID: **RQ-2018-07-16-44**
Customer: **CEN-DIST**
Project ID: **SMP**

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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: WITHLACOOCHEE RIVER @ UPSTREAM OF SR 33 **Collection Date/Time: 08/21/2018 10:10**

Field ID: G4CE0138 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2019003	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P350641	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P350845	
		Sulfate	0.20	U	mg SO4/L	P350848	
	SM 2120 B	Color (true)	610		PCU	P350618	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P350793	
	SM 2540 C-97	TDS	123		mg/L	P351021	
	SM 2540 D-97	TSS	2	I	mg/L	P351016	
	SM 4500 F-C-97	Fluoride	0.072	I	mg F/L	P350796	
2019004	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P350839	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P350891	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P350853	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P350901	
	SM 5310 B-00	Organic Carbon	56		mg C/L	P350836	
2019005	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.029		mg P/L	P350607	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 5310 B-00: 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: P350641

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350845

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350848

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350839

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350891

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350853

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350901

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350607

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

Reference Method: SM 2120 B
Batch ID: P350618

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P350793

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

Reference Method: SM 2540 C-97
Batch ID: P351021

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P351016

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P350796

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P350836

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: P350845

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350848

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350839

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350891

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350853

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: P350901

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350607

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

Reference Method: SM 2120 B
Batch ID: P350618

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.2		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P350793

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	98 - 107

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P350796

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P350836

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350845

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018855	Chloride	94.1		P	90 - 110
2018925	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350848

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018855	Sulfate	98.3		P	90 - 110
2018925	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350839

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018996	Ammonia-N	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350891

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018996	Kjeldahl Nitrogen	95.0	94.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350853

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018996	NO2NO3-N	99.5	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350901

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019022	Total-P	98.7	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350607

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018997	O-Phosphate-P	97.1	98.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P350796

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019110	Fluoride	99.6	99.6	P/P	91 - 105

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P350641

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018995	Turbidity	2.22	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018855	Chloride	0.0733	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350848

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018855	Sulfate	0.0235	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350839

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018996	Ammonia-N	0.930	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350891

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018996	Kjeldahl Nitrogen	0.573	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350853

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018996	NO2NO3-N	2.48	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350901

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019022	Total-P	0.591	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350607

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018997	O-Phosphate-P	1.23	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B
Batch ID: P350618

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018925	Color (true)	1.52	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P350793

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019110	Total Alkalinity	0.105	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P351021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019013	TDS	4.12	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P350796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019110	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P350836

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019004	Organic Carbon	0.204	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: EPA 300.0 Rev. 2.1
Run ID: A86049
Included Lab Sample IDs: 2019003

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A86064
Included Lab Sample IDs: 2019005

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	97.3	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A86065
Included Lab Sample IDs: 2019003

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	100	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A86071
Included Lab Sample IDs: 2019003

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

Reference Method: SM 2320 B-97
Run ID: A86129
Included Lab Sample IDs: 2019003

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	106	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A86129
Included Lab Sample IDs: 2019003

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

Reference Method: SM 5310 B-00
Run ID: A86150
Included Lab Sample IDs: 2019004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.4	96.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A86153
Included Lab Sample IDs: 2019004

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A86155
Included Lab Sample IDs: 2019004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A86206
Included Lab Sample IDs: 2019004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A86208
Included Lab Sample IDs: 2019004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.2	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	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					2.22	
EPA 300.0 Rev. 2.1	Chloride	103	94.1	101		0.0733	
	Sulfate	102	98.3	101		0.0235	
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	102	101			0.930
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	95.0	94.3			0.573
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.5	102			2.48
EPA 365.1 Rev. 2.0	Total-P	98.9	98.7	99.4			0.591
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	97.1	98.3			1.23
SM 2120 B	Color (true)	99.2				1.52	
SM 2320 B-97	Total Alkalinity	105				0.105	
SM 2540 C-97	TDS					4.12	
SM 4500 F-C-97	Fluoride	100	99.6	99.6			0.0
SM 5310 B-00	Organic Carbon	96.8					0.204

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2019003
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2019003
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2019003
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2019004
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2019004
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2019004
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2019004
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2019005
SM 2120 B / E31780	True Color measured at 450 nm	2019003
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2019003
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2019003
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2019003
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2019003
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2019004

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	08/22/2018			08/22/2018 17:25	Megan Treadwell	2019003
EPA 300.0 Rev. 2.1	08/22/2018			08/24/2018 06:58	Lipi Saha	2019003
EPA 350.1 Rev. 2.0	08/22/2018			08/27/2018 11:24	Ping Hua	2019004
EPA 351.2 Rev. 2.0	08/22/2018	08/29/2018 15:30	Adrian Shelby	08/30/2018 12:22	Joseph Suarez	2019004
EPA 353.2 Rev. 2.0	08/22/2018			08/28/2018 11:52	Lauren Bottorf	2019004
EPA 365.1 Rev. 2.0	08/22/2018	08/29/2018 13:20	Sima Feizi	08/30/2018 11:56	Beverly Y. Sanders	2019004
EPA 365.1 Rev. 2.0 dissolved	08/22/2018			08/22/2018 15:13	Julia Storbeck	2019005
SM 2120 B	08/22/2018			08/22/2018 16:38	William L. Brown IV	2019003
SM 2320 B-97	08/22/2018			08/25/2018 10:08	Dale L. Simmons	2019003
SM 2540 C-97	08/22/2018			08/24/2018 16:01	Yijie Li	2019003
SM 2540 D-97	08/22/2018			08/24/2018 16:01	Yijie Li	2019003
SM 4500 F-C-97	08/22/2018			08/25/2018 10:08	Dale L. Simmons	2019003
SM 5310 B-00	08/22/2018			08/27/2018 22:59	Megan Treadwell	2019004