Chemical Analysis Report

CEN-DIST-2018-01-03-01

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

Event Description: **Tiger Crk / Reedy Below Lk Russ + D&B**
Request ID: **RQ-2018-01-01-25**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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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: Tiger Creek 1.45 km DS of Lk Kissimmee **Collection Date/Time: 01/02/2018 11:30**

Field ID: G4CE0070 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1957160	EPA 180.1 Rev. 2.0	Turbidity	6.0		NTU	P337760	
	EPA 300.0 Rev. 2.1	Chloride	16	A	mg Cl/L	P337781	
		Sulfate	12	A	mg SO4/L	P337783	
	SM 2120 B	Color (true)	100		PCU	P337747	
	SM 2320 B-97	Total Alkalinity	15		mg CaCO3/L	P338202	
	SM 2540 C-97	TDS	93		mg/L	P337952	
	SM 2540 D-97	TSS	11		mg/L	P338191	
	SM 4500 F-C-97	Fluoride	0.077	I	mg F/L	P338010	
1957161	EPA 350.1 Rev. 2.0	Ammonia-N	0.036		mg N/L	P337859	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.87		mg N/L	P337741	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.021		mg N/L	P337862	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P337816	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P337847	
1957162	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.053		mg P/L	P337763	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 2540 D-97: 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: P337760

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337781

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337783

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337859

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337741

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337862

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337816

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337763

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

Reference Method: SM 2120 B
Batch ID: P337747

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P338202

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

Reference Method: SM 2540 C-97
Batch ID: P337952

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P338191

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P338010

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P337847

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: P337781

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	109		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337783

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	109		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337859

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337741

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337862

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337816

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337763

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

Reference Method: SM 2320 B-97
Batch ID: P338202

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P338202

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P338010

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.8		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P337847

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337781

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1957160	Chloride	109		P	90 - 110
1957183	Chloride	106		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337783

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1957160	Sulfate	108		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337859

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956950	Ammonia-N	100	90.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337741

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1957161	Kjeldahl Nitrogen	100	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956972	NO2NO3-N	98.8		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337816

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1957172	Total-P	100	105	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P338010

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1957378	Fluoride	94.0	95.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P337847

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1957172	Organic Carbon	97.3	95.5	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P337760

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1957114	Turbidity	4.84	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337781

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1957160	Chloride	0.132	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337783

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1957160	Sulfate	0.0669	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337859

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956950	Ammonia-N	8.66	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337741

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1957161	Kjeldahl Nitrogen	1.32	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956972	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1957172	Total-P	4.57	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337763

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956933	O-Phosphate-P	0.762	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P337747

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1957114	Color (true)	4.86	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P338202

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1957478	Total Alkalinity	0.320	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P337952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956970	TDS	5.54	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P338010

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1957378	Fluoride	1.41	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P337847

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1957172	Organic Carbon	1.16	Spike	P	0 - 20

Quality Assurance Report
Precision

* 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: A81259
Included Lab Sample IDs: 1957160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.7	102	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A81261
Included Lab Sample IDs: 1957160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A81262
Included Lab Sample IDs: 1957162

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A81273
Included Lab Sample IDs: 1957160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	108	109	P/P	90 - 110
Sulfate	107	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A81278
Included Lab Sample IDs: 1957161

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

Reference Method: SM 5310 B-00
Run ID: A81297
Included Lab Sample IDs: 1957161

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.6	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A81299
Included Lab Sample IDs: 1957161

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A81300
Included Lab Sample IDs: 1957161

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.7	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A81303
Included Lab Sample IDs: 1957161

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A81369
Included Lab Sample IDs: 1957160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A81446
Included Lab Sample IDs: 1957160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.5	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	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					4.84	
EPA 300.0 Rev. 2.1	Chloride	109	109	106		0.132	
	Sulfate	109	108			0.0669	
EPA 350.1 Rev. 2.0	Ammonia-N	97.7	100	90.2			8.66
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	100	102			1.32
EPA 353.2 Rev. 2.0	NO2NO3-N	103	98.8				0.0
EPA 365.1 Rev. 2.0	Total-P	102	100	105			4.57
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101					0.762
SM 2120 B	Color (true)					4.86	
SM 2320 B-97	Total Alkalinity	102				0.320	
SM 2540 C-97	TDS					5.54	
SM 4500 F-C-97	Fluoride	94.8	94.0	95.6			1.41
SM 5310 B-00	Organic Carbon	95.0	97.3	95.5			1.16

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1957160
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1957160
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1957160
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1957161
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1957161
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1957161
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1957161
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1957162
SM 2120 B / E31780	True Color measured at 450 nm	1957160
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1957160
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1957160
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1957160
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1957160
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1957161

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	01/03/2018			01/03/2018 14:47	DeAsia Armster	1957160
EPA 300.0 Rev. 2.1	01/03/2018			01/04/2018	Julia Storbeck	1957160
EPA 350.1 Rev. 2.0	01/03/2018			01/04/2018	Sofia Elnemr	1957161
EPA 351.2 Rev. 2.0	01/03/2018	01/03/2018	Adrian Shelby	01/04/2018	Joseph Suarez	1957161
EPA 353.2 Rev. 2.0	01/03/2018			01/05/2018	Beverly Y. Sanders	1957161
EPA 365.1 Rev. 2.0	01/03/2018	01/04/2018	Sima Feizi	01/04/2018	Lipi Saha	1957161
EPA 365.1 Rev. 2.0 dissolved	01/03/2018			01/03/2018 16:08	Megan Treadwell	1957162
SM 2120 B	01/03/2018			01/03/2018 14:42	Tanya Welborn	1957160
SM 2320 B-97	01/03/2018			01/11/2018	Dale L. Simmons	1957160
SM 2540 C-97	01/03/2018			01/05/2018	Yijie Li	1957160
SM 2540 D-97	01/03/2018			01/05/2018	Yijie Li	1957160
SM 4500 F-C-97	01/03/2018			01/09/2018	Dale L. Simmons	1957160
SM 5310 B-00	01/03/2018			01/04/2018	Megan Treadwell	1957161