

Chemical Analysis Report

CEN-DIST-2018-02-14-01

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

Event Description: **Spring Garden Creek**

Request ID: **RQ-2018-02-12-68**

Customer: **CEN-DIST**

Project ID: **SMP**

Send Reports to:

FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 06-MAR-2018 13:52



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: SPRING GARDEN CREEK JUST DS OF DEEP CREEK **Collection Date/Time: 02/13/2018 10:16**

Field ID: G2CE0126

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1967173	EPA 180.1 Rev. 2.0	Turbidity	8.9		NTU	P339986	
	EPA 300.0 Rev. 2.1	Chloride	210		mg Cl/L	P340131	
		Sulfate	33		mg SO4/L	P340136	
	SM 2120 B	Color (true)	130		PCU	P339976	
	SM 2320 B-97	Total Alkalinity	99		mg CaCO3/L	P340527	
	SM 2540 C-97	TDS	503		mg/L	P340572	
	SM 2540 D-97	TSS	16		mg/L	P340231	
	SM 4500 F-C-97	Fluoride	0.089	I	mg F/L	P340690	
1967174	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P340466	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P339997	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P340371	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P340100	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P340335	
1967175	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P339923	

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: P339986

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P340131

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P340136

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P340466

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P339997

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340371

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340100

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339923

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

Reference Method: SM 2120 B
Batch ID: P339976

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P340527

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

Reference Method: SM 2540 C-97
Batch ID: P340572

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P340231

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P340690

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P340335

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: P340131

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340136

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P340466

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: P339997

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340371

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: P340100

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339923

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

Reference Method: SM 2320 B-97
Batch ID: P340527

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P340690

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	93.6		P	91 - 105

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P340335

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: P340131

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1967119	Chloride	102		P	90 - 110
1967125	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340136

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1967119	Sulfate	104		P	90 - 110
1967125	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P340466

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1967121	Ammonia-N	98.7	98.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339997

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1967122	Kjeldahl Nitrogen	97.6	96.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340371

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1967122	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340100

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1967228	Total-P	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339923

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1967248	O-Phosphate-P	96.4	99.9	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
 Batch ID: P340690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968777	Fluoride	100	96.5	P/P	91 - 105

Reference Method: SM 5310 B-00
 Batch ID: P340335

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1967002	Organic Carbon	96.8	97.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P339986

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967417	Turbidity	2.15	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P340131

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967119	Chloride	0.0798	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P340136

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967119	Sulfate	0.0468	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P340466

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967121	Ammonia-N	0.389	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P339997

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967122	Kjeldahl Nitrogen	1.07	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P340371

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340371

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967122	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967228	Total-P	0.117	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339923

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967248	O-Phosphate-P	2.41	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P339976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967227	Color (true)	0.558	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P340527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967700	Total Alkalinity	0.112	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P340572

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967097	TDS	2.29	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P340690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968777	Fluoride	2.92	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P340335

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1967002	Organic Carbon	0.694	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: EPA 300.0 Rev. 2.1

Run ID: A82003

Included Lab Sample IDs: 1967173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	105	105	P/P	90 - 110
Sulfate	103	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A82052

Included Lab Sample IDs: 1967175

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

Reference Method: SM 2120 B

Run ID: A82072

Included Lab Sample IDs: 1967173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	104	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A82076

Included Lab Sample IDs: 1967173

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82125

Included Lab Sample IDs: 1967174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.9	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82133

Included Lab Sample IDs: 1967174

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

Reference Method: SM 5310 B-00

Run ID: A82196

Included Lab Sample IDs: 1967174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.0	94.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A82217

Included Lab Sample IDs: 1967174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A82241

Included Lab Sample IDs: 1967174

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	105	105	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A82266

Included Lab Sample IDs: 1967173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.0	97.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A82320

Included Lab Sample IDs: 1967173

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	96.6	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				2.15	
EPA 300.0 Rev. 2.1	Chloride	102	102	103	0.0798	
	Sulfate	102	104	104	0.0468	
EPA 350.1 Rev. 2.0	Ammonia-N	101	98.7	98.3		0.389
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	97.6	96.0		1.07
EPA 353.2 Rev. 2.0	NO2NO3-N	102	104	104		0.0
EPA 365.1 Rev. 2.0	Total-P	99.3	101	101		0.117
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	96.4	99.9		2.41
SM 2120 B	Color (true)				0.558	
SM 2320 B-97	Total Alkalinity	100			0.112	
SM 2540 C-97	TDS				2.29	
SM 4500 F-C-97	Fluoride	93.6	100	96.5		2.92
SM 5310 B-00	Organic Carbon	97.0	96.8	97.6		0.694

Reference Method Descriptions

Method / DoH Cert #

Description

Associated Samples

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1967173
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1967173
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1967173
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1967174
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1967174
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1967174
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1967174
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1967175
SM 2120 B / E31780	True Color measured at 450 nm	1967173
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1967173
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1967173
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1967173
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1967173
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1967174

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	02/14/2018			02/14/2018 17:19	Sima Feizi	1967173
EPA 300.0 Rev. 2.1	02/14/2018			02/16/2018	Julia Storbeck	1967173
EPA 350.1 Rev. 2.0	02/14/2018			02/22/2018	Ping Hua	1967174
EPA 351.2 Rev. 2.0	02/14/2018	02/15/2018	Adrian Shelby	02/16/2018	Joseph Suarez	1967174
EPA 353.2 Rev. 2.0	02/14/2018			02/21/2018	Lauren Bottorf	1967174
EPA 365.1 Rev. 2.0	02/14/2018	02/16/2018	Sima Feizi	02/19/2018	Beverly Y. Sanders	1967174
EPA 365.1 Rev. 2.0 dissolved	02/14/2018			02/14/2018 13:28	Megan Treadwell	1967175
SM 2120 B	02/14/2018			02/14/2018 15:27	Tanya Welborn	1967173
SM 2320 B-97	02/14/2018			02/24/2018	Dale L. Simmons	1967173
SM 2540 C-97	02/14/2018			02/16/2018	DeAsia Armster	1967173
SM 2540 D-97	02/14/2018			02/16/2018	DeAsia Armster	1967173
SM 4500 F-C-97	02/14/2018			02/27/2018	Dale L. Simmons	1967173
SM 5310 B-00	02/14/2018			02/20/2018	Megan Treadwell	1967174