

Chemical Analysis Report

CEN-DIST-2017-02-02-02

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

Event Description: **Spring Garden Lake & Creek+HA**
Request ID: **RQ-2017-01-30-56**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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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: Spring Garden Creek @ 0.81 miles DS of Spring Garden Lake

Collection Date/Time: 02/01/2017 12:15

Field ID: G2CE0067

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1869137	EPA 180.1 Rev. 2.0	Turbidity	6.3	A	NTU	P319207	
	EPA 300.0 Rev. 2.1	Chloride	240		mg Cl/L	P319468	
		Sulfate	35		mg SO4/L	P319465	
	SM 2120 B	Color (true)	22	A	PCU	P319226	
	SM 2320 B-97	Total Alkalinity	128		mg CaCO3/L	P319505	
	SM 2540 C-97	TDS	579		mg/L	P320052	
	SM 2540 D-97	TSS	15		mg/L	P319587	
	SM 4500 F-C-97	Fluoride	0.098	I	mg F/L	P319508	
1869138	EPA 350.1 Rev. 2.0	Ammonia-N	0.034		mg N/L	P319476	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P319292	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.078		mg N/L	P319734	
	EPA 365.1 Rev. 2.0	Total-P	0.086		mg P/L	P319255	
	SM 5310 B-00	Organic Carbon	6.2		mg C/L	P319390	
1869139	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P319197	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low 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.

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: 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: P319207

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P319465

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P319468

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P319476

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: P319292

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P319734

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319255

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P319197

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

Reference Method: SM 2120 B
Batch ID: P319226

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P319505

Component	Result	Code	Units
Total Alkalinity	1.9	I	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P320052

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P319587

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P319508

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: P319390

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: P319465

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P319468

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P319476

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: P319292

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: P319734

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	105		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319255

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P319197

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

Reference Method: SM 2320 B-97
Batch ID: P319505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P319505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P319508

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.4		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P319390

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P319465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1869095	Sulfate	96.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P319468

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1869095	Chloride	98.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P319292

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1869075	Kjeldahl Nitrogen	108	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P319734

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1868297	NO2NO3-N	99.8	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319255

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1869133	Total-P	95.6	96.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P319197

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P319197

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1869139	O-Phosphate-P	97.0	98.0	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P319390

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1869074	Organic Carbon	93.9	92.5	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P319207

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1869137	Turbidity	6.17	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P319468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1869095	Chloride	0.00884	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P319476

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1868812	Ammonia-N	1.76	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P319292

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1869075	Kjeldahl Nitrogen	6.62	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P319734

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1868297	NO2NO3-N	1.61	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319255

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

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P319255

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1869133	Total-P	1.32	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P319197

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1869139	O-Phosphate-P	0.968	Spike	P	0 - 20

Reference Method: SM 2120 B

Batch ID: P319226

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1869137	Color (true)	2.98	Sample	P	0 - 20

Reference Method: SM 2320 B-97

Batch ID: P319505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1869073	Total Alkalinity	0.321	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97

Batch ID: P320052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1869094	TDS	0.491	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97

Batch ID: P319508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1869073	Fluoride	0.947	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00

Batch ID: P319390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1869074	Organic Carbon	1.19	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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A74242

Included Lab Sample IDs: 1869139

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	98.3	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A74244

Included Lab Sample IDs: 1869137

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

Reference Method: SM 2120 B

Run ID: A74251

Included Lab Sample IDs: 1869137

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A74292

Included Lab Sample IDs: 1869138

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.9	97.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A74307

Included Lab Sample IDs: 1869137

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	P/P	90 - 110
Sulfate	93.2	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A74309

Included Lab Sample IDs: 1869138

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.3	96.2	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A74311

Included Lab Sample IDs: 1869138

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	98.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A74337

Included Lab Sample IDs: 1869138

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

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A74348
Included Lab Sample IDs: 1869137

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A74348
Included Lab Sample IDs: 1869137

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A74430
Included Lab Sample IDs: 1869138

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				6.17	
EPA 300.0 Rev. 2.1	Chloride	101	98.1		0.0088	
	Sulfate	98.2	96.6			
EPA 350.1 Rev. 2.0	Ammonia-N	101				1.76
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	108 97.8			6.62
EPA 353.2 Rev. 2.0	NO2NO3-N	105	99.8 102			1.61
EPA 365.1 Rev. 2.0	Total-P	98.4	95.6 96.9			1.32
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.0 98.0			0.968
SM 2120 B	Color (true)				2.98	
SM 2320 B-97	Total Alkalinity	103			0.321	
SM 2540 C-97	TDS				0.491	
SM 4500 F-C-97	Fluoride	97.4				0.947
SM 5310 B-00	Organic Carbon	99.6	93.9 92.5			1.19

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1869137
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1869137
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1869137
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1869138

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1869138
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1869138
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1869138
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1869139
SM 2120 B / E31780	True Color measured at 450 nm	1869137
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1869137
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1869137
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1869137
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1869137
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1869138

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	02/02/2017			02/02/2017 16:43	Julia Storbeck	1869137
EPA 300.0 Rev. 2.1	02/02/2017			02/08/2017	Ping Hua	1869137
EPA 350.1 Rev. 2.0	02/02/2017			02/07/2017	Sofia Elnemr	1869138
EPA 351.2 Rev. 2.0	02/02/2017	02/06/2017	Adrian Shelby	02/07/2017	Joseph Suarez	1869138
EPA 353.2 Rev. 2.0	02/02/2017			02/13/2017	Beverly Y. Sanders	1869138
EPA 365.1 Rev. 2.0	02/02/2017	02/03/2017	Vijayalakshmi Reddy	02/06/2017	Lipi Saha	1869138
EPA 365.1 Rev. 2.0 dissolved	02/02/2017			02/02/2017 14:22	Julie Michelle Frank	1869139
SM 2120 B	02/02/2017			02/02/2017 17:56	Julie Michelle Frank	1869137
SM 2320 B-97	02/02/2017			02/08/2017	Dale L. Simmons	1869137
SM 2540 C-97	02/02/2017			02/07/2017	Sima Feizi	1869137
SM 2540 D-97	02/02/2017			02/07/2017	Sima Feizi	1869137
SM 4500 F-C-97	02/02/2017			02/08/2017	Dale L. Simmons	1869137
SM 5310 B-00	02/02/2017			02/06/2017	Julie Michelle Frank	1869138