

Chemical Analysis Report

CEN-DIST-2018-02-01-01

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

Event Description: **Silver Springs Group+SCI**
Request ID: **RQ-2018-01-15-37**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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Certified by: Colin Wright, Program Administrator

Date Certified: 21-FEB-2018 10:25

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light-colored rectangular 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: Silver River downstream of boil

Collection Date/Time: 01/31/2018 12:30

Field ID: G1CE0105

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1963441	EPA 180.1 Rev. 2.0	Turbidity	0.25		NTU	P339170	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P339228	
		Sulfate	45		mg SO4/L	P339231	
	SM 2120 B	Color (true)	2.5	U	PCU	P339192	
	SM 2320 B-97	Total Alkalinity	189		mg CaCO3/L	P339514	
	SM 2540 C-97	TDS	286		mg/L	P339634	
	SM 2540 D-97	TSS	2	U	mg/L	P339532	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P339731	
1963442	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P339676	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P339220	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.3		mg N/L	P339242	
	EPA 365.1 Rev. 2.0	Total-P	0.041		mg P/L	P339253	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P339267	
1963443	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.042		mg P/L	P339199	

Ref. Method and Comment:

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: P339170

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P339228

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P339231

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P339676

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P339220

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: P339242

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339253

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339199

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

Reference Method: SM 2120 B
Batch ID: P339192

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P339514

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

Reference Method: SM 2540 C-97
Batch ID: P339634

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P339532

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P339731

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P339267

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: P339228

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339231

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339220

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339242

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: P339253

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339199

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.9		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P339514

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.4		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P339731

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.3		P	91 - 105

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P339267

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: P339228

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963420	Chloride	101		P	90 - 110
1963748	Chloride	97.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963420	Sulfate	98.0		P	90 - 110
1963748	Sulfate	96.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963422	Ammonia-N	101	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339220

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963460	Kjeldahl Nitrogen	95.1	94.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339242

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963353	NO2NO3-N	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963442	Total-P	99.0	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P339731

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963441	Fluoride	93.7	94.3	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P339267

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963163	Organic Carbon	101	98.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P339170

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963433	Turbidity	4.63	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339228

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963420	Chloride	1.06	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339231

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963420	Sulfate	0.476	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963422	Ammonia-N	1.53	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963460	Kjeldahl Nitrogen	0.223	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339242

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963353	NO2NO3-N	0.741	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P339253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963442	Total-P	1.71	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P339199

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963492	O-Phosphate-P	0.994	Spike	P	0 - 20

Reference Method: SM 2120 B

Batch ID: P339192

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963433	Color (true)	2.88	Sample	P	0 - 20

Reference Method: SM 2320 B-97

Batch ID: P339514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963459	Total Alkalinity	0.238	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97

Batch ID: P339634

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963451	TDS	0.234	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97

Batch ID: P339731

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963441	Fluoride	0.477	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00

Batch ID: P339267

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963163	Organic Carbon	1.77	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 300.0 Rev. 2.1

Run ID: 81775

Included Lab Sample IDs: 1963441

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	104	P/P	90 - 110
Sulfate	103	103	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A81797

Included Lab Sample IDs: 1963441

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

Reference Method: SM 2120 B

Run ID: A81803

Included Lab Sample IDs: 1963441

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	103	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A81805

Included Lab Sample IDs: 1963443

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A81821

Included Lab Sample IDs: 1963442

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A81830

Included Lab Sample IDs: 1963442

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A81842

Included Lab Sample IDs: 1963442

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A81847

Included Lab Sample IDs: 1963442

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.8	92.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A81913
Included Lab Sample IDs: 1963441

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.9	95.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A81964
Included Lab Sample IDs: 1963442

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

Reference Method: SM 4500 F-C-97
Run ID: A81981
Included Lab Sample IDs: 1963441

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				4.63	
EPA 300.0 Rev. 2.1	Chloride	97.9	101 97.2		1.06	
	Sulfate	96.7	98.0 96.8		0.476	
EPA 350.1 Rev. 2.0	Ammonia-N	95.6	101 99.0			1.53
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.0	95.1 94.8			0.223
EPA 353.2 Rev. 2.0	NO2NO3-N	105	106 105			0.741
EPA 365.1 Rev. 2.0	Total-P	97.2	99.0 101			1.71
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.9				0.994
SM 2120 B	Color (true)				2.88	
SM 2320 B-97	Total Alkalinity	97.4			0.238	
SM 2540 C-97	TDS				0.234	
SM 4500 F-C-97	Fluoride	97.3	93.7 94.3			0.477
SM 5310 B-00	Organic Carbon	97.0	101 98.6			1.77

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1963441
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1963441
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1963441
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1963442

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1963442
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1963442
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1963442
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1963443
SM 2120 B / E31780	True Color measured at 450 nm	1963441
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1963441
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1963441
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1963441
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1963441
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1963442

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	02/01/2018			02/01/2018 16:00	DeAsia Armster	1963441
EPA 300.0 Rev. 2.1	02/01/2018			02/02/2018	Julia Storbeck	1963441
EPA 350.1 Rev. 2.0	02/01/2018			02/09/2018	Julia Storbeck	1963442
EPA 351.2 Rev. 2.0	02/01/2018	02/02/2018	Adrian Shelby	02/05/2018	Joseph Suarez	1963442
EPA 353.2 Rev. 2.0	02/01/2018			02/02/2018	Lauren Bottorf	1963442
EPA 365.1 Rev. 2.0	02/01/2018	02/02/2018	Sima Feizi	02/05/2018	Beverly Y. Sanders	1963442
EPA 365.1 Rev. 2.0 dissolved	02/01/2018			02/01/2018 15:44	Megan Treadwell	1963443
SM 2120 B	02/01/2018			02/01/2018 15:40	Tanya Welborn	1963441
SM 2320 B-97	02/01/2018			02/07/2018	Lauren Bottorf	1963441
SM 2540 C-97	02/01/2018			02/02/2018	DeAsia Armster	1963441
SM 2540 D-97	02/01/2018			02/02/2018	DeAsia Armster	1963441
SM 4500 F-C-97	02/01/2018			02/10/2018	Lauren Bottorf	1963441
SM 5310 B-00	02/01/2018			02/03/2018	Megan Treadwell	1963442