

Chemical Analysis Report

CEN-DIST-2019-04-04-01

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

Event Description: **Ruth**
Request ID: **RQ-2019-04-01-65**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 19-APR-2019 16:19

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored 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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Fox Lake @ Center of West Lobe

Collection Date/Time: 04/03/2019 11:05

Field ID: G3CE0022

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2075341	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P361616	
	EPA 300.0 Rev. 2.1	Chloride	210		mg Cl/L	P362021	
		Sulfate	35		mg SO4/L	P362023	
	SM 2120 B	Color (true)	230		PCU	P361594	
	SM 2320 B-97	Total Alkalinity	25		mg CaCO3/L	P361984	
	SM 2540 C-97	TDS	520	A	mg/L	P362092	
	SM 2540 D-97	TSS	2	UA	mg/L	P361870	
	SM 4500 F-C-97	Fluoride	0.046	I	mg F/L	P361987	
2075342	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P361961	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P362007	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.022		mg N/L	P362052	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P361831	
	SM 5310 B-00	Organic Carbon	26		mg C/L	P361726	
2075343	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P361608	

Ref. Method and Comment:

SM 2120 B: 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.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P361616

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362021

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362023

Component	Result	Code	Units
Sulfate	0.20	U	mg SO ₄ /L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P361961

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362007

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362052

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: P361831

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361608

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

Reference Method: SM 2120 B
Batch ID: P361594

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P361984

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P362092

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P361870

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P361987

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P361726

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: P362021

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

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P362023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P361961

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P362007

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P362052

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: P361831

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P361608

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.6		P	90 - 110

Reference Method: SM 2120 B
 Batch ID: P361594

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.8		P	85 - 115

Reference Method: SM 2320 B-97
 Batch ID: P361984

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.8		P	98 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P361987

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P361726

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075556	Chloride	97.1		P	90 - 110
2075613	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P362023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075556	Sulfate	96.0		P	90 - 110
2075613	Sulfate	98.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P361961

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075515	Ammonia-N	98.8	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P362007

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075546	Kjeldahl Nitrogen	98.4	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075342	NO2NO3-N	98.2	96.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P361831

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075118	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361608

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075569	O-Phosphate-P	93.5	94.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P361987

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075852	Fluoride	98.4	99.0	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P361726

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2074863	Organic Carbon	100	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P361616

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075115	Turbidity	6.93	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P362021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075556	Chloride	1.17	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P362023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075556	Sulfate	1.18	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P361961

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075515	Ammonia-N	2.01	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P362007

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075546	Kjeldahl Nitrogen	0.343	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P362052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075342	NO2NO3-N	1.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P361831

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075118	Total-P	0.844	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P361608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075569	O-Phosphate-P	0.640	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P361984

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075852	Total Alkalinity	0.826	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P362092

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075341	TDS	0.577	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P361987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075852	Fluoride	0.479	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P361726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2074863	Organic Carbon	0.622	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: SM 2120 B
Run ID: A90452
Included Lab Sample IDs: 2075341

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A90461
Included Lab Sample IDs: 2075343

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	97.3	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A90465
Included Lab Sample IDs: 2075341

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: SM 5310 B-00
Run ID: A90508
Included Lab Sample IDs: 2075342

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A90538
Included Lab Sample IDs: 2075341

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A90603
Included Lab Sample IDs: 2075342

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	98.9	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A90626
Included Lab Sample IDs: 2075341

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.9	99.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A90626
Included Lab Sample IDs: 2075341

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A90637

Included Lab Sample IDs: 2075342

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A90667

Included Lab Sample IDs: 2075342

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A90681

Included Lab Sample IDs: 2075342

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	98.2	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	MS
EPA 180.1 Rev. 2.0	Turbidity				6.93	
EPA 300.0 Rev. 2.1	Chloride	101	97.1	100	1.17	
	Sulfate	99.9	96.0	98.7	1.18	
EPA 350.1 Rev. 2.0	Ammonia-N	99.5	98.8	101		2.01
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	98.4	99.2		0.343
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	98.2	96.8		1.39
EPA 365.1 Rev. 2.0	Total-P	104	102	103		0.844
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.6	93.5	94.1		0.640
SM 2120 B	Color (true)	99.8				
SM 2320 B-97	Total Alkalinity	98.8			0.826	
SM 2540 C-97	TDS				0.577	
SM 4500 F-C-97	Fluoride	97.5	98.4	99.0		0.479
SM 5310 B-00	Organic Carbon	102	100	101		0.622

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2075341
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2075341
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2075341
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2075342
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2075342
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2075342
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2075342
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2075343
SM 2120 B / E31780	True Color measured at 450 nm	2075341
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2075341
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2075341
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2075341
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2075341
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2075342

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	04/04/2019			04/04/2019 15:03	Adrian Shelby	2075341
EPA 300.0 Rev. 2.1	04/04/2019			04/11/2019 17:11	Lipi Saha	2075341
EPA 350.1 Rev. 2.0	04/04/2019			04/10/2019 11:26	Ping Hua	2075342
EPA 351.2 Rev. 2.0	04/04/2019	04/11/2019 14:30	Adrian Shelby	04/12/2019 15:09	Joseph Suarez	2075342
EPA 353.2 Rev. 2.0	04/04/2019			04/12/2019 10:52	Beverly Y. Sanders	2075342
EPA 365.1 Rev. 2.0	04/04/2019	04/09/2019 16:50	Sima Feizi	04/11/2019 13:26	Rosalyn Ballman	2075342
EPA 365.1 Rev. 2.0 dissolved	04/04/2019			04/04/2019 15:49	Jhamieka S. Greenwood	2075343
SM 2120 B	04/04/2019			04/04/2019 16:00	Blanca Fach	2075341
SM 2320 B-97	04/04/2019			04/11/2019 06:10	Dale L. Simmons	2075341
SM 2540 C-97	04/04/2019			04/05/2019 17:22	Mariam Hanna	2075341
SM 2540 D-97	04/04/2019			04/05/2019 15:54	Mariam Hanna	2075341
SM 4500 F-C-97	04/04/2019			04/11/2019 06:10	Dale L. Simmons	2075341
SM 5310 B-00	04/04/2019			04/06/2019 02:30	Julia Storbeck	2075342