Chemical Analysis Report

CEN-DIST-2022-01-25-01

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

Event Description: **Apopka Spring**
Request ID: **RQ-2022-01-24-17**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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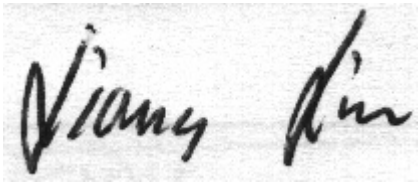
Date Certified: 11-FEB-2022 16:00



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: Apopka Spring near boil **Collection Date/Time: 01/24/2022 10:58**

Field ID: G1CE0113 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2301449	DEP SOP: NU-094-1	Color (true)**	8.7		PCU	P408922	
	EPA 180.1 Rev. 2.0	Turbidity	5.0		NTU	P408926	
	EPA 300.0 Rev. 2.1	Chloride	26	A	mg Cl/L	P409287	
		Sulfate	12	A	mg SO4/L	P409290	
	SM 2320 B-2011	Total Alkalinity	115	A	mg CaCO3/L	P409054	
	SM 2540 C-2011	TDS	161		mg/L	P409500	
	SM 2540 D-2011	TSS	15		mg/L	P409492	
	SM 4500 F-C-2011	Fluoride	0.15		mg F/L	P409057	
2301450	EPA 350.1 Rev. 2.0	Ammonia-N	0.26		mg N/L	P409404	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P409135	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.3		mg N/L	P409207	
	EPA 365.1 Rev. 2.0	Total-P	0.055		mg P/L	P408940	
	SM 5310 B-2011	Organic Carbon	9.5		mg C/L	P409214	
2301451	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P408920	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P408922

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P408926

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409287

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409290

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409404

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409135

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409207

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408940

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408920

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P409054

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

Reference Method: SM 2540 C-2011
Batch ID: P409500

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P409492

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P409057

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P409214

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P408922

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409287

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409290

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409404

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409135

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409207

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408940

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: P408920

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

Reference Method: SM 2320 B-2011
Batch ID: P409054

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-2011
Batch ID: P409057

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P409214

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409287

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301449	Chloride	96.9		P	90 - 110
2301575	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409290

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301449	Sulfate	95.2		P	90 - 110
2301575	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409404

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301510	Ammonia-N	93.6	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409135

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301347	Kjeldahl Nitrogen	104	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409207

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301429	NO2NO3-N	94.8	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408940

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301428	Total-P	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408920

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301421	O-Phosphate-P	100	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P409057

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301449	Fluoride	99.2	99.2	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P409214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2301038	Organic Carbon	94.6	94.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P408922

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301354	Color (true)	0.403	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P408926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301355	Turbidity	3.38	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409287

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301449	Chloride	0.102	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P409290

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301449	Sulfate	0.142	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409404

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301510	Ammonia-N	2.29	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301347	Kjeldahl Nitrogen	3.08	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409207

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301429	NO2NO3-N	0.707	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301428	Total-P	0.0368	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408920

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301421	O-Phosphate-P	1.88	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P409054

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301449	Total Alkalinity	0.123	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P409500

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301299	TDS	5.45	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P409057

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301449	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P409214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2301038	Organic Carbon	0.203	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A110032
Included Lab Sample IDs: 2301451

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

Reference Method: DEP SOP: NU-094-1
Run ID: A110033
Included Lab Sample IDs: 2301449

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A110034
Included Lab Sample IDs: 2301449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.0	P/P	95 - 105

Reference Method: SM 2320 B-2011
Run ID: A110068
Included Lab Sample IDs: 2301449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	99.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A110068
Included Lab Sample IDs: 2301449

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A110075
Included Lab Sample IDs: 2301450

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A110125
Included Lab Sample IDs: 2301450

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

Reference Method: SM 5310 B-2011
Run ID: A110130
Included Lab Sample IDs: 2301450

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.8	97.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A110154
Included Lab Sample IDs: 2301449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.9	101	P/P	90 - 110
Sulfate	98.8	99.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A110188
Included Lab Sample IDs: 2301450

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.9	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110212
Included Lab Sample IDs: 2301450

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	99.0	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
DEP SOP: NU-094-1	Color (true)	98.7				0.403	
EPA 180.1 Rev. 2.0	Turbidity					3.38	
EPA 300.0 Rev. 2.1	Chloride	102	96.9	100		0.102	
	Sulfate	99.0	95.2	98.4		0.142	
EPA 350.1 Rev. 2.0	Ammonia-N	100	93.6	96.4			2.29
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.2	104	108			3.08
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	94.8	95.8			0.707
EPA 365.1 Rev. 2.0	Total-P	104	106	106			0.0368
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	100	102			1.88
SM 2320 B-2011	Total Alkalinity	101				0.123	
SM 2540 C-2011	TDS					5.45	
SM 4500 F-C-2011	Fluoride	99.3	99.2	99.2			0.0
SM 5310 B-2011	Organic Carbon	94.6	94.6	94.8			0.203

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2301449
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2301449
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2301449
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2301449
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2301450
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2301450
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2301450
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2301450
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2301451
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2301449
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2301449
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2301449
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2301449
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2301450

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	01/25/2022			01/25/2022 15:28	Blanca Fach	2301449
EPA 180.1 Rev. 2.0	01/25/2022			01/25/2022 15:03	Khloe J Berg	2301449
EPA 300.0 Rev. 2.1	01/25/2022			02/02/2022 03:21	James L Waggerby	2301449
EPA 350.1 Rev. 2.0	01/25/2022			02/03/2022 15:12	Ping Hua	2301450
EPA 351.2 Rev. 2.0	01/25/2022	01/31/2022 10:51	Samantha L Bates	02/02/2022 12:29	Alexandra J Mattheus	2301450
EPA 353.2 Rev. 2.0	01/25/2022			01/31/2022 09:48	Beverly Y. Sanders	2301450
EPA 365.1 Rev. 2.0	01/25/2022	01/26/2022 17:15	Simonne.V. Calhoun	01/27/2022 12:55	Shengyu Ding	2301450
EPA 365.1 Rev. 2.0 dissolved	01/25/2022			01/25/2022 15:05	James L Waggerby	2301451
SM 2320 B-2011	01/25/2022			01/27/2022 04:14	Dale L. Simmons	2301449
SM 2540 C-2011	01/25/2022			01/28/2022 14:02	Yijie Li	2301449
SM 2540 D-2011	01/25/2022			01/28/2022 14:02	Yijie Li	2301449
SM 4500 F-C-2011	01/25/2022			01/27/2022 04:05	Dale L. Simmons	2301449
SM 5310 B-2011	01/25/2022			01/28/2022 22:11	Nathaniel J Jones	2301450