

Chemical Analysis Report

CEN-DIST-2019-05-08-01

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

Event Description: **Banana Lk + LVI**
Request ID: **RQ-2019-05-06-51**
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

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 23-MAY-2019 14:41



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: Lake Banana @ Center

Collection Date/Time: 05/07/2019 10:38

Field ID: G2CE0206

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2084386	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P363611	
	EPA 300.0 Rev. 2.1	Chloride	51		mg Cl/L	P363823	
		Sulfate	15		mg SO4/L	P363825	
	SM 2120 B	Color (true)	19		PCU	P363638	
	SM 2320 B-97	Total Alkalinity	24	A	mg CaCO3/L	P364170	
	SM 2540 C-97	TDS	139		mg/L	P364142	
	SM 2540 D-97	TSS	2	U	mg/L	P364237	
	SM 4500 F-C-97	Fluoride	0.056	I	mg F/L	P364174	
2084387	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P363906	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32		mg N/L	P363929	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364063	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P363722	
	SM 5310 B-00	Organic Carbon	5.0		mg C/L	P363993	
2084388	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P363650	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 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: P363611

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363823

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363825

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363906

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363929

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364063

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363722

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363650

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

Reference Method: SM 2120 B
Batch ID: P363638

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P364170

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

Reference Method: SM 2540 C-97
Batch ID: P364142

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P364237

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P364174

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P363993

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: P363823

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363825

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363906

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: P363929

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364063

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: P363722

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363650

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.8		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P363638

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.8		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P364170

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P364174

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P363993

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	89.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363823

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084275	Chloride	99.3		P	90 - 110
2084358	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P363825

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084275	Sulfate	99.9		P	90 - 110
2084358	Sulfate	99.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363906

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084361	Ammonia-N	99.7	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364063

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084301	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363722

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084387	Total-P	94.2	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363650

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084277	O-Phosphate-P	98.2	99.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P364174

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084386	Fluoride	96.1	95.6	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P363993

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084109	Organic Carbon	88.6	91.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P363611

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084410	Turbidity	3.48	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P363823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084358	Chloride	2.17	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P363825

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084358	Sulfate	1.21	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P363906

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084361	Ammonia-N	0.442	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P363929

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084442	Kjeldahl Nitrogen	5.61	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P364063

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084301	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P363722

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084387	Total-P	10.4	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P363650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084277	O-Phosphate-P	1.20	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P363638

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084359	Color (true)	1.32	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P364170

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084386	Total Alkalinity	0.743	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P364142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084360	TDS	1.17	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P364174

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084386	Fluoride	0.476	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P363993

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084109	Organic Carbon	1.94	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: EPA 300.0 Rev. 2.1

Run ID: A91228

Included Lab Sample IDs: 2084386

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A91297

Included Lab Sample IDs: 2084386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.5	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A91305

Included Lab Sample IDs: 2084386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A91312

Included Lab Sample IDs: 2084388

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.5	98.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91412

Included Lab Sample IDs: 2084387

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A91428

Included Lab Sample IDs: 2084387

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	100	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A91449

Included Lab Sample IDs: 2084387

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	92.2	91.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A91473

Included Lab Sample IDs: 2084387

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A91485

Included Lab Sample IDs: 2084387

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.8	103	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A91513

Included Lab Sample IDs: 2084386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A91513

Included Lab Sample IDs: 2084386

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	98.6	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		Precision	
					LCS	MS
EPA 180.1 Rev. 2.0	Turbidity				3.48	
EPA 300.0 Rev. 2.1	Chloride	99.8	100	99.3	2.17	
	Sulfate	99.6	99.9	99.9	1.21	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.7	99.2		0.442
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106				5.61
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	100	100		0.0
EPA 365.1 Rev. 2.0	Total-P	98.8	94.2	105		10.4
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	98.2	99.8		1.20
SM 2120 B	Color (true)	97.8			1.32	
SM 2320 B-97	Total Alkalinity	102			0.743	
SM 2540 C-97	TDS				1.17	
SM 4500 F-C-97	Fluoride	96.7	96.1	95.6		0.476
SM 5310 B-00	Organic Carbon	89.4	88.6	91.4		1.94

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2084386
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2084386
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2084386
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2084387
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2084387
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2084387
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2084387
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2084388
SM 2120 B / E31780	True Color measured at 450 nm	2084386
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2084386
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2084386
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2084386
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2084386
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2084387

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	05/08/2019			05/08/2019 16:03	Adrian Shelby	2084386
EPA 300.0 Rev. 2.1	05/08/2019			05/11/2019 02:45	Lipi Saha	2084386
EPA 350.1 Rev. 2.0	05/08/2019			05/13/2019 12:17	Ping Hua	2084387
EPA 351.2 Rev. 2.0	05/08/2019	05/14/2019 12:30	Adrian Shelby	05/16/2019 11:12	Joseph Suarez	2084387
EPA 353.2 Rev. 2.0	05/08/2019			05/16/2019 10:38	Beverly Y. Sanders	2084387
EPA 365.1 Rev. 2.0	05/08/2019	05/10/2019 08:53	Joseph Suarez	05/14/2019 18:18	Rosalyn Ballman	2084387
EPA 365.1 Rev. 2.0 dissolved	05/08/2019			05/08/2019 14:48	Jhamieka S. Greenwood	2084388
SM 2120 B	05/08/2019			05/08/2019 15:31	Blanca Fach	2084386
SM 2320 B-97	05/08/2019			05/16/2019 22:13	Dale L. Simmons	2084386
SM 2540 C-97	05/08/2019			05/10/2019 16:05	Yijie Li	2084386
SM 2540 D-97	05/08/2019			05/10/2019 16:05	Yijie Li	2084386
SM 4500 F-C-97	05/08/2019			05/16/2019 22:05	Dale L. Simmons	2084386
SM 5310 B-00	05/08/2019			05/15/2019 05:35	Julia Storbeck	2084387