Chemical Analysis Report

SW-DIST-2019-11-19-01

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

Event Description: **McKethan Lake**
Request ID: **RQ-2019-11-18-67**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
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Temple Terrace, FL 33637-0926
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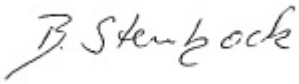
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 06-DEC-2019 18:45



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: Mckethan Lake @ Center **Collection Date/Time: 11/18/2019 09:45**

Field ID: G4SW0021 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2136953	EPA 180.1 Rev. 2.0	Turbidity	0.60		NTU	P374453	
	EPA 300.0 Rev. 2.1	Chloride	2.4	A	mg Cl/L	P375156	
		Sulfate	0.20	UA	mg SO4/L	P375160	
	SM 2120 B	Color (true)	26	A	PCU	P374467	
	SM 2320 B-97	Total Alkalinity	11		mg CaCO3/L	P374991	
	SM 2540 C-97	TDS	25		mg/L	P375012	
	SM 2540 D-97	TSS	2	I	mg/L	P375103	
	SM 4500 F-C-97	Fluoride	0.041	I	mg F/L	P374674	
2136954	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P374720	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.56		mg N/L	P374767	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P374483	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P374905	
	SM 5310 B-00	Organic Carbon	7.3		mg C/L	P374642	
2136955	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P374446	

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.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P374453

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375156

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375160

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374720

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374767

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374483

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374905

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374446

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

Reference Method: SM 2120 B
Batch ID: P374467

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P374991

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

Reference Method: SM 2540 C-97
Batch ID: P375012

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P375103

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P374674

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P374642

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: P375156

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375160

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: P374720

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: P374767

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374483

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: P374905

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: P374446

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

Reference Method: SM 2120 B
Batch ID: P374467

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

Reference Method: SM 2320 B-97
Batch ID: P374991

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P374674

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P374642

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: P375156

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136953	Chloride	102		P	90 - 110
2137146	Chloride	99.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375160

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136953	Sulfate	101		P	90 - 110
2137146	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374720

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136963	Ammonia-N	99.7	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374767

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136979	Kjeldahl Nitrogen	103	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374483

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136941	NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374905

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136914	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374446

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136917	O-Phosphate-P	96.7	96.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P374674

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136908	Fluoride	94.4	95.0	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P374642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136915	Organic Carbon	104	105	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P374453

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136961	Turbidity	3.41	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375156

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136953	Chloride	2.77	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374720

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136963	Ammonia-N	1.18	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374767

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136979	Kjeldahl Nitrogen	1.28	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136941	NO2NO3-N	0.590	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374905

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136914	Total-P	0.848	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374446

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136917	O-Phosphate-P	0.0538	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P374467

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136953	Color (true)	2.55	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P374991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136909	Total Alkalinity	0.581	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P375012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136910	TDS	7.23	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P374674

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136908	Fluoride	0.487	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P374642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136915	Organic Carbon	0.335	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: A95827
Included Lab Sample IDs: 2136955

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A95832
Included Lab Sample IDs: 2136953

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	96.5	101	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A95836
Included Lab Sample IDs: 2136953

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A95842
Included Lab Sample IDs: 2136954

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

Reference Method: SM 5310 B-00
Run ID: A95899
Included Lab Sample IDs: 2136954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	104	106	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A95902
Included Lab Sample IDs: 2136953

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	96.6	97.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A95920
Included Lab Sample IDs: 2136954

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A95977
Included Lab Sample IDs: 2136954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	99.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A96025
Included Lab Sample IDs: 2136953

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A96087
Included Lab Sample IDs: 2136953

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A96092
Included Lab Sample IDs: 2136954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	98.8	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
EPA 180.1 Rev. 2.0	Turbidity					3.41	
EPA 300.0 Rev. 2.1	Chloride	102	102	99.5		2.77	
	Sulfate	99.6	101	101			
EPA 350.1 Rev. 2.0	Ammonia-N	99.5	99.7	101			1.18
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	103	100			1.28
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	101			0.590
EPA 365.1 Rev. 2.0	Total-P	104	102	103			0.848
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.2	96.7	96.6			0.0538
SM 2120 B	Color (true)	101				2.55	
SM 2320 B-97	Total Alkalinity	104				0.581	
SM 2540 C-97	TDS					7.23	
SM 4500 F-C-97	Fluoride	94.2	94.4	95.0			0.487
SM 5310 B-00	Organic Carbon	102	104	105			0.335

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2136953
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2136953
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2136953
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2136954
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2136954
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2136954
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2136954
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2136955
SM 2120 B / E31780	True Color measured at 450 nm	2136953
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2136953
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2136953
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2136953
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2136953
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2136954

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	11/19/2019			11/19/2019 16:22	Samantha Davila	2136953
EPA 300.0 Rev. 2.1	11/19/2019			12/03/2019 00:31	Lipi Saha	2136953
EPA 350.1 Rev. 2.0	11/19/2019			11/22/2019 10:57	Ping Hua	2136954
EPA 351.2 Rev. 2.0	11/19/2019	11/25/2019 11:47	Sima Feizi	11/26/2019 15:39	Jhamieka S. Greenwood	2136954
EPA 353.2 Rev. 2.0	11/19/2019			11/20/2019 09:27	Beverly Y. Sanders	2136954
EPA 365.1 Rev. 2.0	11/19/2019	11/26/2019 14:09	Yen Ta	12/03/2019 15:41	Benjamin T. Nordmann	2136954
EPA 365.1 Rev. 2.0 dissolved	11/19/2019			11/19/2019 14:12	Lipi Saha	2136955
SM 2120 B	11/19/2019			11/19/2019 15:49	Blanca Fach	2136953
SM 2320 B-97	11/19/2019			11/27/2019 23:09	Dale L. Simmons	2136953
SM 2540 C-97	11/19/2019			11/22/2019 15:46	Yijie Li	2136953
SM 2540 D-97	11/19/2019			11/22/2019 15:21	Yijie Li	2136953
SM 4500 F-C-97	11/19/2019			11/22/2019 04:03	Dale L. Simmons	2136953
SM 5310 B-00	11/19/2019			11/21/2019 17:11	Lauren Lees	2136954