

Chemical Analysis Report

TLH-ROC-2017-11-17-01

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

Event Description: **SMP Freshwater Kit A**
Request ID: **RQ-2017-10-30-54**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

For additional information please contact
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 07-DEC-2017 14:50

A handwritten signature in black ink, appearing to read "Liang Lin", is written on a light-colored, textured 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: Blue Hole Spring

Collection Date/Time: 11/16/2017 15:20

Field ID: G2TLHR0009-2017-03

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1947360	EPA 180.1 Rev. 2.0	Turbidity	1.8	A	NTU	P335563	
	EPA 300.0 Rev. 2.1	Chloride	3.1		mg Cl/L	P335684	
	SM 2120 B	Color (true)	2.5	U	PCU	P335549	
	SM 2320 B-97	Total Alkalinity	163		mg CaCO3/L	P335849	
	SM 2540 C-97	TDS	162		mg/L	P335832	
	SM 2540 D-97	TSS	2	I	mg/L	P335839	
	SM 4500 F-C-97	Fluoride	0.075	I	mg F/L	P335852	
1947361	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P336253	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	I	mg N/L	P336052	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.36		mg N/L	P335937	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P335883	
	SM 5310 B-00	Organic Carbon	0.66	I	mg C/L	P336098	
1947362	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P335515	

Ref. Method and Comment:

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: P335563

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P335684

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P336253

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P336052

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

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P335937

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P335883

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P335515

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

Reference Method: SM 2120 B
Batch ID: P335549

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P335849

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

Reference Method: SM 2540 C-97
Batch ID: P335832

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P335839

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P335852

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P336098

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: P335684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P335684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P336253

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336052

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335937

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P335883

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	95.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P335515

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

Reference Method: SM 2320 B-97
Batch ID: P335849

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P335852

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.0		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P336098

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P335684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947161	Chloride	95.6		P	90 - 110
1947426	Chloride	93.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P336253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947251	Ammonia-N	91.9	95.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947267	Kjeldahl Nitrogen	97.4	96.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335937

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947319	NO2NO3-N	105	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P335883

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947361	Total-P	96.6	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P335515

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947354	O-Phosphate-P	98.5	99.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P335852

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947514	Fluoride	98.2	98.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P336098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1947061	Organic Carbon	95.8	95.4	P/P	85 - 115

Quality Assurance Report Precision

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P335563

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947360	Turbidity	10.8	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P335684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947161	Chloride	0.489	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P336253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947251	Ammonia-N	3.26	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P336052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947267	Kjeldahl Nitrogen	0.420	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P335937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947319	NO2NO3-N	0.409	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P335883

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947361	Total-P	1.30	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P335515

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947354	O-Phosphate-P	0.884	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P335549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947374	Color (true)	0.0525	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P335849

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947514	Total Alkalinity	0.0879	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P335832

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1946665	TDS	3.47	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P335852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947514	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P336098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1947061	Organic Carbon	0.362	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: A80230
Included Lab Sample IDs: 1947360

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A80349
Included Lab Sample IDs: 1947362

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	102	99.3	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A80364
Included Lab Sample IDs: 1947360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	104	104	P/P	85 - 115

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A80367

Included Lab Sample IDs: 1947360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	101	P/P	95 - 105

Reference Method: SM 2320 B-97

Run ID: A80493

Included Lab Sample IDs: 1947360

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

Reference Method: SM 4500 F-C-97

Run ID: A80493

Included Lab Sample IDs: 1947360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A80537

Included Lab Sample IDs: 1947361

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A80548

Included Lab Sample IDs: 1947361

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

Reference Method: SM 5310 B-00

Run ID: A80598

Included Lab Sample IDs: 1947361

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.4	96.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A80655

Included Lab Sample IDs: 1947361

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A80668

Included Lab Sample IDs: 1947361

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	97.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

* 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	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					10.8	
EPA 300.0 Rev. 2.1	Chloride	96.5	95.6	93.7		0.489	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	91.9	95.4			3.26
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.6	97.4	96.9			0.420
EPA 353.2 Rev. 2.0	NO2NO3-N	104	105	105			0.409
EPA 365.1 Rev. 2.0	Total-P	95.5	96.6	97.9			1.30
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	98.5	99.5			0.884
SM 2120 B	Color (true)					0.0525	
SM 2320 B-97	Total Alkalinity	102				0.0879	
SM 2540 C-97	TDS					3.47	
SM 4500 F-C-97	Fluoride	97.0	98.2	98.2			0.0
SM 5310 B-00	Organic Carbon	95.2	95.8	95.4			0.362

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1947360
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1947360
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1947361
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1947361
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1947361
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1947361
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1947362
SM 2120 B / E31780	True Color measured at 450 nm	1947360
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1947360
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1947360
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1947360
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1947360
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1947361

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	11/17/2017			11/17/2017 16:59	Tanya Welborn	1947360
EPA 300.0 Rev. 2.1	11/17/2017			11/17/2017	Irina Carbone	1947360
EPA 350.1 Rev. 2.0	11/17/2017			12/01/2017	Sofia Elnemr	1947361
EPA 351.2 Rev. 2.0	11/17/2017	11/29/2017	Adrian Shelby	12/01/2017	Tanya Welborn	1947361
EPA 353.2 Rev. 2.0	11/17/2017			11/28/2017	Beverly Y. Sanders	1947361
EPA 365.1 Rev. 2.0	11/17/2017	11/27/2017	Sima Feizi	11/28/2017	Lipi Saha	1947361
EPA 365.1 Rev. 2.0 dissolved	11/17/2017			11/17/2017 10:55	Megan Treadwell	1947362
SM 2120 B	11/17/2017			11/17/2017 15:02	Tanya Welborn	1947360
SM 2320 B-97	11/17/2017			11/22/2017	Dale L. Simmons	1947360
SM 2540 C-97	11/17/2017			11/20/2017	Yijie Li	1947360
SM 2540 D-97	11/17/2017			11/20/2017	Yijie Li	1947360
SM 4500 F-C-97	11/17/2017			11/22/2017	Dale L. Simmons	1947360
SM 5310 B-00	11/17/2017			11/28/2017	Ping Hua	1947361