

Chemical Analysis Report

SO-DIST-2016-11-09-01

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

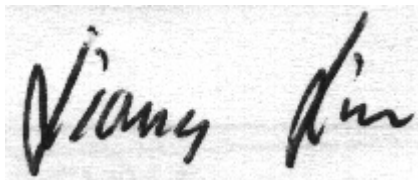
Event Description: **SMP: Florida Keys**
Request ID: **RQ-2016-11-07-15**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901
Attn: Ben Paswater

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 02-DEC-2016 09:38

A handwritten signature in black ink, appearing to read "Liang Lin", 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 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: ENRE9 Harney River

Collection Date/Time: 11/08/2016 15:20

Field ID: G5SD0040

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848673	EPA 180.1 Rev. 2.0	Turbidity	4.1		NTU	P314901	
	SM 2320 B-97	Total Alkalinity	192	A	mg CaCO3/L	P315211	
	SM 2540 D-97	TSS	4	I	mg/L	P315497	
	SM 4500 F-C-97	Fluoride	0.43		mg F/L	P315214	
1848675	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P315191	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.79		mg N/L	P315610	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P315097	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P315309	MS
	SM 5310 B-00	Organic Carbon	12		mg C/L	P314973	
1848677	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	I	mg P/L	P314895	

Ref. Method and Comment:

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

SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: ENRE9 Harney River duplicate

Collection Date/Time: 11/08/2016 15:30

Field ID: G5SD0040-D

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1848674	EPA 180.1 Rev. 2.0	Turbidity	4.2	A	NTU	P314901	
	SM 2320 B-97	Total Alkalinity	193		mg CaCO3/L	P315211	
	SM 2540 D-97	TSS	4	I	mg/L	P315497	
	SM 4500 F-C-97	Fluoride	0.43		mg F/L	P315214	
1848676	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P315191	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.92		mg N/L	P315654	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P315097	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P315309	MS
	SM 5310 B-00	Organic Carbon	13		mg C/L	P314973	
1848678	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P314895	

Ref. Method and Comment:

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

SM 5310 B-00: 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: P314901

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P315191

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315610

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315654

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315097

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315309

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314895

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

Reference Method: SM 2320 B-97
Batch ID: P315211

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

Reference Method: SM 2540 D-97
Batch ID: P315497

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P315214

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P314973

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315191

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: P315610

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315654

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: P315097

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315309

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314895

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

Reference Method: SM 2320 B-97
Batch ID: P315211

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P315214

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P314973

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848286	Ammonia-N	103	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315610

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848295	Kjeldahl Nitrogen	97.6	93.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315654

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848950	Kjeldahl Nitrogen	94.3	94.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315097

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848414	NO2NO3-N	98.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315309

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1847899	Total-P	82.8	86.4	F/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314895

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848677	O-Phosphate-P	94.2	96.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P315214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1848673	Fluoride	97.8	100	P/P	91 - 105

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P314901

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848674	Turbidity	1.90	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848286	Ammonia-N	0.543	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315610

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848295	Kjeldahl Nitrogen	3.61	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P315654

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848950	Kjeldahl Nitrogen	0.192	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P315097

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848414	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P315309

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1847899	Total-P	3.98	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P314895

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848677	O-Phosphate-P	1.75	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P315211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848673	Total Alkalinity	0.499	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P315214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848673	Fluoride	1.52	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P314973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1848594	Organic Carbon	2.76	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 365.1 Rev. 2.0 dissolved
Run ID: A72731
Included Lab Sample IDs: 1848677, 1848678

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	97.6	P/P	90 - 110
O-Phosphate-P	99.3	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A72735
Included Lab Sample IDs: 1848673, 1848674

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

Reference Method: SM 5310 B-00
Run ID: A72755
Included Lab Sample IDs: 1848675, 1848676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.8	94.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A72782
Included Lab Sample IDs: 1848675, 1848676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	96.5	97.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A72816
Included Lab Sample IDs: 1848675, 1848676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.5	96.8	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A72821
Included Lab Sample IDs: 1848673, 1848674

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

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A72821

Included Lab Sample IDs: 1848673, 1848674

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A72933

Included Lab Sample IDs: 1848675, 1848676

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73010

Included Lab Sample IDs: 1848675

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.1	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73042

Included Lab Sample IDs: 1848676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.4	104	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				1.90	
EPA 350.1 Rev. 2.0	Ammonia-N	100	103 103			0.543
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	97.6 93.3			3.61
	Kjeldahl Nitrogen	104	94.3 94.5			0.192
EPA 353.2 Rev. 2.0	NO2NO3-N	102	98.2			0.0
EPA 365.1 Rev. 2.0	Total-P	97.0	82.8 86.4			3.98
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	94.2 96.0			1.75
SM 2320 B-97	Total Alkalinity	100			0.499	
SM 4500 F-C-97	Fluoride	98.2	97.8 100			1.52
SM 5310 B-00	Organic Carbon	95.8				2.76

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1848673, 1848674
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1848675, 1848676

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1848675, 1848676
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1848675, 1848676
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1848675, 1848676
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1848677, 1848678
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1848673, 1848674
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1848673, 1848674
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1848673, 1848674
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1848675, 1848676

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	11/09/2016			11/09/2016 16:14	Julie Michelle Frank	1848673, 1848674
EPA 350.1 Rev. 2.0	11/09/2016			11/15/2016	Julie Michelle Frank	1848675, 1848676
EPA 351.2 Rev. 2.0	11/09/2016	11/22/2016	Adrian Shelby	11/23/2016	Joseph Suarez	1848675
	11/09/2016	11/23/2016	Adrian Shelby	11/29/2016	Joseph Suarez	1848676
EPA 353.2 Rev. 2.0	11/09/2016			11/14/2016	Beverly Y. Sanders	1848675, 1848676
EPA 365.1 Rev. 2.0	11/09/2016	11/17/2016	Christopher Armour	11/21/2016	Lipi Saha	1848675, 1848676
EPA 365.1 Rev. 2.0 dissolved	11/09/2016			11/09/2016 14:50	Julia Storbeck	1848677
	11/09/2016			11/09/2016 14:56	Julia Storbeck	1848678
SM 2320 B-97	11/09/2016			11/15/2016	Dale L. Simmons	1848673, 1848674
SM 2540 D-97	11/09/2016			11/11/2016	Yijie Li	1848673, 1848674
SM 4500 F-C-97	11/09/2016			11/15/2016	Dale L. Simmons	1848673, 1848674
SM 5310 B-00	11/09/2016			11/10/2016	Julie Michelle Frank	1848675, 1848676