Chemical Analysis Report

SO-DIST-2017-10-31-03

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

Event Description: **Sanibel Dune Lakes**
Request ID: **RQ-2017-09-18-40**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
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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: Dunes Lake 4 Weir Downstream **Collection Date/Time: 10/30/2017 09:30**

Field ID: DL04WEIRDS Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1941276	EPA 180.1 Rev. 2.0	Turbidity	17		NTU	P334414	
	EPA 300.0 Rev. 2.1	Chloride	1.1E+03		mg Cl/L	P334687	
		Sulfate	200		mg SO4/L	P334690	
	SM 2120 B	Color (true)	36	A	PCU	P334409	
	SM 2320 B-97	Total Alkalinity	171		mg CaCO3/L	P334549	
	SM 2540 C-97	TDS	2.35E+03		mg/L	P334828	
	SM 2540 D-97	TSS	8	I	mg/L	P334838	
	SM 4500 F-C-97	Fluoride	0.53		mg F/L	P334864	
1941277	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P334770	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P335105	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P334726	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P334482	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P334888	
1941278	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.087		mg P/L	P334401	

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: P334414

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334687

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334690

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P334770

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335105

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334726

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334482

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334401

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

Reference Method: SM 2120 B
Batch ID: P334409

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P334549

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

Reference Method: SM 2540 C-97
Batch ID: P334828

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P334838

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P334864

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P334888

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: P334687

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334690

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P334770

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335105

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: P334726

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: P334482

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334401

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

Reference Method: SM 2320 B-97
Batch ID: P334549

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P334864

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	92 - 103

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P334888

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334687

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941216	Chloride	98.0		P	90 - 110
1941238	Chloride	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941216	Sulfate	96.9		P	90 - 110
1941238	Sulfate	95.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P334770

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941243	Ammonia-N	104	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335105

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941296	Kjeldahl Nitrogen	99.4	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334726

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941222	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941242	Total-P	98.5	95.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941226	O-Phosphate-P	94.5	91.4	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P334864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1941239	Fluoride	98.5	97.9	P/P	91 - 105

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P334414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941238	Turbidity	7.70	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334687

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941216	Chloride	0.620	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P334690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941216	Sulfate	0.669	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P334770

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941243	Ammonia-N	0.252	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P335105

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941296	Kjeldahl Nitrogen	5.90	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P334726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941222	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P334482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941242	Total-P	2.95	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P334401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941226	O-Phosphate-P	3.09	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P334409

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941276	Color (true)	2.79	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P334549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941239	Total Alkalinity	0.414	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P334828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941254	TDS	3.44	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P334864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941239	Fluoride	0.527	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P334888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1941258	Organic Carbon	0.0158	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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A79927
Included Lab Sample IDs: 1941278

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	101	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A79932
Included Lab Sample IDs: 1941276

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A79933
Included Lab Sample IDs: 1941276

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

Reference Method: SM 2320 B-97
Run ID: A79986
Included Lab Sample IDs: 1941276

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	103	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A80039
Included Lab Sample IDs: 1941276

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.8	98.8	P/P	90 - 110
Sulfate	98.9	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A80058
Included Lab Sample IDs: 1941277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A80060
Included Lab Sample IDs: 1941277

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A80077
Included Lab Sample IDs: 1941277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	104	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A80108
Included Lab Sample IDs: 1941276

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A80113
Included Lab Sample IDs: 1941277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.6	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A80265
Included Lab Sample IDs: 1941277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.6	92.6	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	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					7.70	
EPA 300.0 Rev. 2.1	Chloride	98.8	98.0	97.5		0.620	
	Sulfate	96.6	96.9	95.9		0.669	
EPA 350.1 Rev. 2.0	Ammonia-N	99.4	104	105			0.252
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	99.4	107			5.90
EPA 353.2 Rev. 2.0	NO2NO3-N	102	100	100			0.0
EPA 365.1 Rev. 2.0	Total-P	102	98.5	95.6			2.95
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	94.5	91.4			3.09
SM 2120 B	Color (true)					2.79	
SM 2320 B-97	Total Alkalinity	103				0.414	
SM 2540 C-97	TDS					3.44	
SM 4500 F-C-97	Fluoride	97.1	98.5	97.9			0.527
SM 5310 B-00	Organic Carbon	98.0					0.0158

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1941276
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1941276
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1941276
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1941277

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1941277
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1941277
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1941277
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1941278
SM 2120 B / E31780	True Color measured at 450 nm	1941276
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1941276
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1941276
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1941276
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1941276
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1941277

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	10/31/2017			10/31/2017 16:25	DeAsia Armster	1941276
EPA 300.0 Rev. 2.1	10/31/2017			11/04/2017	Irina Carbone	1941276
EPA 350.1 Rev. 2.0	10/31/2017			11/06/2017	Sofia Elnemr	1941277
EPA 351.2 Rev. 2.0	10/31/2017	11/13/2017	Adrian Shelby	11/14/2017	Tanya Welborn	1941277
EPA 353.2 Rev. 2.0	10/31/2017			11/06/2017	Beverly Y. Sanders	1941277
EPA 365.1 Rev. 2.0	10/31/2017	11/01/2017	Sima Feizi	11/06/2017	Lipi Saha	1941277
EPA 365.1 Rev. 2.0 dissolved	10/31/2017			10/31/2017 14:54	Megan Treadwell	1941278
SM 2120 B	10/31/2017			10/31/2017 15:40	Tanya Welborn	1941276
SM 2320 B-97	10/31/2017			11/02/2017	Dale L. Simmons	1941276
SM 2540 C-97	10/31/2017			11/01/2017	Yijie Li	1941276
SM 2540 D-97	10/31/2017			11/01/2017	Yijie Li	1941276
SM 4500 F-C-97	10/31/2017			11/07/2017	Dale L. Simmons	1941276
SM 5310 B-00	10/31/2017			11/06/2017	Ping Hua	1941277