

Chemical Analysis Report

SW-DIST-2018-03-08-01

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

Event Description: **Horsehole Creek**
Request ID: **RQ-2018-03-05-11**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Judy Ashton

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 29-MAR-2018 15:18



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: Horsehole Creek

Collection Date/Time: 03/07/2018 11:35

Field ID: G5SW0141

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1973015	EPA 180.1 Rev. 2.0	Turbidity	5.2		NTU	P341220	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P341423	
		Sulfate	1.7		mg SO4/L	P341428	
	SM 2120 B	Color (true)	140		PCU	P341184	
	SM 2320 B-97	Total Alkalinity	121		mg CaCO3/L	P341623	
	SM 2540 C-97	TDS	191		mg/L	P341501	
	SM 2540 D-97	TSS	3	I	mg/L	P341389	
	SM 4500 F-C-97	Fluoride	0.060	I	mg F/L	P341627	
1973016	EPA 350.1 Rev. 2.0	Ammonia-N	0.027		mg N/L	P341569	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P341432	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P341397	
	EPA 365.1 Rev. 2.0	Total-P	0.058		mg P/L	P341384	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P341971	
1973017	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.028		mg P/L	P341263	

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: P341220

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P341423

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P341428

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P341569

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P341432

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: P341397

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341384

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341263

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

Reference Method: SM 2120 B
Batch ID: P341184

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P341623

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

Reference Method: SM 2540 C-97
Batch ID: P341501

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P341389

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P341627

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P341971

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: P341423

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341428

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341569

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341432

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341397

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341384

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341263

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.3		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P341623

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.0		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P341627

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.8		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P341971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341423

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972912	Chloride	103		P	90 - 110
1972913	Chloride	95.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972912	Sulfate	104		P	90 - 110
1972913	Sulfate	97.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341569

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1972960	Ammonia-N	99.1	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341432

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973032	Kjeldahl Nitrogen	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341397

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973013	NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341384

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973013	Total-P	108	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973017	O-Phosphate-P	94.2	95.1	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P341627

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973062	Fluoride	93.6	94.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P341971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1973013	Organic Carbon	98.4	98.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P341220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973000	Turbidity	2.79	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341423

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972912	Chloride	2.24	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P341428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972912	Sulfate	0.418	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P341569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972960	Ammonia-N	0.347	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P341432

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973032	Kjeldahl Nitrogen	0.0804	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341397

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P341397

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973013	NO2NO3-N	0.226	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P341384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973013	Total-P	0.213	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P341263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973017	O-Phosphate-P	0.736	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P341184

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1972956	Color (true)	1.60	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P341623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973062	Total Alkalinity	0.0659	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P341501

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973012	TDS	0.0	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P341627

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973062	Fluoride	0.993	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P341971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1973013	Organic Carbon	0.225	Spike	P	0 - 20

Quality Assurance Report Precision

* 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: SM 2120 B
Run ID: A82502
Included Lab Sample IDs: 1973015

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	99.1	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A82508
Included Lab Sample IDs: 1973015

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A82509
Included Lab Sample IDs: 1973015

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	94.7	P/P	90 - 110
Sulfate	102	95.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A82516
Included Lab Sample IDs: 1973017

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.0	98.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A82555
Included Lab Sample IDs: 1973016

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A82566
Included Lab Sample IDs: 1973016

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A82613
Included Lab Sample IDs: 1973016

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82615

Included Lab Sample IDs: 1973016

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.3	97.6	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A82634

Included Lab Sample IDs: 1973015

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.0	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A82634

Included Lab Sample IDs: 1973015

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.1	101	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A82777

Included Lab Sample IDs: 1973016

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.1	100	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				2.79	
EPA 300.0 Rev. 2.1	Chloride	97.2	103	95.3	2.24	
	Sulfate	98.1	104	97.0	0.418	
EPA 350.1 Rev. 2.0	Ammonia-N	99.6	99.1	98.6		0.347
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.6	102	102		0.0804
EPA 353.2 Rev. 2.0	NO2NO3-N	103	104			0.226
EPA 365.1 Rev. 2.0	Total-P	103	108	109		0.213
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	94.2	95.1		0.736
SM 2120 B	Color (true)				1.60	
SM 2320 B-97	Total Alkalinity	99.0			0.0659	
SM 2540 C-97	TDS				0.0	
SM 4500 F-C-97	Fluoride	95.8	93.6	94.7		0.993
SM 5310 B-00	Organic Carbon	97.4	98.4	98.0		0.225

Reference Method Descriptions

Method / DoH Cert #

Description

Associated Samples

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1973015
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1973015
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1973015
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1973016
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1973016
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1973016
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1973016
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1973017
SM 2120 B / E31780	True Color measured at 450 nm	1973015
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1973015
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1973015
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1973015
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1973015
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1973016

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	03/08/2018			03/08/2018 15:14	DeAsia Armster	1973015
EPA 300.0 Rev. 2.1	03/08/2018			03/09/2018	Julia Storbeck	1973015
EPA 350.1 Rev. 2.0	03/08/2018			03/13/2018	Ping Hua	1973016
EPA 351.2 Rev. 2.0	03/08/2018	03/13/2018	Adrian Shelby	03/14/2018	Joseph Suarez	1973016
EPA 353.2 Rev. 2.0	03/08/2018			03/12/2018	Lauren Bottorf	1973016
EPA 365.1 Rev. 2.0	03/08/2018	03/12/2018	Lipi Saha	03/13/2018	Beverly Y. Sanders	1973016
EPA 365.1 Rev. 2.0 dissolved	03/08/2018			03/08/2018 15:23	Megan Treadwell	1973017
SM 2120 B	03/08/2018			03/08/2018 14:37	Tanya Welborn	1973015
SM 2320 B-97	03/08/2018			03/15/2018	Dale L. Simmons	1973015
SM 2540 C-97	03/08/2018			03/09/2018	DeAsia Armster	1973015
SM 2540 D-97	03/08/2018			03/09/2018	DeAsia Armster	1973015
SM 4500 F-C-97	03/08/2018			03/15/2018	Dale L. Simmons	1973015
SM 5310 B-00	03/08/2018			03/20/2018	Megan Treadwell	1973016