

Chemical Analysis Report

SW-DIST-2019-09-04-01

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

Event Description: **3703-Horsehole**
Request ID: **RQ-2019-09-02-36**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 18-SEP-2019 10:59

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: HORSEHOLE CREEK @ 19

Collection Date/Time: 09/03/2019 12:35

Field ID: G1SW0103

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2116457	EPA 180.1 Rev. 2.0	Turbidity	2.1	A	NTU	P370152	
	EPA 300.0 Rev. 2.1	Chloride	4.2		mg Cl/L	P370347	
		Sulfate	0.22	I	mg SO4/L	P370350	
	SM 2120 B	Color (true)	560		PCU	P370161	
	SM 2320 B-97	Total Alkalinity	35		mg CaCO3/L	P370282	
	SM 2540 C-97	TDS	112		mg/L	P370730	
	SM 2540 D-97	TSS	3	I	mg/L	P370617	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P370284	
2116458	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P370447	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P370365	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P370266	
	EPA 365.1 Rev. 2.0	Total-P	0.069		mg P/L	P370417	
	SM 5310 B-00	Organic Carbon	38		mg C/L	P370305	
2116459	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.038		mg P/L	P370140	

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: P370152

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370347

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370350

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370447

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370365

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370266

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370417

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370140

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

Reference Method: SM 2120 B
Batch ID: P370161

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P370282

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P370730

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P370617

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P370284

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P370305

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: P370347

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370350

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370447

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.5		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370365

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.1		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370266

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: P370417

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370140

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

Reference Method: SM 2120 B
Batch ID: P370161

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

Reference Method: SM 2320 B-97
Batch ID: P370282

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: P370284

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P370305

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	103		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370347

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116431	Chloride	102		P	90 - 110
2116501	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370350

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116431	Sulfate	100		P	90 - 110
2116501	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370447

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116466	Ammonia-N	96.2	96.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370365

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116480	Kjeldahl Nitrogen	95.1	95.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370266

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116424	NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116424	Total-P	97.0	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370140

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116425	O-Phosphate-P	97.4	98.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P370284

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116463	Fluoride	98.5	97.4	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P370305

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2116466	Organic Carbon	102	102	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P370152

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116457	Turbidity	0.943	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370347

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116431	Chloride	0.0169	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P370350

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116431	Sulfate	2.50	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116466	Ammonia-N	0.669	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370365

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116480	Kjeldahl Nitrogen	0.584	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370266

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116424	NO2NO3-N	1.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116424	Total-P	4.92	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116425	O-Phosphate-P	0.818	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
 Batch ID: P370161

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116367	Color (true)	1.00	Sample	P	0 - 20

Reference Method: SM 2320 B-97
 Batch ID: P370282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116463	Total Alkalinity	1.36	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
 Batch ID: P370730

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116431	TDS	5.75	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
 Batch ID: P370284

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116463	Fluoride	0.958	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
 Batch ID: P370305

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2116466	Organic Carbon	0.0666	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: A93981

Included Lab Sample IDs: 2116459

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	99.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A93983

Included Lab Sample IDs: 2116457

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

Reference Method: SM 2120 B

Run ID: A93988

Included Lab Sample IDs: 2116457

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	104	102	P/P	90 - 115

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A94012

Included Lab Sample IDs: 2116457

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	101	P/P	90 - 110
Sulfate	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94033

Included Lab Sample IDs: 2116458

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A94038

Included Lab Sample IDs: 2116457

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A94038

Included Lab Sample IDs: 2116457

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

Reference Method: SM 5310 B-00

Run ID: A94054

Included Lab Sample IDs: 2116458

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94110

Included Lab Sample IDs: 2116458

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94122

Included Lab Sample IDs: 2116458

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	108	97.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94123

Included Lab Sample IDs: 2116458

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.6	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	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					0.943	
EPA 300.0 Rev. 2.1	Chloride	101	102	102		0.0169	
	Sulfate	101	100	102		2.50	
EPA 350.1 Rev. 2.0	Ammonia-N	97.5	96.2	96.9			0.669
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.1	95.1	95.9			0.584
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	99.5	100			1.00
EPA 365.1 Rev. 2.0	Total-P	99.6	97.0	102			4.92
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.2	97.4	98.2			0.818
SM 2120 B	Color (true)	101				1.00	
SM 2320 B-97	Total Alkalinity	104				1.36	
SM 2540 C-97	TDS					5.75	
SM 4500 F-C-97	Fluoride	98.9	98.5	97.4			0.958
SM 5310 B-00	Organic Carbon	103	102	102			0.0666

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2116457
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2116457
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2116457
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2116458
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2116458
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2116458
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2116458
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2116459
SM 2120 B / E31780	True Color measured at 450 nm	2116457
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2116457
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2116457
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2116457
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2116457
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2116458

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	09/04/2019			09/04/2019 16:44	Rosalyn Ballman	2116457
EPA 300.0 Rev. 2.1	09/04/2019			09/07/2019 03:04	Jhamieka S. Greenwood	2116457
EPA 350.1 Rev. 2.0	09/04/2019			09/10/2019 12:34	Ping Hua	2116458
EPA 351.2 Rev. 2.0	09/04/2019	09/09/2019 11:56	Sima Feizi	09/10/2019 14:21	Julia Storbeck	2116458
EPA 353.2 Rev. 2.0	09/04/2019			09/06/2019 10:14	Beverly Y. Sanders	2116458
EPA 365.1 Rev. 2.0	09/04/2019	09/10/2019 09:48	Lipi Saha	09/11/2019 11:25	Rosalyn Ballman	2116458
EPA 365.1 Rev. 2.0 dissolved	09/04/2019			09/04/2019 15:45	Jhamieka S. Greenwood	2116459
SM 2120 B	09/04/2019			09/04/2019 18:08	Madeline Funaro	2116457
SM 2320 B-97	09/04/2019			09/06/2019 03:34	Dale L. Simmons	2116457
SM 2540 C-97	09/04/2019			09/09/2019 15:08	Yijie Li	2116457
SM 2540 D-97	09/04/2019			09/09/2019 15:08	Yijie Li	2116457
SM 4500 F-C-97	09/04/2019			09/06/2019 03:34	Dale L. Simmons	2116457
SM 5310 B-00	09/04/2019			09/06/2019 16:19	Madeline Funaro	2116458