

Chemical Analysis Report

CEN-DIST-2016-12-29-01

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

Event Description: **Unnamed drain (2673)+HA**
Request ID: **RQ-2016-12-26-13**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

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: 13-JAN-2017 11:29

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: Unnamed Drain of Spruce Creek @ CR 421

Collection Date/Time: 12/28/2016 11:25

Field ID: G5CE0022

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1860555	EPA 180.1 Rev. 2.0	Turbidity	4.9		NTU	P317560	
	EPA 300.0 Rev. 2.1	Chloride	67		mg Cl/L	P317848	
		Sulfate	3.6		mg SO4/L	P317845	
	SM 2120 B	Color (true)	39	A	PCU	P317565	
	SM 2320 B-97	Total Alkalinity	283		mg CaCO3/L	P317579	
	SM 2540 C-97	TDS	416		mg/L	P318138	
	SM 2540 D-97	TSS	5	I	mg/L	P318128	
	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P317582	
1860556	EPA 350.1 Rev. 2.0	Ammonia-N	0.16		mg N/L	P317756	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.69		mg N/L	P317632	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P317993	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P317652	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P317612	
1860557	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.036		mg P/L	P317555	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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: P317560

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P317845

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P317848

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P317756

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P317632

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: P317993

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317652

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317555

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

Reference Method: SM 2120 B
Batch ID: P317565

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P317579

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

Reference Method: SM 2540 C-97
Batch ID: P318138

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P318128

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P317582

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P317612

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: P317845

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317848

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317756

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317632

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: P317993

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: P317652

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	94.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317555

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

Reference Method: SM 2320 B-97
Batch ID: P317579

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P317582

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.4		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P317612

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317845

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860744	Sulfate	96.9		P	90 - 110
1860745	Sulfate	93.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317848

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860744	Chloride	101		P	90 - 110
1860745	Chloride	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860577	Ammonia-N	97.2	99.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317632

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860463	Kjeldahl Nitrogen	97.8	94.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P317993

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860588	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317652

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860577	Total-P	97.0	96.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317555

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860414	O-Phosphate-P	92.7	95.1	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P317582

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860574	Fluoride	100	101	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P317612

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860198	Organic Carbon	95.7	94.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860744	Sulfate	0.473	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317848

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860744	Chloride	0.289	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860577	Ammonia-N	1.21	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317632

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860463	Kjeldahl Nitrogen	3.17	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P317993

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860588	NO2NO3-N	0.480	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317652

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
--------------------------	-----------	-----------	-------------------	-----------	----------------

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P317652

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860577	Total-P	0.384	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P317555

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860414	O-Phosphate-P	2.44	Spike	P	0 - 20

Reference Method: SM 2120 B

Batch ID: P317565

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860555	Color (true)	5.16	Sample	P	0 - 20

Reference Method: SM 2320 B-97

Batch ID: P317579

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860574	Total Alkalinity	0.369	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97

Batch ID: P318138

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860574	TDS	1.98	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97

Batch ID: P317582

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860574	Fluoride	0.483	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00

Batch ID: P317612

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860198	Organic Carbon	0.473	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: A73649

Included Lab Sample IDs: 1860557

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	97.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A73654

Included Lab Sample IDs: 1860555

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	97.5	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A73655

Included Lab Sample IDs: 1860555

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.8	100	P/P	85 - 115

Reference Method: SM 2320 B-97

Run ID: A73661

Included Lab Sample IDs: 1860555

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

Reference Method: SM 4500 F-C-97

Run ID: A73661

Included Lab Sample IDs: 1860555

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

Reference Method: SM 5310 B-00

Run ID: A73673

Included Lab Sample IDs: 1860556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.0	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A73715

Included Lab Sample IDs: 1860556

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: A73722

Included Lab Sample IDs: 1860556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	98.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A73745

Included Lab Sample IDs: 1860556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A73754

Included Lab Sample IDs: 1860555

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	103	P/P	90 - 110
Sulfate	100	96.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A73828

Included Lab Sample IDs: 1860556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	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 300.0 Rev. 2.1	Chloride	102	101 102		0.289	
	Sulfate	96.9	96.9 93.3		0.473	
EPA 350.1 Rev. 2.0	Ammonia-N	104	97.2 99.7			1.21
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	97.8 94.5			3.17
EPA 353.2 Rev. 2.0	NO2NO3-N	104	102 102			0.480
EPA 365.1 Rev. 2.0	Total-P	94.3	97.0 96.5			0.384
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.6	92.7 95.1			2.44
SM 2120 B	Color (true)				5.16	
SM 2320 B-97	Total Alkalinity	104			0.369	
SM 2540 C-97	TDS				1.98	
SM 4500 F-C-97	Fluoride	98.4	100 101			0.483
SM 5310 B-00	Organic Carbon	101	95.7 94.8			0.473

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1860555
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1860555
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1860555
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1860556

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1860556
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1860556
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1860556
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1860557
SM 2120 B / E31780	True Color measured at 450 nm	1860555
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1860555
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1860555
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1860555
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1860555
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1860556

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	12/29/2016			12/29/2016 15:54	Julie Michelle Frank	1860555
EPA 300.0 Rev. 2.1	12/29/2016			01/06/2017	Ping Hua	1860555
EPA 350.1 Rev. 2.0	12/29/2016			01/04/2017	Sofia Elnemr	1860556
EPA 351.2 Rev. 2.0	12/29/2016	01/03/2017	Adrian Shelby	01/04/2017	Joseph Suarez	1860556
EPA 353.2 Rev. 2.0	12/29/2016			01/09/2017	Beverly Y. Sanders	1860556
EPA 365.1 Rev. 2.0	12/29/2016	01/03/2017	Vijayalakshmi Reddy	01/04/2017	Beverly Y. Sanders	1860556
EPA 365.1 Rev. 2.0 dissolved	12/29/2016			12/29/2016 15:32	Virginia P. Brown	1860557
SM 2120 B	12/29/2016			12/29/2016 15:49	Julie Michelle Frank	1860555
SM 2320 B-97	12/29/2016			12/30/2016	Dale L. Simmons	1860555
SM 2540 C-97	12/29/2016			01/03/2017	Sima Feizi	1860555
SM 2540 D-97	12/29/2016			01/03/2017	Sima Feizi	1860555
SM 4500 F-C-97	12/29/2016			12/30/2016	Dale L. Simmons	1860555
SM 5310 B-00	12/29/2016			12/29/2016	Julie Michelle Frank	1860556