

Chemical Analysis Report

CEN-DIST-2017-12-29-03

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

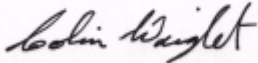
Event Description: **Puzzle Lk Drain**
Request ID: **RQ-2017-11-13-51**
Customer: **CEN-DIST**
Project ID: **SMP**

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

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Certified by: Colin Wright, Program Administrator

Date Certified: 18-JAN-2018 11:52



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: Shaw Lake @ Center of North Lobe

Collection Date/Time: 12/28/2017 11:34

Field ID: G2CE0127

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1956540	EPA 180.1 Rev. 2.0	Turbidity	0.70	A	NTU	P337640	
	EPA 300.0 Rev. 2.1	Chloride	5.4	A	mg Cl/L	P337780	
		Sulfate	5.1	A	mg SO4/L	P337782	
	SM 2120 B	Color (true)	630		PCU	P337631	
	SM 2320 B-97	Total Alkalinity	1.3	I	mg CaCO3/L	P338020	
	SM 2540 C-97	TDS	126		mg/L	P337813	
	SM 2540 D-97	TSS	2	I	mg/L	P337931	
	SM 4500 F-C-97	Fluoride	0.040	I	mg F/L	P338010	
1956541	EPA 350.1 Rev. 2.0	Ammonia-N	0.12		mg N/L	P337857	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P337655	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P337723	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P337725	
	SM 5310 B-00	Organic Carbon	47		mg C/L	P337667	
1956542	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P337644	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The precision data is unavailable because of the small amount of analyte 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: P337640

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P337780

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P337782

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P337857

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P337655

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: P337723

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337725

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337644

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

Reference Method: SM 2120 B
Batch ID: P337631

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P338020

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

Reference Method: SM 2540 C-97
Batch ID: P337813

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P337931

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P338010

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P337667

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: P337780

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337782

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337857

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337655

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337723

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: P337725

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337644

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

Reference Method: SM 2320 B-97
Batch ID: P338020

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P338010

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.8		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P337667

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337780

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956509	Chloride	108		P	90 - 110
1956540	Chloride	109		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337782

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956509	Sulfate	108		P	90 - 110
1956540	Sulfate	107		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337857

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956907	Ammonia-N	106	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337655

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956511	Kjeldahl Nitrogen	106	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337723

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956459	NO2NO3-N	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337725

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956473	Total-P	103	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956462	O-Phosphate-P	94.4	96.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P338010

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1957378	Fluoride	94.0	95.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P337667

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1956483	Organic Carbon	92.4	94.0	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337780

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956540	Chloride	0.596	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P337782

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956540	Sulfate	0.563	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P337857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956907	Ammonia-N	1.96	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P337655

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956511	Kjeldahl Nitrogen	1.76	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P337723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956459	NO2NO3-N	0.351	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337725

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P337725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956473	Total-P	6.55	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P337644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956462	O-Phosphate-P	0.917	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P337631

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956471	Color (true)	1.06	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P338020

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956471	Total Alkalinity	0.782	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P337813

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956218	TDS	3.60	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P338010

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1957378	Fluoride	1.41	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P337667

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1956483	Organic Carbon	0.908	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: SM 2120 B
 Run ID: A81194
 Included Lab Sample IDs: 1956540

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.0	98.0	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
 Run ID: A81196
 Included Lab Sample IDs: 1956540

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Run ID: A81201
 Included Lab Sample IDs: 1956542

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	97.1	P/P	90 - 110

Reference Method: SM 5310 B-00
 Run ID: A81212
 Included Lab Sample IDs: 1956541

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.3	94.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Run ID: A81232
 Included Lab Sample IDs: 1956541

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Run ID: A81235
 Included Lab Sample IDs: 1956541

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

Reference Method: EPA 300.0 Rev. 2.1
 Run ID: A81273
 Included Lab Sample IDs: 1956540

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	104	107	P/P	90 - 110
Sulfate	104	107	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Run ID: A81300
 Included Lab Sample IDs: 1956541

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	98.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A81310

Included Lab Sample IDs: 1956541

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A81369

Included Lab Sample IDs: 1956540

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

Reference Method: SM 2320 B-97

Run ID: A81379

Included Lab Sample IDs: 1956540

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.4	102	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	104	109 108		0.596	
	Sulfate	103	107 108		0.563	
EPA 350.1 Rev. 2.0	Ammonia-N	102	106 104			1.96
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	106 104			1.76
EPA 353.2 Rev. 2.0	NO2NO3-N	102	97.0			0.351
EPA 365.1 Rev. 2.0	Total-P	104	103 96.0			6.55
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.4	94.4 96.0			0.917
SM 2120 B	Color (true)				1.06	
SM 2320 B-97	Total Alkalinity	102			0.782	
SM 2540 C-97	TDS				3.60	
SM 4500 F-C-97	Fluoride	94.8	94.0 95.6			1.41
SM 5310 B-00	Organic Carbon	99.6	92.4 94.0			0.908

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1956540
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1956540
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1956540
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1956541

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1956541
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1956541
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1956541
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1956542
SM 2120 B / E31780	True Color measured at 450 nm	1956540
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1956540
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1956540
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1956540
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1956540
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1956541

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	12/29/2017			12/29/2017 13:17	DeAsia Armster	1956540
EPA 300.0 Rev. 2.1	12/29/2017			01/03/2018	Julia Storbeck	1956540
EPA 350.1 Rev. 2.0	12/29/2017			01/04/2018	Sofia Elnemr	1956541
EPA 351.2 Rev. 2.0	12/29/2017	01/02/2018	Adrian Shelby	01/02/2018	Joseph Suarez	1956541
EPA 353.2 Rev. 2.0	12/29/2017			01/03/2018	Beverly Y. Sanders	1956541
EPA 365.1 Rev. 2.0	12/29/2017	01/03/2018	Sima Feizi	01/05/2018	Lipi Saha	1956541
EPA 365.1 Rev. 2.0 dissolved	12/29/2017			12/29/2017 16:00	Megan Treadwell	1956542
SM 2120 B	12/29/2017			12/29/2017 15:06	Julia Storbeck	1956540
SM 2320 B-97	12/29/2017			01/10/2018	Dale L. Simmons	1956540
SM 2540 C-97	12/29/2017			01/02/2018	Yijie Li	1956540
SM 2540 D-97	12/29/2017			01/02/2018	Yijie Li	1956540
SM 4500 F-C-97	12/29/2017			01/09/2018	Dale L. Simmons	1956540
SM 5310 B-00	12/29/2017			12/29/2017	Megan Treadwell	1956541