Chemical Analysis Report

CEN-DIST-2016-12-20-01

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

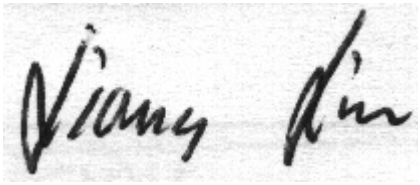
Event Description: **Lake Hatchineha Drain+HA**
Request ID: **RQ-2016-12-12-23**
Customer: **CEN-DIST**
Project ID: **SMP**

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: 09-JAN-2017 14:58



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: LONDON CREEK .25 MILES UPSTREAM OF CONFLUENCE WITH LK. HATCHINEHA **Collection Date/Time: 12/19/2016 12:22**

Field ID: G4CE0120 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1859044	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P317088	
	EPA 300.0 Rev. 2.1	Chloride	17	A	mg Cl/L	P317397	
		Sulfate	6.1	A	mg SO4/L	P317400	
	SM 2120 B	Color (true)	150		PCU	P317100	
	SM 2320 B-97	Total Alkalinity	34		mg CaCO3/L	P317268	
	SM 2540 C-97	TDS	116		mg/L	P317657	
	SM 2540 D-97	TSS	4	I	mg/L	P317635	
	SM 4500 F-C-97	Fluoride	0.079	I	mg F/L	P317141	
1859045	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P317459	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P317108	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P317370	
	EPA 365.1 Rev. 2.0	Total-P	0.056		mg P/L	P317309	
	SM 5310 B-00	Organic Carbon	20		mg C/L	P317234	
1859046	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P317098	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: 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: P317088

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317397

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317400

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317459

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317108

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: P317370

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317309

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317098

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

Reference Method: SM 2120 B
Batch ID: P317100

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P317268

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

Reference Method: SM 2540 C-97
Batch ID: P317657

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P317635

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P317141

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P317234

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: P317397

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317400

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	92.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317459

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317108

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P317370

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317309

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317098

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

Reference Method: SM 2320 B-97
Batch ID: P317268

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.1		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P317141

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	92 - 103

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P317234

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317397

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859044	Chloride	97.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859044	Sulfate	93.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317459

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859002	Ammonia-N	96.1	95.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P317370

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859045	NO2NO3-N	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317309

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859001	Total-P	100	91.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859055	O-Phosphate-P	99.5	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P317141

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859044	Fluoride	99.6	99.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P317234

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P317234

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1858998	Organic Carbon	94.0	94.5	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P317088

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1858993	Turbidity	1.24	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317397

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859044	Chloride	0.838	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317400

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859044	Sulfate	1.15	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859002	Ammonia-N	0.667	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317108

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859035	Kjeldahl Nitrogen	2.30	Sample	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P317370

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859045	NO2NO3-N	0.935	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317309

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859001	Total-P	8.71	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859055	O-Phosphate-P	0.505	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P317100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859034	Color (true)	2.58	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P317268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859068	Total Alkalinity	0.444	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P317657

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859097	TDS	6.32	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P317141

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859044	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P317234

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1858998	Organic Carbon	0.390	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 180.1 Rev. 2.0
Run ID: A73489
Included Lab Sample IDs: 1859044

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	97.5	98.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A73491
Included Lab Sample IDs: 1859046

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	97.9	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A73492
Included Lab Sample IDs: 1859044

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

Reference Method: SM 4500 F-C-97
Run ID: A73509
Included Lab Sample IDs: 1859044

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	99.0	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A73539
Included Lab Sample IDs: 1859045

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.0	96.4	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A73550
Included Lab Sample IDs: 1859044

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.9	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A73555
Included Lab Sample IDs: 1859045

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	107	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A73576
Included Lab Sample IDs: 1859044

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.7	100	P/P	90 - 110
Sulfate	95.4	90.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A73580
Included Lab Sample IDs: 1859045

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A73601
Included Lab Sample IDs: 1859045

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.4	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A73608
Included Lab Sample IDs: 1859045

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	98.6	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					1.24	
EPA 300.0 Rev. 2.1	Chloride	98.9	97.8			0.838	
	Sulfate	92.6	93.7			1.15	
EPA 350.1 Rev. 2.0	Ammonia-N	96.9	96.1	95.3			0.667
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103				2.30	
EPA 353.2 Rev. 2.0	NO2NO3-N	106	104	105			0.935
EPA 365.1 Rev. 2.0	Total-P	98.7	100	91.5			8.71
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	99.5	100			0.505
SM 2120 B	Color (true)					2.58	
SM 2320 B-97	Total Alkalinity	99.1				0.444	
SM 2540 C-97	TDS					6.32	
SM 4500 F-C-97	Fluoride	99.0	99.6	99.6			0.0
SM 5310 B-00	Organic Carbon	95.8	94.0	94.5			0.390

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1859044
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1859044
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1859044
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1859045

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1859045
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1859045
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1859045
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1859046
SM 2120 B / E31780	True Color measured at 450 nm	1859044
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1859044
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1859044
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1859044
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1859044
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1859045

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	12/20/2016			12/20/2016 13:27	Julie Michelle Frank	1859044
EPA 300.0 Rev. 2.1	12/20/2016			12/24/2016	Ping Hua	1859044
EPA 350.1 Rev. 2.0	12/20/2016			12/27/2016	Julie Michelle Frank	1859045
EPA 351.2 Rev. 2.0	12/20/2016	12/21/2016	Adrian Shelby	12/22/2016	Joseph Suarez	1859045
EPA 353.2 Rev. 2.0	12/20/2016			12/23/2016	Beverly Y. Sanders	1859045
EPA 365.1 Rev. 2.0	12/20/2016	12/23/2016	Vijayalakshmi Reddy	12/27/2016	Lipi Saha	1859045
EPA 365.1 Rev. 2.0 dissolved	12/20/2016			12/20/2016 17:05	Julia Storbeck	1859046
SM 2120 B	12/20/2016			12/20/2016 16:38	Jared I. Manley	1859044
SM 2320 B-97	12/20/2016			12/22/2016	Dale L. Simmons	1859044
SM 2540 C-97	12/20/2016			12/23/2016	Yijie Li	1859044
SM 2540 D-97	12/20/2016			12/23/2016	Yijie Li	1859044
SM 4500 F-C-97	12/20/2016			12/20/2016	Dale L. Simmons	1859044
SM 5310 B-00	12/20/2016			12/21/2016	Julie Michelle Frank	1859045