Chemical Analysis Report

CEN-DIST-2018-04-10-02

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

Event Description: **SemCo - Myrtle / Asher**
Request ID: **RQ-2018-04-02-76**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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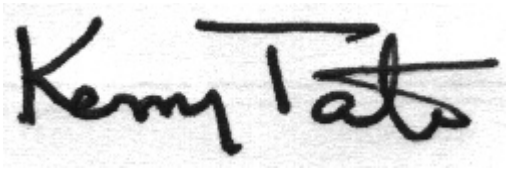
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 08-MAY-2018 15:29



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 groups are included in this report: Metals and 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: Lake Asher (ASH) **Collection Date/Time: 04/05/2018 10:40**

Field ID: G2CE0183 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1983245	EPA 300.0 Rev. 2.1	Chloride	33		mg Cl/L	P343434	
		Sulfate	11		mg SO4/L	P343437	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P344009	

Sample Location: Lake Myrtle @ 350m SW of Center (ML02) **Collection Date/Time: 04/05/2018 09:10**

Field ID: G2CE0179 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1983244	EPA 300.0 Rev. 2.1	Chloride	22	A	mg Cl/L	P343434	
		Sulfate	1.8	A	mg SO4/L	P343437	
	SM 4500 F-C-97	Fluoride	0.069	I	mg F/L	P344009	
1983246	EPA 200.7 Rev. 4.4	Calcium	12.8		mg/L	P343304	
		Iron	73	I	ug/L	P343304	
		Magnesium	2.57		mg/L	P343304	
		Potassium	2.1		mg/L	P343304	
		Sodium	13.9		mg/L	P343304	
		Zinc	5.0	U	ug/L	P343304	
	EPA 200.8 Rev. 5.4	Arsenic	0.97		ug/L	P343304	
		Cadmium	0.020	U	ug/L	P343304	
		Chromium	0.40	U	ug/L	P343304	
		Copper	0.59	I	ug/L	P343304	
		Lead	0.14	I	ug/L	P343304	
		Nickel	0.20	U	ug/L	P343304	
		Silver	0.010	U	ug/L	P343304	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343304

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343304

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343304

Component	Result	Code	Units
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343434

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343437

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: SM 4500 F-C-97
Batch ID: P344009

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343304

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	95.4		P	85 - 115
Iron	97.4		P	85 - 115
Magnesium	96.8		P	85 - 115
Potassium	96.7		P	85 - 115
Sodium	97.8		P	85 - 115
Zinc	92.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343304

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	96.3		P	85 - 115
Chromium	92.1		P	85 - 115
Copper	99.1		P	85 - 115
Lead	91.3		P	85 - 115
Nickel	102		P	85 - 115
Silver	95.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343434

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343437

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.0		P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P344009

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.5		P	91 - 105

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983246	Calcium	97.2		P	80 - 120
1983246	Iron	96.8		P	80 - 120
1983246	Magnesium	98.1		P	80 - 120
1983246	Potassium	94.6		P	80 - 120
1983246	Sodium	99.1		P	80 - 120
1983246	Zinc	94.2		P	80 - 120
1983394	Calcium	96.7		P	80 - 120
1983394	Iron	95.6	96.9	P/P	80 - 120
1983394	Magnesium	97.8		P	80 - 120
1983394	Potassium	97.4		P	80 - 120
1983394	Sodium	97.3		P	80 - 120
1983394	Zinc	90.8	90.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983246	Arsenic	100		P	80 - 120
1983246	Cadmium	97.0		P	80 - 120
1983246	Chromium	92.4		P	80 - 120
1983246	Copper	98.1		P	80 - 120
1983246	Lead	92.3		P	80 - 120
1983246	Nickel	101		P	80 - 120
1983246	Silver	95.6		P	80 - 120
1983394	Arsenic	101	99.8	P/P	80 - 120
1983394	Cadmium	98.2	96.0	P/P	80 - 120
1983394	Chromium	92.5	92.2	P/P	80 - 120
1983394	Copper	96.3	95.6	P/P	80 - 120
1983394	Lead	92.8	92.2	P/P	80 - 120
1983394	Nickel	98.0	98.1	P/P	80 - 120
1983394	Silver	95.7	94.3	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343434

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983244	Chloride	101		P	90 - 110
1983293	Chloride	96.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343437

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1983244	Sulfate	98.3		P	90 - 110
1983293	Sulfate	93.7		P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P344009

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979667	Fluoride	95.9	97.2	P/P	91 - 105

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983394	Calcium	0.0135	Spike	P	0 - 20
1983394	Iron	1.25	Spike	P	0 - 20
1983394	Magnesium	0.177	Spike	P	0 - 20
1983394	Potassium	0.513	Spike	P	0 - 20
1983394	Sodium	1.12	Spike	P	0 - 20
1983394	Zinc	0.00947	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983394	Arsenic	0.759	Spike	P	0 - 20
1983394	Cadmium	2.24	Spike	P	0 - 20
1983394	Chromium	0.245	Spike	P	0 - 20
1983394	Copper	0.705	Spike	P	0 - 20
1983394	Lead	0.678	Spike	P	0 - 20
1983394	Nickel	0.107	Spike	P	0 - 20
1983394	Silver	1.44	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983244	Chloride	0.573	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1983244	Sulfate	0.423	Sample	P	0 - 20

Reference Method: SM 4500 F-C-97
Batch ID: P344009

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979667	Fluoride	0.979	Spike	P	0 - 3.5

* 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 300.0 Rev. 2.1
Run ID: A83234
Included Lab Sample IDs: 1983244, 1983245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.6	100	P/P	90 - 110
Sulfate	100	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83239
Included Lab Sample IDs: 1983246

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	103	101	P/P	90 - 110
Cadmium	97.2	98.4	P/P	90 - 110
Chromium	95.6	95.8	P/P	90 - 110
Copper	104	103	P/P	90 - 110
Lead	95.0	96.0	P/P	90 - 110
Nickel	103	102	P/P	90 - 110
Silver	97.6	98.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83243
Included Lab Sample IDs: 1983246

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	95.6	94.5	P/P	90 - 110
Iron	96.7	95.9	P/P	90 - 110
Magnesium	97.1	96.2	P/P	90 - 110
Potassium	97.4	96.4	P/P	90 - 110
Sodium	98.1	96.9	P/P	90 - 110
Zinc	99.0	96.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A83439
Included Lab Sample IDs: 1983244, 1983245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	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 200.7 Rev. 4.4	Calcium	95.4	97.2	96.7				0.0135
	Iron	97.4	96.8	95.6	96.9			1.25
	Magnesium	96.8	98.1	97.8				0.177
	Potassium	96.7	94.6	97.4				0.513
	Sodium	97.8	99.1	97.3				1.12
	Zinc	92.5	94.2	90.8	90.8			0.0094
EPA 200.8 Rev. 5.4	Arsenic	100	100	101	99.8			0.759
	Cadmium	96.3	97.0	98.2	96.0			2.24
	Chromium	92.1	92.4	92.5	92.2			0.245
	Copper	99.1	98.1	96.3	95.6			0.705
	Lead	91.3	92.3	92.8	92.2			0.678
	Nickel	102	101	98.0	98.1			0.107
	Silver	95.0	95.6	95.7	94.3			1.44
EPA 300.0 Rev. 2.1	Chloride	98.9	101	96.3			0.573	
	Sulfate	98.0	98.3	93.7			0.423	
SM 4500 F-C-97	Fluoride	96.5	95.9	97.2				0.979

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1983246
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1983246
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1983244, 1983245
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1983244, 1983245
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1983244, 1983245

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	04/10/2018	04/12/2018 18:50	Elliott D. Healy	04/13/2018 20:25	Betina Topolski	1983246
EPA 200.8 Rev. 5.4	04/10/2018	04/12/2018 18:50	Elliott D. Healy	04/15/2018 04:13	Robert K Palmer	1983246
EPA 300.0 Rev. 2.1	04/10/2018			04/13/2018 23:05	Lipi Saha	1983244
	04/10/2018			04/14/2018 00:16	Lipi Saha	1983245
SM 4500 F-C-97	04/10/2018			04/24/2018 17:05	Dale L. Simmons	1983244
	04/10/2018			04/24/2018 17:08	Dale L. Simmons	1983245