Chemical Analysis Report

CEN-DIST-2018-07-06-02

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

Event Description: **Asher Lk / Lk Myrtle (SemCo)**
Request ID: **RQ-2018-07-02-43**
Customer: **CEN-DIST**
Project ID: **SMP**

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B. Steinbock

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 Myrtle @ 350m SW of Center (ML02) **Collection Date/Time: 07/02/2018 08:45**

Field ID: G2CE0179 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2005264	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P348795	
		Sulfate	1.6		mg SO4/L	P348800	
	SM 4500 F-C-97	Fluoride	0.065	I	mg F/L	P348197	
2005265	EPA 200.7 Rev. 4.4	Calcium	12.8		mg/L	P348183	
		Iron	73	I	ug/L	P348183	
		Magnesium	2.38		mg/L	P348183	
		Potassium	1.6		mg/L	P348183	
		Sodium	14.0		mg/L	P348183	
		Zinc	5.0	U	ug/L	P348183	
	EPA 200.8 Rev. 5.4	Arsenic	0.76		ug/L	P348183	
		Cadmium	0.020	U	ug/L	P348183	
		Chromium	0.40	U	ug/L	P348183	
		Copper	0.29	I	ug/L	P348183	
		Lead	0.078	I	ug/L	P348183	
		Nickel	0.20	U	ug/L	P348183	
		Silver	0.010	U	ug/L	P348183	

Sample Location: Lake Asher (ASH) **Collection Date/Time: 07/02/2018 12:00**

Field ID: G2CE0183 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2005263	EPA 300.0 Rev. 2.1	Chloride	23	A	mg Cl/L	P348795	
		Sulfate	6.1	A	mg SO4/L	P348800	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P348197	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348183

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: P348183

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
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348795

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348800

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: SM 4500 F-C-97
Batch ID: P348197

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: P348183

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	106		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	103		P	85 - 115
Sodium	99.0		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348183

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	96.9		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	94.1		P	85 - 115
Copper	95.6		P	85 - 115
Lead	101		P	85 - 115
Nickel	95.8		P	85 - 115
Silver	106		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348795

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348800

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

Reference Method: SM 4500 F-C-97
Batch ID: P348197

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		P	91 - 105

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348183

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005265	Calcium	105		P	80 - 120
2005265	Iron	104	105	P/P	80 - 120
2005265	Magnesium	106	106	P/P	80 - 120
2005265	Potassium	103	105	P/P	80 - 120
2005265	Sodium	98.6		P	80 - 120
2005265	Zinc	105	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348183

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005265	Arsenic	103	102	P/P	80 - 120
2005265	Cadmium	109	109	P/P	80 - 120
2005265	Chromium	99.8	99.0	P/P	80 - 120
2005265	Copper	101	101	P/P	80 - 120
2005265	Lead	106	106	P/P	80 - 120
2005265	Nickel	100	100	P/P	80 - 120
2005265	Silver	108	108	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348795

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005263	Chloride	108		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348800

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005263	Sulfate	105		P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P348197

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2005058	Fluoride	96.3	95.7	P/P	91 - 105

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P348183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005265	Calcium	0.307	Spike	P	0 - 20
2005265	Iron	0.318	Spike	P	0 - 20
2005265	Magnesium	0.144	Spike	P	0 - 20
2005265	Potassium	1.26	Spike	P	0 - 20
2005265	Sodium	0.302	Spike	P	0 - 20
2005265	Zinc	0.994	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P348183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005265	Arsenic	0.591	Spike	P	0 - 20
2005265	Cadmium	0.143	Spike	P	0 - 20
2005265	Chromium	0.799	Spike	P	0 - 20
2005265	Copper	0.466	Spike	P	0 - 20
2005265	Lead	0.577	Spike	P	0 - 20
2005265	Nickel	0.224	Spike	P	0 - 20
2005265	Silver	0.308	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348795

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005263	Chloride	6.45	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P348800

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005263	Sulfate	7.16	Sample	P	0 - 20

Reference Method: SM 4500 F-C-97
Batch ID: P348197

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2005058	Fluoride	0.470	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: SM 4500 F-C-97
Run ID: A85129
Included Lab Sample IDs: 2005263, 2005264

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	98.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A85157
Included Lab Sample IDs: 2005265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.6	99.4	P/P	90 - 110
Cadmium	104	105	P/P	90 - 110
Chromium	97.8	100	P/P	90 - 110
Copper	98.8	100	P/P	90 - 110
Lead	103	103	P/P	90 - 110
Nickel	96.4	97.9	P/P	90 - 110
Silver	102	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A85190
Included Lab Sample IDs: 2005265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	103	P/P	90 - 110
Iron	99.6	101	P/P	90 - 110
Magnesium	100	101	P/P	90 - 110
Potassium	99.2	102	P/P	90 - 110
Sodium	97.5	98.2	P/P	90 - 110
Zinc	103	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A85337
Included Lab Sample IDs: 2005263, 2005264

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.9	99.3	P/P	90 - 110
Sulfate	101	99.9	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	106	105				0.307
	Iron	106	104	105			0.318
	Magnesium	109	106	106			0.144
	Potassium	103	103	105			1.26
	Sodium	99.0	98.6				0.302
	Zinc	103	105	104			0.994
EPA 200.8 Rev. 5.4	Arsenic	96.9	103	102			0.591
	Cadmium	104	109	109			0.143
	Chromium	94.1	99.8	99.0			0.799
	Copper	95.6	101	101			0.466
	Lead	101	106	106			0.577
	Nickel	95.8	100	100			0.224
	Silver	106	108	108			0.308
EPA 300.0 Rev. 2.1	Chloride	104	108			6.45	
	Sulfate	102	105			7.16	
SM 4500 F-C-97	Fluoride	97.5	96.3	95.7			0.470

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	2005265
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2005265
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2005263, 2005264
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2005263, 2005264
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2005263, 2005264

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	07/06/2018	07/10/2018 18:30	Elliott D. Healy	07/12/2018 12:09	Betina Topolski	2005265
EPA 200.8 Rev. 5.4	07/06/2018	07/10/2018 18:30	Elliott D. Healy	07/11/2018 17:50	Allison Taylor	2005265
EPA 300.0 Rev. 2.1	07/06/2018			07/19/2018 16:38	Lipi Saha	2005263
	07/06/2018			07/19/2018 17:02	Lipi Saha	2005264
SM 4500 F-C-97	07/06/2018			07/10/2018 15:31	Dale L. Simmons	2005263
	07/06/2018			07/10/2018 15:35	Dale L. Simmons	2005264