

Chemical Analysis Report

CEN-DIST-2023-04-18-03

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Run 19**
Request ID: **RQ-2023-04-24-26**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 03-MAY-2023 16:53



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: Metals.

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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Sweetwater Creek at Howard Ave.

Collection Date/Time: 04/17/2023 11:48

Field ID: G2CE0273

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2400991	EPA 200.7 Rev. 4.4	Calcium	64.6		mg/L	P428697	
		Iron	620		ug/L	P428697	
		Magnesium	26.8		mg/L	P428697	
		Potassium	8.5		mg/L	P428697	
		Sodium	224		mg/L	P428697	
		Strontium	614		ug/L	P428697	
		Tin	3.0	U	ug/L	P428697	
		Titanium	6.5		ug/L	P428697	
		Vanadium	2.0	U	ug/L	P428697	
	EPA 200.8 Rev. 5.4	Zinc	10	I	ug/L	P428697	
		Aluminum	406		ug/L	P428697	
		Antimony	0.078	I	ug/L	P428697	
		Arsenic	2.42		ug/L	P428697	
		Barium	33.9		ug/L	P428697	
		Beryllium	0.016	I	ug/L	P428697	
		Boron	109		ug/L	P428697	
		Cadmium	0.022	I	ug/L	P428697	
		Chromium	0.96	I	ug/L	P428697	
		Cobalt	0.072	I	ug/L	P428697	
		Copper	3.44		ug/L	P428697	
		Lead	0.66		ug/L	P428697	
		Manganese	43.3		ug/L	P428697	
		Molybdenum	0.54	I	ug/L	P428697	
		Nickel	0.50	U	ug/L	P428697	
		Selenium	0.20	U	ug/L	P428697	
		Silver	0.012	I	ug/L	P428697	
		Thallium	0.10	U	ug/L	P428697	
	SM 2340 B-2011	Hardness	272		mg/L	P428697	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for arsenic, manganese and molybdenum are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: Sweetwater Creek at Artesia St.

Collection Date/Time: 04/17/2023 12:20

Field ID: G2CE0287

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2400992	EPA 200.7 Rev. 4.4	Calcium	49.3		mg/L	P428697	
		Iron	380		ug/L	P428697	
		Magnesium	5.54		mg/L	P428697	
		Potassium	4.7		mg/L	P428697	
		Sodium	22.6		mg/L	P428697	
		Strontium	187		ug/L	P428697	
		Tin	3.0	U	ug/L	P428697	
		Titanium	4.1		ug/L	P428697	
		Vanadium	2.0	U	ug/L	P428697	
		Zinc	5.0	U	ug/L	P428697	
	EPA 200.8 Rev. 5.4	Aluminum	328		ug/L	P428697	
		Antimony	0.17	I	ug/L	P428697	
		Arsenic	1.91		ug/L	P428697	
		Barium	34.8		ug/L	P428697	
		Beryllium	0.022	I	ug/L	P428697	
		Boron	57.6		ug/L	P428697	
		Cadmium	0.020	U	ug/L	P428697	
		Chromium	0.65	I	ug/L	P428697	
		Cobalt	0.119		ug/L	P428697	
		Copper	2.21		ug/L	P428697	
		Lead	0.58		ug/L	P428697	
		Manganese	26.0		ug/L	P428697	
		Molybdenum	1.17		ug/L	P428697	
		Nickel	0.52	I	ug/L	P428697	
		Selenium	0.20	U	ug/L	P428697	
		Silver	0.010	U	ug/L	P428697	
		Thallium	0.10	U	ug/L	P428697	
	SM 2340 B-2011	Hardness	146		mg/L	P428697	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for arsenic, manganese and molybdenum are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P428697

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
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P428697

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P428697

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	100		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	102		P	85 - 115
Sodium	103		P	85 - 115
Strontium	100		P	85 - 115
Tin	98.7		P	85 - 115
Titanium	98.7		P	85 - 115
Vanadium	98.7		P	85 - 115
Zinc	99.1		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P428697

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.7		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	101		P	85 - 115
Barium	102		P	85 - 115
Beryllium	94.0		P	85 - 115
Boron	101		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	97.1		P	85 - 115
Cobalt	103		P	85 - 115
Copper	97.5		P	85 - 115
Lead	103		P	85 - 115
Manganese	99.6		P	85 - 115
Molybdenum	98.9		P	85 - 115
Nickel	99.3		P	85 - 115
Selenium	100		P	85 - 115
Silver	105		P	85 - 115
Thallium	99.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P428697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2400401	Calcium	97.4		P	80 - 120
2400401	Iron	99.0	99.7	P/P	80 - 120
2400401	Magnesium	96.4		P	80 - 120
2400401	Potassium	98.4	99.3	P/P	80 - 120
2400401	Sodium	102		P	80 - 120
2400401	Strontium	98.4	98.7	P/P	80 - 120
2400401	Tin	98.2	96.6	P/P	80 - 120
2400401	Titanium	99.3	98.9	P/P	80 - 120
2400401	Vanadium	99.2	98.6	P/P	80 - 120
2400401	Zinc	95.2	94.7	P/P	80 - 120
2400729	Calcium	100		P	80 - 120
2400729	Iron	100		P	80 - 120
2400729	Magnesium	102		P	80 - 120
2400729	Potassium	101		P	80 - 120
2400729	Sodium	106		P	80 - 120
2400729	Strontium	99.6		P	80 - 120
2400729	Tin	99.5		P	80 - 120
2400729	Titanium	97.9		P	80 - 120
2400729	Vanadium	101		P	80 - 120
2400729	Zinc	99.5		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P428697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2400401	Aluminum	101	98.9	P/P	80 - 120
2400401	Antimony	105	104	P/P	80 - 120
2400401	Barium	103	102	P/P	80 - 120
2400401	Beryllium	94.0	96.3	P/P	80 - 120
2400401	Boron	106	105	P/P	80 - 120
2400401	Cadmium	104	105	P/P	80 - 120
2400401	Chromium	98.2	96.9	P/P	80 - 120
2400401	Cobalt	102	102	P/P	80 - 120
2400401	Copper	95.4	95.0	P/P	80 - 120
2400401	Lead	105	106	P/P	80 - 120
2400401	Manganese	101	101	P/P	80 - 120
2400401	Nickel	96.2	94.7	P/P	80 - 120
2400401	Selenium	98.7	98.0	P/P	80 - 120
2400401	Silver	106	106	P/P	80 - 120
2400401	Thallium	103	106	P/P	80 - 120
2400729	Aluminum	96.5		P	80 - 120
2400729	Antimony	102		P	80 - 120
2400729	Arsenic	98.1		P	80 - 120
2400729	Barium	99.0		P	80 - 120
2400729	Beryllium	92.5		P	80 - 120
2400729	Boron	99.3		P	80 - 120
2400729	Cadmium	103		P	80 - 120
2400729	Chromium	95.2		P	80 - 120
2400729	Cobalt	102		P	80 - 120
2400729	Copper	97.5		P	80 - 120
2400729	Lead	105		P	80 - 120
2400729	Molybdenum	101		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P428697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2400729	Nickel	97.5		P	80 - 120
2400729	Selenium	97.1		P	80 - 120
2400729	Silver	104		P	80 - 120
2400729	Thallium	103		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P428697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2400401	Calcium	0.515	Spike	P	0 - 20
2400401	Iron	0.622	Spike	P	0 - 20
2400401	Magnesium	0.129	Spike	P	0 - 20
2400401	Potassium	0.773	Spike	P	0 - 20
2400401	Sodium	0.249	Spike	P	0 - 20
2400401	Strontium	0.307	Spike	P	0 - 20
2400401	Tin	1.62	Spike	P	0 - 20
2400401	Titanium	0.386	Spike	P	0 - 20
2400401	Vanadium	0.480	Spike	P	0 - 20
2400401	Zinc	0.478	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P428697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2400401	Aluminum	2.22	Spike	P	0 - 20
2400401	Antimony	1.18	Spike	P	0 - 20
2400401	Arsenic	0.345	Spike	P	0 - 20
2400401	Barium	0.997	Spike	P	0 - 20
2400401	Beryllium	2.46	Spike	P	0 - 20
2400401	Boron	0.346	Spike	P	0 - 20
2400401	Cadmium	0.356	Spike	P	0 - 20
2400401	Chromium	1.29	Spike	P	0 - 20
2400401	Cobalt	0.461	Spike	P	0 - 20
2400401	Copper	0.365	Spike	P	0 - 20
2400401	Lead	0.681	Spike	P	0 - 20
2400401	Manganese	0.0797	Spike	P	0 - 20
2400401	Molybdenum	2.31	Spike	P	0 - 20
2400401	Nickel	1.45	Spike	P	0 - 20
2400401	Selenium	0.762	Spike	P	0 - 20
2400401	Silver	0.656	Spike	P	0 - 20
2400401	Thallium	2.59	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A118693

Included Lab Sample IDs: 2400991, 2400992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	99.5	P/P	90 - 110
Antimony	103	102	P/P	90 - 110
Arsenic	102	100	P/P	90 - 110
Barium	101	99.3	P/P	90 - 110
Beryllium	99.4	97.7	P/P	90 - 110
Boron	105	102	P/P	90 - 110
Cadmium	102	101	P/P	90 - 110
Chromium	99.4	99.2	P/P	90 - 110
Cobalt	106	104	P/P	90 - 110
Copper	99.0	97.6	P/P	90 - 110
Lead	103	105	P/P	90 - 110
Manganese	100	101	P/P	90 - 110
Molybdenum	100	100	P/P	90 - 110
Nickel	101	99.6	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	106	105	P/P	90 - 110
Thallium	101	104	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A118713

Included Lab Sample IDs: 2400991, 2400992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.3	98.9	P/P	90 - 110
Iron	95.7	97.0	P/P	90 - 110
Magnesium	95.7	97.3	P/P	90 - 110
Potassium	97.6	98.2	P/P	90 - 110
Sodium	99.8	100	P/P	90 - 110
Strontium	99.0	99.1	P/P	90 - 110
Tin	97.7	98.1	P/P	90 - 110
Titanium	96.4	97.4	P/P	90 - 110
Vanadium	97.7	98.0	P/P	90 - 110
Zinc	97.8	98.7	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	101	97.4	100			0.515
	Iron	100	100	99.0	99.7		0.622
	Magnesium	101	96.4	102			0.129
	Potassium	102	98.4	99.3	101		0.773
	Sodium	103	102	106			0.249
	Strontium	100	99.6	98.4	98.7		0.307
	Tin	98.7	98.2	96.6	99.5		1.62
	Titanium	98.7	99.3	98.9	97.9		0.386
	Vanadium	98.7	99.2	98.6	101		0.480
	Zinc	99.1	95.2	94.7	99.5		0.478
EPA 200.8 Rev. 5.4	Aluminum	99.7	101	98.9	96.5		2.22
	Antimony	102	105	104	102		1.18
	Arsenic	101	98.1				0.345
	Barium	102	103	102	99.0		0.997
	Beryllium	94.0	94.0	96.3	92.5		2.46
	Boron	101	106	105	99.3		0.346
	Cadmium	102	104	105	103		0.356
	Chromium	97.1	98.2	96.9	95.2		1.29
	Cobalt	103	102	102	102		0.461
	Copper	97.5	95.4	95.0	97.5		0.365
	Lead	103	105	106	105		0.681
	Manganese	99.6	101	101			0.0797
	Molybdenum	98.9	101				2.31
	Nickel	99.3	96.2	94.7	97.5		1.45
	Selenium	100	98.7	98.0	97.1		0.762
	Silver	105	106	106	104		0.656
	Thallium	99.7	103	106	103		2.59

Reference Method Descriptions

Method	Description	Associated Samples
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2400991, 2400992
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2400991, 2400992
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2400991, 2400992

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	04/18/2023	04/19/2023 11:45	George D Taylor	04/20/2023 23:11	McKinley C Carter	2400991
	04/18/2023	04/19/2023 11:45	George D Taylor	04/20/2023 23:19	McKinley C Carter	2400991
	04/18/2023	04/19/2023 11:45	George D Taylor	04/20/2023 23:26	McKinley C Carter	2400992
EPA 200.8 Rev. 5.4	04/18/2023	04/19/2023 11:45	George D Taylor	04/20/2023 18:59	Conrad Hartmann	2400991
	04/18/2023	04/19/2023 11:45	George D Taylor	04/20/2023 19:08	Conrad Hartmann	2400992
SM 2340 B-2011	04/18/2023			04/20/2023 23:11	McKinley C Carter	2400991
	04/18/2023			04/20/2023 23:26	McKinley C Carter	2400992