

Chemical Analysis Report

CEN-DIST-2023-07-26-01

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

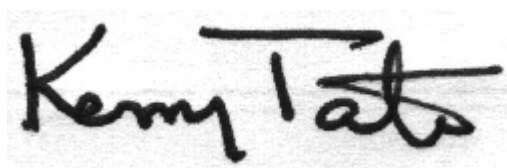
Event Description: **Run 19**
Request ID: **RQ-2023-07-24-12**
Customer: **CEN-DIST**
Project ID: **SMP**

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: 03-AUG-2023 10:12

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the name.

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: 07/25/2023 09:44

Field ID: G2CE0273

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes	
2426788	EPA 200.7 Rev. 4.4	Calcium	61.4		mg/L	P433182		
		Iron	1.01E+03		ug/L	P433182		
		Magnesium	22.6		mg/L	P433182		
		Potassium	8.3		mg/L	P433182		
		Sodium	173		mg/L	P433182		
		Strontium	515		ug/L	P433182		
		Tin	7.3	I	ug/L	P433182		
		Titanium	16.8		ug/L	P433182		
		Vanadium	2.0	U	ug/L	P433182		
		Zinc	29		ug/L	P433182		
	EPA 200.8 Rev. 5.4	Aluminum	870		ug/L	P433182		
		Antimony	0.083	I	ug/L	P433182		
		Arsenic	2.97		ug/L	P433182		
		Barium	34.6		ug/L	P433182		
		Beryllium	0.034	I	ug/L	P433182		
		Boron	129		ug/L	P433182		
		Cadmium	0.029	I	ug/L	P433182		
		Chromium	1.7		ug/L	P433182		
		Cobalt	0.116		ug/L	P433182		
		Copper	4.23		ug/L	P433182		
		Lead	1.35		ug/L	P433182		
		Manganese	59.9		ug/L	P433182		
		Molybdenum	0.63		ug/L	P433182		
		Nickel	0.54	I	ug/L	P433182		
		Selenium	0.20	U	ug/L	P433182		
		Silver	0.011	I	ug/L	P433182		
		Thallium	0.10	U	ug/L	P433182		
		SM 2340 B-2011	Hardness	246		mg/L	P433182	

Sample Location: SWEETWATER CREEK AT ARTESIA ST

Collection Date/Time: 07/25/2023 09:08

Field ID: G2CE0287

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2426789	EPA 200.7 Rev. 4.4	Calcium	50.5		mg/L	P433182	
		Iron	330		ug/L	P433182	
		Magnesium	5.00		mg/L	P433182	
		Potassium	3.2		mg/L	P433182	
		Sodium	24.6		mg/L	P433182	
		Strontium	168		ug/L	P433182	
		Tin	4.3	I	ug/L	P433182	
		Titanium	2.3	I	ug/L	P433182	
		Vanadium	2.0	U	ug/L	P433182	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P433182	
		Aluminum	137		ug/L	P433182	
		Antimony	0.12	I	ug/L	P433182	
		Arsenic	2.91		ug/L	P433182	
		Barium	34.2		ug/L	P433182	
		Beryllium	0.016	I	ug/L	P433182	
		Boron	55.9		ug/L	P433182	
		Cadmium	0.020	U	ug/L	P433182	
		Chromium	0.69	I	ug/L	P433182	
		Cobalt	0.132		ug/L	P433182	
		Copper	2.62		ug/L	P433182	
		Lead	0.48		ug/L	P433182	
		Manganese	35.2		ug/L	P433182	
		Molybdenum	0.91		ug/L	P433182	
		Nickel	0.53	I	ug/L	P433182	
		Selenium	0.30	I	ug/L	P433182	
		Silver	0.010	U	ug/L	P433182	
		Thallium	0.10	U	ug/L	P433182	
	SM 2340 B-2011	Hardness	147		mg/L	P433182	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P433182

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: P433182

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: P433182

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	109		P	85 - 115
Iron	109		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	103		P	85 - 115
Sodium	107		P	85 - 115
Strontium	102		P	85 - 115
Tin	106		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	102		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P433182

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	108		P	80 - 120
Antimony	107		P	80 - 120
Arsenic	100		P	80 - 120
Barium	108		P	80 - 120
Beryllium	99.8		P	80 - 120
Boron	111		P	80 - 120
Cadmium	105		P	80 - 120
Chromium	100		P	80 - 120
Cobalt	99.2		P	80 - 120
Copper	96.9		P	80 - 120
Lead	106		P	80 - 120
Manganese	109		P	80 - 120
Molybdenum	103		P	80 - 120
Nickel	98.5		P	80 - 120
Selenium	104		P	80 - 120
Silver	106		P	80 - 120
Thallium	103		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P433182

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427008	Calcium	101		P	80 - 120
2427008	Iron	107	106	P/P	80 - 120
2427008	Magnesium	99.5		P	80 - 120
2427008	Potassium	102	101	P/P	80 - 120
2427008	Sodium	104	104	P/P	80 - 120
2427008	Strontium	100	100	P/P	80 - 120
2427008	Tin	102	99.1	P/P	80 - 120
2427008	Titanium	104	101	P/P	80 - 120
2427008	Vanadium	105	103	P/P	80 - 120
2427008	Zinc	100	96.8	P/P	80 - 120
2427063	Calcium	109		P	80 - 120
2427063	Iron	107		P	80 - 120
2427063	Magnesium	105		P	80 - 120
2427063	Potassium	101		P	80 - 120
2427063	Sodium	104		P	80 - 120
2427063	Strontium	99.8		P	80 - 120
2427063	Tin	105		P	80 - 120
2427063	Titanium	102		P	80 - 120
2427063	Vanadium	102		P	80 - 120
2427063	Zinc	99.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P433182

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427008	Aluminum	107	107	P/P	80 - 120
2427008	Antimony	109	109	P/P	80 - 120
2427008	Arsenic	102	102	P/P	80 - 120
2427008	Barium	110	110	P/P	80 - 120
2427008	Beryllium	95.7	99.5	P/P	80 - 120
2427008	Boron	108	108	P/P	80 - 120
2427008	Cadmium	106	106	P/P	80 - 120
2427008	Chromium	100	100	P/P	80 - 120
2427008	Cobalt	97.1	96.7	P/P	80 - 120
2427008	Copper	95.4	95.5	P/P	80 - 120
2427008	Lead	106	106	P/P	80 - 120
2427008	Manganese	112	112	P/P	80 - 120
2427008	Molybdenum	106	107	P/P	80 - 120
2427008	Nickel	97.6	97.2	P/P	80 - 120
2427008	Selenium	103	102	P/P	80 - 120
2427008	Silver	107	108	P/P	80 - 120
2427008	Thallium	106	107	P/P	80 - 120
2427063	Aluminum	111		P	80 - 120
2427063	Antimony	109		P	80 - 120
2427063	Arsenic	102		P	80 - 120
2427063	Barium	111		P	80 - 120
2427063	Beryllium	97.0		P	80 - 120
2427063	Boron	112		P	80 - 120
2427063	Cadmium	104		P	80 - 120
2427063	Chromium	102		P	80 - 120
2427063	Cobalt	98.2		P	80 - 120
2427063	Copper	95.7		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P433182

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2427063	Lead	109		P	80 - 120
2427063	Manganese	114		P	80 - 120
2427063	Molybdenum	106		P	80 - 120
2427063	Nickel	97.9		P	80 - 120
2427063	Selenium	105		P	80 - 120
2427063	Silver	110		P	80 - 120
2427063	Thallium	109		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P433182

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427008	Calcium	0.826	Spike	P	0 - 20
2427008	Iron	1.54	Spike	P	0 - 20
2427008	Magnesium	1.44	Spike	P	0 - 20
2427008	Potassium	0.327	Spike	P	0 - 20
2427008	Sodium	0.0219	Spike	P	0 - 20
2427008	Strontium	0.358	Spike	P	0 - 20
2427008	Tin	2.79	Spike	P	0 - 20
2427008	Titanium	3.30	Spike	P	0 - 20
2427008	Vanadium	2.53	Spike	P	0 - 20
2427008	Zinc	3.29	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P433182

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2427008	Aluminum	0.149	Spike	P	0 - 20
2427008	Antimony	0.113	Spike	P	0 - 20
2427008	Arsenic	0.329	Spike	P	0 - 20
2427008	Barium	0.191	Spike	P	0 - 20
2427008	Beryllium	3.89	Spike	P	0 - 20
2427008	Boron	0.568	Spike	P	0 - 20
2427008	Cadmium	0.266	Spike	P	0 - 20
2427008	Chromium	0.201	Spike	P	0 - 20
2427008	Cobalt	0.348	Spike	P	0 - 20
2427008	Copper	0.0285	Spike	P	0 - 20
2427008	Lead	0.0783	Spike	P	0 - 20
2427008	Manganese	0.0157	Spike	P	0 - 20
2427008	Molybdenum	0.517	Spike	P	0 - 20
2427008	Nickel	0.415	Spike	P	0 - 20
2427008	Selenium	0.634	Spike	P	0 - 20
2427008	Silver	0.865	Spike	P	0 - 20
2427008	Thallium	0.834	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A120749

Included Lab Sample IDs: 2426788, 2426789

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	107	105	P/P	90 - 110
Iron	107	104	P/P	90 - 110
Magnesium	105	102	P/P	90 - 110
Potassium	103	101	P/P	90 - 110
Sodium	104	104	P/P	90 - 110
Strontium	100	104	P/P	90 - 110
Tin	103	104	P/P	90 - 110
Titanium	102	102	P/P	90 - 110
Vanadium	102	102	P/P	90 - 110
Zinc	102	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A120750

Included Lab Sample IDs: 2426788, 2426789

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	104	P/P	90 - 110
Arsenic	98.2	98.3	P/P	90 - 110
Barium	103	103	P/P	90 - 110
Beryllium	97.7	97.3	P/P	90 - 110
Boron	101	101	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	98.6	99.1	P/P	90 - 110
Cobalt	95.8	96.5	P/P	90 - 110
Copper	94.8	94.3	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Manganese	106	107	P/P	90 - 110
Molybdenum	99.9	100	P/P	90 - 110
Nickel	95.6	96.0	P/P	90 - 110
Selenium	101	102	P/P	90 - 110
Silver	97.8	98.2	P/P	90 - 110
Thallium	103	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A120776

Included Lab Sample IDs: 2426788, 2426789

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	94.0	91.7	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 SMP	MS
			LCS				
EPA 200.7 Rev. 4.4	Calcium	109	101	109			0.826
	Iron	109	107	106	107		1.54
	Magnesium	107	99.5	105			1.44
	Potassium	103	102	101	101		0.327
	Sodium	107	104	104	104		0.0219
	Strontium	102	100	100	99.8		0.358
	Tin	106	102	99.1	105		2.79
	Titanium	102	104	101	102		3.30
	Vanadium	102	105	103	102		2.53
	Zinc	103	100	96.8	99.9		3.29
EPA 200.8 Rev. 5.4	Aluminum	108	107	107	111		0.149
	Antimony	107	109	109	109		0.113
	Arsenic	100	102	102	102		0.329
	Barium	108	110	110	111		0.191
	Beryllium	99.8	95.7	99.5	97.0		3.89
	Boron	111	108	108	112		0.568
	Cadmium	105	106	106	104		0.266
	Chromium	100	100	100	102		0.201
	Cobalt	99.2	97.1	96.7	98.2		0.348
	Copper	96.9	95.4	95.5	95.7		0.0285
	Lead	106	106	106	109		0.0783
	Manganese	109	112	112	114		0.0157
	Molybdenum	103	106	107	106		0.517
	Nickel	98.5	97.6	97.2	97.9		0.415
	Selenium	104	103	102	105		0.634
	Silver	106	107	108	110		0.865
	Thallium	103	106	107	109		0.834

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	2426788, 2426789
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2426788, 2426789
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2426788, 2426789

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	07/26/2023	07/28/2023 12:50	George D Taylor	07/31/2023 17:12	Samatha Luckman	2426788
	07/26/2023	07/28/2023 12:50	George D Taylor	07/31/2023 17:29	Samatha Luckman	2426789
EPA 200.8 Rev. 5.4	07/26/2023	07/28/2023 12:50	George D Taylor	07/31/2023 16:16	Conrad Hartmann	2426788
	07/26/2023	07/28/2023 12:50	George D Taylor	07/31/2023 16:25	Conrad Hartmann	2426789
	07/26/2023	07/28/2023 12:50	George D Taylor	08/02/2023 01:04	Conrad Hartmann	2426788
	07/26/2023	07/28/2023 12:50	George D Taylor	08/02/2023 01:13	Conrad Hartmann	2426789
	07/26/2023					
SM 2340 B-2011	07/26/2023			07/31/2023 17:12	Samatha Luckman	2426788
	07/26/2023			07/31/2023 17:29	Samatha Luckman	2426789