

Chemical Analysis Report

CEN-DIST-2023-08-23-01

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

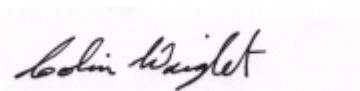
Event Description: **Run 19**
Request ID: **RQ-2023-08-21-33**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Matthew Bearden

For additional information please contact
Colin Wright, Ph.D.
Chris Bowen, B.S.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 11-SEP-2023 13:50

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light blue rectangular background.

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: 08/22/2023 09:45

Field ID: G2CE0273

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2433036	EPA 200.7 Rev. 4.4	Calcium	72.2		mg/L	P434294	
		Iron	260		ug/L	P434294	
		Magnesium	30.7		mg/L	P434294	
		Potassium	9.1		mg/L	P434294	
		Sodium	247		mg/L	P434294	
		Strontium	686		ug/L	P434294	
		Tin	3.0	U	ug/L	P434294	
		Titanium	2.5	I	ug/L	P434294	
		Vanadium	2.0	U	ug/L	P434294	
		Zinc	5.0	U	ug/L	P434294	
	EPA 200.8 Rev. 5.4	Aluminum	123		ug/L	P434294	
		Antimony	0.093	I	ug/L	P434294	
		Arsenic	2.59		ug/L	P434294	
		Barium	37.0		ug/L	P434294	
		Beryllium	0.011	I	ug/L	P434294	
		Boron	124		ug/L	P434294	
		Cadmium	0.020	U	ug/L	P434294	
		Chromium	0.50	I	ug/L	P434294	
		Cobalt	0.060	I	ug/L	P434294	
		Copper	1.27		ug/L	P434294	
		Lead	0.23	I	ug/L	P434294	
		Manganese	49.7		ug/L	P434294	
		Molybdenum	0.47	I	ug/L	P434294	
		Nickel	0.50	U	ug/L	P434294	
		Selenium	0.20	U	ug/L	P434294	
		Silver	0.010	U	ug/L	P434294	
		Thallium	0.10	U	ug/L	P434294	
	SM 2340 B-2011	Hardness	307		mg/L	P434294	

Sample Location: SWEETWATER CREEK AT ARTESIA ST

Collection Date/Time: 08/22/2023 10:18

Field ID: G2CE0287

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2433037	EPA 200.7 Rev. 4.4	Calcium	53.1		mg/L	P434294	
		Iron	360		ug/L	P434294	
		Magnesium	5.72		mg/L	P434294	
		Potassium	3.6		mg/L	P434294	
		Sodium	27.3		mg/L	P434294	
		Strontium	190		ug/L	P434294	
		Tin	3.0	U	ug/L	P434294	
		Titanium	2.6	I	ug/L	P434294	
		Vanadium	2.0	U	ug/L	P434294	
		Zinc	5.0	U	ug/L	P434294	
	EPA 200.8 Rev. 5.4	Aluminum	128		ug/L	P434294	
		Antimony	0.13	I	ug/L	P434294	
		Arsenic	2.95		ug/L	P434294	
		Barium	34.7		ug/L	P434294	
		Beryllium	0.017	I	ug/L	P434294	
		Boron	56.6		ug/L	P434294	
		Cadmium	0.020	U	ug/L	P434294	
		Chromium	0.59	I	ug/L	P434294	
		Cobalt	0.138		ug/L	P434294	
		Copper	2.14		ug/L	P434294	
		Lead	0.46		ug/L	P434294	
		Manganese	36.2		ug/L	P434294	
		Molybdenum	0.81		ug/L	P434294	
		Nickel	0.53	I	ug/L	P434294	
		Selenium	0.26	I	ug/L	P434294	
		Silver	0.010	U	ug/L	P434294	
		Thallium	0.10	U	ug/L	P434294	
	SM 2340 B-2011	Hardness	156		mg/L	P434294	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P434294

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: P434294

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: P434294

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	102		P	85 - 115
Sodium	101		P	85 - 115
Strontium	99.7		P	85 - 115
Tin	98.7		P	85 - 115
Titanium	98.9		P	85 - 115
Vanadium	99.5		P	85 - 115
Zinc	99.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P434294

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.5		P	85 - 115
Antimony	99.9		P	85 - 115
Arsenic	97.9		P	85 - 115
Barium	103		P	85 - 115
Beryllium	94.9		P	85 - 115
Boron	101		P	85 - 115
Cadmium	99.0		P	85 - 115
Chromium	95.3		P	85 - 115
Cobalt	100		P	85 - 115
Copper	98.9		P	85 - 115
Lead	100		P	85 - 115
Manganese	96.0		P	85 - 115
Molybdenum	96.9		P	85 - 115
Nickel	97.6		P	85 - 115
Selenium	99.8		P	85 - 115
Silver	110		P	80 - 120
Thallium	101		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P434294

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432739	Calcium	103		P	80 - 120
2432739	Iron	106	102	P/P	80 - 120
2432739	Magnesium	106	101	P/P	80 - 120
2432739	Potassium	109	104	P/P	80 - 120
2432739	Sodium	101		P	80 - 120
2432739	Strontium	101	97.5	P/P	80 - 120
2432739	Tin	102	98.2	P/P	80 - 120
2432739	Titanium	100	97.4	P/P	80 - 120
2432739	Vanadium	101	99.2	P/P	80 - 120
2432739	Zinc	100	98.2	P/P	80 - 120
2433112	Calcium	97.5		P	80 - 120
2433112	Iron	108		P	80 - 120
2433112	Magnesium	106		P	80 - 120
2433112	Potassium	110		P	80 - 120
2433112	Sodium	107		P	80 - 120
2433112	Strontium	104		P	80 - 120
2433112	Tin	102		P	80 - 120
2433112	Titanium	104		P	80 - 120
2433112	Vanadium	107		P	80 - 120
2433112	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P434294

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432739	Aluminum	97.9	98.3	P/P	80 - 120
2432739	Antimony	99.4	100	P/P	80 - 120
2432739	Arsenic	98.8	98.2	P/P	80 - 120
2432739	Barium	103	104	P/P	80 - 120
2432739	Beryllium	95.0	94.5	P/P	80 - 120
2432739	Boron	103	100	P/P	80 - 120
2432739	Cadmium	102	99.3	P/P	80 - 120
2432739	Chromium	99.4	99.6	P/P	80 - 120
2432739	Cobalt	101	101	P/P	80 - 120
2432739	Copper	99.7	101	P/P	80 - 120
2432739	Lead	101	100	P/P	80 - 120
2432739	Manganese	95.9	96.7	P/P	80 - 120
2432739	Molybdenum	98.4	97.4	P/P	80 - 120
2432739	Nickel	99.7	99.3	P/P	80 - 120
2432739	Selenium	100	97.9	P/P	80 - 120
2432739	Silver	114	116	P/P	80 - 120
2432739	Thallium	101	101	P/P	80 - 120
2433112	Aluminum	97.6		P	80 - 120
2433112	Antimony	102		P	80 - 120
2433112	Arsenic	97.4		P	80 - 120
2433112	Barium	103		P	80 - 120
2433112	Beryllium	94.7		P	80 - 120
2433112	Boron	103		P	80 - 120
2433112	Cadmium	101		P	80 - 120
2433112	Chromium	95.4		P	80 - 120
2433112	Cobalt	99.0		P	80 - 120
2433112	Copper	94.8		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P434294

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2433112	Lead	101		P	80 - 120
2433112	Manganese	97.1		P	80 - 120
2433112	Molybdenum	99.2		P	80 - 120
2433112	Nickel	96.5		P	80 - 120
2433112	Selenium	99.4		P	80 - 120
2433112	Silver	116		P	80 - 120
2433112	Thallium	102		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P434294

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432739	Calcium	3.69	Spike	P	0 - 20
2432739	Iron	3.27	Spike	P	0 - 20
2432739	Magnesium	3.20	Spike	P	0 - 20
2432739	Potassium	4.09	Spike	P	0 - 20
2432739	Sodium	4.25	Spike	P	0 - 20
2432739	Strontium	3.89	Spike	P	0 - 20
2432739	Tin	3.58	Spike	P	0 - 20
2432739	Titanium	2.66	Spike	P	0 - 20
2432739	Vanadium	2.16	Spike	P	0 - 20
2432739	Zinc	2.23	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P434294

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432739	Aluminum	0.351	Spike	P	0 - 20
2432739	Antimony	0.895	Spike	P	0 - 20
2432739	Arsenic	0.608	Spike	P	0 - 20
2432739	Barium	1.04	Spike	P	0 - 20
2432739	Beryllium	0.464	Spike	P	0 - 20
2432739	Boron	2.59	Spike	P	0 - 20
2432739	Cadmium	2.23	Spike	P	0 - 20
2432739	Chromium	0.195	Spike	P	0 - 20
2432739	Cobalt	0.0812	Spike	P	0 - 20
2432739	Copper	1.15	Spike	P	0 - 20
2432739	Lead	0.714	Spike	P	0 - 20
2432739	Manganese	0.515	Spike	P	0 - 20
2432739	Molybdenum	0.967	Spike	P	0 - 20
2432739	Nickel	0.453	Spike	P	0 - 20
2432739	Selenium	2.41	Spike	P	0 - 20
2432739	Silver	1.01	Spike	P	0 - 20
2432739	Thallium	0.778	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: A121267

Included Lab Sample IDs: 2433036, 2433037

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	100	P/P	90 - 110
Iron	103	101	P/P	90 - 110
Magnesium	103	101	P/P	90 - 110
Potassium	99.3	97.7	P/P	90 - 110
Sodium	99.1	99.0	P/P	90 - 110
Strontium	97.4	98.7	P/P	90 - 110
Tin	96.9	99.6	P/P	90 - 110
Titanium	95.9	99.0	P/P	90 - 110
Vanadium	96.5	100	P/P	90 - 110
Zinc	97.6	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A121319

Included Lab Sample IDs: 2433036, 2433037

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.0	96.8	P/P	90 - 110
Antimony	96.6	94.5	P/P	90 - 110
Arsenic	97.3	94.4	P/P	90 - 110
Barium	98.9	96.7	P/P	90 - 110
Beryllium	94.6	93.1	P/P	90 - 110
Boron	94.9	97.4	P/P	90 - 110
Cadmium	97.8	97.3	P/P	90 - 110
Chromium	94.7	91.8	P/P	90 - 110
Cobalt	98.6	95.2	P/P	90 - 110
Copper	96.2	93.3	P/P	90 - 110
Lead	97.5	95.1	P/P	90 - 110
Manganese	95.7	94.4	P/P	90 - 110
Molybdenum	96.0	95.2	P/P	90 - 110
Nickel	96.3	92.8	P/P	90 - 110
Selenium	99.3	96.8	P/P	90 - 110
Silver	99.3	98.4	P/P	90 - 110
Thallium	95.0	93.9	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			LCS	Precision SMP	MS
EPA 200.7 Rev. 4.4	Calcium	103	103	97.5				3.69
	Iron	105	106	102	108			3.27
	Magnesium	105	106	101	106			3.20
	Potassium	102	109	104	110			4.09
	Sodium	101	101	107				4.25
	Strontium	99.7	101	97.5	104			3.89
	Tin	98.7	102	98.2	102			3.58
	Titanium	98.9	100	97.4	104			2.66
	Vanadium	99.5	101	99.2	107			2.16
	Zinc	99.8	100	98.2	102			2.23
EPA 200.8 Rev. 5.4	Aluminum	98.5	97.9	98.3	97.6			0.351
	Antimony	99.9	99.4	100	102			0.895
	Arsenic	97.9	98.8	98.2	97.4			0.608
	Barium	103	103	104	103			1.04
	Beryllium	94.9	95.0	94.5	94.7			0.464
	Boron	101	103	100	103			2.59
	Cadmium	99.0	102	99.3	101			2.23
	Chromium	95.3	99.4	99.6	95.4			0.195
	Cobalt	100	101	101	99.0			0.0812
	Copper	98.9	99.7	101	94.8			1.15
	Lead	100	101	100	101			0.714
	Manganese	96.0	95.9	96.7	97.1			0.515
	Molybdenum	96.9	98.4	97.4	99.2			0.967
	Nickel	97.6	99.7	99.3	96.5			0.453
	Selenium	99.8	100	97.9	99.4			2.41
	Silver	110	114	116	116			1.01
	Thallium	101	101	101	102			0.778

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	2433036, 2433037
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2433036, 2433037
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2433036, 2433037

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	08/23/2023	08/24/2023 13:25	George D Taylor	08/25/2023 15:10	Samatha Luckman	2433036
	08/23/2023	08/24/2023 13:25	George D Taylor	08/25/2023 15:19	Samatha Luckman	2433036
	08/23/2023	08/24/2023 13:25	George D Taylor	08/25/2023 15:27	Samatha Luckman	2433037
EPA 200.8 Rev. 5.4	08/23/2023	08/24/2023 13:25	George D Taylor	08/29/2023 18:13	Conrad Hartmann	2433036
	08/23/2023	08/24/2023 13:25	George D Taylor	08/29/2023 18:22	Conrad Hartmann	2433037
SM 2340 B-2011	08/23/2023			08/25/2023 15:10	Samatha Luckman	2433036
	08/23/2023			08/25/2023 15:27	Samatha Luckman	2433037