

Chemical Analysis Report

CEN-DIST-2023-03-23-02

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

Event Description: **Run 19**
Request ID: **RQ-2023-03-20-11**
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
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Date Certified: 07-APR-2023 13:37



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 @ Artesia St

Collection Date/Time: 03/22/2023 11:33

Field ID: G2CE0287

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2396068	EPA 200.7 Rev. 4.4	Calcium	55.7		mg/L	P427613	
		Iron	400		ug/L	P427613	
		Magnesium	6.75		mg/L	P427613	
		Potassium	3.7		mg/L	P427613	
		Sodium	29.7		mg/L	P427613	
		Strontium	213		ug/L	P427613	
		Tin	3.0	U	ug/L	P427613	
		Titanium	6.6		ug/L	P427613	
		Vanadium	2.0	U	ug/L	P427613	
		Zinc	5.0	U	ug/L	P427613	
	EPA 200.8 Rev. 5.4	Aluminum	241		ug/L	P427613	
		Antimony	0.12	I	ug/L	P427791	
		Arsenic	1.36		ug/L	P427791	
		Barium	38.7		ug/L	P427613	
		Beryllium	0.017	I	ug/L	P427613	
		Boron	63.1		ug/L	P427613	
		Cadmium	0.020	U	ug/L	P427613	
		Chromium	0.72	I	ug/L	P427613	
		Cobalt	0.131		ug/L	P427791	
		Copper	1.49		ug/L	P427613	
		Lead	0.46		ug/L	P427613	
		Manganese	29.6		ug/L	P427613	
		Molybdenum	0.85		ug/L	P427613	
		Nickel	0.56	I	ug/L	P427613	
		Selenium	0.20	U	ug/L	P427613	
		Silver	0.010	U	ug/L	P427613	
		Thallium	0.10	U	ug/L	P427613	
	SM 2340 B-2011	Hardness	167		mg/L	P427613	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P427613

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: P427613

Component	Result	Code	Units
Aluminum	5.0	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
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

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P427791

Component	Result	Code	Units
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Cobalt	0.020	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P427613

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	98.5		P	85 - 115
Iron	106		P	85 - 115
Magnesium	98.0		P	85 - 115
Potassium	95.2		P	85 - 115
Sodium	96.9		P	85 - 115
Strontium	105		P	85 - 115
Tin	103		P	85 - 115
Titanium	105		P	85 - 115
Vanadium	103		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427613

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Barium	104		P	85 - 115
Beryllium	100		P	85 - 115
Boron	102		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	101		P	85 - 115
Copper	102		P	85 - 115
Lead	104		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	103		P	85 - 115
Nickel	103		P	85 - 115
Selenium	99.6		P	85 - 115
Silver	104		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427791

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Antimony	107		P	85 - 115
Arsenic	102		P	85 - 115
Cobalt	104		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P427613

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395000	Calcium	105		P	80 - 120
2395000	Iron	102	102	P/P	80 - 120
2395000	Magnesium	107		P	80 - 120
2395000	Potassium	90.9	92.0	P/P	80 - 120
2395000	Sodium	104		P	80 - 120
2395000	Strontium	99.9	101	P/P	80 - 120
2395000	Tin	93.5	94.6	P/P	80 - 120
2395000	Titanium	100	83.0	P/P	80 - 120
2395000	Vanadium	99.8	99.8	P/P	80 - 120
2395000	Zinc	96.8	96.4	P/P	80 - 120
2395927	Calcium	96.9		P	80 - 120
2395927	Iron	107		P	80 - 120
2395927	Magnesium	97.8		P	80 - 120
2395927	Potassium	97.6		P	80 - 120
2395927	Sodium	96.5		P	80 - 120
2395927	Strontium	104		P	80 - 120
2395927	Tin	105		P	80 - 120
2395927	Titanium	109		P	80 - 120
2395927	Vanadium	107		P	80 - 120
2395927	Zinc	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P427613

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395000	Aluminum	92.6	118	P/P	80 - 120
2395000	Barium	94.2	96.2	P/P	80 - 120
2395000	Beryllium	91.9	91.9	P/P	80 - 120
2395000	Boron	103	102	P/P	80 - 120
2395000	Cadmium	100	101	P/P	80 - 120
2395000	Chromium	95.2	97.3	P/P	80 - 120
2395000	Copper	94.6	95.4	P/P	80 - 120
2395000	Lead	102	102	P/P	80 - 120
2395000	Manganese	97.2	98.8	P/P	80 - 120
2395000	Molybdenum	100	101	P/P	80 - 120
2395000	Nickel	95.1	95.9	P/P	80 - 120
2395000	Selenium	95.6	96.2	P/P	80 - 120
2395000	Silver	101	102	P/P	80 - 120
2395000	Thallium	104	106	P/P	80 - 120
2395927	Aluminum	97.9		P	80 - 120
2395927	Barium	99.9		P	80 - 120
2395927	Beryllium	94.2		P	80 - 120
2395927	Boron	103		P	80 - 120
2395927	Cadmium	101		P	80 - 120
2395927	Chromium	96.1		P	80 - 120
2395927	Copper	94.2		P	80 - 120
2395927	Lead	101		P	80 - 120
2395927	Manganese	97.5		P	80 - 120
2395927	Molybdenum	102		P	80 - 120
2395927	Nickel	95.2		P	80 - 120
2395927	Selenium	95.2		P	80 - 120
2395927	Silver	101		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427613

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395927	Thallium	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396455	Antimony	107	105	P/P	80 - 120
2396455	Arsenic	101	100	P/P	80 - 120
2396455	Cobalt	100	98.3	P/P	80 - 120
2396470	Antimony	105		P	80 - 120
2396470	Arsenic	99.8		P	80 - 120
2396470	Cobalt	97.8		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P427613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395000	Calcium	0.986	Spike	P	0 - 20
2395000	Iron	0.0222	Spike	P	0 - 20
2395000	Magnesium	0.604	Spike	P	0 - 20
2395000	Potassium	0.679	Spike	P	0 - 20
2395000	Sodium	0.582	Spike	P	0 - 20
2395000	Strontium	1.30	Spike	P	0 - 20
2395000	Tin	1.15	Spike	P	0 - 20
2395000	Titanium	9.71	Spike	P	0 - 20
2395000	Vanadium	0.0172	Spike	P	0 - 20
2395000	Zinc	0.288	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P427613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395000	Aluminum	10.3	Spike	P	0 - 20
2395000	Barium	0.686	Spike	P	0 - 20
2395000	Beryllium	0.0552	Spike	P	0 - 20
2395000	Boron	0.502	Spike	P	0 - 20
2395000	Cadmium	1.20	Spike	P	0 - 20
2395000	Chromium	1.95	Spike	P	0 - 20
2395000	Copper	0.838	Spike	P	0 - 20
2395000	Lead	0.440	Spike	P	0 - 20
2395000	Manganese	1.47	Spike	P	0 - 20
2395000	Molybdenum	0.966	Spike	P	0 - 20
2395000	Nickel	0.805	Spike	P	0 - 20
2395000	Selenium	0.701	Spike	P	0 - 20
2395000	Silver	0.748	Spike	P	0 - 20
2395000	Thallium	0.989	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P427791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396455	Antimony	1.21	Spike	P	0 - 20
2396455	Arsenic	0.995	Spike	P	0 - 20
2396455	Cobalt	2.02	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: A118222

Included Lab Sample IDs: 2396068

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.6	98.4	P/P	90 - 110
Barium	99.9	96.8	P/P	90 - 110
Beryllium	95.6	95.0	P/P	90 - 110
Boron	101	104	P/P	90 - 110
Cadmium	101	98.4	P/P	90 - 110
Chromium	97.1	94.6	P/P	90 - 110
Copper	97.2	94.8	P/P	90 - 110
Lead	102	101	P/P	90 - 110
Manganese	98.6	97.1	P/P	90 - 110
Nickel	97.8	94.7	P/P	90 - 110
Selenium	99.9	98.3	P/P	90 - 110
Silver	103	101	P/P	90 - 110
Thallium	102	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A118249

Included Lab Sample IDs: 2396068

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Molybdenum	100	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A118307

Included Lab Sample IDs: 2396068

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	105	105	P/P	90 - 110
Arsenic	101	99.9	P/P	90 - 110
Cobalt	101	99.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A118384

Included Lab Sample IDs: 2396068

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	102	P/P	90 - 110
Iron	103	106	P/P	90 - 110
Magnesium	101	103	P/P	90 - 110
Potassium	97.0	99.1	P/P	90 - 110
Sodium	98.8	101	P/P	90 - 110
Strontium	102	100	P/P	90 - 110
Tin	103	103	P/P	90 - 110
Titanium	102	102	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	102	101	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	98.5	105	96.9		0.986	
	Iron	106	102	102	107	0.0222	
	Magnesium	98.0	107	97.8		0.604	
	Potassium	95.2	90.9	92.0	97.6	0.679	
	Sodium	96.9	104	96.5		0.582	
	Strontium	105	99.9	101	104	1.30	
	Tin	103	93.5	94.6	105	1.15	
	Titanium	105	100	83.0	109	9.71	
	Vanadium	103	99.8	99.8	107	0.0172	
	Zinc	102	96.8	96.4	104	0.288	
EPA 200.8 Rev. 5.4	Aluminum	101	92.6	118	97.9	10.3	
	Antimony	107	107	105	105	1.21	
	Arsenic	102	101	100	99.8	0.995	
	Barium	104	94.2	96.2	99.9	0.686	
	Beryllium	100	91.9	91.9	94.2	0.0552	
	Boron	102	103	103	102	0.502	
	Cadmium	103	100	101	101	1.20	
	Chromium	101	95.2	97.3	96.1	1.95	
	Cobalt	104	100	98.3	97.8	2.02	
	Copper	102	94.6	95.4	94.2	0.838	
	Lead	104	102	102	101	0.440	
	Manganese	101	97.2	98.8	97.5	1.47	
	Molybdenum	103	100	101	102	0.966	
	Nickel	103	95.1	95.9	95.2	0.805	
	Selenium	99.6	95.6	96.2	95.2	0.701	
	Silver	104	101	102	101	0.748	
	Thallium	103	104	106	101	0.989	

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	2396068
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2396068
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2396068

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	03/23/2023	03/24/2023 09:44	Vijayalakshmi Reddy	04/04/2023 16:41	Chase Roberts	2396068
EPA 200.8 Rev. 5.4	03/23/2023	03/24/2023 09:44	Vijayalakshmi Reddy	03/27/2023 17:27	Conrad Hartmann	2396068
	03/23/2023	03/24/2023 09:44	Vijayalakshmi Reddy	03/28/2023 20:55	Emily M Philpot	2396068
	03/23/2023	03/29/2023 10:50	Vijayalakshmi Reddy	03/30/2023 16:41	Conrad Hartmann	2396068
SM 2340 B-2011	03/23/2023			04/04/2023 16:41	Chase Roberts	2396068