

Chemical Analysis Report

CEN-DIST-2023-09-22-01

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

Event Description: **Run 7**
Request ID: **RQ-2023-09-18-31**
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: 02-OCT-2023 10:57



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: ALLIGATOR LAKE AT CENTER OF SOUTH LOBE

Collection Date/Time: 09/21/2023 12:31

Field ID: G4CE0170

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2439400	EPA 200.7 Rev. 4.4	Calcium	5.25		mg/L	P435448	
		Iron	620		ug/L	P435448	
		Magnesium	2.77		mg/L	P435448	
		Potassium	3.2		mg/L	P435448	
		Sodium	15.1		mg/L	P435448	
		Strontium	37.7		ug/L	P435448	
		Tin	3.0	U	ug/L	P435448	
		Titanium	1.1	I	ug/L	P435448	
		Vanadium	2.0	U	ug/L	P435448	
		Zinc	131		ug/L	P435448	
	EPA 200.8 Rev. 5.4	Aluminum	205		ug/L	P435448	
		Antimony	0.071	I	ug/L	P435448	
		Arsenic	0.84		ug/L	P435448	
		Barium	15.8		ug/L	P435448	
		Beryllium	0.025	I	ug/L	P435448	
		Boron	36.3		ug/L	P435448	
		Cadmium	0.020	U	ug/L	P435448	
		Chromium	0.50	I	ug/L	P435448	
		Cobalt	0.068	I	ug/L	P435448	
		Copper	1.23		ug/L	P435448	
		Lead	0.63		ug/L	P435448	
		Manganese	8.62		ug/L	P435448	
		Molybdenum	0.15	U	ug/L	P435448	
		Nickel	1.1	I	ug/L	P435448	
		Selenium	0.20	U	ug/L	P435448	
		Silver	0.010	U	ug/L	P435448	
		Thallium	0.10	U	ug/L	P435448	
	SM 2340 B-2011	Hardness	24.5		mg/L	P435448	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 09/27/2023.

Sample Location: LAKE HART AT CENTER

Collection Date/Time: 09/21/2023 10:36

Field ID: G4CE0243

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2439401	EPA 200.7 Rev. 4.4	Calcium	8.21		mg/L	P435448	
		Iron	790		ug/L	P435448	
		Magnesium	2.30		mg/L	P435448	
		Potassium	2.0		mg/L	P435448	
		Sodium	15.8		mg/L	P435448	
		Strontium	65.6		ug/L	P435448	
		Tin	3.0	U	ug/L	P435448	
		Titanium	1.3	I	ug/L	P435448	
		Vanadium	2.0	U	ug/L	P435448	
		Zinc	5.0	U	ug/L	P435448	
	EPA 200.8 Rev. 5.4	Aluminum	243		ug/L	P435448	
		Antimony	0.086	I	ug/L	P435448	
		Arsenic	0.85		ug/L	P435448	
		Barium	14.3		ug/L	P435448	
		Beryllium	0.021	I	ug/L	P435448	
		Boron	33.9		ug/L	P435448	
		Cadmium	0.020	U	ug/L	P435448	
		Chromium	0.51	I	ug/L	P435448	
		Cobalt	0.101		ug/L	P435448	
		Copper	0.98		ug/L	P435448	
		Lead	0.53		ug/L	P435448	
		Manganese	7.27		ug/L	P435448	
		Molybdenum	0.15	U	ug/L	P435448	
		Nickel	0.50	U	ug/L	P435448	
		Selenium	0.20	U	ug/L	P435448	
		Silver	0.010	U	ug/L	P435448	
		Thallium	0.10	U	ug/L	P435448	
	SM 2340 B-2011	Hardness	30.0		mg/L	P435448	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P435448

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: P435448

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: P435448

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	80 - 120
Iron	99.2		P	80 - 120
Magnesium	102		P	80 - 120
Potassium	99.9		P	80 - 120
Sodium	102		P	80 - 120
Strontium	106		P	80 - 120
Tin	104		P	80 - 120
Titanium	102		P	80 - 120
Vanadium	104		P	80 - 120
Zinc	106		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P435448

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.7		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	102		P	85 - 115
Barium	101		P	85 - 115
Beryllium	96.7		P	85 - 115
Boron	102		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	97.9		P	85 - 115
Cobalt	97.7		P	85 - 115
Copper	98.9		P	85 - 115
Lead	101		P	85 - 115
Manganese	97.6		P	85 - 115
Molybdenum	99.3		P	85 - 115
Nickel	99.3		P	85 - 115
Selenium	100		P	85 - 115
Silver	113		P	85 - 115
Thallium	103		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P435448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439134	Calcium	101		P	80 - 120
2439134	Iron	100	99.4	P/P	80 - 120
2439134	Magnesium	99.6		P	80 - 120
2439134	Potassium	100	101	P/P	80 - 120
2439134	Sodium	102		P	80 - 120
2439134	Strontium	105	106	P/P	80 - 120
2439134	Tin	101	102	P/P	80 - 120
2439134	Titanium	104	106	P/P	80 - 120
2439134	Vanadium	106	106	P/P	80 - 120
2439134	Zinc	106	107	P/P	80 - 120
2439159	Calcium	104		P	80 - 120
2439159	Iron	101		P	80 - 120
2439159	Magnesium	104		P	80 - 120
2439159	Potassium	103		P	80 - 120
2439159	Sodium	106		P	80 - 120
2439159	Strontium	106		P	80 - 120
2439159	Tin	106		P	80 - 120
2439159	Titanium	106		P	80 - 120
2439159	Vanadium	108		P	80 - 120
2439159	Zinc	108		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P435448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439134	Aluminum	97.9	99.0	P/P	80 - 120
2439134	Antimony	103	103	P/P	80 - 120
2439134	Arsenic	102	103	P/P	80 - 120
2439134	Barium	102	102	P/P	80 - 120
2439134	Beryllium	97.2	95.2	P/P	80 - 120
2439134	Boron	105	106	P/P	80 - 120
2439134	Cadmium	102	105	P/P	80 - 120
2439134	Chromium	97.6	99.2	P/P	80 - 120
2439134	Cobalt	94.3	95.4	P/P	80 - 120
2439134	Copper	95.4	96.4	P/P	80 - 120
2439134	Lead	102	102	P/P	80 - 120
2439134	Manganese	89.7	98.4	P/P	80 - 120
2439134	Molybdenum	103	103	P/P	80 - 120
2439134	Nickel	96.6	96.8	P/P	80 - 120
2439134	Selenium	101	102	P/P	80 - 120
2439134	Silver	114	114	P/P	80 - 120
2439134	Thallium	105	106	P/P	80 - 120
2439159	Aluminum	102		P	80 - 120
2439159	Antimony	102		P	80 - 120
2439159	Arsenic	101		P	80 - 120
2439159	Barium	101		P	80 - 120
2439159	Beryllium	94.9		P	80 - 120
2439159	Boron	113		P	80 - 120
2439159	Cadmium	105		P	80 - 120
2439159	Chromium	104		P	80 - 120
2439159	Cobalt	96.9		P	80 - 120
2439159	Copper	101		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P435448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2439159	Lead	104		P	80 - 120
2439159	Manganese	96.5		P	80 - 120
2439159	Molybdenum	101		P	80 - 120
2439159	Nickel	102		P	80 - 120
2439159	Selenium	101		P	80 - 120
2439159	Silver	115		P	80 - 120
2439159	Thallium	106		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P435448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439134	Calcium	0.131	Spike	P	0 - 20
2439134	Iron	0.857	Spike	P	0 - 20
2439134	Magnesium	1.11	Spike	P	0 - 20
2439134	Potassium	0.757	Spike	P	0 - 20
2439134	Sodium	0.753	Spike	P	0 - 20
2439134	Strontium	0.644	Spike	P	0 - 20
2439134	Tin	0.651	Spike	P	0 - 20
2439134	Titanium	1.43	Spike	P	0 - 20
2439134	Vanadium	0.000215	Spike	P	0 - 20
2439134	Zinc	1.12	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P435448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2439134	Aluminum	1.14	Spike	P	0 - 20
2439134	Antimony	0.0716	Spike	P	0 - 20
2439134	Arsenic	1.06	Spike	P	0 - 20
2439134	Barium	0.258	Spike	P	0 - 20
2439134	Beryllium	2.14	Spike	P	0 - 20
2439134	Boron	1.12	Spike	P	0 - 20
2439134	Cadmium	2.75	Spike	P	0 - 20
2439134	Chromium	1.66	Spike	P	0 - 20
2439134	Cobalt	1.19	Spike	P	0 - 20
2439134	Copper	1.09	Spike	P	0 - 20
2439134	Lead	0.265	Spike	P	0 - 20
2439134	Manganese	3.21	Spike	P	0 - 20
2439134	Molybdenum	0.206	Spike	P	0 - 20
2439134	Nickel	0.211	Spike	P	0 - 20
2439134	Selenium	1.03	Spike	P	0 - 20
2439134	Silver	0.547	Spike	P	0 - 20
2439134	Thallium	0.616	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: A121777

Included Lab Sample IDs: 2439400, 2439401

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	90.8	91.6	P/P	90 - 110
Arsenic	93.2	93.0	P/P	90 - 110
Barium	91.3	91.1	P/P	90 - 110
Boron	99.8	94.5	P/P	90 - 110
Cadmium	93.7	94.3	P/P	90 - 110
Chromium	97.2	94.4	P/P	90 - 110
Lead	93.4	93.5	P/P	90 - 110
Molybdenum	93.2	92.9	P/P	90 - 110
Nickel	93.8	91.7	P/P	90 - 110
Selenium	94.0	91.6	P/P	90 - 110
Silver	95.2	95.5	P/P	90 - 110
Thallium	93.1	92.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A121804

Included Lab Sample IDs: 2439400, 2439401

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.6	95.0	P/P	90 - 110
Beryllium	92.6	91.8	P/P	90 - 110
Cobalt	91.0	91.8	P/P	90 - 110
Copper	91.2	92.4	P/P	90 - 110
Manganese	91.1	92.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A121807

Included Lab Sample IDs: 2439400, 2439401

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	98.0	P/P	90 - 110
Iron	98.2	95.3	P/P	90 - 110
Magnesium	100	97.4	P/P	90 - 110
Potassium	101	99.0	P/P	90 - 110
Sodium	102	99.1	P/P	90 - 110
Strontium	101	102	P/P	90 - 110
Tin	101	102	P/P	90 - 110
Titanium	101	102	P/P	90 - 110
Vanadium	101	102	P/P	90 - 110
Zinc	103	104	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	101	101	104			0.131
	Iron	99.2	100	99.4	101		0.857
	Magnesium	102	99.6	104			1.11
	Potassium	99.9	100	101	103		0.757
	Sodium	102	102	106			0.753
	Strontium	106	105	106	106		0.644
	Tin	104	101	102	106		0.651
	Titanium	102	104	106	106		1.43
	Vanadium	104	106	106	108		0.0002
	Zinc	106	106	107	108		1.12
EPA 200.8 Rev. 5.4	Aluminum	98.7	97.9	99.0	102		1.14
	Antimony	100	103	103	102		0.0716
	Arsenic	102	102	103	101		1.06
	Barium	101	102	102	101		0.258
	Beryllium	96.7	97.2	95.2	94.9		2.14
	Boron	102	105	106	113		1.12
	Cadmium	101	102	105	105		2.75
	Chromium	97.9	97.6	99.2	104		1.66
	Cobalt	97.7	94.3	95.4	96.9		1.19
	Copper	98.9	95.4	96.4	101		1.09
	Lead	101	102	102	104		0.265
	Manganese	97.6	89.7	98.4	96.5		3.21
	Molybdenum	99.3	103	103	101		0.206
	Nickel	99.3	96.6	96.8	102		0.211
	Selenium	100	101	102	101		1.03
	Silver	113	114	114	115		0.547
	Thallium	103	105	106	106		0.616

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	2439400, 2439401
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2439400, 2439401
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2439400, 2439401

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	09/22/2023	09/25/2023 12:30	George D Taylor	09/27/2023 19:05	McKinley C Carter	2439400
	09/22/2023	09/25/2023 12:30	George D Taylor	09/27/2023 19:13	McKinley C Carter	2439401
EPA 200.8 Rev. 5.4	09/22/2023	09/25/2023 12:30	George D Taylor	09/27/2023 00:04	Conrad Hartmann	2439400
	09/22/2023	09/25/2023 12:30	George D Taylor	09/27/2023 00:13	Conrad Hartmann	2439401
	09/22/2023	09/25/2023 12:30	George D Taylor	09/27/2023 17:54	Conrad Hartmann	2439400
	09/22/2023	09/25/2023 12:30	George D Taylor	09/27/2023 18:03	Conrad Hartmann	2439401
	09/22/2023	09/25/2023 12:30	George D Taylor	09/27/2023 19:05	McKinley C Carter	2439400
SM 2340 B-2011	09/22/2023			09/27/2023 19:13	McKinley C Carter	2439401