

Chemical Analysis Report

CEN-DIST-2023-02-02-03

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

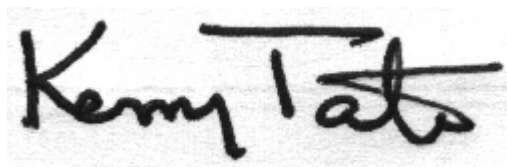
Event Description: **Run 4**
Request ID: **RQ-2023-01-23-24**
Customer: **CEN-DIST**
Project ID: **SMP**

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.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 14-FEB-2023 10:03

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: Corner Lake @ Center

Collection Date/Time: 02/01/2023 13:10

Field ID: G2CE0284

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2384574	EPA 200.7 Rev. 4.4	Calcium	3.74		mg/L	P425338	
		Chromium	1.0	U	ug/L	P425338	
		Iron	110	I	ug/L	P425338	
		Magnesium	1.29		mg/L	P425338	
		Potassium	1.7		mg/L	P425338	
		Sodium	8.5		mg/L	P425338	
		Strontium	20.7		ug/L	P425338	
		Tin	3.0	U	ug/L	P425338	
		Titanium	0.75	U	ug/L	P425338	
		Vanadium	2.0	U	ug/L	P425338	
		Zinc	5.0	U	ug/L	P425338	
	EPA 200.8 Rev. 5.4	Aluminum	141		ug/L	P425338	
		Antimony	0.050	U	ug/L	P425338	
		Arsenic	0.43		ug/L	P425338	
		Barium	12.2		ug/L	P425338	
		Beryllium	0.015	I	ug/L	P425338	
		Boron	20.0		ug/L	P425338	
		Cadmium	0.020	U	ug/L	P425338	
		Cobalt	0.034	I	ug/L	P425338	
		Copper	1.25		ug/L	P425338	
		Lead	0.20	I	ug/L	P425338	
		Manganese	4.62		ug/L	P425338	
		Molybdenum	0.15	U	ug/L	P425338	
		Nickel	0.50	U	ug/L	P425338	
		Selenium	0.20	U	ug/L	P425338	
		Silver	0.010	U	ug/L	P425338	
		Thallium	0.10	U	ug/L	P425338	
	SM 2340 B-2011	Hardness	14.6		mg/L	P425338	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P425338

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/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: P425338

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
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: P425338

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Chromium	101		P	85 - 115
Iron	104		P	85 - 115
Magnesium	99.9		P	85 - 115
Potassium	103		P	85 - 115
Sodium	104		P	85 - 115
Strontium	101		P	85 - 115
Tin	101		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	102		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P425338

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	96.0		P	85 - 115
Arsenic	101		P	85 - 115
Barium	103		P	85 - 115
Beryllium	99.5		P	85 - 115
Boron	101		P	85 - 115
Cadmium	99.2		P	85 - 115
Cobalt	97.3		P	85 - 115
Copper	101		P	85 - 115
Lead	93.0		P	85 - 115
Manganese	99.4		P	85 - 115
Molybdenum	95.1		P	85 - 115
Nickel	102		P	85 - 115
Selenium	100		P	85 - 115
Silver	97.1		P	85 - 115
Thallium	95.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P425338

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384376	Calcium	98.5		P	80 - 120
2384376	Chromium	99.8		P	80 - 120
2384376	Iron	101		P	80 - 120
2384376	Magnesium	100		P	80 - 120
2384376	Potassium	100		P	80 - 120
2384376	Sodium	101		P	80 - 120
2384376	Strontium	98.6		P	80 - 120
2384376	Tin	99.4		P	80 - 120
2384376	Titanium	98.6		P	80 - 120
2384376	Vanadium	101		P	80 - 120
2384376	Zinc	102		P	80 - 120
2384636	Calcium	101		P	80 - 120
2384636	Chromium	99.5	102	P/P	80 - 120
2384636	Iron	104	107	P/P	80 - 120
2384636	Magnesium	99.8		P	80 - 120
2384636	Potassium	102	103	P/P	80 - 120
2384636	Sodium	101	104	P/P	80 - 120
2384636	Strontium	101	101	P/P	80 - 120
2384636	Tin	100	103	P/P	80 - 120
2384636	Titanium	98.6	102	P/P	80 - 120
2384636	Vanadium	101	104	P/P	80 - 120
2384636	Zinc	101	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P425338

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2384636	Aluminum	100	100	P/P	80 - 120
2384636	Antimony	97.5	98.0	P/P	80 - 120
2384636	Arsenic	101	101	P/P	80 - 120
2384636	Barium	102	104	P/P	80 - 120
2384636	Beryllium	98.3	97.9	P/P	80 - 120
2384636	Boron	103	104	P/P	80 - 120
2384636	Cadmium	101	102	P/P	80 - 120
2384636	Cobalt	96.6	97.8	P/P	80 - 120
2384636	Copper	98.1	99.8	P/P	80 - 120
2384636	Lead	92.8	94.1	P/P	80 - 120
2384636	Manganese	99.3	105	P/P	80 - 120
2384636	Molybdenum	95.0	96.9	P/P	80 - 120
2384636	Nickel	100	101	P/P	80 - 120
2384636	Selenium	97.5	97.0	P/P	80 - 120
2384636	Silver	97.1	97.4	P/P	80 - 120
2384636	Thallium	97.2	98.3	P/P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P425338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384636	Calcium	0.426	Spike	P	0 - 20
2384636	Chromium	2.78	Spike	P	0 - 20
2384636	Iron	2.76	Spike	P	0 - 20
2384636	Magnesium	2.97	Spike	P	0 - 20
2384636	Potassium	0.770	Spike	P	0 - 20
2384636	Sodium	1.45	Spike	P	0 - 20
2384636	Strontium	0.119	Spike	P	0 - 20
2384636	Tin	2.28	Spike	P	0 - 20
2384636	Titanium	2.90	Spike	P	0 - 20
2384636	Vanadium	2.87	Spike	P	0 - 20
2384636	Zinc	2.57	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P425338

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2384636	Aluminum	0.00313	Spike	P	0 - 20
2384636	Antimony	0.582	Spike	P	0 - 20
2384636	Arsenic	0.281	Spike	P	0 - 20
2384636	Barium	1.65	Spike	P	0 - 20
2384636	Beryllium	0.408	Spike	P	0 - 20
2384636	Boron	0.0751	Spike	P	0 - 20
2384636	Cadmium	1.22	Spike	P	0 - 20
2384636	Cobalt	1.27	Spike	P	0 - 20
2384636	Copper	1.72	Spike	P	0 - 20
2384636	Lead	1.33	Spike	P	0 - 20
2384636	Manganese	3.41	Spike	P	0 - 20
2384636	Molybdenum	1.85	Spike	P	0 - 20
2384636	Nickel	1.15	Spike	P	0 - 20
2384636	Selenium	0.472	Spike	P	0 - 20
2384636	Silver	0.259	Spike	P	0 - 20
2384636	Thallium	1.16	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: A117342

Included Lab Sample IDs: 2384574

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.9	97.3	P/P	90 - 110
Antimony	94.9	95.0	P/P	90 - 110
Arsenic	100	101	P/P	90 - 110
Barium	100	99.4	P/P	90 - 110
Beryllium	101	101	P/P	90 - 110
Boron	101	94.0	P/P	90 - 110
Cadmium	98.7	98.5	P/P	90 - 110
Cobalt	95.5	95.7	P/P	90 - 110
Copper	99.4	99.0	P/P	90 - 110
Lead	95.8	95.9	P/P	90 - 110
Manganese	99.9	100	P/P	90 - 110
Molybdenum	93.4	94.2	P/P	90 - 110
Nickel	98.7	98.4	P/P	90 - 110
Selenium	99.5	97.8	P/P	90 - 110
Thallium	95.9	96.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A117362

Included Lab Sample IDs: 2384574

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.5	100	P/P	90 - 110
Chromium	104	105	P/P	90 - 110
Iron	99.0	99.8	P/P	90 - 110
Magnesium	98.9	99.3	P/P	90 - 110
Potassium	99.9	100	P/P	90 - 110
Sodium	99.6	100	P/P	90 - 110
Strontium	103	103	P/P	90 - 110
Tin	103	104	P/P	90 - 110
Titanium	102	103	P/P	90 - 110
Vanadium	103	103	P/P	90 - 110
Zinc	107	108	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A117366

Included Lab Sample IDs: 2384574

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	94.5	94.1	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	98.5	101				0.426
	Chromium	101	99.8	99.5	102			2.78
	Iron	104	101	104	107			2.76
	Magnesium	99.9	100	99.8				2.97
	Potassium	103	100	102	103			0.770
	Sodium	104	101	101	104			1.45
	Strontium	101	98.6	101	101			0.119
	Tin	101	99.4	100	103			2.28
	Titanium	102	98.6	98.6	102			2.90
	Vanadium	102	101	101	104			2.87
	Zinc	105	102	101	104			2.57
EPA 200.8 Rev. 5.4	Aluminum	100	100	100				0.0031
	Antimony	96.0	97.5	98.0				0.582
	Arsenic	101	101	101				0.281
	Barium	103	102	104				1.65
	Beryllium	99.5	98.3	97.9				0.408
	Boron	101	103	104				0.0751
	Cadmium	99.2	101	102				1.22
	Cobalt	97.3	96.6	97.8				1.27
	Copper	101	98.1	99.8				1.72
	Lead	93.0	92.8	94.1				1.33
	Manganese	99.4	99.3	105				3.41
	Molybdenum	95.1	95.0	96.9				1.85
	Nickel	102	100	101				1.15
	Selenium	100	97.5	97.0				0.472
	Silver	97.1	97.1	97.4				0.259
	Thallium	95.5	97.2	98.3				1.16

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	2384574
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2384574
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2384574

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	02/02/2023	02/03/2023 11:15	George D Taylor	02/10/2023 03:05	McKinley C Carter	2384574
EPA 200.8 Rev. 5.4	02/02/2023	02/03/2023 11:15	George D Taylor	02/08/2023 20:11	Emily M Philpot	2384574
	02/02/2023	02/03/2023 11:15	George D Taylor	02/09/2023 14:28	Emily M Philpot	2384574
SM 2340 B-2011	02/02/2023			02/10/2023 03:05	McKinley C Carter	2384574