

Chemical Analysis Report

CEN-DIST-2023-03-07-03

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

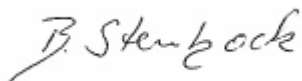
Event Description: **Run 7**
Request ID: **RQ-2023-03-06-23**
Customer: **CEN-DIST**
Project ID: **SMP**

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: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 28-MAR-2023 15:02



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: Lake Hart @ Center

Collection Date/Time: 03/06/2023 10:15

Field ID: G4CE0243

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2392216	EPA 200.7 Rev. 4.4	Calcium	6.59		mg/L	P426800	
		Iron	670		ug/L	P426800	
		Magnesium	1.85		mg/L	P426800	
		Potassium	1.6		mg/L	P426800	
		Sodium	11.5		mg/L	P426800	
		Strontium	47.1		ug/L	P426800	
		Tin	3.0	U	ug/L	P426800	
		Titanium	2.5	I	ug/L	P426800	
		Vanadium	2.0	U	ug/L	P426800	
		Zinc	5.0	U	ug/L	P426800	
	EPA 200.8 Rev. 5.4	Aluminum	345		ug/L	P426800	
		Antimony	0.080	I	ug/L	P426800	
		Arsenic	0.71		ug/L	P426800	
		Barium	12.8		ug/L	P426800	
		Beryllium	0.022	I	ug/L	P426800	
		Boron	27.1		ug/L	P426800	
		Cadmium	0.020	U	ug/L	P426800	
		Chromium	0.61	I	ug/L	P426800	
		Cobalt	0.100		ug/L	P426800	
		Copper	0.93		ug/L	P426800	
	SM 2340 B-2011	Lead	0.49		ug/L	P426800	
		Manganese	5.19		ug/L	P426800	
		Molybdenum	0.15	U	ug/L	P426800	
		Nickel	0.50	U	ug/L	P426800	
		Selenium	0.21	I	ug/L	P426800	
		Silver	0.010	U	ug/L	P426800	
		Thallium	0.10	U	ug/L	P426800	
		Hardness	24.1		mg/L	P426800	

Sample Location: FB

Collection Date/Time: 03/06/2023 10:45

Field ID: FB_03062023

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2392217	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P426800	
		Iron	30	U	ug/L	P426800	
		Magnesium	0.040	U	mg/L	P426800	
		Potassium	0.30	U	mg/L	P426800	
		Sodium	0.50	U	mg/L	P426800	
		Strontium	2.0	U	ug/L	P426800	
		Tin	3.0	U	ug/L	P426800	
		Titanium	0.75	U	ug/L	P426800	
		Vanadium	2.0	U	ug/L	P426800	
		Zinc	5.0	U	ug/L	P426800	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P426800	
		Antimony	0.050	U	ug/L	P426800	
		Arsenic	0.050	U	ug/L	P426800	
		Barium	0.20	U	ug/L	P426800	
		Beryllium	0.010	U	ug/L	P426800	
		Boron	2.0	U	ug/L	P426800	
		Cadmium	0.020	U	ug/L	P426800	
		Chromium	0.40	U	ug/L	P426800	
		Cobalt	0.020	U	ug/L	P426800	
		Copper	0.40	U	ug/L	P426800	
		Lead	0.20	U	ug/L	P426800	
		Manganese	0.10	U	ug/L	P426800	
		Molybdenum	0.15	U	ug/L	P426800	
		Nickel	0.50	U	ug/L	P426800	
		Selenium	0.20	U	ug/L	P426800	
		Silver	0.010	U	ug/L	P426800	
		Thallium	0.10	U	ug/L	P426800	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426800

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: P426800

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: P426800

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	106		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	103		P	85 - 115
Sodium	103		P	85 - 115
Strontium	101		P	85 - 115
Tin	104		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	103		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P426800

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	101		P	85 - 115
Barium	105		P	85 - 115
Beryllium	97.0		P	85 - 115
Boron	102		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	99.4		P	85 - 115
Cobalt	99.3		P	85 - 115
Copper	100		P	85 - 115
Lead	98.4		P	85 - 115
Manganese	104		P	85 - 115
Molybdenum	98.5		P	85 - 115
Nickel	102		P	85 - 115
Selenium	101		P	85 - 115
Silver	99.7		P	85 - 115
Thallium	101		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P426800

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2392180	Calcium	105		P	80 - 120
2392180	Iron	106	107	P/P	80 - 120
2392180	Magnesium	104	105	P/P	80 - 120
2392180	Potassium	101	102	P/P	80 - 120
2392180	Sodium	104		P	80 - 120
2392180	Strontium	101	101	P/P	80 - 120
2392180	Tin	101	102	P/P	80 - 120
2392180	Titanium	102	103	P/P	80 - 120
2392180	Vanadium	103	104	P/P	80 - 120
2392180	Zinc	102	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P426800

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2392180	Aluminum	101	101	P/P	80 - 120
2392180	Antimony	102	103	P/P	80 - 120
2392180	Arsenic	101	102	P/P	80 - 120
2392180	Barium	104	104	P/P	80 - 120
2392180	Beryllium	96.6	96.8	P/P	80 - 120
2392180	Boron	102	103	P/P	80 - 120
2392180	Cadmium	103	104	P/P	80 - 120
2392180	Chromium	99.6	100	P/P	80 - 120
2392180	Cobalt	98.0	99.6	P/P	80 - 120
2392180	Copper	98.8	99.1	P/P	80 - 120
2392180	Lead	102	100	P/P	80 - 120
2392180	Manganese	101	103	P/P	80 - 120
2392180	Molybdenum	99.8	99.6	P/P	80 - 120
2392180	Nickel	100	102	P/P	80 - 120
2392180	Selenium	101	99.4	P/P	80 - 120
2392180	Silver	98.1	98.6	P/P	80 - 120
2392180	Thallium	104	103	P/P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426800

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2392180	Calcium	0.0798	Spike	P	0 - 20
2392180	Iron	0.722	Spike	P	0 - 20
2392180	Magnesium	0.796	Spike	P	0 - 20
2392180	Potassium	0.899	Spike	P	0 - 20
2392180	Sodium	0.118	Spike	P	0 - 20
2392180	Strontium	0.333	Spike	P	0 - 20
2392180	Tin	0.943	Spike	P	0 - 20
2392180	Titanium	0.297	Spike	P	0 - 20
2392180	Vanadium	0.912	Spike	P	0 - 20
2392180	Zinc	0.727	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426800

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2392180	Aluminum	0.214	Spike	P	0 - 20
2392180	Antimony	1.14	Spike	P	0 - 20
2392180	Arsenic	0.906	Spike	P	0 - 20
2392180	Barium	0.575	Spike	P	0 - 20
2392180	Beryllium	0.190	Spike	P	0 - 20
2392180	Boron	0.923	Spike	P	0 - 20
2392180	Cadmium	0.737	Spike	P	0 - 20
2392180	Chromium	0.746	Spike	P	0 - 20
2392180	Cobalt	1.64	Spike	P	0 - 20
2392180	Copper	0.302	Spike	P	0 - 20
2392180	Lead	1.53	Spike	P	0 - 20
2392180	Manganese	1.78	Spike	P	0 - 20
2392180	Molybdenum	0.166	Spike	P	0 - 20
2392180	Nickel	1.30	Spike	P	0 - 20
2392180	Selenium	1.29	Spike	P	0 - 20
2392180	Silver	0.602	Spike	P	0 - 20
2392180	Thallium	0.951	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: A117884

Included Lab Sample IDs: 2392216, 2392217

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.9	99.8	P/P	90 - 110
Aluminum	99.8	101	P/P	90 - 110
Antimony	99.5	100	P/P	90 - 110
Antimony	100	102	P/P	90 - 110
Arsenic	99.9	100	P/P	90 - 110
Arsenic	100	102	P/P	90 - 110
Barium	101	102	P/P	90 - 110
Barium	102	103	P/P	90 - 110
Beryllium	98.5	98.6	P/P	90 - 110
Beryllium	98.6	99.7	P/P	90 - 110
Boron	101	97.7	P/P	90 - 110
Boron	99.1	101	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	97.7	99.1	P/P	90 - 110
Chromium	97.8	97.7	P/P	90 - 110
Cobalt	96.6	97.9	P/P	90 - 110
Cobalt	96.8	96.6	P/P	90 - 110
Copper	96.9	97.5	P/P	90 - 110
Copper	97.5	98.4	P/P	90 - 110
Lead	97.3	100	P/P	90 - 110
Lead	97.4	97.3	P/P	90 - 110
Manganese	101	103	P/P	90 - 110
Manganese	102	101	P/P	90 - 110
Molybdenum	97.9	97.9	P/P	90 - 110
Molybdenum	97.9	99.4	P/P	90 - 110
Nickel	98.5	99.3	P/P	90 - 110
Nickel	98.8	98.5	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Selenium	101	102	P/P	90 - 110
Silver	98.6	98.9	P/P	90 - 110
Silver	98.9	98.6	P/P	90 - 110
Thallium	100	99.0	P/P	90 - 110
Thallium	99.0	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A118147

Included Lab Sample IDs: 2392216, 2392217

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	103	P/P	95 - 105
Calcium	103	104	P/P	90 - 110
Iron	102	104	P/P	95 - 105
Iron	104	104	P/P	90 - 110
Magnesium	101	104	P/P	95 - 105
Magnesium	104	104	P/P	90 - 110
Potassium	102	102	P/P	90 - 110
Potassium	98.5	102	P/P	95 - 105
Sodium	102	101	P/P	90 - 110
Sodium	102	102	P/P	95 - 105
Strontium	101	102	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A118147

Included Lab Sample IDs: 2392216, 2392217

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Strontium	102	103	P/P	90 - 110
Tin	101	103	P/P	95 - 105
Tin	103	104	P/P	90 - 110
Titanium	101	101	P/P	90 - 110
Titanium	99.4	101	P/P	95 - 105
Vanadium	102	102	P/P	90 - 110
Vanadium	99.6	102	P/P	95 - 105
Zinc	103	105	P/P	95 - 105
Zinc	105	105	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	105	105				0.0798
	Iron	106	106	107			0.722
	Magnesium	107	104	105			0.796
	Potassium	103	101	102			0.899
	Sodium	103	104				0.118
	Strontium	101	101	101			0.333
	Tin	104	101	102			0.943
	Titanium	102	102	103			0.297
	Vanadium	103	103	104			0.912
	Zinc	105	102	103			0.727
EPA 200.8 Rev. 5.4	Aluminum	101	101	101			0.214
	Antimony	101	102	103			1.14
	Arsenic	101	101	102			0.906
	Barium	105	104	104			0.575
	Beryllium	97.0	96.6	96.8			0.190
	Boron	102	102	103			0.923
	Cadmium	103	103	104			0.737
	Chromium	99.4	99.6	100			0.746
	Cobalt	99.3	98.0	99.6			1.64
	Copper	100	98.8	99.1			0.302
	Lead	98.4	102	100			1.53
	Manganese	104	101	103			1.78
	Molybdenum	98.5	99.8	99.6			0.166
	Nickel	102	100	102			1.30
	Selenium	101	101	99.4			1.29
	Silver	99.7	98.1	98.6			0.602
	Thallium	101	104	103			0.951

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	2392216, 2392217
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2392216, 2392217
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2392216

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	03/07/2023	03/07/2023 14:00	George D Taylor	03/22/2023 14:52	Chase Roberts	2392217
	03/07/2023	03/07/2023 14:00	George D Taylor	03/22/2023 16:53	Chase Roberts	2392216
EPA 200.8 Rev. 5.4	03/07/2023	03/07/2023 14:00	George D Taylor	03/08/2023 18:49	Conrad Hartmann	2392216
	03/07/2023	03/07/2023 14:00	George D Taylor	03/08/2023 19:43	Conrad Hartmann	2392217
SM 2340 B-2011	03/07/2023			03/22/2023 16:53	Chase Roberts	2392216