

Chemical Analysis Report

CEN-DIST-2023-06-01-02

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

Event Description: **SJR Above Winder**
Request ID: **RQ-2023-04-24-27**
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: 15-JUN-2023 13:35



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: SJR ~ 700M UPSTREAM OF LAKE WINDER

Collection Date/Time: 05/31/2023 10:59

Field ID: G3CE0030

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2413882	EPA 200.7 Rev. 4.4	Calcium	68.6		mg/L	P430738	
		Iron	270		ug/L	P430738	
		Magnesium	16.6		mg/L	P430738	
		Potassium	5.5		mg/L	P430738	
		Sodium	100		mg/L	P430738	
		Strontium	2.37E+03		ug/L	P430738	
		Tin	3.0	U	ug/L	P430738	
		Titanium	1.1	I	ug/L	P430738	
		Vanadium	2.0	U	ug/L	P430738	
		Zinc	7.8	I	ug/L	P430738	
	EPA 200.8 Rev. 5.4	Aluminum	141		ug/L	P430738	
		Antimony	0.11	I	ug/L	P430738	
		Arsenic	1.13		ug/L	P430738	
		Barium	54.2		ug/L	P430738	
		Beryllium	0.018	I	ug/L	P430738	
		Boron	40.5		ug/L	P430738	
		Cadmium	0.037	I	ug/L	P430738	
		Chromium	0.40	U	ug/L	P430738	
		Cobalt	0.172		ug/L	P430738	
		Copper	0.80	I	ug/L	P430738	
		Lead	0.25	I	ug/L	P430738	
		Manganese	23.2		ug/L	P430738	
		Molybdenum	1.02		ug/L	P430738	
		Nickel	0.50	U	ug/L	P430738	
		Selenium	0.20	U	ug/L	P430738	
		Silver	0.010	U	ug/L	P430738	
		Thallium	0.10	U	ug/L	P430738	
	SM 2340 B-2011	Hardness	239		mg/L	P430738	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P430738

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: P430738

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: P430738

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

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P430738

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	100		P	85 - 115
Barium	103		P	85 - 115
Beryllium	98.7		P	85 - 115
Boron	100		P	85 - 115
Cadmium	99.6		P	85 - 115
Chromium	96.3		P	85 - 115
Cobalt	101		P	85 - 115
Copper	97.2		P	85 - 115
Lead	103		P	85 - 115
Manganese	96.7		P	85 - 115
Molybdenum	98.5		P	85 - 115
Nickel	98.0		P	85 - 115
Selenium	99.3		P	85 - 115
Silver	105		P	85 - 115
Thallium	99.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P430738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413780	Calcium	112		P	80 - 120
2413780	Iron	103	102	P/P	80 - 120
2413780	Magnesium	98.5	97.2	P/P	80 - 120
2413780	Potassium	100	101	P/P	80 - 120
2413780	Sodium	110		P	80 - 120
2413780	Strontium	103	100	P/P	80 - 120
2413780	Tin	103	102	P/P	80 - 120
2413780	Titanium	97.3	94.5	P/P	80 - 120
2413780	Vanadium	104	102	P/P	80 - 120
2413780	Zinc	104	101	P/P	80 - 120
2413934	Calcium	82.1		P	80 - 120
2413934	Iron	102		P	80 - 120
2413934	Magnesium	82.6		P	80 - 120
2413934	Potassium	80.9		P	80 - 120
2413934	Sodium	83.4		P	80 - 120
2413934	Strontium	99.9		P	80 - 120
2413934	Tin	80.4		P	80 - 120
2413934	Titanium	104		P	80 - 120
2413934	Vanadium	102		P	80 - 120
2413934	Zinc	99.3		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P430738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413780	Aluminum	100	101	P/P	80 - 120
2413780	Antimony	107	106	P/P	80 - 120
2413780	Arsenic	103	103	P/P	80 - 120
2413780	Barium	105	105	P/P	80 - 120
2413780	Beryllium	99.1	99.8	P/P	80 - 120
2413780	Boron	100	101	P/P	80 - 120
2413780	Cadmium	102	99.8	P/P	80 - 120
2413780	Chromium	97.1	97.3	P/P	80 - 120
2413780	Cobalt	103	102	P/P	80 - 120
2413780	Copper	97.9	97.1	P/P	80 - 120
2413780	Lead	105	105	P/P	80 - 120
2413780	Manganese	97.2	97.7	P/P	80 - 120
2413780	Molybdenum	100	101	P/P	80 - 120
2413780	Nickel	98.1	99.4	P/P	80 - 120
2413780	Selenium	104	102	P/P	80 - 120
2413780	Silver	105	104	P/P	80 - 120
2413780	Thallium	102	103	P/P	80 - 120
2413934	Aluminum	101		P	80 - 120
2413934	Antimony	104		P	80 - 120
2413934	Arsenic	101		P	80 - 120
2413934	Barium	103		P	80 - 120
2413934	Beryllium	95.9		P	80 - 120
2413934	Boron	104		P	80 - 120
2413934	Cadmium	98.9		P	80 - 120
2413934	Chromium	98.8		P	80 - 120
2413934	Cobalt	102		P	80 - 120
2413934	Copper	100		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P430738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2413934	Lead	105		P	80 - 120
2413934	Manganese	101		P	80 - 120
2413934	Molybdenum	98.8		P	80 - 120
2413934	Nickel	101		P	80 - 120
2413934	Selenium	103		P	80 - 120
2413934	Silver	105		P	80 - 120
2413934	Thallium	101		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P430738

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413780	Calcium	4.03	Spike	P	0 - 20
2413780	Iron	0.388	Spike	P	0 - 20
2413780	Magnesium	0.693	Spike	P	0 - 20
2413780	Potassium	0.207	Spike	P	0 - 20
2413780	Sodium	2.55	Spike	P	0 - 20
2413780	Strontium	2.57	Spike	P	0 - 20
2413780	Tin	1.52	Spike	P	0 - 20
2413780	Titanium	2.84	Spike	P	0 - 20
2413780	Vanadium	2.08	Spike	P	0 - 20
2413780	Zinc	2.58	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P430738

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2413780	Aluminum	0.911	Spike	P	0 - 20
2413780	Antimony	1.24	Spike	P	0 - 20
2413780	Arsenic	0.101	Spike	P	0 - 20
2413780	Barium	0.737	Spike	P	0 - 20
2413780	Beryllium	0.650	Spike	P	0 - 20
2413780	Boron	0.648	Spike	P	0 - 20
2413780	Cadmium	1.73	Spike	P	0 - 20
2413780	Chromium	0.246	Spike	P	0 - 20
2413780	Cobalt	0.305	Spike	P	0 - 20
2413780	Copper	0.775	Spike	P	0 - 20
2413780	Lead	0.664	Spike	P	0 - 20
2413780	Manganese	0.492	Spike	P	0 - 20
2413780	Molybdenum	0.887	Spike	P	0 - 20
2413780	Nickel	1.29	Spike	P	0 - 20
2413780	Selenium	2.22	Spike	P	0 - 20
2413780	Silver	1.35	Spike	P	0 - 20
2413780	Thallium	1.06	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: A119588

Included Lab Sample IDs: 2413882

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	99.6	P/P	90 - 110
Antimony	104	104	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Barium	102	101	P/P	90 - 110
Beryllium	99.6	98.8	P/P	90 - 110
Boron	101	102	P/P	90 - 110
Cadmium	100	100	P/P	90 - 110
Chromium	100	99.6	P/P	90 - 110
Cobalt	103	103	P/P	90 - 110
Copper	99.1	98.0	P/P	90 - 110
Lead	103	103	P/P	90 - 110
Manganese	101	101	P/P	90 - 110
Molybdenum	99.8	99.1	P/P	90 - 110
Nickel	100	99.3	P/P	90 - 110
Selenium	103	102	P/P	90 - 110
Silver	105	105	P/P	90 - 110
Thallium	102	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A119677

Included Lab Sample IDs: 2413882

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.7	98.1	P/P	90 - 110
Iron	99.2	101	P/P	90 - 110
Magnesium	98.6	99.8	P/P	90 - 110
Potassium	98.7	99.3	P/P	90 - 110
Sodium	98.3	96.9	P/P	90 - 110
Strontium	99.6	98.8	P/P	90 - 110
Tin	102	102	P/P	90 - 110
Titanium	101	100	P/P	90 - 110
Vanadium	101	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A119728

Included Lab Sample IDs: 2413882

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	97.3	96.7	P/P	95 - 105

* 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	101	112	82.1				4.03
	Iron	104	103	102	102			0.388
	Magnesium	104	98.5	97.2	82.6			0.693
	Potassium	103	100	101	80.9			0.207
	Sodium	101	110	83.4				2.55
	Strontium	102	99.9	103	100			2.57
	Tin	107	103	102	80.4			1.52
	Titanium	103	104	97.3	94.5			2.84
	Vanadium	104	102	104	102			2.08
	Zinc	107	99.3	104	101			2.58
EPA 200.8 Rev. 5.4	Aluminum	100	100	101	101			0.911
	Antimony	104	107	106	104			1.24
	Arsenic	100	103	103	101			0.101
	Barium	103	105	105	103			0.737
	Beryllium	98.7	99.1	99.8	95.9			0.650
	Boron	100	100	101	104			0.648
	Cadmium	99.6	102	99.8	98.9			1.73
	Chromium	96.3	97.1	97.3	98.8			0.246
	Cobalt	101	103	102	102			0.305
	Copper	97.2	97.9	97.1	100			0.775
	Lead	103	105	105	105			0.664
	Manganese	96.7	97.2	97.7	101			0.492
	Molybdenum	98.5	100	101	98.8			0.887
	Nickel	98.0	99.4	101	98.1			1.29
	Selenium	99.3	104	102	103			2.22
	Silver	105	105	104	105			1.35
	Thallium	99.4	102	103	101			1.06

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	2413882
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2413882
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2413882

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	06/01/2023	06/02/2023 11:55	George D Taylor	06/08/2023 21:10	McKinley C Carter	2413882
	06/01/2023	06/02/2023 11:55	George D Taylor	06/09/2023 13:37	McKinley C Carter	2413882
EPA 200.8 Rev. 5.4	06/01/2023	06/02/2023 11:55	George D Taylor	06/05/2023 19:19	Conrad Hartmann	2413882
SM 2340 B-2011	06/01/2023			06/08/2023 21:10	McKinley C Carter	2413882