

Chemical Analysis Report

NE-DIST-2023-08-11-02

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

Event Description: **Nassau West 2023**
Request ID: **RQ-2023-07-17-15**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 29-AUG-2023 09:02

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: ST MARYS S PRONG AT US 90

Collection Date/Time: 08/10/2023 10:00

Field ID: 19010021

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2430579	EPA 200.7 Rev. 4.4	Calcium	3.64		mg/L	P433931	
		Iron	2.23E+03		ug/L	P433931	
		Magnesium	1.10		mg/L	P433931	
		Potassium	0.73	I	mg/L	P433931	
		Sodium	4.1		mg/L	P433931	
		Strontium	18.2		ug/L	P433931	
		Tin	3.0	U	ug/L	P433931	
		Titanium	2.3	I	ug/L	P433931	
		Vanadium	2.0	U	ug/L	P433931	
	EPA 200.8 Rev. 5.4	Zinc	6.8	I	ug/L	P433931	
		Aluminum	900		ug/L	P434124	
		Antimony	0.064	I	ug/L	P434124	
		Arsenic	0.71		ug/L	P434124	
		Barium	20.7		ug/L	P434124	
		Beryllium	0.057		ug/L	P434124	
		Boron	18.6		ug/L	P434124	
		Cadmium	0.021	I	ug/L	P434124	
		Chromium	1.0	I	ug/L	P434124	
		Cobalt	0.566		ug/L	P434124	
		Copper	0.42	I	ug/L	P434124	
		Lead	1.05		ug/L	P434124	
		Manganese	25.2		ug/L	P434124	
		Molybdenum	0.15	U	ug/L	P434124	
		Nickel	0.99	I	ug/L	P434124	
		Selenium	0.23	I	ug/L	P434124	
		Silver	0.010	U	ug/L	P434124	
		Thallium	0.10	U	ug/L	P434124	
	SM 2340 B-2011	Hardness	13.6		mg/L	P433931	

Ref. Method and Comment:

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 08/25/2023.

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P433931

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: P434124

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: P433931

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	100		P	85 - 115
Iron	101		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	99.8		P	85 - 115
Sodium	107		P	85 - 115
Strontium	102		P	85 - 115
Tin	98.6		P	85 - 115
Titanium	99.7		P	85 - 115
Vanadium	100		P	85 - 115
Zinc	97.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P434124

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.3		P	85 - 115
Antimony	98.5		P	85 - 115
Arsenic	93.5		P	85 - 115
Barium	100		P	85 - 115
Beryllium	91.7		P	85 - 115
Boron	100		P	85 - 115
Cadmium	97.0		P	85 - 115
Chromium	92.5		P	85 - 115
Cobalt	90.0		P	85 - 115
Copper	93.8		P	85 - 115
Lead	95.4		P	85 - 115
Manganese	97.3		P	85 - 115
Molybdenum	94.2		P	85 - 115
Nickel	89.8		P	85 - 115
Selenium	96.2		P	85 - 115
Silver	108		P	85 - 115
Thallium	96.3		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P433931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2430634	Calcium	99.6		P	80 - 120
2430634	Iron	101	103	P/P	80 - 120
2430634	Magnesium	99.3	102	P/P	80 - 120
2430634	Potassium	99.9	103	P/P	80 - 120
2430634	Sodium	105		P	80 - 120
2430634	Strontium	99.9	103	P/P	80 - 120
2430634	Tin	97.9	98.6	P/P	80 - 120
2430634	Titanium	99.0	99.9	P/P	80 - 120
2430634	Vanadium	100	101	P/P	80 - 120
2430634	Zinc	98.0	98.9	P/P	80 - 120
2430791	Iron	104		P	80 - 120
2430791	Magnesium	104		P	80 - 120
2430791	Potassium	99.8		P	80 - 120
2430791	Strontium	104		P	80 - 120
2430791	Tin	104		P	80 - 120
2430791	Titanium	103		P	80 - 120
2430791	Vanadium	105		P	80 - 120
2430791	Zinc	105		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P434124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432078	Aluminum	97.1	98.2	P/P	80 - 120
2432078	Antimony	98.6	97.5	P/P	80 - 120
2432078	Arsenic	94.0	93.6	P/P	80 - 120
2432078	Barium	99.1	99.0	P/P	80 - 120
2432078	Beryllium	92.2	91.6	P/P	80 - 120
2432078	Boron	101	101	P/P	80 - 120
2432078	Cadmium	97.1	95.9	P/P	80 - 120
2432078	Chromium	93.1	93.3	P/P	80 - 120
2432078	Cobalt	89.4	89.4	P/P	80 - 120
2432078	Copper	95.4	95.6	P/P	80 - 120
2432078	Lead	96.1	97.1	P/P	80 - 120
2432078	Manganese	96.5	95.8	P/P	80 - 120
2432078	Molybdenum	94.8	94.6	P/P	80 - 120
2432078	Nickel	89.7	89.2	P/P	80 - 120
2432078	Selenium	97.3	94.1	P/P	80 - 120
2432078	Silver	106	105	P/P	80 - 120
2432078	Thallium	98.3	99.2	P/P	80 - 120
2432154	Aluminum	98.2		P	80 - 120
2432154	Antimony	97.7		P	80 - 120
2432154	Arsenic	92.2		P	80 - 120
2432154	Barium	98.1		P	80 - 120
2432154	Beryllium	89.2		P	80 - 120
2432154	Boron	102		P	80 - 120
2432154	Cadmium	97.0		P	80 - 120
2432154	Chromium	91.9		P	80 - 120
2432154	Cobalt	91.1		P	80 - 120
2432154	Copper	92.1		P	80 - 120
2432154	Lead	95.0		P	80 - 120
2432154	Manganese	95.6		P	80 - 120

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P434124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2432154	Molybdenum	94.5		P	80 - 120
2432154	Nickel	92.9		P	80 - 120
2432154	Selenium	93.7		P	80 - 120
2432154	Silver	105		P	80 - 120
2432154	Thallium	98.5		P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P433931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2430634	Calcium	2.37	Spike	P	0 - 20
2430634	Iron	1.43	Spike	P	0 - 20
2430634	Magnesium	1.64	Spike	P	0 - 20
2430634	Potassium	1.89	Spike	P	0 - 20
2430634	Sodium	1.90	Spike	P	0 - 20
2430634	Strontium	2.78	Spike	P	0 - 20
2430634	Tin	0.688	Spike	P	0 - 20
2430634	Titanium	0.867	Spike	P	0 - 20
2430634	Vanadium	0.908	Spike	P	0 - 20
2430634	Zinc	0.940	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P434124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2432078	Aluminum	1.01	Spike	P	0 - 20
2432078	Antimony	1.04	Spike	P	0 - 20
2432078	Arsenic	0.482	Spike	P	0 - 20
2432078	Barium	0.136	Spike	P	0 - 20
2432078	Beryllium	0.705	Spike	P	0 - 20
2432078	Boron	0.124	Spike	P	0 - 20
2432078	Cadmium	1.24	Spike	P	0 - 20
2432078	Chromium	0.266	Spike	P	0 - 20
2432078	Cobalt	0.0368	Spike	P	0 - 20
2432078	Copper	0.215	Spike	P	0 - 20
2432078	Lead	1.03	Spike	P	0 - 20
2432078	Manganese	0.683	Spike	P	0 - 20
2432078	Molybdenum	0.221	Spike	P	0 - 20
2432078	Nickel	0.636	Spike	P	0 - 20
2432078	Selenium	3.33	Spike	P	0 - 20
2432078	Silver	0.675	Spike	P	0 - 20
2432078	Thallium	0.894	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A121108

Included Lab Sample IDs: 2430579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.3	101	P/P	90 - 110
Iron	99.7	101	P/P	90 - 110
Magnesium	99.7	101	P/P	90 - 110
Potassium	100	99.6	P/P	90 - 110
Sodium	106	104	P/P	90 - 110
Strontium	103	100	P/P	90 - 110
Tin	101	97.2	P/P	90 - 110
Titanium	100	96.1	P/P	90 - 110
Vanadium	100	96.9	P/P	90 - 110
Zinc	99.3	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A121188

Included Lab Sample IDs: 2430579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.1	96.8	P/P	90 - 110
Antimony	95.7	95.5	P/P	90 - 110
Arsenic	94.3	93.3	P/P	90 - 110
Barium	97.0	97.4	P/P	90 - 110
Beryllium	92.4	92.3	P/P	90 - 110
Boron	99.9	99.7	P/P	90 - 110
Cadmium	96.8	96.3	P/P	90 - 110
Chromium	94.5	94.8	P/P	90 - 110
Copper	93.0	92.0	P/P	90 - 110
Manganese	97.3	97.1	P/P	90 - 110
Molybdenum	93.7	92.7	P/P	90 - 110
Selenium	97.7	96.1	P/P	90 - 110
Silver	92.3	92.1	P/P	90 - 110
Thallium	93.7	93.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A121217

Included Lab Sample IDs: 2430579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cobalt	92.5	91.3	P/P	90 - 110
Lead	93.7	92.9	P/P	90 - 110
Nickel	93.6	92.5	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	100	99.6					2.37
	Iron	101	101	103	104			1.43
	Magnesium	101	99.3	102	104			1.64
	Potassium	99.8	99.9	103	99.8			1.89
	Sodium	107	105					1.90
	Strontium	102	99.9	103	104			2.78
	Tin	98.6	97.9	98.6	104			0.688
	Titanium	99.7	99.0	99.9	103			0.867
	Vanadium	100	100	101	105			0.908
	Zinc	97.2	98.0	98.9	105			0.940
EPA 200.8 Rev. 5.4	Aluminum	97.3	97.1	98.2	98.2			1.01
	Antimony	98.5	98.6	97.5	97.7			1.04
	Arsenic	93.5	94.0	93.6	92.2			0.482
	Barium	100	99.1	99.0	98.1			0.136
	Beryllium	91.7	92.2	91.6	89.2			0.705
	Boron	100	101	101	102			0.124
	Cadmium	97.0	97.1	95.9	97.0			1.24
	Chromium	92.5	93.1	93.3	91.9			0.266
	Cobalt	90.0	89.4	89.4	91.1			0.0368
	Copper	93.8	95.4	95.6	92.1			0.215
	Lead	95.4	96.1	97.1	95.0			1.03
	Manganese	97.3	96.5	95.8	95.6			0.683
	Molybdenum	94.2	94.8	94.6	94.5			0.221
	Nickel	89.8	89.7	89.2	92.9			0.636
	Selenium	96.2	97.3	94.1	93.7			3.33
	Silver	108	106	105	105			0.675
	Thallium	96.3	98.3	99.2	98.5			0.894

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	2430579
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2430579
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2430579

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	08/11/2023	08/16/2023 12:35	George D Taylor	08/17/2023 16:21	Samatha Luckman	2430579
EPA 200.8 Rev. 5.4	08/11/2023	08/21/2023 12:45	George D Taylor	08/22/2023 19:01	Conrad Hartmann	2430579
	08/11/2023	08/21/2023 12:45	George D Taylor	08/23/2023 14:21	Conrad Hartmann	2430579
SM 2340 B-2011	08/11/2023			08/17/2023 16:21	Samatha Luckman	2430579