Chemical Analysis Report

NW-DIST-2023-11-16-01

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

Event Description: **Milton North Run**
Request ID: **RQ-2023-11-13-36**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 27-NOV-2023 09:54

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: BUCKET BRANCH DOWNSTREAM OF PAT BROWN ROAD **Collection Date/Time: 11/15/2023 13:30**

Field ID: G4NW0532 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2451846	EPA 200.7 Rev. 4.4	Calcium	1.56		mg/L	P437971	
		Iron	1.09E+03		ug/L	P437971	
		Magnesium	1.49		mg/L	P437971	
		Potassium	1.5		mg/L	P437971	
		Sodium	2.3		mg/L	P437971	
		Strontium	9.5		ug/L	P437971	
		Tin	3.0	U	ug/L	P437971	
		Titanium	1.5	I	ug/L	P437971	
		Vanadium	2.0	U	ug/L	P437971	
		Zinc	5.0	U	ug/L	P437971	
	EPA 200.8 Rev. 5.4	Aluminum	144		ug/L	P437971	
		Antimony	0.050	U	ug/L	P437971	
		Arsenic	0.34		ug/L	P437971	
		Barium	20.7		ug/L	P437971	
		Beryllium	0.014	I	ug/L	P437971	
		Boron	17.2		ug/L	P437971	
		Cadmium	0.020	U	ug/L	P437971	
		Chromium	0.40	U	ug/L	P437971	
		Cobalt	0.426		ug/L	P437971	
		Copper	0.40	U	ug/L	P437971	
		Lead	0.27	I	ug/L	P437971	
		Manganese	64.5		ug/L	P437971	
		Molybdenum	0.15	U	ug/L	P437971	
		Nickel	0.50	U	ug/L	P437971	
		Selenium	0.20	U	ug/L	P437971	
		Silver	0.023	I	ug/L	P437971	
		Thallium	0.10	U	ug/L	P437971	
	SM 2340 B-2011	Hardness	10.0		mg/L	P437971	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: PACE MILL CREEK UPSTREAM OF HWY 90 **Collection Date/Time: 11/15/2023 14:50**

Field ID: G4NW0481 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2451847	EPA 200.7 Rev. 4.4	Calcium	3.04		mg/L	P437971	
		Iron	840		ug/L	P437971	
		Magnesium	1.61		mg/L	P437971	
		Potassium	1.3		mg/L	P437971	
		Sodium	4.8		mg/L	P437971	
		Strontium	15.8		ug/L	P437971	
		Tin	3.0	U	ug/L	P437971	
		Titanium	0.88	I	ug/L	P437971	
		Vanadium	2.0	U	ug/L	P437971	
		Zinc	5.0	U	ug/L	P437971	
	EPA 200.8 Rev. 5.4	Aluminum	101		ug/L	P437971	
		Antimony	0.12	I	ug/L	P437971	
		Arsenic	0.39		ug/L	P437971	
		Barium	25.6		ug/L	P437971	
		Beryllium	0.018	I	ug/L	P437971	
		Boron	22.6		ug/L	P437971	
		Cadmium	0.020	U	ug/L	P437971	
		Chromium	0.40	U	ug/L	P437971	
		Cobalt	0.193		ug/L	P437971	
		Copper	0.40	U	ug/L	P437971	
		Lead	0.32	I	ug/L	P437971	
		Manganese	40.0		ug/L	P437971	
		Molybdenum	0.15	U	ug/L	P437971	
		Nickel	0.50	U	ug/L	P437971	
		Selenium	0.20	U	ug/L	P437971	
		Silver	0.010	U	ug/L	P437971	
		Thallium	0.10	U	ug/L	P437971	
	SM 2340 B-2011	Hardness	14.2		mg/L	P437971	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437971

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: P437971

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	0.60	I	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: P437971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	104		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	103		P	85 - 115
Sodium	101		P	85 - 115
Strontium	98.0		P	85 - 115
Tin	102		P	85 - 115
Titanium	98.9		P	85 - 115
Vanadium	99.4		P	85 - 115
Zinc	98.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	101		P	85 - 115
Barium	101		P	85 - 115
Beryllium	94.8		P	85 - 115
Boron	103		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	102		P	85 - 115
Cobalt	98.7		P	85 - 115
Copper	95.9		P	85 - 115
Lead	96.5		P	85 - 115
Manganese	99.8		P	85 - 115
Molybdenum	99.2		P	85 - 115
Nickel	97.1		P	85 - 115
Selenium	100		P	85 - 115
Silver	106		P	85 - 115
Thallium	100		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2451847	Calcium	102	97.9	P/P	80 - 120
2451847	Iron	104	102	P/P	80 - 120
2451847	Magnesium	107	104	P/P	80 - 120
2451847	Potassium	103	100	P/P	80 - 120
2451847	Sodium	101		P	80 - 120
2451847	Strontium	97.8	97.2	P/P	80 - 120
2451847	Tin	101	98.3	P/P	80 - 120
2451847	Titanium	99.1	98.7	P/P	80 - 120
2451847	Vanadium	99.9	99.2	P/P	80 - 120
2451847	Zinc	99.6	98.5	P/P	80 - 120
2452039	Calcium	101		P	80 - 120
2452039	Iron	105		P	80 - 120
2452039	Magnesium	107		P	80 - 120
2452039	Potassium	102		P	80 - 120
2452039	Sodium	102		P	80 - 120
2452039	Strontium	96.6		P	80 - 120
2452039	Tin	99.8		P	80 - 120
2452039	Titanium	97.2		P	80 - 120
2452039	Vanadium	97.5		P	80 - 120
2452039	Zinc	96.6		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2451847	Aluminum	98.9	98.0	P/P	80 - 120
2451847	Antimony	103	102	P/P	80 - 120
2451847	Arsenic	98.1	97.2	P/P	80 - 120
2451847	Barium	102	101	P/P	80 - 120
2451847	Beryllium	92.0	92.4	P/P	80 - 120
2451847	Boron	106	104	P/P	80 - 120
2451847	Cadmium	103	101	P/P	80 - 120
2451847	Chromium	105	103	P/P	80 - 120
2451847	Cobalt	97.0	96.3	P/P	80 - 120
2451847	Copper	96.2	96.5	P/P	80 - 120
2451847	Lead	97.1	96.2	P/P	80 - 120
2451847	Molybdenum	98.4	97.9	P/P	80 - 120
2451847	Nickel	96.6	96.3	P/P	80 - 120
2451847	Selenium	96.8	95.7	P/P	80 - 120
2451847	Silver	105	105	P/P	80 - 120
2451847	Thallium	103	102	P/P	80 - 120
2452039	Aluminum	98.5		P	80 - 120
2452039	Antimony	104		P	80 - 120
2452039	Arsenic	97.4		P	80 - 120
2452039	Barium	99.6		P	80 - 120
2452039	Beryllium	91.6		P	80 - 120
2452039	Boron	103		P	80 - 120
2452039	Cadmium	103		P	80 - 120
2452039	Chromium	104		P	80 - 120
2452039	Cobalt	95.0		P	80 - 120
2452039	Copper	92.5		P	80 - 120
2452039	Lead	95.0		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452039	Manganese	99.5		P	80 - 120
2452039	Molybdenum	99.2		P	80 - 120
2452039	Nickel	93.7		P	80 - 120
2452039	Selenium	96.0		P	80 - 120
2452039	Silver	106		P	80 - 120
2452039	Thallium	99.7		P	80 - 120

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P437971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2451847	Calcium	2.46	Spike	P	0 - 20
2451847	Iron	2.16	Spike	P	0 - 20
2451847	Magnesium	1.88	Spike	P	0 - 20
2451847	Potassium	1.54	Spike	P	0 - 20
2451847	Sodium	0.820	Spike	P	0 - 20
2451847	Strontium	0.687	Spike	P	0 - 20
2451847	Tin	2.24	Spike	P	0 - 20
2451847	Titanium	0.374	Spike	P	0 - 20
2451847	Vanadium	0.720	Spike	P	0 - 20
2451847	Zinc	1.17	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P437971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2451847	Aluminum	0.768	Spike	P	0 - 20
2451847	Antimony	1.28	Spike	P	0 - 20
2451847	Arsenic	0.930	Spike	P	0 - 20
2451847	Barium	0.548	Spike	P	0 - 20
2451847	Beryllium	0.352	Spike	P	0 - 20
2451847	Boron	1.36	Spike	P	0 - 20
2451847	Cadmium	2.44	Spike	P	0 - 20
2451847	Chromium	1.47	Spike	P	0 - 20
2451847	Cobalt	0.729	Spike	P	0 - 20
2451847	Copper	0.336	Spike	P	0 - 20
2451847	Lead	0.986	Spike	P	0 - 20
2451847	Manganese	1.65	Spike	P	0 - 20
2451847	Molybdenum	0.548	Spike	P	0 - 20
2451847	Nickel	0.223	Spike	P	0 - 20
2451847	Selenium	1.16	Spike	P	0 - 20
2451847	Silver	0.197	Spike	P	0 - 20
2451847	Thallium	0.643	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: A122845
Included Lab Sample IDs: 2451846, 2451847

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	101	P/P	90 - 110
Aluminum	99.6	101	P/P	90 - 110
Antimony	101	102	P/P	90 - 110
Antimony	102	103	P/P	90 - 110
Arsenic	101	98.3	P/P	90 - 110
Arsenic	98.3	96.8	P/P	90 - 110
Barium	98.7	99.6	P/P	90 - 110
Barium	99.6	98.9	P/P	90 - 110
Beryllium	96.4	95.8	P/P	90 - 110
Beryllium	97.7	96.4	P/P	90 - 110
Boron	103	104	P/P	90 - 110
Boron	99.0	103	P/P	90 - 110
Cadmium	102	103	P/P	90 - 110
Cadmium	103	102	P/P	90 - 110
Chromium	104	106	P/P	90 - 110
Chromium	106	106	P/P	90 - 110
Cobalt	98.1	97.0	P/P	90 - 110
Cobalt	99.7	98.1	P/P	90 - 110
Copper	93.3	91.9	P/P	90 - 110
Copper	95.9	93.3	P/P	90 - 110
Lead	96.4	96.8	P/P	90 - 110
Lead	96.5	96.4	P/P	90 - 110
Manganese	102	105	P/P	90 - 110
Manganese	105	104	P/P	90 - 110
Molybdenum	100	99.4	P/P	90 - 110
Molybdenum	100	100	P/P	90 - 110
Nickel	97.0	96.1	P/P	90 - 110
Nickel	99.8	97.0	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	100	100	P/P	90 - 110
Silver	100	99.5	P/P	90 - 110
Thallium	97.6	98.7	P/P	90 - 110
Thallium	98.7	98.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A122852
Included Lab Sample IDs: 2451846, 2451847

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.1	97.8	P/P	90 - 110
Iron	98.1	98.9	P/P	90 - 110
Magnesium	98.9	99.8	P/P	90 - 110
Potassium	97.2	97.5	P/P	90 - 110
Sodium	97.6	97.5	P/P	90 - 110
Strontium	99.6	96.3	P/P	90 - 110
Tin	101	99.5	P/P	90 - 110
Titanium	101	99.0	P/P	90 - 110
Vanadium	100	98.2	P/P	90 - 110
Zinc	99.9	97.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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		
						LCS	SMP	MS
EPA 200.7 Rev. 4.4	Calcium	104	102	97.9	101			2.46
	Iron	104	104	102	105			2.16
	Magnesium	107	107	104	107			1.88
	Potassium	103	103	100	102			1.54
	Sodium	101	101	102				0.820
	Strontium	98.0	97.8	97.2	96.6			0.687
	Tin	102	101	98.3	99.8			2.24
	Titanium	98.9	99.1	98.7	97.2			0.374
	Vanadium	99.4	99.9	99.2	97.5			0.720
	Zinc	98.5	99.6	98.5	96.6			1.17
EPA 200.8 Rev. 5.4	Aluminum	100	98.9	98.0	98.5			0.768
	Antimony	103	103	102	104			1.28
	Arsenic	101	98.1	97.2	97.4			0.930
	Barium	101	102	101	99.6			0.548
	Beryllium	94.8	92.0	92.4	91.6			0.352
	Boron	103	106	104	103			1.36
	Cadmium	102	103	101	103			2.44
	Chromium	102	105	103	104			1.47
	Cobalt	98.7	97.0	96.3	95.0			0.729
	Copper	95.9	96.2	96.5	92.5			0.336
	Lead	96.5	97.1	96.2	95.0			0.986
	Manganese	99.8	99.5					1.65
	Molybdenum	99.2	98.4	97.9	99.2			0.548
	Nickel	97.1	96.6	96.3	93.7			0.223
	Selenium	100	96.8	95.7	96.0			1.16
	Silver	106	105	105	106			0.197
	Thallium	100	99.7	103	102			0.643

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	2451846, 2451847
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2451846, 2451847
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2451846, 2451847

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	11/16/2023	11/17/2023 14:30	George D Taylor	11/20/2023 19:31	McKinley C Carter	2451846
	11/16/2023	11/17/2023 14:30	George D Taylor	11/20/2023 19:37	McKinley C Carter	2451847
EPA 200.8 Rev. 5.4	11/16/2023	11/17/2023 14:30	George D Taylor	11/20/2023 14:36	Emily M Philpot	2451847
	11/16/2023	11/17/2023 14:30	George D Taylor	11/20/2023 15:52	Emily M Philpot	2451846
SM 2340 B-2011	11/16/2023			11/20/2023 19:31	McKinley C Carter	2451846
	11/16/2023			11/20/2023 19:37	McKinley C Carter	2451847