

Chemical Analysis Report

NE-DIST-2020-08-18-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Alachua County 2020**
Request ID: **RQ-2020-08-31-29**
Customer: **NE-DIST**
Project ID: **SMP**

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

Date Certified: 27-AUG-2020 13:38

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the "T" and a long horizontal stroke at the end.

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: Bivens Arm on 441

Collection Date/Time: 08/17/2020 09:50

Field ID: Biv 441 Group B

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2190893	EPA 200.7 Rev. 4.4	Barium	11.1		ug/L	P386231	
		Calcium	27.4		mg/L	P386231	
		Iron	30	U	ug/L	P386231	
		Magnesium	3.57		mg/L	P386231	
		Potassium	2.9		mg/L	P386231	
		Sodium	6.2		mg/L	P386231	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P386231	
		Aluminum	176		ug/L	P386231	
		Antimony	0.39		ug/L	P386231	
		Arsenic	0.85		ug/L	P386231	
		Boron**	32.8		ug/L	P386231	
		Cadmium	0.020	U	ug/L	P386231	
		Chromium	0.40	U	ug/L	P386231	
		Copper	0.40	U	ug/L	P386231	
		Lead	0.78		ug/L	P386231	
		Nickel	0.50	U	ug/L	P386231	
		Selenium	0.20	U	ug/L	P386231	
		Silver	0.010	U	ug/L	P386231	
		Thallium	0.10	U	ug/L	P386231	
	SM 2340B	Hardness	83.1		mg/L	P386231	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386231

Component	Result	Code	Units
Barium	1.0	U	ug/L
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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386231

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	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: P386231

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	109		P	85 - 115
Iron	107		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	104		P	85 - 115
Sodium	105		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386231

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	105		P	85 - 115
Antimony	107		P	85 - 115
Arsenic	103		P	85 - 115
Boron	107		P	85 - 115
Cadmium	105		P	85 - 115
Chromium	104		P	85 - 115
Copper	100		P	85 - 115
Lead	108		P	85 - 115
Nickel	101		P	85 - 115
Selenium	102		P	85 - 115
Silver	106		P	85 - 115
Thallium	105		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190501	Barium	104		P	80 - 120
2190501	Calcium	105		P	80 - 120
2190501	Iron	107		P	80 - 120
2190501	Magnesium	106		P	80 - 120
2190501	Potassium	103		P	80 - 120
2190501	Sodium	105		P	80 - 120
2190501	Zinc	104		P	80 - 120
2190729	Barium	105	103	P/P	80 - 120
2190729	Calcium	111	108	P/P	80 - 120
2190729	Iron	108	105	P/P	80 - 120
2190729	Magnesium	109	105	P/P	80 - 120
2190729	Potassium	111	107	P/P	80 - 120
2190729	Sodium	105	101	P/P	80 - 120
2190729	Zinc	107	105	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386231

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190501	Aluminum	105		P	80 - 120
2190501	Antimony	108		P	80 - 120
2190501	Arsenic	102		P	80 - 120
2190501	Boron	107		P	80 - 120
2190501	Cadmium	106		P	80 - 120
2190501	Chromium	107		P	80 - 120
2190501	Copper	104		P	80 - 120
2190501	Lead	110		P	80 - 120
2190501	Nickel	102		P	80 - 120
2190501	Selenium	100		P	80 - 120
2190501	Silver	108		P	80 - 120
2190501	Thallium	106		P	80 - 120
2190729	Aluminum	104	104	P/P	80 - 120
2190729	Antimony	107	105	P/P	80 - 120
2190729	Arsenic	104	103	P/P	80 - 120
2190729	Boron	104	103	P/P	80 - 120
2190729	Cadmium	104	104	P/P	80 - 120
2190729	Chromium	104	104	P/P	80 - 120
2190729	Copper	104	102	P/P	80 - 120
2190729	Lead	108	108	P/P	80 - 120
2190729	Nickel	102	100	P/P	80 - 120
2190729	Selenium	98.4	99.6	P/P	80 - 120
2190729	Silver	107	106	P/P	80 - 120
2190729	Thallium	107	108	P/P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P386231

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190729	Barium	1.48	Spike	P	0 - 20
2190729	Calcium	2.82	Spike	P	0 - 20
2190729	Iron	2.92	Spike	P	0 - 20
2190729	Magnesium	2.83	Spike	P	0 - 20
2190729	Potassium	3.20	Spike	P	0 - 20
2190729	Sodium	2.79	Spike	P	0 - 20
2190729	Zinc	1.63	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P386231

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190729	Aluminum	0.316	Spike	P	0 - 20
2190729	Antimony	1.67	Spike	P	0 - 20
2190729	Arsenic	0.359	Spike	P	0 - 20
2190729	Boron	0.601	Spike	P	0 - 20
2190729	Cadmium	0.191	Spike	P	0 - 20
2190729	Chromium	0.832	Spike	P	0 - 20
2190729	Copper	2.66	Spike	P	0 - 20
2190729	Lead	0.556	Spike	P	0 - 20
2190729	Nickel	1.61	Spike	P	0 - 20
2190729	Selenium	1.27	Spike	P	0 - 20
2190729	Silver	0.487	Spike	P	0 - 20
2190729	Thallium	0.931	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: A100548

Included Lab Sample IDs: 2190893

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	104	P/P	90 - 110
Calcium	103	103	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	99.8	99.1	P/P	90 - 110
Sodium	102	101	P/P	90 - 110
Zinc	101	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100601

Included Lab Sample IDs: 2190893

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	109	109	P/P	90 - 110
Arsenic	102	103	P/P	90 - 110
Boron	104	104	P/P	90 - 110
Cadmium	103	103	P/P	90 - 110
Chromium	101	102	P/P	90 - 110
Copper	97.0	97.5	P/P	90 - 110
Lead	107	106	P/P	90 - 110
Nickel	98.5	99.7	P/P	90 - 110
Selenium	102	102	P/P	90 - 110
Silver	104	106	P/P	90 - 110
Thallium	101	98.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100621

Included Lab Sample IDs: 2190893

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	104	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			Precision SMP	MS
			LCS				
EPA 200.7 Rev. 4.4	Barium	104	104	105	103		1.48
	Calcium	109	105	111	108		2.82
	Iron	107	107	108	105		2.92
	Magnesium	108	106	109	105		2.83
	Potassium	104	103	111	107		3.20
	Sodium	105	105	105	101		2.79
	Zinc	105	104	107	105		1.63
EPA 200.8 Rev. 5.4	Aluminum	105	104	104	105		0.316
	Antimony	107	107	105	108		1.67
	Arsenic	103	104	103	102		0.359
	Boron	107	104	103	107		0.601
	Cadmium	105	104	104	106		0.191
	Chromium	104	104	104	107		0.832
	Copper	100	104	102	104		2.66
	Lead	108	108	108	110		0.556
	Nickel	101	102	100	102		1.61
	Selenium	102	98.4	99.6	100		1.27
	Silver	106	107	106	108		0.487
	Thallium	105	107	108	106		0.931

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2190893
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2190893
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2190893

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	08/18/2020	08/18/2020 12:37	Elliott D. Healy	08/19/2020 20:11	Betina Topolski	2190893
EPA 200.8 Rev. 5.4	08/18/2020	08/18/2020 12:37	Elliott D. Healy	08/21/2020 20:09	Alexander Thompson	2190893
	08/18/2020	08/18/2020 12:37	Elliott D. Healy	08/24/2020 15:01	Alexander Thompson	2190893
SM 2340B	08/18/2020			08/19/2020 20:11	Betina Topolski	2190893