

Chemical Analysis Report

CEN-DIST-2021-03-04-02

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

Event Description: **Little Haw Creek / Lake Dias**
Request ID: **RQ-2021-03-01-15**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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3319 Maguire Blvd., Suite 232
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 23-MAR-2021 14:39

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 first 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: LITTLE HAW CREEK @ 25M DS OF SR40

Collection Date/Time: 03/03/2021 11:52

Field ID: G2CE0128

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2229125	EPA 200.7 Rev. 4.4	Barium	7.9		ug/L	P394489	
		Calcium	4.56		mg/L	P394489	
		Iron	590		ug/L	P394489	
		Magnesium	1.22		mg/L	P394489	
		Potassium	0.43	I	mg/L	P394489	
		Sodium	10.6		mg/L	P394489	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P394489	
		Aluminum	392		ug/L	P394489	
		Antimony	0.050	U	ug/L	P394489	
		Arsenic	0.39		ug/L	P394489	
		Beryllium	0.017	I	ug/L	P394489	
		Boron**	27.6		ug/L	P394489	
		Cadmium	0.020	U	ug/L	P394489	
		Chromium	0.63	I	ug/L	P394489	
		Copper	0.53	I	ug/L	P394489	
		Lead	0.33	I	ug/L	P394489	
		Nickel	0.50	U	ug/L	P394489	
		Selenium	0.20	U	ug/L	P394489	
		Silver	0.010	U	ug/L	P394489	
		Thallium	0.10	U	ug/L	P394489	
	SM 2340B	Hardness	16.4		mg/L	P394489	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P394489

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: P394489

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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
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: P394489

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	106		P	85 - 115
Iron	102		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	100		P	85 - 115
Sodium	104		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P394489

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	94.9		P	85 - 115
Boron	105		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	100		P	85 - 115
Copper	100		P	85 - 115
Lead	109		P	85 - 115
Nickel	99.2		P	85 - 115
Selenium	101		P	85 - 115
Silver	110		P	85 - 115
Thallium	104		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P394489

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228876	Barium	107	105	P/P	80 - 120
2228876	Calcium	107		P	80 - 120
2228876	Iron	107	106	P/P	80 - 120
2228876	Magnesium	103		P	80 - 120
2228876	Potassium	104	103	P/P	80 - 120
2228876	Sodium	105		P	80 - 120
2228876	Zinc	106	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P394489

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228876	Aluminum	100	103	P/P	80 - 120
2228876	Antimony	103	105	P/P	80 - 120
2228876	Arsenic	102	103	P/P	80 - 120
2228876	Beryllium	93.7	96.4	P/P	80 - 120
2228876	Boron	104	109	P/P	80 - 120
2228876	Cadmium	103	107	P/P	80 - 120
2228876	Chromium	101	104	P/P	80 - 120
2228876	Copper	99.2	101	P/P	80 - 120
2228876	Lead	110	112	P/P	80 - 120
2228876	Nickel	99.0	101	P/P	80 - 120
2228876	Selenium	99.1	100	P/P	80 - 120
2228876	Silver	110	110	P/P	80 - 120
2228876	Thallium	107	111	P/P	80 - 120

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P394489

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228876	Barium	1.83	Spike	P	0 - 20
2228876	Calcium	0.181	Spike	P	0 - 20
2228876	Iron	0.369	Spike	P	0 - 20
2228876	Magnesium	0.0912	Spike	P	0 - 20
2228876	Potassium	0.463	Spike	P	0 - 20
2228876	Sodium	0.349	Spike	P	0 - 20
2228876	Zinc	2.15	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P394489

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228876	Aluminum	2.07	Spike	P	0 - 20
2228876	Antimony	1.66	Spike	P	0 - 20
2228876	Arsenic	0.590	Spike	P	0 - 20
2228876	Beryllium	2.72	Spike	P	0 - 20
2228876	Boron	4.30	Spike	P	0 - 20
2228876	Cadmium	3.31	Spike	P	0 - 20
2228876	Chromium	2.31	Spike	P	0 - 20
2228876	Copper	1.54	Spike	P	0 - 20
2228876	Lead	2.07	Spike	P	0 - 20
2228876	Nickel	1.73	Spike	P	0 - 20
2228876	Selenium	1.30	Spike	P	0 - 20
2228876	Silver	0.638	Spike	P	0 - 20
2228876	Thallium	3.43	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: A103926

Included Lab Sample IDs: 2229125

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	106	104	P/P	90 - 110
Calcium	103	103	P/P	90 - 110
Iron	102	104	P/P	90 - 110
Magnesium	101	103	P/P	90 - 110
Potassium	98.4	102	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Zinc	105	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A104075

Included Lab Sample IDs: 2229125

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	101	P/P	90 - 110
Antimony	97.3	97.7	P/P	90 - 110
Arsenic	99.0	100	P/P	90 - 110
Beryllium	97.6	98.9	P/P	90 - 110
Boron	108	101	P/P	90 - 110
Cadmium	99.8	99.8	P/P	90 - 110
Chromium	99.7	99.5	P/P	90 - 110
Copper	98.1	97.7	P/P	90 - 110
Nickel	99.3	99.4	P/P	90 - 110
Selenium	99.3	99.8	P/P	90 - 110
Silver	103	103	P/P	90 - 110
Thallium	104	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A104099

Included Lab Sample IDs: 2229125

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	97.3	96.6	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	Barium	102	107	105			1.83
	Calcium	106	107				0.181
	Iron	102	107	106			0.369
	Magnesium	101	103				0.0912
	Potassium	100	104	103			0.463
	Sodium	104	105				0.349
	Zinc	101	106	103			2.15
EPA 200.8 Rev. 5.4	Aluminum	102	100	103			2.07
	Antimony	103	103	105			1.66
	Arsenic	102	102	103			0.590
	Beryllium	94.9	93.7	96.4			2.72
	Boron	105	104	109			4.30
	Cadmium	101	103	107			3.31
	Chromium	100	101	104			2.31
	Copper	100	99.2	101			1.54
	Lead	109	110	112			2.07
	Nickel	99.2	99.0	101			1.73
	Selenium	101	99.1	100			1.30
	Silver	110	110	110			0.638
	Thallium	104	107	111			3.43

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	2229125
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2229125
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2229125

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	03/04/2021	03/04/2021 16:20	Elliott D. Healy	03/05/2021 16:03	Betina Topolski	2229125
EPA 200.8 Rev. 5.4	03/04/2021	03/04/2021 16:20	Elliott D. Healy	03/15/2021 19:28	McKinley C Carter	2229125
	03/04/2021	03/04/2021 16:20	Elliott D. Healy	03/16/2021 17:38	Josef B Mick	2229125
SM 2340B	03/04/2021			03/05/2021 16:03	Betina Topolski	2229125