Chemical Analysis Report

SO-DIST-2021-11-19-01

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

Event Description: **2021 SMP: DeSoto Cricks**
Request ID: **RQ-2021-11-15-47**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
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Attn: William Mullen

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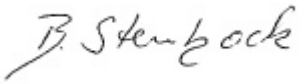
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 03-DEC-2021 18:18



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: Myrtle Slough @ Washington **Collection Date/Time: 11/18/2021 08:35**

Field ID: G3SD0180 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2290800	EPA 200.7 Rev. 4.4	Calcium	11.8		mg/L	P406606	
		Iron	220		ug/L	P406606	
		Magnesium	1.56		mg/L	P406606	
		Potassium	0.50	I	mg/L	P406606	
		Sodium	9.8		mg/L	P406606	
		Strontium	170		ug/L	P406606	
		Tin	3.0	U	ug/L	P406606	
		Titanium	0.75	U	ug/L	P406606	
		Vanadium	2.0	U	ug/L	P406606	
		Zinc	5.0	U	ug/L	P406606	
	EPA 200.8 Rev. 5.4	Aluminum	91		ug/L	P406606	
		Antimony	0.050	U	ug/L	P406606	
		Arsenic	0.30		ug/L	P406606	
		Barium	4.01		ug/L	P406606	
		Beryllium	0.010	U	ug/L	P406606	
		Boron**	13.3		ug/L	P406606	
		Cadmium	0.020	U	ug/L	P406606	
		Chromium	0.40	U	ug/L	P406606	
		Cobalt	0.038	I	ug/L	P406606	
		Copper	0.40	U	ug/L	P406606	
		Lead	0.20	U	ug/L	P406606	
		Manganese	3.55		ug/L	P406606	
		Molybdenum	0.30	I	ug/L	P406606	
		Nickel	0.50	U	ug/L	P406606	
		Selenium	0.20	U	ug/L	P406606	
		Silver	0.010	U	ug/L	P406606	
		Thallium	0.10	U	ug/L	P406606	
	SM 2340B	Hardness	36.0		mg/L	P406606	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron 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: P406606

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: P406606

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: P406606

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	109		P	85 - 115
Iron	107		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	103		P	85 - 115
Sodium	103		P	85 - 115
Strontium	105		P	85 - 115
Tin	110		P	85 - 115
Titanium	113		P	85 - 115
Vanadium	107		P	85 - 115
Zinc	110		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406606

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	109		P	85 - 115
Arsenic	99.9		P	85 - 115
Barium	109		P	85 - 115
Beryllium	101		P	85 - 115
Boron	98.9		P	85 - 115
Cadmium	105		P	85 - 115
Chromium	103		P	85 - 115
Cobalt	96.0		P	85 - 115
Copper	96.1		P	85 - 115
Lead	98.4		P	85 - 115
Manganese	97.6		P	85 - 115
Molybdenum	102		P	85 - 115
Nickel	96.4		P	85 - 115
Selenium	98.9		P	85 - 115
Silver	99.3		P	85 - 115
Thallium	99.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406606

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2290685	Calcium	105	106	P/P	80 - 120
2290685	Iron	108	112	P/P	80 - 120
2290685	Magnesium	107	111	P/P	80 - 120
2290685	Potassium	99.9	101	P/P	80 - 120
2290685	Sodium	99.3		P	80 - 120
2290685	Strontium	101	103	P/P	80 - 120
2290685	Tin	107	109	P/P	80 - 120
2290685	Titanium	103	105	P/P	80 - 120
2290685	Vanadium	101	103	P/P	80 - 120
2290685	Zinc	104	107	P/P	80 - 120
2290769	Calcium	104		P	80 - 120
2290769	Iron	109		P	80 - 120
2290769	Magnesium	105		P	80 - 120
2290769	Sodium	100		P	80 - 120
2290769	Strontium	100		P	80 - 120
2290769	Tin	106		P	80 - 120
2290769	Titanium	104		P	80 - 120
2290769	Vanadium	104		P	80 - 120
2290769	Zinc	109		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406606

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2290685	Aluminum	99.8	103	P/P	80 - 120
2290685	Antimony	111	112	P/P	80 - 120
2290685	Arsenic	98.5	101	P/P	80 - 120
2290685	Barium	107	111	P/P	80 - 120
2290685	Beryllium	103	105	P/P	80 - 120
2290685	Boron	95.7	101	P/P	80 - 120
2290685	Cadmium	103	105	P/P	80 - 120
2290685	Chromium	102	105	P/P	80 - 120
2290685	Cobalt	95.9	97.6	P/P	80 - 120
2290685	Copper	97.9	99.7	P/P	80 - 120
2290685	Lead	96.7	98.9	P/P	80 - 120
2290685	Manganese	99.1	101	P/P	80 - 120
2290685	Molybdenum	102	106	P/P	80 - 120
2290685	Nickel	98.5	101	P/P	80 - 120
2290685	Selenium	98.0	97.3	P/P	80 - 120
2290685	Silver	98.3	100	P/P	80 - 120
2290685	Thallium	100	103	P/P	80 - 120
2290769	Aluminum	101		P	80 - 120
2290769	Antimony	113		P	80 - 120
2290769	Arsenic	103		P	80 - 120
2290769	Barium	108		P	80 - 120
2290769	Beryllium	100		P	80 - 120
2290769	Cadmium	105		P	80 - 120
2290769	Chromium	97.9		P	80 - 120
2290769	Cobalt	97.4		P	80 - 120
2290769	Copper	95.3		P	80 - 120
2290769	Lead	97.5		P	80 - 120
2290769	Manganese	99.9		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406606

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2290769	Molybdenum	109		P	80 - 120
2290769	Nickel	97.0		P	80 - 120
2290769	Selenium	98.0		P	80 - 120
2290769	Silver	96.6		P	80 - 120
2290769	Thallium	99.1		P	80 - 120

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406606

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2290685	Calcium	0.414	Spike	P	0 - 20
2290685	Iron	4.10	Spike	P	0 - 20
2290685	Magnesium	2.22	Spike	P	0 - 20
2290685	Potassium	0.637	Spike	P	0 - 20
2290685	Sodium	0.0395	Spike	P	0 - 20
2290685	Strontium	1.91	Spike	P	0 - 20
2290685	Tin	2.13	Spike	P	0 - 20
2290685	Titanium	1.64	Spike	P	0 - 20
2290685	Vanadium	1.55	Spike	P	0 - 20
2290685	Zinc	2.34	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406606

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2290685	Aluminum	2.39	Spike	P	0 - 20
2290685	Antimony	0.957	Spike	P	0 - 20
2290685	Arsenic	2.88	Spike	P	0 - 20
2290685	Barium	2.84	Spike	P	0 - 20
2290685	Beryllium	1.16	Spike	P	0 - 20
2290685	Boron	4.53	Spike	P	0 - 20
2290685	Cadmium	1.27	Spike	P	0 - 20
2290685	Chromium	3.20	Spike	P	0 - 20
2290685	Cobalt	1.77	Spike	P	0 - 20
2290685	Copper	1.87	Spike	P	0 - 20
2290685	Lead	2.27	Spike	P	0 - 20
2290685	Manganese	1.87	Spike	P	0 - 20
2290685	Molybdenum	3.64	Spike	P	0 - 20
2290685	Nickel	2.03	Spike	P	0 - 20
2290685	Selenium	0.722	Spike	P	0 - 20
2290685	Silver	1.71	Spike	P	0 - 20
2290685	Thallium	2.93	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: A109036
Included Lab Sample IDs: 2290800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	99.4	P/P	90 - 110
Antimony	108	106	P/P	90 - 110
Arsenic	99.4	98.0	P/P	90 - 110
Barium	104	102	P/P	90 - 110
Beryllium	103	102	P/P	90 - 110
Boron	100	97.4	P/P	90 - 110
Cadmium	104	102	P/P	90 - 110
Chromium	99.9	99.1	P/P	90 - 110
Cobalt	93.3	90.2	P/P	90 - 110
Copper	95.2	91.7	P/P	90 - 110
Lead	94.4	93.2	P/P	90 - 110
Manganese	99.3	97.8	P/P	90 - 110
Molybdenum	102	99.5	P/P	90 - 110
Nickel	94.5	90.5	P/P	90 - 110
Selenium	101	100	P/P	90 - 110
Silver	97.1	94.8	P/P	90 - 110
Thallium	95.0	92.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A109107
Included Lab Sample IDs: 2290800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	104	P/P	90 - 110
Iron	105	106	P/P	90 - 110
Magnesium	104	106	P/P	90 - 110
Potassium	97.4	98.6	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Strontium	102	103	P/P	90 - 110
Tin	105	106	P/P	90 - 110
Titanium	98.9	99.6	P/P	90 - 110
Vanadium	98.3	99.7	P/P	90 - 110
Zinc	105	107	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		
						LCS	SMP	MS
EPA 200.7 Rev. 4.4	Calcium	109	105	106	104			0.414
	Iron	107	108	112	109			4.10
	Magnesium	109	107	111	105			2.22
	Potassium	103	99.9	101				0.637
	Sodium	103	99.3	100				0.0395
	Strontium	105	101	103	100			1.91
	Tin	110	107	109	106			2.13
	Titanium	113	103	105	104			1.64
	Vanadium	107	101	103	104			1.55
	Zinc	110	104	107	109			2.34
EPA 200.8 Rev. 5.4	Aluminum	102	99.8	103	101			2.39
	Antimony	109	111	112	113			0.957
	Arsenic	99.9	98.5	101	103			2.88
	Barium	109	107	111	108			2.84
	Beryllium	101	103	105	100			1.16
	Boron	98.9	95.7	101				4.53
	Cadmium	105	103	105	105			1.27
	Chromium	103	102	105	97.9			3.20
	Cobalt	96.0	95.9	97.6	97.4			1.77
	Copper	96.1	97.9	99.7	95.3			1.87
	Lead	98.4	96.7	98.9	97.5			2.27
	Manganese	97.6	99.1	101	99.9			1.87
	Molybdenum	102	102	106	109			3.64
	Nickel	96.4	98.5	101	97.0			2.03
	Selenium	98.9	98.0	97.3	98.0			0.722
	Silver	99.3	98.3	100	96.6			1.71
	Thallium	99.6	100	103	99.1			2.93

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	2290800
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2290800
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2290800

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	11/19/2021	11/22/2021 10:30	Vijayalakshmi Reddy	11/24/2021 15:49	Josef B Mick	2290800
EPA 200.8 Rev. 5.4	11/19/2021	11/22/2021 10:30	Vijayalakshmi Reddy	11/23/2021 02:42	Alexander Thompson	2290800
SM 2340B	11/19/2021			11/24/2021 15:49	Josef B Mick	2290800