Chemical Analysis Report

SE-DIST-2021-11-16-01

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

Event Description: **SMP - IRC Boat**
Request ID: **RQ-2021-11-15-50**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 07-DEC-2021 11:32

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: South IRL outside Vero Beach Yacht Club **Collection Date/Time: 11/15/2021 14:40**

Field ID: G5SE0089 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2289786	EPA 200.7 Rev. 4.4	Aluminum	240	U	ug/L	P406550	
		Calcium	373		mg/L	P406550	
		Chromium	4.0	U	ug/L	P406550	
		Iron	140	I	ug/L	P406550	
		Magnesium	1.23E+03		mg/L	P406550	
		Manganese	9.5	I	ug/L	P406550	
		Zinc	20	U	ug/L	P406550	
	EPA 200.8 Rev. 5.4	Antimony	0.24	I	ug/L	P406550	
		Arsenic	1.87		ug/L	P406550	
		Beryllium	0.10	U	ug/L	P406550	
		Cadmium	0.080	U	ug/L	P406550	
		Copper	1.6	U	ug/L	P406550	
		Lead	2.0	U	ug/L	P406550	
		Nickel	2.0	U	ug/L	P406550	
		Selenium	0.80	U	ug/L	P406550	
		Silver	0.040	U	ug/L	P406550	
		Thallium	1.0	U	ug/L	P406550	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and magnesium are unavailable because of high analyte concentration in the QC sample.

Sample Location: South IRL outside Bob Summers Park **Collection Date/Time: 11/15/2021 14:30**

Field ID: G5SE0088 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2289787	EPA 200.7 Rev. 4.4	Aluminum	240	U	ug/L	P406550	
		Calcium	462		mg/L	P406550	
		Chromium	4.0	U	ug/L	P406550	
		Iron	170	I	ug/L	P406550	
		Magnesium	1.22E+03		mg/L	P406550	
		Manganese	9.2	I	ug/L	P406550	
		Zinc	20	U	ug/L	P406550	
	EPA 200.8 Rev. 5.4	Antimony	0.27	I	ug/L	P406550	
		Arsenic	1.82		ug/L	P406550	
		Beryllium	0.10	U	ug/L	P406550	
		Cadmium	0.080	U	ug/L	P406550	
		Copper	1.6	U	ug/L	P406550	
		Lead	2.0	U	ug/L	P406550	
		Nickel	2.0	U	ug/L	P406550	
		Selenium	0.80	U	ug/L	P406550	
		Silver	0.040	U	ug/L	P406550	
		Thallium	1.0	U	ug/L	P406550	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and magnesium are unavailable 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: P406550

Component	Result	Code	Units
Aluminum	60	U	ug/L
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406550

Component	Result	Code	Units
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	U	ug/L
Cadmium	0.020	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: P406550

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	110		P	85 - 115
Calcium	106		P	85 - 115
Chromium	105		P	85 - 115
Iron	111		P	85 - 115
Magnesium	106		P	85 - 115
Manganese	105		P	85 - 115
Zinc	109		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406550

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Antimony	105		P	85 - 115
Arsenic	97.7		P	85 - 115
Beryllium	92.3		P	85 - 115
Cadmium	98.9		P	85 - 115
Copper	97.0		P	85 - 115
Lead	98.9		P	85 - 115
Nickel	98.7		P	85 - 115
Selenium	100		P	85 - 115
Silver	99.9		P	85 - 115
Thallium	99.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406550

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289786	Aluminum	105	117	P/P	70 - 130
2289786	Chromium	100	95.9	P/P	70 - 130
2289786	Iron	104	117	P/P	70 - 130
2289786	Manganese	98.1	94.4	P/P	70 - 130
2289786	Zinc	106	103	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406550

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2289786	Antimony	119	126	P/P	70 - 130
2289786	Arsenic	107	112	P/P	70 - 130
2289786	Beryllium	124	116	P/P	70 - 130
2289786	Cadmium	101	107	P/P	70 - 130
2289786	Copper	124	129	P/P	70 - 130
2289786	Lead	123	110	P/P	70 - 130
2289786	Nickel	113	118	P/P	70 - 130
2289786	Selenium	110	116	P/P	70 - 130
2289786	Silver	93.9	99.5	P/P	70 - 130
2289786	Thallium	121	111	P/P	70 - 130

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P406550

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289786	Aluminum	10.9	Spike	P	0 - 20
2289786	Calcium	11.1	Spike	P	0 - 20
2289786	Chromium	4.64	Spike	P	0 - 20
2289786	Iron	10.7	Spike	P	0 - 20
2289786	Magnesium	6.82	Spike	P	0 - 20
2289786	Manganese	3.66	Spike	P	0 - 20
2289786	Zinc	3.12	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P406550

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2289786	Antimony	5.48	Spike	P	0 - 20
2289786	Arsenic	4.58	Spike	P	0 - 20
2289786	Beryllium	7.35	Spike	P	0 - 20
2289786	Cadmium	5.81	Spike	P	0 - 20
2289786	Copper	4.28	Spike	P	0 - 20
2289786	Lead	10.6	Spike	P	0 - 20
2289786	Nickel	4.11	Spike	P	0 - 20
2289786	Selenium	5.13	Spike	P	0 - 20
2289786	Silver	5.73	Spike	P	0 - 20
2289786	Thallium	8.36	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: A109073
Included Lab Sample IDs: 2289786, 2289787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	102	105	P/P	90 - 110
Arsenic	101	98.3	P/P	90 - 110
Cadmium	99.2	100	P/P	90 - 110
Copper	101	105	P/P	90 - 110
Lead	95.2	96.1	P/P	90 - 110
Nickel	100	103	P/P	90 - 110
Selenium	103	105	P/P	90 - 110
Silver	97.9	97.7	P/P	90 - 110
Thallium	92.8	93.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A109107
Included Lab Sample IDs: 2289786, 2289787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	106	106	P/P	90 - 110
Aluminum	106	106	P/P	90 - 110
Calcium	104	103	P/P	90 - 110
Calcium	104	104	P/P	90 - 110
Chromium	101	103	P/P	90 - 110
Chromium	103	101	P/P	90 - 110
Iron	106	105	P/P	90 - 110
Iron	106	106	P/P	90 - 110
Magnesium	105	104	P/P	90 - 110
Magnesium	106	105	P/P	90 - 110
Manganese	102	103	P/P	90 - 110
Manganese	103	102	P/P	90 - 110
Zinc	105	106	P/P	90 - 110
Zinc	107	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A109183
Included Lab Sample IDs: 2289786, 2289787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	94.0	91.2	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	Aluminum	110	105	117			10.9
	Calcium	106					11.1
	Chromium	105	100	95.9			4.64
	Iron	111	104	117			10.7
	Magnesium	106					6.82
	Manganese	105	98.1	94.4			3.66
	Zinc	109	106	103			3.12
EPA 200.8 Rev. 5.4	Antimony	105	119	126			5.48
	Arsenic	97.7	107	112			4.58
	Beryllium	92.3	124	116			7.35
	Cadmium	98.9	101	107			5.81
	Copper	97.0	124	129			4.28
	Lead	98.9	123	110			10.6
	Nickel	98.7	113	118			4.11
	Selenium	100	110	116			5.13
	Silver	99.9	93.9	99.5			5.73
	Thallium	99.2	121	111			8.36

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	2289786, 2289787
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2289786, 2289787

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	11/16/2021	11/19/2021 10:30	Emily M Philpot	11/24/2021 17:17	Josef B Mick	2289786
	11/16/2021	11/19/2021 10:30	Emily M Philpot	11/24/2021 17:41	Josef B Mick	2289786
	11/16/2021	11/19/2021 10:30	Emily M Philpot	11/24/2021 19:00	Josef B Mick	2289787
	11/16/2021	11/19/2021 10:30	Emily M Philpot	11/24/2021 19:06	Josef B Mick	2289787
EPA 200.8 Rev. 5.4	11/16/2021	11/19/2021 10:30	Emily M Philpot	11/23/2021 16:16	McKinley C Carter	2289786
	11/16/2021	11/19/2021 10:30	Emily M Philpot	11/23/2021 16:43	McKinley C Carter	2289787
	11/16/2021	11/19/2021 10:30	Emily M Philpot	11/23/2021 17:28	McKinley C Carter	2289786
	11/16/2021	11/19/2021 10:30	Emily M Philpot	11/23/2021 17:55	McKinley C Carter	2289787
	11/16/2021	11/19/2021 10:30	Emily M Philpot	12/02/2021 14:34	Alexander Thompson	2289787
	11/16/2021	11/19/2021 10:30	Emily M Philpot	12/02/2021 14:47	Alexander Thompson	2289786