Chemical Analysis Report

SO-DIST-2016-06-01-03

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

Event Description: **San Carlos Bay**
Request ID: **RQ-2016-05-02-07**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
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FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
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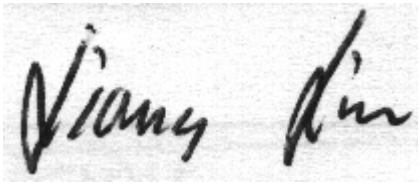
Certified by: Liang Lin, Environmental Administrator

Date Certified: 20-JUN-2016 09:44



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 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: PI-01 **Collection Date/Time: 05/23/2016 09:09**

Field ID: PI-01 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1803192	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P305477	
	EPA 200.8 Rev. 5.4	Arsenic	1.33		ug/L	P305477	
		Cadmium	0.060	U	ug/L	P305477	
		Chromium	0.15	U	ug/L	P305477	
		Copper	0.88	I	ug/L	P305477	
		Lead	0.15	U	ug/L	P305477	
		Nickel	0.30	I	ug/L	P305477	
		Silver	0.015	U	ug/L	P305477	
		Zinc	3.0	U	ug/L	P305477	

Sample Location: PI-02 **Collection Date/Time: 05/23/2016 09:20**

Field ID: PI-02 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1803193	EPA 200.7 Rev. 4.4	Iron	36	I	ug/L	P305477	
	EPA 200.8 Rev. 5.4	Arsenic	1.12		ug/L	P305477	
		Cadmium	0.060	U	ug/L	P305477	
		Chromium	0.15	U	ug/L	P305477	
		Copper	0.56	I	ug/L	P305477	
		Lead	0.15	U	ug/L	P305477	
		Nickel	0.15	I	ug/L	P305477	
		Silver	0.015	U	ug/L	P305477	
		Zinc	3.0	U	ug/L	P305477	

Sample Location: PI-14 **Collection Date/Time: 05/23/2016 12:19**

Field ID: PI-14 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1803194	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P305477	
	EPA 200.8 Rev. 5.4	Arsenic	1.81		ug/L	P305477	
		Cadmium	0.060	U	ug/L	P305477	
		Chromium	0.15	U	ug/L	P305477	
		Copper	0.58	I	ug/L	P305477	
		Lead	0.15	U	ug/L	P305477	
		Nickel	0.20	I	ug/L	P305477	
		Silver	0.015	U	ug/L	P305477	
		Zinc	3.0	U	ug/L	P305477	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P305477

Component	Result	Code	Units
Iron	30	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P305477

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L
Zinc	1.0	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P305477

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P305477

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.1		P	85 - 115
Cadmium	99.6		P	85 - 115
Chromium	99.1		P	85 - 115
Copper	94.9		P	85 - 115
Lead	99.8		P	85 - 115
Nickel	96.0		P	85 - 115
Silver	96.9		P	85 - 115
Zinc	96.5		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P305477

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803193	Iron	103	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P305477

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803193	Arsenic	105	103	P/P	70 - 130
1803193	Cadmium	97.5	95.4	P/P	70 - 130
1803193	Chromium	91.6	90.5	P/P	70 - 130
1803193	Copper	94.3	93.5	P/P	70 - 130
1803193	Lead	103	101	P/P	70 - 130
1803193	Nickel	96.1	95.6	P/P	70 - 130
1803193	Silver	92.2	90.3	P/P	70 - 130

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P305477

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1803193	Zinc	94.1	93.3	P/P	70 - 130

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P305477

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803193	Iron	0.863	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P305477

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1803193	Arsenic	1.57	Spike	P	0 - 20
1803193	Cadmium	2.24	Spike	P	0 - 20
1803193	Chromium	1.25	Spike	P	0 - 20
1803193	Copper	0.822	Spike	P	0 - 20
1803193	Lead	1.43	Spike	P	0 - 20
1803193	Nickel	0.540	Spike	P	0 - 20
1803193	Silver	2.07	Spike	P	0 - 20
1803193	Zinc	0.863	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A69864
Included Lab Sample IDs: 1803192, 1803193, 1803194

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	100	100	P/P	90 - 110
Iron	100	98.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A69879
Included Lab Sample IDs: 1803192, 1803193, 1803194

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	100	P/P	90 - 110
Cadmium	97.8	98.1	P/P	90 - 110
Cadmium	98.4	97.8	P/P	90 - 110
Chromium	97.6	98.5	P/P	90 - 110
Copper	97.1	99.1	P/P	90 - 110
Copper	99.1	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A69879
Included Lab Sample IDs: 1803192, 1803193, 1803194

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	95.5	98.0	P/P	90 - 110
Lead	96.0	95.5	P/P	90 - 110
Nickel	97.3	98.9	P/P	90 - 110
Nickel	98.9	99.7	P/P	90 - 110
Silver	95.6	96.0	P/P	90 - 110
Silver	96.0	96.2	P/P	90 - 110
Zinc	97.6	98.8	P/P	90 - 110
Zinc	98.8	98.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A69936
Included Lab Sample IDs: 1803192, 1803193

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.4	97.8	P/P	90 - 110
Chromium	99.6	97.8	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	Iron	105	103	102			0.863
EPA 200.8 Rev. 5.4	Arsenic	99.1	105	103			1.57
	Cadmium	99.6	97.5	95.4			2.24
	Chromium	99.1	91.6	90.5			1.25
	Copper	94.9	94.3	93.5			0.822
	Lead	99.8	103	101			1.43
	Nickel	96.0	96.1	95.6			0.540
	Silver	96.9	92.2	90.3			2.07
	Zinc	96.5	94.1	93.3			0.863

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1803192, 1803193, 1803194
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1803192, 1803193, 1803194

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	06/01/2016	06/02/2016	Elliott D. Healy	06/06/2016	Joshua Ayres	1803192, 1803193, 1803194
EPA 200.8 Rev. 5.4	06/01/2016	06/02/2016	Elliott D. Healy	06/03/2016	Charles J. Peterson	1803192, 1803193
	06/01/2016	06/02/2016	Elliott D. Healy	06/04/2016	Charles J. Peterson	1803194
	06/01/2016	06/02/2016	Elliott D. Healy	06/08/2016	Charles J. Peterson	1803192, 1803193