Chemical Analysis Report

SO-DIST-2016-08-12-01

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-2016-07-04-02**
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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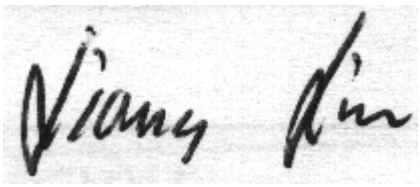
Certified by: Liang Lin, Environmental Administrator

Date Certified: 08-SEP-2016 09:47



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: 07/25/2016 09:26**

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

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823461	EPA 200.7 Rev. 4.4	Iron	90	I	ug/L	P309828	
	EPA 200.8 Rev. 5.4	Arsenic	1.87		ug/L	P309828	
		Cadmium	0.060	U	ug/L	P309828	
		Chromium	0.17	I	ug/L	P309828	
		Copper	0.91	I	ug/L	P309828	
		Lead	0.15	U	ug/L	P309828	
		Nickel	0.27	I	ug/L	P309828	
		Silver	0.015	U	ug/L	P309828	
		Zinc	3.0	U	ug/L	P309828	

Sample Location: PI-02 **Collection Date/Time: 07/25/2016 09:36**

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

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823462	EPA 200.7 Rev. 4.4	Iron	80	I	ug/L	P309828	
	EPA 200.8 Rev. 5.4	Arsenic	1.0		ug/L	P309828	
		Cadmium	0.060	U	ug/L	P309828	
		Chromium	0.16	I	ug/L	P309828	
		Copper	1.4		ug/L	P309828	
		Lead	0.15	U	ug/L	P309828	
		Nickel	0.64		ug/L	P309828	
		Silver	0.015	U	ug/L	P309828	
		Zinc	3.0	U	ug/L	P309828	

Sample Location: PI-14 **Collection Date/Time: 07/25/2016 13:19**

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

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823463	EPA 200.7 Rev. 4.4	Iron	66	I	ug/L	P309828	
	EPA 200.8 Rev. 5.4	Arsenic	1.67		ug/L	P309828	
		Cadmium	0.060	U	ug/L	P309828	
		Chromium	0.15	I	ug/L	P309828	
		Copper	0.86	I	ug/L	P309828	
		Lead	0.15	U	ug/L	P309828	
		Nickel	0.28	I	ug/L	P309828	
		Silver	0.015	U	ug/L	P309828	
		Zinc	3.0	U	ug/L	P309828	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309828

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: P309828

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: P309828

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309828

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	95.3		P	85 - 115
Cadmium	92.7		P	85 - 115
Chromium	93.2		P	85 - 115
Copper	90.9		P	85 - 115
Lead	93.2		P	85 - 115
Nickel	92.2		P	85 - 115
Silver	94.0		P	85 - 115
Zinc	91.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823967	Iron	106	106	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823967	Arsenic	99.4	99.9	P/P	70 - 130
1823967	Cadmium	91.0	89.5	P/P	70 - 130
1823967	Chromium	85.4	86.7	P/P	70 - 130
1823967	Copper	88.5	89.9	P/P	70 - 130
1823967	Lead	98.9	98.3	P/P	70 - 130
1823967	Nickel	90.0	90.5	P/P	70 - 130
1823967	Silver	90.0	89.3	P/P	70 - 130

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823967	Zinc	86.6	86.8	P/P	70 - 130

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823967	Iron	0.109	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823967	Arsenic	0.480	Spike	P	0 - 20
1823967	Cadmium	1.63	Spike	P	0 - 20
1823967	Chromium	1.43	Spike	P	0 - 20
1823967	Copper	1.35	Spike	P	0 - 20
1823967	Lead	0.579	Spike	P	0 - 20
1823967	Nickel	0.514	Spike	P	0 - 20
1823967	Silver	0.784	Spike	P	0 - 20
1823967	Zinc	0.206	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: A71215
Included Lab Sample IDs: 1823461, 1823462, 1823463

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	102	99.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71245
Included Lab Sample IDs: 1823461, 1823462, 1823463

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.4	95.5	P/P	90 - 110
Cadmium	94.3	92.8	P/P	90 - 110
Copper	94.8	95.7	P/P	90 - 110
Lead	93.8	93.6	P/P	90 - 110
Nickel	94.1	95.8	P/P	90 - 110
Silver	95.5	94.3	P/P	90 - 110
Zinc	95.1	96.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71266
Included Lab Sample IDs: 1823461, 1823462, 1823463

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	93.5	91.4	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	103	106	106			0.109
EPA 200.8 Rev. 5.4	Arsenic	95.3	99.4	99.9			0.480
	Cadmium	92.7	91.0	89.5			1.63
	Chromium	93.2	85.4	86.7			1.43
	Copper	90.9	88.5	89.9			1.35
	Lead	93.2	98.9	98.3			0.579
	Nickel	92.2	90.0	90.5			0.514
	Silver	94.0	90.0	89.3			0.784
	Zinc	91.8	86.6	86.8			0.206

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	1823461, 1823462, 1823463
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1823461, 1823462, 1823463

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	08/12/2016	08/16/2016	Elliott D. Healy	08/18/2016	Joshua Ayres	1823461, 1823462, 1823463
EPA 200.8 Rev. 5.4	08/12/2016	08/16/2016	Elliott D. Healy	08/19/2016	Charles J. Peterson	1823461, 1823462, 1823463
	08/12/2016	08/16/2016	Elliott D. Healy	08/22/2016	Charles J. Peterson	1823461, 1823462, 1823463