

Chemical Analysis Report

SE-DIST-2017-03-29-01

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

Event Description: **SMP-IRL Run**
Request ID: **RQ-2017-03-06-25**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Matthew Sewell

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 26-APR-2017 11:25

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

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 groups are included in this report: Metals and Nutrients.

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: Indian River Lagoon Ft. Pierce

Collection Date/Time: 03/28/2017 12:30

Field ID: G2SE0028

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1884088	EPA 180.1 Rev. 2.0	Turbidity	2.2	A	NTU	P322463	
	SM 2320 B-97	Total Alkalinity	126	A	mg CaCO3/L	P322917	
	SM 2540 D-97	TSS	6	I	mg/L	P323022	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P323077	
1884090	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P322426	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26	I	mg N/L	P322459	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P322650	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P322639	
	SM 5310 B-00	Organic Carbon	1.5	I	mg C/L	P322513	
1884092	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P322444	
1884116	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P322769	
	EPA 200.8 Rev. 5.4	Arsenic	2.10		ug/L	P322769	
		Cadmium	0.080	U	ug/L	P322769	
		Chromium	1.6	U	ug/L	P322769	
		Copper	0.80	U	ug/L	P322769	
		Lead	0.25	U	ug/L	P322769	
		Nickel	0.80	U	ug/L	P322769	
		Silver	0.040	U	ug/L	P322769	
		Zinc	4.0	U	ug/L	P322769	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: IRL Vero Beach

Collection Date/Time: 03/28/2017 13:10

Field ID: G5SE0051

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1884089	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P322463	
	SM 2320 B-97	Total Alkalinity	131		mg CaCO3/L	P322917	
	SM 2540 D-97	TSS	3	U	mg/L	P323022	
	SM 4500 F-C-97	Fluoride	1.2		mg F/L	P323077	
1884091	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P322498	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33	I	mg N/L	P322459	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P322650	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P322639	
	SM 5310 B-00	Organic Carbon	2.6		mg C/L	P322513	
1884093	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P322444	
1884117	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P322769	
	EPA 200.8 Rev. 5.4	Arsenic	1.67		ug/L	P322769	
		Cadmium	0.080	U	ug/L	P322769	
		Chromium	1.6	U	ug/L	P322769	
		Copper	0.80	U	ug/L	P322769	
		Lead	0.20	U	ug/L	P322769	
		Nickel	0.80	U	ug/L	P322769	
		Silver	0.040	U	ug/L	P322769	

Field ID: G5SE0051

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1884117	EPA 200.8 Rev. 5.4	Zinc	5.2	I	ug/L	P322769	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P322463

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P322769

Component	Result	Code	Units
Iron	30	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P322769

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L
Zinc	1.0	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P322426

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P322498

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P322459

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P322650

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322639

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322444

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2320 B-97
Batch ID: P322917

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 D-97
Batch ID: P323022

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P323077

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P322513

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P322769

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322769

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	101		P	85 - 115
Copper	99.5		P	85 - 115
Lead	101		P	85 - 115
Nickel	101		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322769

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Silver	103		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322426

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	105		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322498

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	103		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322459

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	107		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322650

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322639

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322444

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	100		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P322917

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P323077

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P322513

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P322769

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884148	Iron	104	106	P/P	70 - 130
1885599	Iron	109		P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322769

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884148	Arsenic	110	108	P/P	80 - 120
1884148	Cadmium	100	102	P/P	80 - 120
1884148	Chromium	97.4	94.6	P/P	80 - 120
1884148	Copper	91.8	92.8	P/P	80 - 120
1884148	Lead	108	107	P/P	80 - 120
1884148	Nickel	99.8	98.2	P/P	80 - 120
1884148	Silver	94.9	96.4	P/P	80 - 120
1884148	Zinc	93.6	94.2	P/P	80 - 120
1885599	Arsenic	112		P	80 - 120
1885599	Cadmium	105		P	80 - 120
1885599	Chromium	99.2		P	80 - 120
1885599	Copper	99.2		P	80 - 120
1885599	Lead	105		P	80 - 120
1885599	Nickel	101		P	80 - 120
1885599	Silver	97.6		P	80 - 120
1885599	Zinc	101		P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884090	Ammonia-N	107	107	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322498

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883962	Ammonia-N	110	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322459

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883963	Kjeldahl Nitrogen	98.4	97.8	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322650

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883950	NO2NO3-N	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322639

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884125	Total-P	101	96.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322444

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883969	O-Phosphate-P	98.1	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P323077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1884088	Fluoride	92.1	92.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P322513

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1883947	Organic Carbon	91.7	92.1	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P322463

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884088	Turbidity	4.10	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P322769

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884148	Iron	2.22	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322769

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884148	Arsenic	1.78	Spike	P	0 - 20
1884148	Cadmium	1.82	Spike	P	0 - 20
1884148	Chromium	2.90	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P322769

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884148	Copper	1.01	Spike	P	0 - 20
1884148	Lead	0.403	Spike	P	0 - 20
1884148	Nickel	1.66	Spike	P	0 - 20
1884148	Silver	1.54	Spike	P	0 - 20
1884148	Zinc	0.602	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884090	Ammonia-N	0.209	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P322498

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883962	Ammonia-N	5.27	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P322459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883963	Kjeldahl Nitrogen	0.559	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P322650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883950	NO2NO3-N	1.46	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P322639

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884125	Total-P	4.26	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P322444

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883969	O-Phosphate-P	2.12	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P322917

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884088	Total Alkalinity	0.131	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P323077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1884088	Fluoride	0.480	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P322513

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1883947	Organic Carbon	0.397	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 350.1 Rev. 2.0
Run ID: A75437
Included Lab Sample IDs: 1884090

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A75452
Included Lab Sample IDs: 1884092, 1884093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.6	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A75456
Included Lab Sample IDs: 1884088, 1884089

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A75470
Included Lab Sample IDs: 1884091

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	104	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A75475

Included Lab Sample IDs: 1884090, 1884091

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.2	95.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A75499

Included Lab Sample IDs: 1884090, 1884091

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A75520

Included Lab Sample IDs: 1884090, 1884091

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A75528

Included Lab Sample IDs: 1884090, 1884091

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.5	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A75625

Included Lab Sample IDs: 1884088, 1884089

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A75631

Included Lab Sample IDs: 1884116, 1884117

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	100	98.9	P/P	90 - 110
Arsenic	98.9	99.0	P/P	90 - 110
Cadmium	98.6	99.4	P/P	90 - 110
Cadmium	99.4	97.3	P/P	90 - 110
Chromium	100	104	P/P	90 - 110
Chromium	104	98.5	P/P	90 - 110
Copper	93.5	95.8	P/P	90 - 110
Copper	99.3	93.5	P/P	90 - 110
Lead	97.6	96.5	P/P	90 - 110
Nickel	100	94.7	P/P	90 - 110
Nickel	94.7	96.9	P/P	90 - 110
Silver	97.6	98.5	P/P	90 - 110
Silver	98.5	96.3	P/P	90 - 110
Zinc	100	95.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
 Run ID: A75643
 Included Lab Sample IDs: 1884116, 1884117

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	102	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
 Run ID: A75667
 Included Lab Sample IDs: 1884117

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	97.6	94.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
 Run ID: A75710
 Included Lab Sample IDs: 1884088, 1884089

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	95.5	97.6	P/P	90 - 110
Fluoride	97.6	97.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
 Run ID: A75965
 Included Lab Sample IDs: 1884116

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	98.0	96.5	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 180.1 Rev. 2.0	Turbidity				4.10	
EPA 200.7 Rev. 4.4	Iron	103	104 106 109			2.22
EPA 200.8 Rev. 5.4	Arsenic	101	110 108 112			1.78
	Cadmium	102	100 102 105			1.82
	Chromium	101	97.4 94.6 99.2			2.90
	Copper	99.5	91.8 92.8 99.2			1.01
	Lead	101	108 107 105			0.403
	Nickel	101	99.8 98.2 101			1.66
	Silver	103	94.9 96.4 97.6			1.54
	Zinc	101	93.6 94.2 101			0.602
EPA 350.1 Rev. 2.0	Ammonia-N	105	107 107			0.209
	Ammonia-N	103	110 104			5.27
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	98.4 97.8			0.559
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	104 102			1.46
EPA 365.1 Rev. 2.0	Total-P	104	101 96.1			4.26
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	98.1 100			2.12
SM 2320 B-97	Total Alkalinity	104			0.131	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
SM 4500 F-C-97	Fluoride	99.4	92.1	92.8		0.480
SM 5310 B-00	Organic Carbon	98.0	91.7	92.1		0.397

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1884088, 1884089
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1884116, 1884117
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1884116, 1884117
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1884090, 1884091
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1884090, 1884091
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1884090, 1884091
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1884090, 1884091
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1884092, 1884093
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1884088, 1884089
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1884088, 1884089
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1884088, 1884089
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1884090, 1884091

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	03/29/2017			03/29/2017 17:01	Blanca Fach	1884088, 1884089
EPA 200.7 Rev. 4.4	03/29/2017	04/04/2017	Elliott D. Healy	04/06/2017	Martin Acosta	1884116, 1884117
EPA 200.8 Rev. 5.4	03/29/2017	04/04/2017	Elliott D. Healy	04/06/2017	Betina Topolski	1884116, 1884117
	03/29/2017	04/04/2017	Elliott D. Healy	04/07/2017	Betina Topolski	1884117
	03/29/2017	04/04/2017	Elliott D. Healy	04/24/2017	Betina Topolski	1884116
EPA 350.1 Rev. 2.0	03/29/2017			03/29/2017	Julie Michelle Frank	1884090
	03/29/2017			03/30/2017	Julie Michelle Frank	1884091
EPA 351.2 Rev. 2.0	03/29/2017	03/30/2017	Adrian Shelby	03/31/2017	Joseph Suarez	1884090, 1884091
EPA 353.2 Rev. 2.0	03/29/2017			04/03/2017	Beverly Y. Sanders	1884090, 1884091
EPA 365.1 Rev. 2.0	03/29/2017	03/31/2017	Adrian Shelby	04/03/2017	Lipi Saha	1884090, 1884091
EPA 365.1 Rev. 2.0 dissolved	03/29/2017			03/29/2017 14:39	Anthony C. Onicha	1884092
	03/29/2017			03/29/2017 14:40	Anthony C. Onicha	1884093
SM 2320 B-97	03/29/2017			04/06/2017	Dale L. Simmons	1884088, 1884089
SM 2540 D-97	03/29/2017			03/31/2017	Yijie Li	1884088, 1884089
SM 4500 F-C-97	03/29/2017			04/10/2017	Dale L. Simmons	1884088, 1884089
SM 5310 B-00	03/29/2017			03/30/2017	Julie Michelle Frank	1884090, 1884091