

Chemical Analysis Report

SW-DIST-2017-06-02-01

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

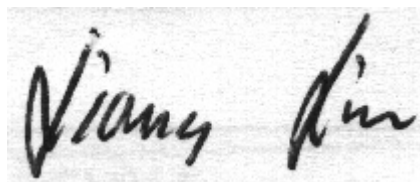
Event Description: **Reference Lake**
Request ID: **RQ-2017-05-29-19**
Customer: **SW-DIST**
Project ID: **LAKESREF**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Judy Ashton

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 26-JUN-2017 15:47

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: Lake Rosalie

Collection Date/Time: 06/01/2017 14:35

Field ID: TP12051L

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1903324	EPA 300.0	Bromide**	0.052		mg Br/L	P326740	
	EPA 300.0 Rev. 2.1	Chloride	15	A	mg Cl/L	P326860	
		Sulfate	12	A	mg SO4/L	P326862	
	SM 2120 B	Color (true)	51		PCU	P326236	
	SM 2320 B-97	Total Alkalinity	21		mg CaCO3/L	P326591	
	SM 4500 F-C-97	Fluoride	0.090	I	mg F/L	P326595	
1903325	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P326187	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.73		mg N/L	P326318	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P326265	
	EPA 365.1 Rev. 2.0	Total-P	0.046		mg P/L	P326260	
1903326	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P326177	
1903335	EPA 200.7 Rev. 4.4	Calcium	9.34		mg/L	P326217	
		Iron	250		ug/L	P326217	
		Magnesium	4.29		mg/L	P326217	
		Potassium	4.2		mg/L	P326217	
		Sodium	7.6		mg/L	P326217	
		Zinc	5.0	U	ug/L	P326217	
	EPA 200.8 Rev. 5.4	Arsenic	0.55		ug/L	P326217	
		Cadmium	0.020	U	ug/L	P326217	
		Chromium	0.40	U	ug/L	P326217	
		Copper	0.40	I	ug/L	P326217	
		Lead	0.22		ug/L	P326217	
		Nickel	0.34	I	ug/L	P326217	
		Silver	0.010	U	ug/L	P326217	

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P326217

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
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P326217

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326217

Component	Result	Code	Units
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0
Batch ID: P326740

Component	Result	Code	Units
Bromide	0.016	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326860

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326862

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326187

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326318

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326265

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326260

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326177

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
Batch ID: P326236

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P326591

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

Reference Method: SM 4500 F-C-97
Batch ID: P326595

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326217

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	106		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	99.6		P	85 - 115
Sodium	101		P	85 - 115
Zinc	99.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326217

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	91.0		P	85 - 115
Cadmium	98.7		P	85 - 115
Chromium	90.5		P	85 - 115
Copper	96.5		P	85 - 115
Lead	91.6		P	85 - 115
Nickel	97.9		P	85 - 115
Silver	94.8		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P326740

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326860

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.2		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326862

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326187

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	102		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326318

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326265

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326260

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.9		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326177

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.7		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P326591

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P326595

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326217

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326217

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902426	Calcium	107		P	80 - 120
1902426	Iron	104		P	80 - 120
1902426	Magnesium	104		P	80 - 120
1902426	Potassium	96.7		P	80 - 120
1902426	Sodium	102		P	80 - 120
1902426	Zinc	96.3		P	80 - 120
1903011	Calcium	107		P	80 - 120
1903011	Iron	106	105	P/P	80 - 120
1903011	Magnesium	105		P	80 - 120
1903011	Potassium	99.0	99.1	P/P	80 - 120
1903011	Sodium	103		P	80 - 120
1903011	Zinc	98.5	98.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326217

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1902426	Arsenic	95.1		P	80 - 120
1902426	Cadmium	99.0		P	80 - 120
1902426	Chromium	95.1		P	80 - 120
1902426	Copper	91.9		P	80 - 120
1902426	Lead	94.3		P	80 - 120
1902426	Nickel	93.3		P	80 - 120
1902426	Silver	95.0		P	80 - 120
1903011	Arsenic	97.4	98.4	P/P	80 - 120
1903011	Cadmium	101	103	P/P	80 - 120
1903011	Chromium	94.0	94.8	P/P	80 - 120
1903011	Copper	93.2	94.5	P/P	80 - 120
1903011	Lead	98.8	100	P/P	80 - 120
1903011	Nickel	95.0	95.9	P/P	80 - 120
1903011	Silver	94.7	95.6	P/P	80 - 120

Reference Method: EPA 300.0
Batch ID: P326740

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1903324	Bromide	102	105	P/P	90 - 110
1904305	Bromide	97.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326860

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1903324	Chloride	106		P	90 - 110
1903963	Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1903324	Sulfate	104		P	90 - 110
1903963	Sulfate	95.3		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326187

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1903266	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326318

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1903399	Kjeldahl Nitrogen	95.0	93.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1903325	NO2NO3-N	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326260

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1903268	Total-P	95.4	94.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326177

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1903194	O-Phosphate-P	95.0	95.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P326595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1904081	Fluoride	99.4	99.4	P/P	91 - 105

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P326217

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903011	Calcium	1.20	Spike	P	0 - 20
1903011	Iron	0.847	Spike	P	0 - 20
1903011	Magnesium	0.378	Spike	P	0 - 20
1903011	Potassium	0.0319	Spike	P	0 - 20
1903011	Sodium	0.806	Spike	P	0 - 20
1903011	Zinc	0.202	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P326217

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903011	Arsenic	0.968	Spike	P	0 - 20
1903011	Cadmium	1.70	Spike	P	0 - 20
1903011	Chromium	0.895	Spike	P	0 - 20
1903011	Copper	1.24	Spike	P	0 - 20
1903011	Lead	1.20	Spike	P	0 - 20
1903011	Nickel	0.929	Spike	P	0 - 20
1903011	Silver	1.03	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P326740

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903324	Bromide	2.68	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903324	Chloride	2.98	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P326862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903324	Sulfate	3.34	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326187

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903266	Ammonia-N	0.760	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P326318

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903399	Kjeldahl Nitrogen	0.997	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P326265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903325	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326260

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903268	Total-P	0.595	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903194	O-Phosphate-P	0.630	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P326236

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1903147	Color (true)	3.33	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P326591

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904081	Total Alkalinity	0.0261	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P326595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1904081	Fluoride	0.0	Spike	P	0 - 3.0

* 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 365.1 Rev. 2.0 dissolved
Run ID: A76839
Included Lab Sample IDs: 1903326

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A76841
Included Lab Sample IDs: 1903325

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A76866
Included Lab Sample IDs: 1903324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	85 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A76880
Included Lab Sample IDs: 1903325

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A76899
Included Lab Sample IDs: 1903335

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	92.9	91.2	P/P	90 - 110
Cadmium	96.2	97.1	P/P	90 - 110
Silver	95.0	94.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A76900
Included Lab Sample IDs: 1903335

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	104	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Magnesium	103	103	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	101	103	P/P	90 - 110
Zinc	101	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A76936
Included Lab Sample IDs: 1903335

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	95.4	94.8	P/P	90 - 110
Copper	95.0	94.6	P/P	90 - 110
Lead	94.2	94.0	P/P	90 - 110
Nickel	94.6	93.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A76950
Included Lab Sample IDs: 1903325

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A76957

Included Lab Sample IDs: 1903325

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.9	95.3	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A77001

Included Lab Sample IDs: 1903324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A77001

Included Lab Sample IDs: 1903324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.1	99.0	P/P	90 - 110

Reference Method: EPA 300.0

Run ID: A77062

Included Lab Sample IDs: 1903324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	97.9	98.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A77076

Included Lab Sample IDs: 1903324

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	98.3	P/P	90 - 110
Sulfate	108	105	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 200.7 Rev. 4.4	Calcium	105	107			1.20
	Iron	106	104	106		0.847
	Magnesium	103	104	105		0.378
	Potassium	99.6	96.7	99.0	99.1	0.0319
	Sodium	101	102	103		0.806
	Zinc	99.8	96.3	98.5	98.7	0.202
EPA 200.8 Rev. 5.4	Arsenic	91.0	95.1	97.4	98.4	0.968
	Cadmium	98.7	99.0	101	103	1.70
	Chromium	90.5	95.1	94.0	94.8	0.895
	Copper	96.5	91.9	93.2	94.5	1.24

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.8 Rev. 5.4	Lead	91.6	94.3	98.8	100		1.20
	Nickel	97.9	93.3	95.0	95.9		0.929
	Silver	94.8	95.0	94.7	95.6		1.03
EPA 300.0	Bromide	105	102	105	97.5		2.68
EPA 300.0 Rev. 2.1	Chloride	99.2	106	97.9		2.98	
	Sulfate	99.9	104	95.3		3.34	
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	102			0.760
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	95.0	93.8			0.997
EPA 353.2 Rev. 2.0	NO2NO3-N	104	103	103			0.0
EPA 365.1 Rev. 2.0	Total-P	96.9	95.4	94.5			0.595
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.7	95.0	95.6			0.630
SM 2120 B	Color (true)					3.33	
SM 2320 B-97	Total Alkalinity	102				0.0261	
SM 4500 F-C-97	Fluoride	98.2	99.4	99.4			0.0

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	1903335
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1903335
EPA 300.0 / E31780	Bromide in aqueous matrices	1903324
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1903324
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1903324
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1903325
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1903325
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1903325
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1903325
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1903326
SM 2120 B / E31780	True Color measured at 450 nm	1903324
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1903324
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1903324

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	06/02/2017	06/05/2017	Elliott D. Healy	06/06/2017	Betina Topolski	1903335
EPA 200.8 Rev. 5.4	06/02/2017	06/05/2017	Elliott D. Healy	06/07/2017	Robert K Palmer	1903335
EPA 300.0	06/02/2017			06/13/2017	Ping Hua	1903324
EPA 300.0 Rev. 2.1	06/02/2017			06/14/2017	Julia Storbeck	1903324
EPA 350.1 Rev. 2.0	06/02/2017			06/02/2017	Julie Michelle Frank	1903325
EPA 351.2 Rev. 2.0	06/02/2017	06/07/2017	Adrian Shelby	06/08/2017	Joseph Suarez	1903325
EPA 353.2 Rev. 2.0	06/02/2017			06/06/2017	Beverly Y. Sanders	1903325
EPA 365.1 Rev. 2.0	06/02/2017	06/06/2017	Adrian Shelby	06/08/2017	Lipi Saha	1903325
EPA 365.1 Rev. 2.0 dissolved	06/02/2017			06/02/2017 14:37	Anthony C. Onicha	1903326
SM 2120 B	06/02/2017			06/02/2017 15:33	Tanya Welborn	1903324
SM 2320 B-97	06/02/2017			06/09/2017	Dale L. Simmons	1903324
SM 4500 F-C-97	06/02/2017			06/09/2017	Dale L. Simmons	1903324