Chemical Analysis Report

SW-DIST-2017-06-15-01

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

Event Description: **Ref Lake-Arbuckle**
Request ID: **RQ-2017-06-12-26**
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

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 07-JUL-2017 13:20

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 ARBUCKLE REF LAKE **Collection Date/Time: 06/14/2017 13:05**

Field ID: ARBUCKL155 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1906577	EPA 300.0	Bromide**	0.073		mg Br/L	P327508	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P327214	
		Sulfate	32		mg SO4/L	P327216	
	SM 2120 B	Color (true)	57		PCU	P326905	
	SM 2320 B-97	Total Alkalinity	24		mg CaCO3/L	P327450	
	SM 4500 F-C-97	Fluoride	0.089	I	mg F/L	P327454	
1906578	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P326988	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P327013	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P327299	
	EPA 365.1 Rev. 2.0	Total-P	0.065		mg P/L	P326981	
1906579	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P326932	
1906590	EPA 200.7 Rev. 4.4	Calcium	13.7		mg/L	P327071	
		Iron	160		ug/L	P327071	
		Magnesium	7.22		mg/L	P327071	
		Potassium	6.8		mg/L	P327071	
		Sodium	8.6		mg/L	P327071	
		Zinc	5.0	U	ug/L	P327071	
	EPA 200.8 Rev. 5.4	Arsenic	0.56		ug/L	P327071	
		Cadmium	0.020	U	ug/L	P327071	
		Chromium	0.40	U	ug/L	P327071	
		Copper	1.06		ug/L	P327071	
		Lead	0.37		ug/L	P327071	
		Nickel	0.30	I	ug/L	P327071	
		Silver	0.010	U	ug/L	P327071	

Ref. Method and Comment:
EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries 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: P327071

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: P327071

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327071

Component	Result	Code	Units
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

Reference Method: EPA 300.0
Batch ID: P327508

Component	Result	Code	Units
Bromide	0.016	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327214

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327216

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326988

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327013

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327299

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326981

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326932

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326932

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

Reference Method: SM 2120 B
Batch ID: P326905

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P327450

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

Reference Method: SM 4500 F-C-97
Batch ID: P327454

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: P327071

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	102		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	96.2		P	85 - 115
Sodium	100		P	85 - 115
Zinc	97.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327071

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	97.3		P	85 - 115
Copper	97.5		P	85 - 115
Lead	96.7		P	85 - 115
Nickel	99.7		P	85 - 115
Silver	97.6		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P327508

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Bromide	101		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327214

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327216

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326988

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: P327013

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327299

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326981

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326932

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

Reference Method: SM 2320 B-97
Batch ID: P327450

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P327454

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	92 - 103

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327071

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906311	Calcium	95.3		P	80 - 120
1906311	Iron	102		P	80 - 120
1906311	Magnesium	98.3		P	80 - 120
1906311	Potassium	95.5		P	80 - 120
1906311	Sodium	96.3		P	80 - 120
1906311	Zinc	97.0		P	80 - 120
1906438	Calcium	100		P	80 - 120
1906438	Iron	102	102	P/P	80 - 120
1906438	Magnesium	102	101	P/P	80 - 120
1906438	Potassium	97.0	97.3	P/P	80 - 120
1906438	Sodium	100	99.3	P/P	80 - 120
1906438	Zinc	96.5	97.1	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327071

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906311	Arsenic	103		P	80 - 120
1906311	Cadmium	101		P	80 - 120
1906311	Chromium	95.5		P	80 - 120
1906311	Copper	95.5		P	80 - 120
1906311	Lead	98.2		P	80 - 120
1906311	Nickel	98.1		P	80 - 120
1906311	Silver	97.6		P	80 - 120
1906438	Arsenic	99.4	100	P/P	80 - 120
1906438	Cadmium	100	104	P/P	80 - 120
1906438	Chromium	97.1	98.6	P/P	80 - 120
1906438	Copper	94.3	95.7	P/P	80 - 120
1906438	Lead	96.9	98.4	P/P	80 - 120
1906438	Nickel	97.2	97.2	P/P	80 - 120
1906438	Silver	98.3	99.9	P/P	80 - 120

Reference Method: EPA 300.0
Batch ID: P327508

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906742	Bromide	98.4		P	90 - 110
1908515	Bromide	100	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906485	Chloride	100		P	90 - 110
1906580	Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327216

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906485	Sulfate	97.5		P	90 - 110
1906580	Sulfate	97.6		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327299

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906578	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906491	Total-P	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326932

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906579	O-Phosphate-P	95.5	95.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P327454

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1906739	Fluoride	97.0	95.9	P/P	91 - 105

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P327071

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906438	Calcium	0.310	Spike	P	0 - 20
1906438	Iron	0.125	Spike	P	0 - 20
1906438	Magnesium	0.490	Spike	P	0 - 20
1906438	Potassium	0.224	Spike	P	0 - 20
1906438	Sodium	0.517	Spike	P	0 - 20
1906438	Zinc	0.620	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P327071

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906438	Arsenic	0.658	Spike	P	0 - 20
1906438	Cadmium	3.57	Spike	P	0 - 20
1906438	Chromium	1.48	Spike	P	0 - 20
1906438	Copper	1.54	Spike	P	0 - 20
1906438	Lead	1.61	Spike	P	0 - 20
1906438	Nickel	0.0394	Spike	P	0 - 20
1906438	Silver	1.62	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0
Batch ID: P327508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1908515	Bromide	1.28	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906485	Chloride	1.78	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P327216

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906485	Sulfate	1.77	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P326988

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906521	Ammonia-N	1.07	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P327013

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906610	Kjeldahl Nitrogen	1.26	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P327299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906578	NO2NO3-N	0.491	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P326981

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906491	Total-P	0.0737	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P326932

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906579	O-Phosphate-P	0.300	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B
Batch ID: P326905

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906582	Color (true)	2.40	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P327450

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906739	Total Alkalinity	0.0455	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P327454

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1906739	Fluoride	1.04	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: SM 2120 B
Run ID: A77120
Included Lab Sample IDs: 1906577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.1	103	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A77126
Included Lab Sample IDs: 1906579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A77147
Included Lab Sample IDs: 1906578

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A77167
Included Lab Sample IDs: 1906578

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A77183
Included Lab Sample IDs: 1906577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	100	P/P	90 - 110
Sulfate	103	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A77212
Included Lab Sample IDs: 1906578

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.7	97.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A77213
Included Lab Sample IDs: 1906590

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	100	P/P	90 - 110
Iron	100	101	P/P	90 - 110
Magnesium	100	101	P/P	90 - 110
Potassium	98.3	98.4	P/P	90 - 110
Sodium	101	99.0	P/P	90 - 110
Zinc	98.3	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A77262
Included Lab Sample IDs: 1906578

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

Reference Method: SM 2320 B-97
Run ID: A77329
Included Lab Sample IDs: 1906577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A77329
Included Lab Sample IDs: 1906577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.0	97.6	P/P	90 - 110

Reference Method: EPA 300.0
Run ID: A77352
Included Lab Sample IDs: 1906577

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A77402
Included Lab Sample IDs: 1906590

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.8	97.7	P/P	90 - 110
Cadmium	98.7	98.6	P/P	90 - 110
Chromium	97.7	99.0	P/P	90 - 110
Copper	97.7	98.5	P/P	90 - 110
Lead	96.3	97.3	P/P	90 - 110
Nickel	98.1	98.5	P/P	90 - 110
Silver	91.1	91.1	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	Calcium	101	95.3	100				0.310
	Iron	102	102	102	102			0.125
	Magnesium	104	98.3	102	101			0.490
	Potassium	96.2	95.5	97.0	97.3			0.224
	Sodium	100	96.3	100	99.3			0.517
	Zinc	97.5	97.0	96.5	97.1			0.620
EPA 200.8 Rev. 5.4	Arsenic	100	103	99.4	100			0.658
	Cadmium	100	101	100	104			3.57
	Chromium	97.3	95.5	97.1	98.6			1.48
	Copper	97.5	95.5	94.3	95.7			1.54
	Lead	96.7	98.2	96.9	98.4			1.61
	Nickel	99.7	98.1	97.2	97.2			0.0394
	Silver	97.6	97.6	98.3	99.9			1.62
EPA 300.0	Bromide	101	100	102	98.4			1.28
EPA 300.0 Rev. 2.1	Chloride	101	100	99.3			1.78	
	Sulfate	100	97.5	97.6			1.77	
EPA 350.1 Rev. 2.0	Ammonia-N	103						1.07
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.2						1.26
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	102				0.491
EPA 365.1 Rev. 2.0	Total-P	102	100	100				0.0737
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.9	95.8	95.5				0.300
SM 2120 B	Color (true)						2.40	
SM 2320 B-97	Total Alkalinity	103					0.0455	
SM 4500 F-C-97	Fluoride	96.1	97.0	95.9				1.04

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	1906590
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1906590
EPA 300.0 / E31780	Bromide in aqueous matrices	1906577

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1906577
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1906577
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1906578
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1906578
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1906578
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1906578
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1906579
SM 2120 B / E31780	True Color measured at 450 nm	1906577
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1906577
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1906577

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	06/15/2017	06/19/2017	Elliott D. Healy	06/20/2017	Betina Topolski	1906590
EPA 200.8 Rev. 5.4	06/15/2017	06/19/2017	Elliott D. Healy	06/26/2017	Nadine Brooks	1906590
EPA 300.0	06/15/2017			06/26/2017	Ping Hua	1906577
EPA 300.0 Rev. 2.1	06/15/2017			06/20/2017	Julia Storbeck	1906577
EPA 350.1 Rev. 2.0	06/15/2017			06/16/2017	Sofia Elnemr	1906578
EPA 351.2 Rev. 2.0	06/15/2017	06/19/2017	Adrian Shelby	06/20/2017	Tanya Welborn	1906578
EPA 353.2 Rev. 2.0	06/15/2017			06/22/2017	Beverly Y. Sanders	1906578
EPA 365.1 Rev. 2.0	06/15/2017	06/16/2017	Vijayalakshmi Reddy	06/19/2017	Lipi Saha	1906578
EPA 365.1 Rev. 2.0 dissolved	06/15/2017			06/15/2017 14:44	Anthony C. Onicha	1906579
SM 2120 B	06/15/2017			06/15/2017 15:40	Tanya Welborn	1906577
SM 2320 B-97	06/15/2017			06/24/2017	Dale L. Simmons	1906577
SM 4500 F-C-97	06/15/2017			06/24/2017	Dale L. Simmons	1906577