Chemical Analysis Report

SW-DIST-2016-07-29-01

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-2016-07-25-90**
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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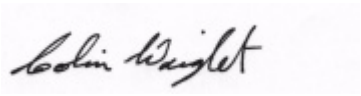
Certified by: Colin Wright, Environmental Administrator

Date Certified: 19-AUG-2016 10:07



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: REF. LAKE MCKETHAN **Collection Date/Time: 07/28/2016 10:55**

Field ID: TPMCTHN01L Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1820254	EPA 300.0	Bromide**	0.016	U	mg Br/L	P308951	
	EPA 300.0 Rev. 2.1	Chloride	2.7		mg Cl/L	P308926	
		Sulfate	0.20	U	mg SO4/L	P308930	
	SM 2120 B	Color (true)	12	A	PCU	P308876	
	SM 2320 B-97	Total Alkalinity	5.4		mg CaCO3/L	P309296	
	SM 4500 F-C-97	Fluoride	0.052	I	mg F/L	P309299	
1820255	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P308957	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.74		mg N/L	P309377	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P309207	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P309492	
1820256	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P308875	
1820259	EPA 200.7 Rev. 4.4	Calcium	2.07		mg/L	P308969	
		Iron	34	I	ug/L	P308969	
		Magnesium	0.77		mg/L	P308969	
		Potassium	0.30	U	mg/L	P308969	
		Sodium	1.7	I	mg/L	P308969	
		Zinc	5.0	U	ug/L	P308969	
	EPA 200.8 Rev. 5.4	Arsenic	0.068	I	ug/L	P308969	
		Cadmium	0.020	U	ug/L	P308969	
		Chromium	0.050	U	ug/L	P308969	
		Copper	0.10	U	ug/L	P308969	
		Lead	0.050	U	ug/L	P308969	
		Nickel	0.050	U	ug/L	P308969	
		Silver	0.0050	U	ug/L	P308969	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P308969

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: P308969

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308969

Component	Result	Code	Units
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0
Batch ID: P308951

Component	Result	Code	Units
Bromide	0.016	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308926

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308930

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308957

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309377

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309207

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309492

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P308875

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: P308876

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P309296

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

Reference Method: SM 4500 F-C-97
Batch ID: P309299

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: P308969

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	103		P	85 - 115
Sodium	104		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308969

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	95.8		P	85 - 115
Cadmium	98.3		P	85 - 115
Chromium	101		P	85 - 115
Copper	92.6		P	85 - 115
Lead	94.9		P	85 - 115
Nickel	93.0		P	85 - 115
Silver	94.9		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P308951

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308926

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.3		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308930

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308957

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309377

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: P309207

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309492

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P308875

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

Reference Method: SM 2320 B-97
Batch ID: P309296

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

Reference Method: SM 4500 F-C-97
Batch ID: P309299

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.7		P	92 - 103

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P308969

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P308969

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819297	Calcium	104		P	80 - 120
1819297	Iron	105		P	80 - 120
1819297	Magnesium	104		P	80 - 120
1819297	Potassium	102		P	80 - 120
1819297	Sodium	102		P	80 - 120
1819297	Zinc	97.2		P	80 - 120
1820259	Calcium	107	110	P/P	80 - 120
1820259	Iron	107	108	P/P	80 - 120
1820259	Magnesium	109	111	P/P	80 - 120
1820259	Potassium	109	110	P/P	80 - 120
1820259	Sodium	105	107	P/P	80 - 120
1820259	Zinc	100	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308969

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819297	Arsenic	96.2		P	80 - 120
1819297	Cadmium	98.2		P	80 - 120
1819297	Chromium	100		P	80 - 120
1819297	Copper	88.7		P	80 - 120
1819297	Lead	96.3		P	80 - 120
1819297	Nickel	90.4		P	80 - 120
1819297	Silver	95.9		P	80 - 120
1820259	Arsenic	95.6	97.7	P/P	80 - 120
1820259	Cadmium	102	101	P/P	80 - 120
1820259	Chromium	105	104	P/P	80 - 120
1820259	Copper	92.9	94.2	P/P	80 - 120
1820259	Lead	98.2	98.0	P/P	80 - 120
1820259	Nickel	92.6	94.7	P/P	80 - 120
1820259	Silver	97.6	97.2	P/P	80 - 120

Reference Method: EPA 300.0
Batch ID: P308951

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1820254	Bromide	100	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308926

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815826	Chloride	98.9		P	90 - 110
1820254	Chloride	98.8	99.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308930

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815826	Sulfate	95.8		P	90 - 110
1820254	Sulfate	95.2	95.4	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308957

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1819838	Ammonia-N	97.5	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309377

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1820255	Kjeldahl Nitrogen	97.9	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309207

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1820110	NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309492

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1820685	Total-P	101	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P308875

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1820256	O-Phosphate-P	99.8	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P309299

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1820683	Fluoride	98.3	98.9	P/P	91 - 105

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P308969

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820259	Calcium	1.98	Spike	P	0 - 20
1820259	Iron	1.38	Spike	P	0 - 20
1820259	Magnesium	1.74	Spike	P	0 - 20
1820259	Potassium	1.58	Spike	P	0 - 20
1820259	Sodium	1.32	Spike	P	0 - 20
1820259	Zinc	5.22	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308969

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820259	Arsenic	2.23	Spike	P	0 - 20
1820259	Cadmium	1.73	Spike	P	0 - 20
1820259	Chromium	0.582	Spike	P	0 - 20
1820259	Copper	1.32	Spike	P	0 - 20
1820259	Lead	0.287	Spike	P	0 - 20
1820259	Nickel	2.21	Spike	P	0 - 20
1820259	Silver	0.438	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P308951

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820254	Bromide	0.444	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308926

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820254	Chloride	0.140	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308930

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820254	Sulfate	0.229	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P308957

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1819838	Ammonia-N	1.25	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309377

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820255	Kjeldahl Nitrogen	2.25	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309207

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820110	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820685	Total-P	1.54	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P308875

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820256	O-Phosphate-P	0.798	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P308876

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820254	Color (true)	0.809	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P309296

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820683	Total Alkalinity	0.151	Sample	P	0 - 4.8

Reference Method: SM 4500 F-C-97
Batch ID: P309299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1820683	Fluoride	0.525	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 300.0
Run ID: A70802
Included Lab Sample IDs: 1820254

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	97.4	99.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A70802
Included Lab Sample IDs: 1820254

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	103	P/P	90 - 110
Sulfate	96.8	97.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A70833
Included Lab Sample IDs: 1820256

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	98.4	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A70834
Included Lab Sample IDs: 1820254

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.8	100	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A70871
Included Lab Sample IDs: 1820255

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	99.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A70934
Included Lab Sample IDs: 1820259

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	102	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	103	103	P/P	90 - 110
Potassium	102	102	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Zinc	98.9	99.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A70940
Included Lab Sample IDs: 1820259

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	97.5	97.7	P/P	90 - 110
Chromium	99.9	102	P/P	90 - 110
Lead	93.2	92.7	P/P	90 - 110
Silver	93.2	92.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A70949
Included Lab Sample IDs: 1820255

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A70963
Included Lab Sample IDs: 1820259

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	94.7	93.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A70963
Included Lab Sample IDs: 1820259

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	91.5	91.1	P/P	90 - 110
Nickel	92.3	91.2	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A70974
Included Lab Sample IDs: 1820254

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A70974
Included Lab Sample IDs: 1820254

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A71051
Included Lab Sample IDs: 1820255

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.6	94.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71106
Included Lab Sample IDs: 1820255

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	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	Calcium	106	104	107	110			1.98
	Iron	105	105	107	108			1.38
	Magnesium	107	104	109	111			1.74
	Potassium	103	102	109	110			1.58
	Sodium	104	102	105	107			1.32
	Zinc	100	97.2	100	106			5.22
EPA 200.8 Rev. 5.4	Arsenic	95.8	96.2	95.6	97.7			2.23
	Cadmium	98.3	98.2	102	101			1.73
	Chromium	101	100	105	104			0.582
	Copper	92.6	88.7	92.9	94.2			1.32

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 200.8 Rev. 5.4	Lead	94.9	96.3	98.2	98.0			0.287
	Nickel	93.0	90.4	92.6	94.7			2.21
	Silver	94.9	95.9	97.6	97.2			0.438
EPA 300.0	Bromide	100	100	101				0.444
EPA 300.0 Rev. 2.1	Chloride	99.3	98.8	99.0	98.9			0.140
	Sulfate	96.1	95.2	95.4	95.8			0.229
EPA 350.1 Rev. 2.0	Ammonia-N	98.9	97.5	99.2				1.25
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	97.9	102				2.25
EPA 353.2 Rev. 2.0	NO2NO3-N	106	106	106				0.0
EPA 365.1 Rev. 2.0	Total-P	101	101	99.2				1.54
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	99.8	101				0.798
SM 2120 B	Color (true)						0.809	
SM 2320 B-97	Total Alkalinity	103					0.151	
SM 4500 F-C-97	Fluoride	98.7	98.3	98.9				0.525

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	1820259
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1820259
EPA 300.0 / E31780	Bromide in aqueous matrices	1820254
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1820254
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1820254
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1820255
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1820255
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1820255
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1820255
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1820256
SM 2120 B / E31780	True Color measured at 450 nm	1820254
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1820254
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1820254

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	07/29/2016	08/01/2016	Elliott D. Healy	08/03/2016	Joshua Ayres	1820259
EPA 200.8 Rev. 5.4	07/29/2016	08/01/2016	Elliott D. Healy	08/04/2016	Charles J. Peterson	1820259
EPA 300.0	07/29/2016			07/30/2016	Ping Hua	1820254
EPA 300.0 Rev. 2.1	07/29/2016			07/30/2016	Ping Hua	1820254
EPA 350.1 Rev. 2.0	07/29/2016			08/01/2016	Julie Michelle Frank	1820255
EPA 351.2 Rev. 2.0	07/29/2016	08/09/2016	Sofia Elnemr	08/10/2016	Virginia P. Brown	1820255
EPA 353.2 Rev. 2.0	07/29/2016			08/04/2016	Beverly Y. Sanders	1820255
EPA 365.1 Rev. 2.0	07/29/2016	08/10/2016	Vijayalakshmi Reddy	08/11/2016	Lipi Saha	1820255
EPA 365.1 Rev. 2.0 dissolved	07/29/2016			07/29/2016 14:30	Julia Storbeck	1820256
SM 2120 B	07/29/2016			07/29/2016 14:36	Rochelle Y Jackson	1820254
SM 2320 B-97	07/29/2016			08/04/2016	Dale L. Simmons	1820254
SM 4500 F-C-97	07/29/2016			08/04/2016	Dale L. Simmons	1820254