Chemical Analysis Report

NE-DIST-2016-08-11-01

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

Event Description: **Reference Lakes**
Request ID: **RQ-2016-08-08-65**
Customer: **NE-DIST**
Project ID: **LAKESREF**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Jacksonville, FL 32256-7577
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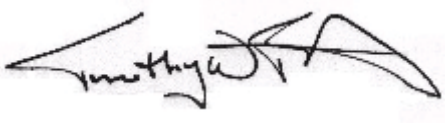
Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 08-SEP-2016 09:02



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: GORE LAKE CENTER **Collection Date/Time: 08/10/2016 10:25**

Field ID: 20030339 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1823277	EPA 180.1 Rev. 2.0	Turbidity	1.0		NTU	P309608	
	EPA 300.0	Bromide**	0.12		mg Br/L	P310191	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P309867	
		Sulfate	3.3		mg SO4/L	P309871	
	SM 2120 B	Color (true)	110		PCU	P309631	
	SM 2320 B-97	Total Alkalinity	39		mg CaCO3/L	P309876	
	SM 2540 C-97	TDS	116		mg/L	P310302	
	SM 2540 D-97	TSS	2	U	mg/L	P310134	
	SM 4500 F-C-97	Fluoride	0.048	I	mg F/L	P309878	
1823278	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P309748	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P309862	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P309820	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P309805	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P310262	
1823279	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.026		mg P/L	P309604	
1823282	EPA 200.7 Rev. 4.4	Calcium	16.9		mg/L	P309745	
		Iron	97	I	ug/L	P309745	
		Magnesium	2.70		mg/L	P309745	
		Potassium	1.8		mg/L	P309745	
		Sodium	15.5		mg/L	P309745	
		Zinc	5.0	U	ug/L	P309745	
	EPA 200.8 Rev. 5.4	Arsenic	0.31		ug/L	P309745	
		Cadmium	0.020	U	ug/L	P309745	
		Chromium	0.11	I	ug/L	P309745	
		Copper	0.23	I	ug/L	P309745	
		Lead	0.13	I	ug/L	P309745	
		Nickel	0.061	I	ug/L	P309745	
		Silver	0.0050	U	ug/L	P309745	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: The result was confirmed on 08/28/2016.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: High concentration of orthophosphate in comparison to the total phosphorus concentration confirmed on 08/30/2016.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P309608

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309745

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309745

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: P309745

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0
Batch ID: P310191

Component	Result	Code	Units
Bromide	0.016	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309867

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309871

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309748

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309862

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309820

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309805

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309604

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

Reference Method: SM 2120 B
Batch ID: P309631

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P309876

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

Reference Method: SM 2540 C-97
Batch ID: P310302

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310134

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P309878

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P310262

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: P309745

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	106		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	101		P	85 - 115
Sodium	104		P	85 - 115
Zinc	99.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309745

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	101		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	101		P	85 - 115
Copper	99.3		P	85 - 115
Lead	101		P	85 - 115
Nickel	100		P	85 - 115
Silver	101		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P310191

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309867

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309871

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	93.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309748

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309862

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309820

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309805

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309604

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.3		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P309876

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

Reference Method: SM 4500 F-C-97
Batch ID: P309878

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P310262

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.7		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309745

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1821387	Calcium	102		P	80 - 120
1821387	Iron	106		P	80 - 120
1821387	Magnesium	104		P	80 - 120
1821387	Potassium	101		P	80 - 120
1821387	Sodium	103		P	80 - 120
1821387	Zinc	100		P	80 - 120
1823155	Calcium	99.8	103	P/P	80 - 120
1823155	Iron	105	107	P/P	80 - 120
1823155	Magnesium	104	107	P/P	80 - 120
1823155	Potassium	101	101	P/P	80 - 120
1823155	Sodium	99.3	100	P/P	80 - 120
1823155	Zinc	99.6	102	P/P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309745

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1821387	Arsenic	102		P	80 - 120
1821387	Cadmium	103		P	80 - 120
1821387	Chromium	101		P	80 - 120
1821387	Copper	96.0		P	80 - 120
1821387	Lead	104		P	80 - 120
1821387	Nickel	97.6		P	80 - 120
1821387	Silver	101		P	80 - 120
1823155	Arsenic	99.3	100	P/P	80 - 120
1823155	Cadmium	101	105	P/P	80 - 120
1823155	Chromium	102	103	P/P	80 - 120
1823155	Copper	98.1	97.8	P/P	80 - 120
1823155	Lead	103	104	P/P	80 - 120
1823155	Nickel	96.8	96.8	P/P	80 - 120
1823155	Silver	102	103	P/P	80 - 120

Reference Method: EPA 300.0
Batch ID: P310191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1825042	Bromide	103	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309867

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822433	Chloride	98.2		P	90 - 110
1823277	Chloride	96.1	96.2	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309871

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1822433	Sulfate	93.3		P	90 - 110
1823277	Sulfate	95.0	94.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309748

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823278	Ammonia-N	99.5	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309862

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823237	Kjeldahl Nitrogen	92.8	96.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309820

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823278	NO2NO3-N	99.4	97.4	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309805

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823241	Total-P	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309604

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823148	O-Phosphate-P	95.9	96.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P309878

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823444	Fluoride	95.9	96.4	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P310262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1823238	Organic Carbon	99.2	103	P/P	85 - 115
1823238	Organic Carbon	99.4		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P309608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823235	Turbidity	5.13	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P309745

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823155	Calcium	1.64	Spike	P	0 - 20
1823155	Iron	2.23	Spike	P	0 - 20
1823155	Magnesium	2.35	Spike	P	0 - 20
1823155	Potassium	0.217	Spike	P	0 - 20
1823155	Sodium	0.414	Spike	P	0 - 20
1823155	Zinc	2.31	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309745

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823155	Arsenic	0.911	Spike	P	0 - 20
1823155	Cadmium	3.68	Spike	P	0 - 20
1823155	Chromium	0.624	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P309745

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823155	Copper	0.330	Spike	P	0 - 20
1823155	Lead	0.164	Spike	P	0 - 20
1823155	Nickel	0.0923	Spike	P	0 - 20
1823155	Silver	0.958	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P310191

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1825042	Bromide	1.37	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309867

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823277	Chloride	0.0554	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P309871

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823277	Sulfate	0.443	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P309748

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823278	Ammonia-N	1.99	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P309862

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823237	Kjeldahl Nitrogen	2.12	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P309820

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823278	NO2NO3-N	1.90	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P309805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823241	Total-P	0.119	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P309604

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823148	O-Phosphate-P	0.416	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P309631

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823234	Color (true)	0.429	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P309876

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823444	Total Alkalinity	0.0627	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P310302

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823236	TDS	1.03	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P309878

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823444	Fluoride	0.484	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P310262

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1823238	Organic Carbon	0.0736	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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71083
Included Lab Sample IDs: 1823279

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	99.3	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71085
Included Lab Sample IDs: 1823277

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

Reference Method: SM 2120 B
Run ID: A71092
Included Lab Sample IDs: 1823277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.8	97.1	P/P	90 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71129
Included Lab Sample IDs: 1823278

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A71156
Included Lab Sample IDs: 1823278

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A71166
Included Lab Sample IDs: 1823282

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	107	104	P/P	90 - 110
Iron	105	103	P/P	90 - 110
Magnesium	105	103	P/P	90 - 110
Potassium	104	101	P/P	90 - 110
Sodium	104	102	P/P	90 - 110
Zinc	100	99.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A71177
Included Lab Sample IDs: 1823277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.1	P/P	90 - 110
Sulfate	98.8	95.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A71178
Included Lab Sample IDs: 1823277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A71178
Included Lab Sample IDs: 1823277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A71200
Included Lab Sample IDs: 1823278

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.6	97.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A71207
Included Lab Sample IDs: 1823282

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.1	99.7	P/P	90 - 110
Cadmium	100	102	P/P	90 - 110
Chromium	100	100	P/P	90 - 110
Copper	98.1	97.0	P/P	90 - 110
Lead	99.3	99.9	P/P	90 - 110
Nickel	98.6	97.0	P/P	90 - 110
Silver	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71235
Included Lab Sample IDs: 1823278

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	96.8	P/P	90 - 110

Reference Method: EPA 300.0
Run ID: A71280
Included Lab Sample IDs: 1823277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	97.1	97.9	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A71302
Included Lab Sample IDs: 1823278

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.3	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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 180.1 Rev. 2.0	Turbidity						5.13	
EPA 200.7 Rev. 4.4	Calcium	105	99.8	103	102			1.64
	Iron	106	105	107	106			2.23
	Magnesium	106	104	107	104			2.35
	Potassium	101	101	101	101			0.217
	Sodium	104	99.3	100	103			0.414
	Zinc	99.8	99.6	102	100			2.31
EPA 200.8 Rev. 5.4	Arsenic	101	102	99.3	100			0.911
	Cadmium	101	103	101	105			3.68
	Chromium	101	101	102	103			0.624
	Copper	99.3	96.0	98.1	97.8			0.330
	Lead	101	104	103	104			0.164
	Nickel	100	97.6	96.8	96.8			0.0923
	Silver	101	101	102	103			0.958
EPA 300.0	Bromide	103	103	104				1.37
EPA 300.0 Rev. 2.1	Chloride	97.8	96.1	96.2	98.2			0.0554
	Sulfate	93.5	95.0	94.5	93.3			0.443
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	99.5	102				1.99
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	92.8	96.0				2.12
EPA 353.2 Rev. 2.0	NO2NO3-N	103	99.4	97.4				1.90
EPA 365.1 Rev. 2.0	Total-P	103	101	101				0.119
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	95.9	96.3				0.416
SM 2120 B	Color (true)						0.429	
SM 2320 B-97	Total Alkalinity	103					0.0627	
SM 2540 C-97	TDS						1.03	
SM 4500 F-C-97	Fluoride	97.7	95.9	96.4				0.484
SM 5310 B-00	Organic Carbon	99.7	99.2	99.4	103			0.0736

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1823277
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1823282
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1823282
EPA 300.0 / E31780	Bromide in aqueous matrices	1823277
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1823277
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1823277
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1823278
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1823278

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1823278
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1823278
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1823279
SM 2120 B / E31780	True Color measured at 450 nm	1823277
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1823277
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1823277
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1823277
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1823277
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1823278

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	08/11/2016			08/11/2016 16:15	Sima Feizi	1823277
EPA 200.7 Rev. 4.4	08/11/2016	08/15/2016	Elliott D. Healy	08/16/2016	Joshua Ayres	1823282
EPA 200.8 Rev. 5.4	08/11/2016	08/15/2016	Elliott D. Healy	08/17/2016	Charles J. Peterson	1823282
EPA 300.0	08/11/2016			08/23/2016	Ping Hua	1823277
EPA 300.0 Rev. 2.1	08/11/2016			08/16/2016	Ping Hua	1823277
EPA 350.1 Rev. 2.0	08/11/2016			08/15/2016	Julie Michelle Frank	1823278
EPA 351.2 Rev. 2.0	08/11/2016	08/17/2016	Sofia Elnemr	08/18/2016	Christopher Armour	1823278
EPA 353.2 Rev. 2.0	08/11/2016			08/16/2016	Beverly Y. Sanders	1823278
EPA 365.1 Rev. 2.0	08/11/2016	08/16/2016	Vijayalakshmi Reddy	08/19/2016	Lipi Saha	1823278
EPA 365.1 Rev. 2.0 dissolved	08/11/2016			08/11/2016 15:27	Virginia P. Brown	1823279
SM 2120 B	08/11/2016			08/11/2016 16:15	Rochelle Y Jackson	1823277
SM 2320 B-97	08/11/2016			08/16/2016	Dale L. Simmons	1823277
SM 2540 C-97	08/11/2016			08/15/2016	Sima Feizi	1823277
SM 2540 D-97	08/11/2016			08/15/2016	Sima Feizi	1823277
SM 4500 F-C-97	08/11/2016			08/16/2016	Dale L. Simmons	1823277
SM 5310 B-00	08/11/2016			08/23/2016	Sofia Elnemr	1823278