

Chemical Analysis Report

SW-DIST-2018-09-11-01

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

Event Description: **Reference Lake-Mattie**
Request ID: **RQ-2018-09-10-25**
Customer: **SW-DIST**
Project ID: **LAKESREF**

Send Reports to:
FL Dept. of Environmental Protection
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13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
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Certified by: Colin Wright, Program Administrator

Date Certified: 09-OCT-2018 09:06

A handwritten signature in black ink, appearing to read "Colin Wright", is shown 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 Mattie Ref. Lake

Collection Date/Time: 09/10/2018 11:40

Field ID: 23010410

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2023807	EPA 300.0	Bromide	0.013	U	mg Br/L	P352121	
	EPA 300.0 Rev. 2.1	Chloride	29		mg Cl/L	P351984	
		Sulfate	17		mg SO4/L	P351988	
		Color (true)	130	A	PCU	P351433	
	SM 2320 B-97	Total Alkalinity	21		mg CaCO3/L	P351706	
	SM 4500 F-C-97	Fluoride	0.26		mg F/L	P351709	
2023809	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P351628	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P351570	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P351692	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P351502	
2023811	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.041		mg P/L	P351445	
2023817	EPA 200.7 Rev. 4.4	Calcium	5.58		mg/L	P351526	
		Iron	86	I	ug/L	P351526	
		Magnesium	6.98		mg/L	P351526	
		Potassium	9.7		mg/L	P351526	
		Sodium	15.3		mg/L	P351526	
		Zinc	5.0	U	ug/L	P351526	
	EPA 200.8 Rev. 5.4	Arsenic	0.97		ug/L	P351526	
		Cadmium	0.020	U	ug/L	P351526	
		Chromium	0.40	U	ug/L	P351526	
		Copper	0.55	I	ug/L	P351526	
		Lead	0.13	I	ug/L	P351526	
		Nickel	0.20	U	ug/L	P351526	
		Silver	0.010	U	ug/L	P351526	

Sample Location: Field Blank_09/10/2018

Collection Date/Time: 09/10/2018 11:45

Field ID: BLANK

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2023808	EPA 300.0	Bromide	0.013	U	mg Br/L	P352121	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P351984	
		Sulfate	0.20	U	mg SO4/L	P351988	
		Color (true)	2.5	U	PCU	P351433	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P351706	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P351709	
2023810	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P351628	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P351570	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P351692	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P351564	
2023812	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P351445	
2023818	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P351526	
		Iron	30	U	ug/L	P351526	
		Magnesium	0.040	U	mg/L	P351526	
		Potassium	0.30	U	mg/L	P351526	
		Sodium	0.50	U	mg/L	P351526	
		Zinc	5.0	U	ug/L	P351526	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P351526	
		Cadmium	0.020	U	ug/L	P351526	
		Chromium	0.40	U	ug/L	P351526	
		Copper	0.20	U	ug/L	P351526	
		Lead	0.050	U	ug/L	P351526	
		Nickel	0.20	U	ug/L	P351526	
		Silver	0.010	U	ug/L	P351526	

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P351526

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: P351526

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

Reference Method: EPA 300.0
Batch ID: P352121

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351984

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351988

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351628

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351570

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: P351692

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351502

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351564

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351445

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

Reference Method: SM 2120 B
Batch ID: P351433

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P351706

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

Reference Method: SM 4500 F-C-97
Batch ID: P351709

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: P351526

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	100		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	99.4		P	85 - 115
Sodium	101		P	85 - 115
Zinc	98.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P351526

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	104		P	85 - 115
Copper	98.1		P	85 - 115
Lead	103		P	85 - 115
Nickel	97.1		P	85 - 115
Silver	101		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P352121

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Bromide	108		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351984

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351988

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351628

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351570

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351692

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351502

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351564

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: P351445

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.2		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P351433

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.3		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P351706

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P351709

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P351526

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023697	Calcium	103		P	80 - 120
2023697	Iron	101		P	80 - 120
2023697	Magnesium	105		P	80 - 120
2023697	Potassium	104		P	80 - 120
2023697	Sodium	101		P	80 - 120
2023697	Zinc	98.5		P	80 - 120
2024444	Calcium	104	104	P/P	80 - 120
2024444	Iron	103	102	P/P	80 - 120
2024444	Magnesium	107	107	P/P	80 - 120
2024444	Potassium	105	104	P/P	80 - 120
2024444	Sodium	104		P	80 - 120
2024444	Zinc	103	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P351526

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023697	Arsenic	103		P	80 - 120
2023697	Cadmium	102		P	80 - 120
2023697	Chromium	105		P	80 - 120
2023697	Copper	97.0		P	80 - 120
2023697	Lead	103		P	80 - 120
2023697	Nickel	96.9		P	80 - 120
2023697	Silver	103		P	80 - 120
2024444	Arsenic	104	104	P/P	80 - 120
2024444	Cadmium	104	104	P/P	80 - 120
2024444	Chromium	107	108	P/P	80 - 120
2024444	Copper	100	99.7	P/P	80 - 120
2024444	Lead	105	105	P/P	80 - 120
2024444	Nickel	96.1	96.6	P/P	80 - 120
2024444	Silver	104	104	P/P	80 - 120

Reference Method: EPA 300.0
Batch ID: P352121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023807	Bromide	103	101	P/P	90 - 110
2024609	Bromide	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351984

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023174	Chloride	98.2		P	90 - 110
2023721	Chloride	99.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351988

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023174	Sulfate	98.3		P	90 - 110
2023721	Sulfate	98.1		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351628

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023724	Ammonia-N	98.9	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351570

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023854	Kjeldahl Nitrogen	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351692

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023809	NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351502

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023743	Total-P	97.0	97.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351564

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023854	Total-P	100	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351445

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2023728	O-Phosphate-P	98.9	96.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P351709

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024195	Fluoride	97.9	97.3	P/P	91 - 105

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P351526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024444	Calcium	0.294	Spike	P	0 - 20
2024444	Iron	0.613	Spike	P	0 - 20
2024444	Magnesium	0.0656	Spike	P	0 - 20
2024444	Potassium	1.08	Spike	P	0 - 20
2024444	Sodium	0.406	Spike	P	0 - 20
2024444	Zinc	1.64	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P351526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024444	Arsenic	0.199	Spike	P	0 - 20
2024444	Cadmium	0.0846	Spike	P	0 - 20
2024444	Chromium	0.454	Spike	P	0 - 20
2024444	Copper	0.281	Spike	P	0 - 20
2024444	Lead	0.0488	Spike	P	0 - 20
2024444	Nickel	0.491	Spike	P	0 - 20
2024444	Silver	0.216	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P352121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023807	Bromide	1.81	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351984

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023174	Chloride	0.135	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351988

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023174	Sulfate	0.0848	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351628

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023724	Ammonia-N	1.25	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351570

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023854	Kjeldahl Nitrogen	0.187	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023809	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351502

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023743	Total-P	0.425	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023854	Total-P	1.05	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023728	O-Phosphate-P	2.38	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P351433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2023807	Color (true)	2.81	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P351706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024195	Total Alkalinity	1.10	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P351709

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024195	Fluoride	0.480	Spike	P	0 - 3.5

Quality Assurance Report

Precision

* 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: A86405

Included Lab Sample IDs: 2023807, 2023808

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.7	99.7	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A86408

Included Lab Sample IDs: 2023811, 2023812

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.3	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86451

Included Lab Sample IDs: 2023809

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A86466

Included Lab Sample IDs: 2023817, 2023818

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.0	97.8	P/P	90 - 110
Calcium	98.4	98.0	P/P	95 - 105
Iron	101	98.4	P/P	95 - 105
Iron	98.4	99.3	P/P	90 - 110
Magnesium	98.3	99.1	P/P	90 - 110
Magnesium	99.6	98.3	P/P	95 - 105
Potassium	99.3	99.6	P/P	90 - 110
Potassium	99.5	99.3	P/P	95 - 105
Sodium	102	102	P/P	90 - 110
Sodium	104	102	P/P	95 - 105
Zinc	98.9	99.6	P/P	95 - 105
Zinc	99.6	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86472

Included Lab Sample IDs: 2023809, 2023810

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86506

Included Lab Sample IDs: 2023809, 2023810

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A86511

Included Lab Sample IDs: 2023807, 2023808

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

Reference Method: SM 4500 F-C-97

Run ID: A86511

Included Lab Sample IDs: 2023807, 2023808

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	98.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86516

Included Lab Sample IDs: 2023810

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	95.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86527

Included Lab Sample IDs: 2023809, 2023810

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86563

Included Lab Sample IDs: 2023817, 2023818

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.3	97.3	P/P	90 - 110
Arsenic	97.9	97.3	P/P	90 - 110
Cadmium	94.2	95.9	P/P	90 - 110
Cadmium	95.9	97.1	P/P	90 - 110
Chromium	98.0	99.3	P/P	90 - 110
Chromium	99.3	101	P/P	90 - 110
Copper	95.5	95.1	P/P	90 - 110
Copper	98.0	95.5	P/P	90 - 110
Lead	106	105	P/P	90 - 110
Lead	106	106	P/P	90 - 110
Silver	100	101	P/P	90 - 110
Silver	101	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A86566

Included Lab Sample IDs: 2023807, 2023808

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86628

Included Lab Sample IDs: 2023818

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	95.0	93.3	P/P	90 - 110

Reference Method: EPA 300.0

Run ID: A86659

Included Lab Sample IDs: 2023807, 2023808

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	100	97.3	P/P	90 - 110
Bromide	97.3	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86697

Included Lab Sample IDs: 2023817

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	95.0	90.9	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 SMP	MS
			LCS				
EPA 200.7 Rev. 4.4	Calcium	104	103	104	104		0.294
	Iron	100	101	103	102		0.613
	Magnesium	106	105	107	107		0.0656
	Potassium	99.4	104	105	104		1.08
	Sodium	101	101	104			0.406
	Zinc	98.2	98.5	103	101		1.64
EPA 200.8 Rev. 5.4	Arsenic	102	103	104	104		0.199
	Cadmium	102	102	104	104		0.0846
	Chromium	104	105	107	108		0.454
	Copper	98.1	97.0	100	99.7		0.281
	Lead	103	103	105	105		0.0488
	Nickel	97.1	96.1	96.6	96.9		0.491
	Silver	101	103	104	104		0.216
EPA 300.0	Bromide	108	103	101	105		1.81
EPA 300.0 Rev. 2.1	Chloride	100	98.2	99.5		0.135	
	Sulfate	99.2	98.3	98.1		0.0848	
EPA 350.1 Rev. 2.0	Ammonia-N	99.5	98.9	101			1.25
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	102	102			0.187
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.5	99.5	99.5			0.0
EPA 365.1 Rev. 2.0	Total-P	96.6	97.0	97.4			0.425
	Total-P	101	100	99.4			1.05
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.2	98.9	96.3			2.38
SM 2120 B	Color (true)	99.3				2.81	
SM 2320 B-97	Total Alkalinity	102				1.10	
SM 4500 F-C-97	Fluoride	97.9	97.9	97.3			0.480

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	2023817, 2023818
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2023817, 2023818
EPA 300.0 / E31780	Bromide in aqueous matrices	2023807, 2023808
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2023807, 2023808
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2023807, 2023808
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2023809, 2023810
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2023809, 2023810
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2023809, 2023810
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2023809, 2023810
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2023811, 2023812
SM 2120 B / E31780	True Color measured at 450 nm	2023807, 2023808
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2023807, 2023808
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2023807, 2023808

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	09/11/2018	09/12/2018 17:50	Elliott D. Healy	09/13/2018 12:51	Betina Topolski	2023818
	09/11/2018	09/12/2018 17:50	Elliott D. Healy	09/13/2018 14:15	Betina Topolski	2023817
EPA 200.8 Rev. 5.4	09/11/2018	09/12/2018 17:50	Elliott D. Healy	09/18/2018 18:42	Allison Taylor	2023818
	09/11/2018	09/12/2018 17:50	Elliott D. Healy	09/18/2018 20:47	Allison Taylor	2023817
	09/11/2018	09/12/2018 17:50	Elliott D. Healy	09/20/2018 14:59	Allison Taylor	2023818
	09/11/2018	09/12/2018 17:50	Elliott D. Healy	09/24/2018 17:49	Allison Taylor	2023817
	09/11/2018			09/21/2018 22:32	Lipi Saha	2023807
EPA 300.0	09/11/2018			09/22/2018 03:56	Lipi Saha	2023808
	09/11/2018			09/18/2018 20:32	Lipi Saha	2023807
EPA 300.0 Rev. 2.1	09/11/2018			09/18/2018 20:44	Lipi Saha	2023808
	09/11/2018			09/13/2018 11:21	Ping Hua	2023809
EPA 350.1 Rev. 2.0	09/11/2018			09/13/2018 11:22	Ping Hua	2023810
	09/11/2018			09/17/2018 12:10	Joseph Suarez	2023809
EPA 351.2 Rev. 2.0	09/11/2018	09/13/2018 10:50	Adrian Shelby	09/17/2018 12:11	Joseph Suarez	2023810
	09/11/2018	09/13/2018 10:50	Adrian Shelby	09/14/2018 11:14	Lauren Bottorf	2023809
EPA 353.2 Rev. 2.0	09/11/2018			09/14/2018 11:20	Lauren Bottorf	2023810
	09/11/2018			09/13/2018 08:54	Beverly Y. Sanders	2023809
EPA 365.1 Rev. 2.0	09/11/2018	09/12/2018 12:10	Sima Feizi	09/14/2018 12:29	Beverly Y. Sanders	2023810
	09/11/2018	09/13/2018 15:36	Sima Feizi	09/11/2018 14:52	Lipi Saha	2023811
EPA 365.1 Rev. 2.0 dissolved	09/11/2018			09/11/2018 14:53	Lipi Saha	2023812
	09/11/2018			09/11/2018 15:36	DeAsia Armster	2023807
SM 2120 B	09/11/2018			09/11/2018 15:37	DeAsia Armster	2023808
	09/11/2018			09/13/2018 22:51	Dale L. Simmons	2023807
SM 2320 B-97	09/11/2018			09/13/2018 23:04	Dale L. Simmons	2023808
	09/11/2018			09/13/2018 22:51	Dale L. Simmons	2023807
SM 4500 F-C-97	09/11/2018			09/13/2018 23:04	Dale L. Simmons	2023808
	09/11/2018					