

Chemical Analysis Report

WAS-SECT-2018-09-12-01

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

Event Description: **Merrit's Mill Pond BMAP**

Request ID: **RQ-2018-09-10-22**

Customer: **WAS-SECT**

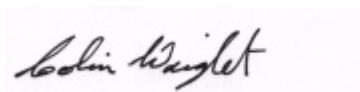
Project ID: **BMAP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 09-OCT-2018 09:03

A handwritten signature in black ink, appearing to read "Colin Wright", is shown on a light-colored rectangular 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: MERRITT'S MILL POND 500 METERS
UPSTREAM OF DAM**

Collection Date/Time: 09/12/2018 09:50

Field ID: G2WA0009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2024635	EPA 180.1 Rev. 2.0	Turbidity	0.60		NTU	P351637	
	EPA 300.0 Rev. 2.1	Chloride	5.0		mg Cl/L	P351986	
		Sulfate	1.4		mg SO4/L	P351990	
		Color (true)	2.5	U	PCU	P351517	
	SM 2320 B-97	Total Alkalinity	119		mg CaCO3/L	P351713	
	SM 2540 C-97	TDS	141		mg/L	P351935	
	SM 2540 D-97	TSS	2	U	mg/L	P351977	
	SM 4500 F-C-97	Fluoride	0.045	I	mg F/L	P351717	
2024638	EPA 350.1 Rev. 2.0	Ammonia-N	0.052		mg N/L	P351767	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.23		mg N/L	P351806	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.4		mg N/L	P351697	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P351670	
	SM 5310 B-00	Organic Carbon	0.96	I	mg C/L	P351879	
2024641	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P351521	
2024647	EPA 200.7 Rev. 4.4	Calcium	48.0		mg/L	P351526	
		Iron	30	U	ug/L	P351526	
		Magnesium	3.23		mg/L	P351526	
		Potassium	0.38	I	mg/L	P351526	
		Sodium	2.2		mg/L	P351526	
		Zinc	5.0	U	ug/L	P351526	
	EPA 200.8 Rev. 5.4	Arsenic	0.40		ug/L	P351526	
		Cadmium	0.020	U	ug/L	P351526	
		Chromium	0.87	I	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	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: MERRITT'S MILL POND MID UNDER POWERLINES

Collection Date/Time: 09/12/2018 10:10

Field ID: G2WA0008

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2024636	EPA 180.1 Rev. 2.0	Turbidity	0.95	A	NTU	P351637	
	EPA 300.0 Rev. 2.1	Chloride	5.1		mg Cl/L	P351986	
		Sulfate	1.4		mg SO4/L	P351990	
	SM 2120 B	Color (true)	2.5	U	PCU	P351517	
	SM 2320 B-97	Total Alkalinity	122		mg CaCO3/L	P351713	
	SM 2540 C-97	TDS	138		mg/L	P351935	
	SM 2540 D-97	TSS	2	I	mg/L	P351977	
	SM 4500 F-C-97	Fluoride	0.043	I	mg F/L	P351717	
2024639	EPA 350.1 Rev. 2.0	Ammonia-N	0.069		mg N/L	P351768	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.24		mg N/L	P351806	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.7		mg N/L	P351697	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P351670	
	SM 5310 B-00	Organic Carbon	0.88	I	mg C/L	P351879	
2024642	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P351521	
2024648	EPA 200.7 Rev. 4.4	Calcium	50.8		mg/L	P351526	
		Iron	30	U	ug/L	P351526	
		Magnesium	3.35		mg/L	P351526	
		Potassium	0.42	I	mg/L	P351526	
		Sodium	2.2		mg/L	P351526	
		Zinc	5.0	U	ug/L	P351526	
	EPA 200.8 Rev. 5.4	Arsenic	0.39		ug/L	P351526	
		Cadmium	0.020	U	ug/L	P351526	
		Chromium	1.1	I	ug/L	P351526	
		Copper	0.20	U	ug/L	P351526	
		Lead	0.050	U	ug/L	P351526	
		Nickel	0.20	U	ug/L	P352390	
		Silver	0.010	U	ug/L	P351526	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

**Sample Location: MERRITT'S MILL POND 600 METERS
DOWNSTREAM OF JACKSON BLUE SPRING**

Collection Date/Time: 09/12/2018 09:20

Field ID: G2WA0007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2024637	EPA 180.1 Rev. 2.0	Turbidity	0.20		NTU	P351637	
	EPA 300.0 Rev. 2.1	Chloride	4.9		mg Cl/L	P351986	
		Sulfate	1.3		mg SO4/L	P351990	
		Color (true)	2.5	U	PCU	P351517	
	SM 2320 B-97	Total Alkalinity	121		mg CaCO3/L	P351713	
	SM 2540 C-97	TDS	146		mg/L	P351935	
	SM 2540 D-97	TSS	2	U	mg/L	P351977	
	SM 4500 F-C-97	Fluoride	0.040	I	mg F/L	P351717	
2024640	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P351768	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.099	IJ	mg N/L	P351806	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	3.6		mg N/L	P351697	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P351670	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P351879	
2024643	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.017		mg P/L	P351521	
2024649	EPA 200.7 Rev. 4.4	Calcium	49.8		mg/L	P351526	
		Iron	30	U	ug/L	P351526	
		Magnesium	2.85		mg/L	P351526	
		Potassium	0.36	I	mg/L	P351526	
		Sodium	1.9	I	mg/L	P351526	
		Zinc	5.0	U	ug/L	P351526	
	EPA 200.8 Rev. 5.4	Arsenic	0.34		ug/L	P351526	
		Cadmium	0.020	U	ug/L	P351526	
		Chromium	1.3	I	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	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Refer to the narrative for an explanation of QC Codes.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P351637

Component	Result	Code	Units
Turbidity	0.10	U	NTU

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 200.8 Rev. 5.4
Batch ID: P352390

Component	Result	Code	Units
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351986

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351990

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351767

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351768

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351806

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351697

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351670

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351521

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

Reference Method: SM 2120 B
Batch ID: P351517

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P351713

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

Reference Method: SM 2540 C-97
Batch ID: P351935

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P351977

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P351717

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P351879

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: 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 200.8 Rev. 5.4

Batch ID: P352390

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Nickel	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P351986

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P351990

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P351767

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	92.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P351768

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351806

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351697

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351670

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: P351521

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.4		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P351517

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.6		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P351713

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

Reference Method: SM 4500 F-C-97
Batch ID: P351717

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.7		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P351879

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.6		P	85 - 115

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 200.8 Rev. 5.4
Batch ID: P352390

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028316	Nickel	99.7		P	80 - 120
2028580	Nickel	101	98.3	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351986

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024610	Chloride	101		P	90 - 110
2024660	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351990

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024610	Sulfate	99.5		P	90 - 110
2024660	Sulfate	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351767

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024433	Ammonia-N	91.4	91.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351768

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024640	Ammonia-N	97.4	98.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351806

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024640	Kjeldahl Nitrogen	110	113	F/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024661	NO2NO3-N	95.2	94.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351670

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024639	Total-P	98.6	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351521

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024622	O-Phosphate-P	95.9	97.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P351717

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024610	Fluoride	99.9	98.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P351879

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2024615	Organic Carbon	95.8	93.6	P/P	85 - 115

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 200.8 Rev. 5.4
Batch ID: P352390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028580	Nickel	2.52	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351986

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024610	Chloride	0.0855	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P351990

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024610	Sulfate	0.134	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351767

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024433	Ammonia-N	0.169	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351768

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024640	Ammonia-N	0.696	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P351806

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024640	Kjeldahl Nitrogen	2.23	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024661	NO2NO3-N	0.401	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P351670

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024639	Total-P	2.70	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P351521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024622	O-Phosphate-P	1.19	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P351517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024408	Color (true)	3.87	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P351713

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024610	Total Alkalinity	0.329	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P351935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024610	TDS	3.71	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P351717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024610	Fluoride	0.986	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P351879

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2024615	Organic Carbon	2.30	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

Reference Method: SM 2120 B

Run ID: A86442

Included Lab Sample IDs: 2024635, 2024636, 2024637

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.1	97.7	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A86443

Included Lab Sample IDs: 2024641, 2024642, 2024643

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.9	P/P	90 - 110
O-Phosphate-P	99.2	98.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A86466

Included Lab Sample IDs: 2024647, 2024648, 2024649

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.8	97.4	P/P	90 - 110
Iron	99.3	98.6	P/P	90 - 110
Magnesium	99.1	98.5	P/P	90 - 110
Potassium	99.6	98.8	P/P	90 - 110
Sodium	102	102	P/P	90 - 110
Zinc	100	99.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A86474

Included Lab Sample IDs: 2024635, 2024636, 2024637

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	104	102	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86506

Included Lab Sample IDs: 2024638, 2024639, 2024640

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

Reference Method: SM 2320 B-97

Run ID: A86512

Included Lab Sample IDs: 2024635, 2024636, 2024637

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: A86512

Included Lab Sample IDs: 2024635, 2024636, 2024637

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86525

Included Lab Sample IDs: 2024638, 2024639, 2024640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86531

Included Lab Sample IDs: 2024638, 2024639, 2024640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	97.5	P/P	90 - 110
Ammonia-N	98.5	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86563

Included Lab Sample IDs: 2024647, 2024648, 2024649

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.3	97.1	P/P	90 - 110
Cadmium	97.1	98.1	P/P	90 - 110
Chromium	101	102	P/P	90 - 110
Copper	95.1	94.4	P/P	90 - 110
Lead	105	106	P/P	90 - 110
Silver	100	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A86566

Included Lab Sample IDs: 2024635, 2024636, 2024637

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86570

Included Lab Sample IDs: 2024638, 2024639, 2024640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.9	101	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A86574

Included Lab Sample IDs: 2024638, 2024639, 2024640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.2	94.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86743

Included Lab Sample IDs: 2024647, 2024649

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	92.7	92.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86804

Included Lab Sample IDs: 2024648

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	101	99.4	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
	Nickel	101	99.7	101	98.3		2.52
	Silver	101	103	104	104		0.216
EPA 300.0 Rev. 2.1	Chloride	101	101	102		0.0855	
	Sulfate	99.9	99.5	101		0.134	
EPA 350.1 Rev. 2.0	Ammonia-N	92.7	91.4	91.6			0.169
	Ammonia-N	96.1	97.4	98.1			0.696
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	110	113			2.23
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	95.2	94.6			0.401
EPA 365.1 Rev. 2.0	Total-P	101	98.6	101			2.70
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.4	95.9	97.3			1.19
SM 2120 B	Color (true)	96.6				3.87	
SM 2320 B-97	Total Alkalinity	102				0.329	
SM 2540 C-97	TDS					3.71	
SM 4500 F-C-97	Fluoride	97.7	99.9	98.5			0.986
SM 5310 B-00	Organic Carbon	96.6	95.8	93.6			2.30

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2024635, 2024636, 2024637
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2024647, 2024648, 2024649
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2024647, 2024648, 2024649
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2024635, 2024636, 2024637
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2024635, 2024636, 2024637
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2024638, 2024639, 2024640
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2024638, 2024639, 2024640
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2024638, 2024639, 2024640
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2024638, 2024639, 2024640
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2024641, 2024642, 2024643
SM 2120 B / E31780	True Color measured at 450 nm	2024635, 2024636, 2024637
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2024635, 2024636, 2024637
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2024635, 2024636, 2024637
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2024635, 2024636, 2024637

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2024635, 2024636, 2024637
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2024638, 2024639, 2024640

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	09/12/2018			09/12/2018 17:42	Megan Treadwell	2024635, 2024636, 2024637
EPA 200.7 Rev. 4.4	09/12/2018	09/12/2018 17:50	Elliott D. Healy	09/13/2018 16:04	Betina Topolski	2024647
	09/12/2018	09/12/2018 17:50	Elliott D. Healy	09/13/2018 16:11	Betina Topolski	2024648
	09/12/2018	09/12/2018 17:50	Elliott D. Healy	09/13/2018 16:19	Betina Topolski	2024649
EPA 200.8 Rev. 5.4	09/12/2018	09/12/2018 17:50	Elliott D. Healy	09/18/2018 23:11	Allison Taylor	2024647
	09/12/2018	09/12/2018 17:50	Elliott D. Healy	09/18/2018 23:21	Allison Taylor	2024648
	09/12/2018	09/12/2018 17:50	Elliott D. Healy	09/18/2018 23:31	Allison Taylor	2024649
	09/12/2018	09/12/2018 17:50	Elliott D. Healy	09/25/2018 16:55	Allison Taylor	2024647
	09/12/2018	09/12/2018 17:50	Elliott D. Healy	09/25/2018 17:03	Allison Taylor	2024649
	09/12/2018	09/27/2018 16:45	Elliott D. Healy	09/30/2018 21:17	Robert K Palmer	2024648
EPA 300.0 Rev. 2.1	09/12/2018			09/19/2018 07:00	Lipi Saha	2024635
	09/12/2018			09/19/2018 07:12	Lipi Saha	2024636
	09/12/2018			09/19/2018 07:24	Lipi Saha	2024637
EPA 350.1 Rev. 2.0	09/12/2018			09/17/2018 15:42	Ping Hua	2024638
	09/12/2018			09/17/2018 15:48	Ping Hua	2024639
	09/12/2018			09/17/2018 15:58	Ping Hua	2024640
EPA 351.2 Rev. 2.0	09/12/2018	09/18/2018 12:10	Adrian Shelby	09/19/2018 09:00	Joseph Suarez	2024638
	09/12/2018	09/18/2018 12:10	Adrian Shelby	09/19/2018 09:02	Joseph Suarez	2024639
	09/12/2018	09/18/2018 12:10	Adrian Shelby	09/19/2018 09:03	Joseph Suarez	2024640
EPA 353.2 Rev. 2.0	09/12/2018			09/14/2018 14:19	Lauren Bottorf	2024638
	09/12/2018			09/14/2018 14:20	Lauren Bottorf	2024639
	09/12/2018			09/14/2018 14:21	Lauren Bottorf	2024640
EPA 365.1 Rev. 2.0	09/12/2018	09/14/2018 11:50	Sima Feizi	09/17/2018 12:19	Beverly Y. Sanders	2024638
	09/12/2018	09/14/2018 11:50	Sima Feizi	09/17/2018 12:20	Beverly Y. Sanders	2024639
	09/12/2018	09/14/2018 11:50	Sima Feizi	09/17/2018 12:21	Beverly Y. Sanders	2024640
EPA 365.1 Rev. 2.0 dissolved	09/12/2018			09/12/2018 16:06	Julia Storbeck	2024641
	09/12/2018			09/12/2018 16:07	Julia Storbeck	2024642
	09/12/2018			09/12/2018 16:12	Julia Storbeck	2024643
SM 2120 B	09/12/2018			09/12/2018 16:18	DeAsia Armster	2024635
	09/12/2018			09/12/2018 16:19	DeAsia Armster	2024636
	09/12/2018			09/12/2018 16:20	DeAsia Armster	2024637
SM 2320 B-97	09/12/2018			09/14/2018 22:20	Dale L. Simmons	2024635
	09/12/2018			09/14/2018 22:30	Dale L. Simmons	2024636
	09/12/2018			09/14/2018 22:41	Dale L. Simmons	2024637
SM 2540 C-97	09/12/2018			09/14/2018 15:32	Yijie Li	2024635, 2024636, 2024637
SM 2540 D-97	09/12/2018			09/14/2018 15:32	Yijie Li	2024635, 2024636, 2024637
SM 4500 F-C-97	09/12/2018			09/14/2018 22:20	Dale L. Simmons	2024635
	09/12/2018			09/14/2018 22:30	Dale L. Simmons	2024636
	09/12/2018			09/14/2018 22:41	Dale L. Simmons	2024637
SM 5310 B-00	09/12/2018			09/18/2018 02:10	Megan Treadwell	2024638

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	09/12/2018			09/18/2018 02:26	Megan Treadwell	2024639
	09/12/2018			09/18/2018 02:39	Megan Treadwell	2024640