

Chemical Analysis Report

CEN-DIST-2018-08-23-02

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

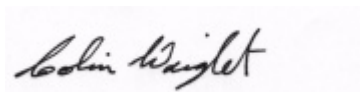
Event Description: **McCoy X3**
Request ID: **RQ-2018-08-20-67**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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Certified by: Colin Wright, Program Administrator

Date Certified: 11-SEP-2018 15:07

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray 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: Lake McCoy @ Center of Southern Lobe

Collection Date/Time: 08/22/2018 11:00

Field ID: G2CE0098

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2019629	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P350784	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P350933	
		Sulfate	15		mg SO4/L	P350935	
		Color (true)	37	A	PCU	P350678	
	SM 2320 B-97	Total Alkalinity	34		mg CaCO3/L	P351049	
	SM 2540 C-97	TDS	100		mg/L	P351067	
	SM 2540 D-97	TSS	3	I	mg/L	P351029	
	SM 4500 F-C-97	Fluoride	0.043	I	mg F/L	P351145	
2019632	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P351010	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.84		mg N/L	P350753	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P350856	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P350767	
	SM 5310 B-00	Organic Carbon	9.9		mg C/L	P350876	
2019635	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P350696	
2019684	EPA 200.7 Rev. 4.4	Calcium	16.3		mg/L	P350680	
		Iron	30	U	ug/L	P350680	
		Magnesium	2.69		mg/L	P350680	
		Potassium	1.4		mg/L	P350680	
		Sodium	8.1		mg/L	P350680	
		Zinc	5.0	U	ug/L	P350680	
	EPA 200.8 Rev. 5.4	Arsenic	1.71		ug/L	P350680	
		Cadmium	0.020	U	ug/L	P350680	
		Chromium	0.40	U	ug/L	P350680	
		Copper	0.34	I	ug/L	P350680	
		Lead	0.050	U	ug/L	P350680	
		Nickel	0.20	U	ug/L	P350680	
		Silver	0.010	U	ug/L	P350680	

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: Lake McCoy @ 220m SW of Center of Southern Lobe **Collection Date/Time: 08/22/2018 10:48**

Field ID: G2CE0144

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2019630	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P350784	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P350933	
		Sulfate	16		mg SO4/L	P350935	
		Color (true)	37		PCU	P350678	
	SM 2320 B-97	Total Alkalinity	36		mg CaCO3/L	P351049	
	SM 2540 C-97	TDS	103		mg/L	P351067	
	SM 2540 D-97	TSS	2	I	mg/L	P351029	
	SM 4500 F-C-97	Fluoride	0.042	I	mg F/L	P351145	
2019633	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P351010	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P350753	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P350856	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P350767	
	SM 5310 B-00	Organic Carbon	9.5		mg C/L	P350876	
2019636	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P350696	
2019685	EPA 200.7 Rev. 4.4	Calcium	17.4		mg/L	P350680	
		Iron	42	I	ug/L	P350680	
		Magnesium	2.78		mg/L	P350680	
		Potassium	1.7		mg/L	P350680	
		Sodium	8.2		mg/L	P350680	
		Zinc	5.0	U	ug/L	P350680	
	EPA 200.8 Rev. 5.4	Arsenic	1.38		ug/L	P350680	
		Cadmium	0.020	U	ug/L	P350680	
		Chromium	0.40	U	ug/L	P350680	
		Copper	0.27	I	ug/L	P350680	
		Lead	0.050	U	ug/L	P350680	
		Nickel	0.20	U	ug/L	P350680	
		Silver	0.010	U	ug/L	P350680	

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: Lake McCoy @ 245m NE of Center of Southern Lobe **Collection Date/Time: 08/22/2018 23:15**

Field ID: G2CE0145

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2019631	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P350784	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P350933	
		Sulfate	15		mg SO4/L	P350935	
	SM 2120 B	Color (true)	33		PCU	P350678	
	SM 2320 B-97	Total Alkalinity	32		mg CaCO3/L	P351049	
	SM 2540 C-97	TDS	91		mg/L	P351067	
	SM 2540 D-97	TSS	3	I	mg/L	P351029	
	SM 4500 F-C-97	Fluoride	0.043	I	mg F/L	P351145	
2019634	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P351010	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.69		mg N/L	P350825	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P350856	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P350767	
	SM 5310 B-00	Organic Carbon	9.7		mg C/L	P350876	
2019637	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P350697	
2019686	EPA 200.7 Rev. 4.4	Calcium	15.8		mg/L	P350680	
		Iron	30	U	ug/L	P350680	
		Magnesium	2.63		mg/L	P350680	
		Potassium	1.3		mg/L	P350680	
		Sodium	8.0		mg/L	P350680	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P350680	
		Arsenic	1.98		ug/L	P350680	
		Cadmium	0.020	U	ug/L	P350680	
		Chromium	0.40	U	ug/L	P350680	
		Copper	0.44	I	ug/L	P350680	
		Lead	0.059	I	ug/L	P350680	
		Nickel	0.20	U	ug/L	P350680	
		Silver	0.010	U	ug/L	P350680	

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.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P350784

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350680

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: P350680

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 Rev. 2.1
Batch ID: P350933

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350935

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351010

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350753

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350825

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350856

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350767

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350696

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350697

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

Reference Method: SM 2120 B
Batch ID: P350678

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P351049

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P351067

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P351029

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P351145

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P350876

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: P350680

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	107		P	85 - 115
Iron	105		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	102		P	85 - 115
Sodium	101		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350680

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	98.9		P	85 - 115
Copper	97.6		P	85 - 115
Lead	102		P	85 - 115
Nickel	101		P	85 - 115
Silver	99.5		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350933

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	107		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350935

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351010

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350753

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	104		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350825

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: P350856

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350767

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350696

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350697

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

Reference Method: SM 2120 B
Batch ID: P350678

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

Reference Method: SM 2320 B-97
Batch ID: P351049

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P351145

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

Reference Method: SM 5310 B-00
Batch ID: P350876

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350680

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019133	Calcium	108	109	P/P	80 - 120
2019133	Iron	106	107	P/P	80 - 120
2019133	Magnesium	109	110	P/P	80 - 120
2019133	Potassium	107	107	P/P	80 - 120
2019133	Sodium	102	102	P/P	80 - 120
2019133	Zinc	102	104	P/P	80 - 120
2019437	Calcium	105		P	80 - 120
2019437	Iron	104		P	80 - 120
2019437	Magnesium	103		P	80 - 120
2019437	Potassium	100		P	80 - 120
2019437	Sodium	97.9		P	80 - 120
2019437	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350680

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019133	Arsenic	102	100	P/P	80 - 120
2019133	Cadmium	103	101	P/P	80 - 120
2019133	Chromium	97.3	97.7	P/P	80 - 120
2019133	Copper	98.8	96.9	P/P	80 - 120
2019133	Lead	102	99.3	P/P	80 - 120
2019133	Nickel	99.9	98.2	P/P	80 - 120
2019133	Silver	99.0	98.0	P/P	80 - 120
2019437	Arsenic	105		P	80 - 120
2019437	Cadmium	103		P	80 - 120
2019437	Chromium	98.2		P	80 - 120
2019437	Copper	97.0		P	80 - 120
2019437	Lead	103		P	80 - 120
2019437	Nickel	99.3		P	80 - 120
2019437	Silver	99.4		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350933

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019572	Chloride	107		P	90 - 110
2019922	Chloride	104		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019572	Sulfate	106		P	90 - 110
2019922	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351010

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019632	Ammonia-N	99.6	102	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350753

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019397	Kjeldahl Nitrogen	105	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350825

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019693	Kjeldahl Nitrogen	91.0	94.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350856

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019398	NO2NO3-N	97.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350767

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019632	Total-P	96.4	94.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350696

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019399	O-Phosphate-P	96.6	96.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019637	O-Phosphate-P	93.9	95.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P351145

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019575	Fluoride	104	104	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P350876

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2019393	Organic Carbon	99.6	99.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350680

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019133	Calcium	1.41	Spike	P	0 - 20
2019133	Iron	1.41	Spike	P	0 - 20
2019133	Magnesium	0.918	Spike	P	0 - 20
2019133	Potassium	0.732	Spike	P	0 - 20
2019133	Sodium	0.0594	Spike	P	0 - 20
2019133	Zinc	2.00	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350680

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019133	Arsenic	1.96	Spike	P	0 - 20
2019133	Cadmium	2.05	Spike	P	0 - 20
2019133	Chromium	0.403	Spike	P	0 - 20
2019133	Copper	1.97	Spike	P	0 - 20
2019133	Lead	2.82	Spike	P	0 - 20
2019133	Nickel	1.74	Spike	P	0 - 20
2019133	Silver	1.02	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019572	Chloride	3.75	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019572	Sulfate	4.20	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351010

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019632	Ammonia-N	2.04	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350753

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019397	Kjeldahl Nitrogen	0.555	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350825

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019693	Kjeldahl Nitrogen	2.61	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350856

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019398	NO2NO3-N	1.03	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350767

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019632	Total-P	1.62	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350696

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019399	O-Phosphate-P	0.341	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019637	O-Phosphate-P	1.27	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P350678

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019629	Color (true)	0.896	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P351049

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019575	Total Alkalinity	0.917	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P351067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019575	TDS	6.84	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P351145

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019575	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P350876

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019393	Organic Carbon	0.111	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: A86089

Included Lab Sample IDs: 2019629, 2019630, 2019631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.7	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A86099

Included Lab Sample IDs: 2019635, 2019636, 2019637

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	98.1	P/P	90 - 110
O-Phosphate-P	99.5	98.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A86111

Included Lab Sample IDs: 2019684, 2019685, 2019686

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	99.2	P/P	90 - 110
Iron	103	100	P/P	90 - 110
Magnesium	102	99.3	P/P	90 - 110
Potassium	101	98.0	P/P	90 - 110
Sodium	98.6	95.5	P/P	90 - 110
Zinc	95.1	96.2	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A86127

Included Lab Sample IDs: 2019629, 2019630, 2019631

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86147

Included Lab Sample IDs: 2019632, 2019633, 2019634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86155

Included Lab Sample IDs: 2019632, 2019633, 2019634

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86157

Included Lab Sample IDs: 2019632, 2019633

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	106	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A86162

Included Lab Sample IDs: 2019632, 2019633, 2019634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.1	94.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86169

Included Lab Sample IDs: 2019634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.9	98.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A86194

Included Lab Sample IDs: 2019629, 2019630, 2019631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	103	P/P	90 - 110
Sulfate	101	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86223

Included Lab Sample IDs: 2019684, 2019685, 2019686

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.9	96.4	P/P	90 - 110
Cadmium	94.6	96.6	P/P	90 - 110
Chromium	92.6	94.1	P/P	90 - 110
Copper	93.3	93.0	P/P	90 - 110
Lead	101	103	P/P	90 - 110
Nickel	94.0	93.6	P/P	90 - 110
Silver	94.2	95.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86236

Included Lab Sample IDs: 2019632, 2019633, 2019634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	102	P/P	90 - 110
Ammonia-N	102	100	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A86252

Included Lab Sample IDs: 2019629, 2019630, 2019631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A86303

Included Lab Sample IDs: 2019629, 2019630, 2019631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.1	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 200.7 Rev. 4.4	Calcium	107	108	109	105			1.41
	Iron	105	106	107	104			1.41
	Magnesium	108	109	110	103			0.918
	Potassium	102	107	107	100			0.732
	Sodium	101	102	102	97.9			0.0594
	Zinc	102	102	104	102			2.00
EPA 200.8 Rev. 5.4	Arsenic	102	102	100	105			1.96
	Cadmium	104	103	101	103			2.05
	Chromium	98.9	97.3	97.7	98.2			0.403
	Copper	97.6	98.8	96.9	97.0			1.97
	Lead	102	102	99.3	103			2.82
	Nickel	101	99.9	98.2	99.3			1.74
	Silver	99.5	99.0	98.0	99.4			1.02
EPA 300.0 Rev. 2.1	Chloride	107	107	104			3.75	
	Sulfate	104	106	102			4.20	
EPA 350.1 Rev. 2.0	Ammonia-N	100	99.6	102				2.04
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	105	106				0.555
	Kjeldahl Nitrogen	105	91.0	94.7				2.61
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	97.0	99.0				1.03
EPA 365.1 Rev. 2.0	Total-P	98.3	96.4	94.8				1.62
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.6	96.6	96.1				0.341
	O-Phosphate-P	97.0	93.9	95.1				1.27
SM 2120 B	Color (true)	100					0.896	
SM 2320 B-97	Total Alkalinity	103					0.917	
SM 2540 C-97	TDS						6.84	
SM 4500 F-C-97	Fluoride	98.5	104	104				0.0
SM 5310 B-00	Organic Carbon	96.4	99.6	99.4				0.111

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2019629, 2019630, 2019631
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2019684, 2019685, 2019686
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2019684, 2019685, 2019686
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2019629, 2019630, 2019631
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2019629, 2019630, 2019631
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2019632, 2019633, 2019634
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2019632, 2019633, 2019634
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2019632, 2019633, 2019634
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2019632, 2019633, 2019634
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2019635, 2019636, 2019637
SM 2120 B / E31780	True Color measured at 450 nm	2019629, 2019630, 2019631
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2019629, 2019630, 2019631
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2019629, 2019630, 2019631
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2019629, 2019630, 2019631

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)	2019629, 2019630, 2019631
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2019632, 2019633, 2019634

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	08/23/2018			08/23/2018 17:10	Megan Treadwell	2019629, 2019630, 2019631
EPA 200.7 Rev. 4.4	08/23/2018	08/23/2018 17:30	Elliott D. Healy	08/24/2018 15:36	Betina Topolski	2019684
	08/23/2018	08/23/2018 17:30	Elliott D. Healy	08/24/2018 15:44	Betina Topolski	2019685
	08/23/2018	08/23/2018 17:30	Elliott D. Healy	08/24/2018 15:51	Betina Topolski	2019686
EPA 200.8 Rev. 5.4	08/23/2018	08/23/2018 17:30	Elliott D. Healy	08/30/2018 23:31	Allison Taylor	2019684
	08/23/2018	08/23/2018 17:30	Elliott D. Healy	08/30/2018 23:41	Allison Taylor	2019685
	08/23/2018	08/23/2018 17:30	Elliott D. Healy	08/30/2018 23:50	Allison Taylor	2019686
EPA 300.0 Rev. 2.1	08/23/2018			08/29/2018 23:53	Lipi Saha	2019629
	08/23/2018			08/30/2018 00:05	Lipi Saha	2019630
	08/23/2018			08/30/2018 00:18	Lipi Saha	2019631
EPA 350.1 Rev. 2.0	08/23/2018			08/28/2018 13:16	Ping Hua	2019632
	08/23/2018			08/28/2018 13:37	Ping Hua	2019633
	08/23/2018			08/28/2018 13:39	Ping Hua	2019634
EPA 351.2 Rev. 2.0	08/23/2018	08/27/2018 11:00	Adrian Shelby	08/28/2018 15:50	Joseph Suarez	2019632
	08/23/2018	08/27/2018 11:00	Adrian Shelby	08/28/2018 15:52	Joseph Suarez	2019633
	08/23/2018	08/28/2018 11:00	Adrian Shelby	08/29/2018 10:45	Joseph Suarez	2019634
EPA 353.2 Rev. 2.0	08/23/2018			08/28/2018 13:02	Lauren Bottorf	2019632
	08/23/2018			08/28/2018 13:03	Lauren Bottorf	2019633
	08/23/2018			08/28/2018 13:04	Lauren Bottorf	2019634
EPA 365.1 Rev. 2.0	08/23/2018	08/27/2018 12:15	Sima Feizi	08/28/2018 12:42	Beverly Y. Sanders	2019632
	08/23/2018	08/27/2018 12:15	Sima Feizi	08/28/2018 12:43	Beverly Y. Sanders	2019633
	08/23/2018	08/27/2018 12:15	Sima Feizi	08/28/2018 12:44	Beverly Y. Sanders	2019634
EPA 365.1 Rev. 2.0 dissolved	08/23/2018			08/23/2018 14:08	Julia Storbeck	2019637
	08/23/2018			08/23/2018 14:38	Julia Storbeck	2019635
	08/23/2018			08/23/2018 14:39	Julia Storbeck	2019636
SM 2120 B	08/23/2018			08/23/2018 16:02	William L. Brown IV	2019629, 2019630
	08/23/2018			08/23/2018 16:03	William L. Brown IV	2019631
SM 2320 B-97	08/23/2018			08/30/2018 23:14	Dale L. Simmons	2019629
	08/23/2018			08/30/2018 23:25	Dale L. Simmons	2019630
	08/23/2018			08/30/2018 23:35	Dale L. Simmons	2019631
SM 2540 C-97	08/23/2018			08/28/2018 15:02	Yijie Li	2019629, 2019630, 2019631
SM 2540 D-97	08/23/2018			08/28/2018 15:02	Yijie Li	2019629, 2019630, 2019631
SM 4500 F-C-97	08/23/2018			09/05/2018 16:17	Dale L. Simmons	2019629
	08/23/2018			09/05/2018 16:22	Dale L. Simmons	2019630
	08/23/2018			09/05/2018 16:26	Dale L. Simmons	2019631
SM 5310 B-00	08/23/2018			08/28/2018 22:11	Megan Treadwell	2019632
	08/23/2018			08/28/2018 22:26	Megan Treadwell	2019633
	08/23/2018			08/28/2018 22:39	Megan Treadwell	2019634