Chemical Analysis Report

SW-DIST-2021-01-07-01

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

Event Description: **SCIs**
Request ID: **RQ-2021-01-04-46**
Customer: **SW-DIST**
Project ID: **SMP**

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Date Certified: 29-JAN-2021 10:48

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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Owens Branch In Park **Collection Date/Time: 01/06/2021 14:45**

Field ID: G2SW0132 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2217283	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P392093	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P392250	
		Sulfate	32		mg SO4/L	P392252	
	SM 2120 B-2011	Color (true)	92		PCU	P392193	
	SM 2320 B-2011	Total Alkalinity	34		mg CaCO3/L	P392571	
	SM 2540 C-2011	TDS	131		mg/L	P392619	
	SM 2540 D-2011	TSS	4	I	mg/L	P392538	
	SM 4500 F-C-2011	Fluoride	0.35		mg F/L	P392301	MS
2217285	EPA 350.1 Rev. 2.0	Ammonia-N	0.028		mg N/L	P392169	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71	J	mg N/L	P392340	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.73		mg N/L	P392205	
	EPA 365.1 Rev. 2.0	Total-P	0.84		mg P/L	P392268	
	SM 5310 B-2011	Organic Carbon	13		mg C/L	P392212	
2217287	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.40		mg P/L	P392086	
2217307	EPA 200.7 Rev. 4.4	Barium	3.3	I	ug/L	P392079	
		Calcium	17.0		mg/L	P392079	
		Iron	490		ug/L	P392079	
		Magnesium	7.83		mg/L	P392079	
		Potassium	4.3		mg/L	P392079	
		Sodium	10.2		mg/L	P392079	
		Zinc	5.0	U	ug/L	P392079	
	EPA 200.8 Rev. 5.4	Aluminum	150		ug/L	P392079	
		Antimony	0.11	I	ug/L	P392079	
		Arsenic	0.46		ug/L	P392079	
		Boron**	29.7		ug/L	P392079	
		Cadmium	0.037	I	ug/L	P392079	
		Chromium	0.86	I	ug/L	P392079	
		Copper	0.40	U	ug/L	P392079	
		Lead	0.20	U	ug/L	P392079	
		Nickel	0.50	I	ug/L	P392079	
		Selenium	0.31	I	ug/L	P392079	
		Silver	0.010	U	ug/L	P392079	
		Thallium	0.10	U	ug/L	P392079	
	SM 2340B	Hardness	74.6		mg/L	P392079	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Refer to the Lab Analysis Report for an explanation of QC Codes.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: Mizelle Creek In Park **Collection Date/Time: 01/06/2021 11:50**

Field ID: G2SW0131 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2217284	EPA 180.1 Rev. 2.0	Turbidity	5.2	A	NTU	P392094	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P392250	
		Sulfate	12		mg SO4/L	P392252	
	SM 2120 B-2011	Color (true)	82	A	PCU	P392193	
	SM 2320 B-2011	Total Alkalinity	105		mg CaCO3/L	P392571	
	SM 2540 C-2011	TDS	159		mg/L	P392619	
	SM 2540 D-2011	TSS	3	I	mg/L	P392538	
	SM 4500 F-C-2011	Fluoride	0.79		mg F/L	P392301	MS
2217286	EPA 350.1 Rev. 2.0	Ammonia-N	0.053		mg N/L	P392170	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.81		mg N/L	P392340	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.45		mg N/L	P392205	
	EPA 365.1 Rev. 2.0	Total-P	0.50		mg P/L	P392269	
	SM 5310 B-2011	Organic Carbon	15		mg C/L	P392212	
2217288	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.41		mg P/L	P392086	
2217308	EPA 200.7 Rev. 4.4	Barium	2.1	I	ug/L	P392079	
		Calcium	27.2		mg/L	P392079	
		Iron	770		ug/L	P392079	
		Magnesium	15.1		mg/L	P392079	
		Potassium	1.4		mg/L	P392079	
		Sodium	14.6		mg/L	P392079	
		Zinc	5.0	U	ug/L	P392079	
	EPA 200.8 Rev. 5.4	Aluminum	165		ug/L	P392079	
		Antimony	0.085	I	ug/L	P392079	
		Arsenic	0.56		ug/L	P392079	
		Boron**	19.1		ug/L	P392079	
		Cadmium	0.037	I	ug/L	P392079	
		Chromium	0.88	I	ug/L	P392079	
		Copper	0.40	U	ug/L	P392079	
		Lead	0.20	U	ug/L	P392079	
		Nickel	0.54	I	ug/L	P392079	
		Selenium	0.33	I	ug/L	P392079	
		Silver	0.010	U	ug/L	P392079	
		Thallium	0.10	U	ug/L	P392079	
	SM 2340B	Hardness	130		mg/L	P392079	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392093

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392094

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P392079

Component	Result	Code	Units
Barium	1.0	U	ug/L
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: P392079

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392250

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392252

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392169

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392170

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392340

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392205

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392268

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392269

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392086

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

Reference Method: SM 2120 B-2011
Batch ID: P392193

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P392571

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P392619

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P392538

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P392301

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P392212

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: P392079

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	105		P	85 - 115
Calcium	104		P	85 - 115
Iron	107		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	103		P	85 - 115
Sodium	106		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392079

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.8		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	103		P	85 - 115
Boron	99.8		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	97.7		P	85 - 115
Copper	101		P	85 - 115
Lead	105		P	85 - 115
Nickel	102		P	85 - 115
Selenium	102		P	85 - 115
Silver	115		P	85 - 115
Thallium	99.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392250

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392252

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392169

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392170

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.8		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392340

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392205

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392268

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392269

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392086

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

Reference Method: SM 2120 B-2011
Batch ID: P392193

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P392571

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.8		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P392301

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.2		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P392212

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P392079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2216722	Barium	106		P	75 - 125
2216722	Iron	109		P	75 - 125
2216722	Magnesium	108		P	75 - 125
2216722	Potassium	107		P	75 - 125
2216722	Sodium	111		P	75 - 125
2216722	Zinc	98.4		P	75 - 125
2216900	Barium	106	106	P/P	80 - 120
2216900	Calcium	103		P	80 - 120
2216900	Iron	109	109	P/P	80 - 120
2216900	Magnesium	107	108	P/P	80 - 120
2216900	Potassium	104	104	P/P	80 - 120
2216900	Sodium	105	107	P/P	80 - 120
2216900	Zinc	99.9	100	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2216722	Aluminum	104		P	75 - 125
2216722	Antimony	101		P	75 - 125
2216722	Arsenic	101		P	75 - 125
2216722	Boron	98.1		P	75 - 125
2216722	Cadmium	102		P	75 - 125
2216722	Chromium	97.6		P	75 - 125
2216722	Copper	95.3		P	75 - 125
2216722	Lead	106		P	75 - 125
2216722	Nickel	99.1		P	75 - 125
2216722	Selenium	97.9		P	75 - 125
2216722	Silver	111		P	75 - 125
2216722	Thallium	105		P	75 - 125
2216900	Aluminum	98.1	101	P/P	80 - 120
2216900	Antimony	99.0	101	P/P	80 - 120
2216900	Arsenic	100	102	P/P	80 - 120
2216900	Boron	98.5	103	P/P	80 - 120
2216900	Cadmium	99.3	102	P/P	80 - 120
2216900	Chromium	97.4	99.9	P/P	80 - 120
2216900	Copper	98.2	99.0	P/P	80 - 120
2216900	Lead	104	107	P/P	80 - 120
2216900	Nickel	98.5	101	P/P	80 - 120
2216900	Selenium	96.3	99.6	P/P	80 - 120
2216900	Silver	109	111	P/P	80 - 120
2216900	Thallium	99.8	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392250

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217238	Chloride	99.4		P	90 - 110
2217284	Chloride	98.8		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392252

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217238	Sulfate	99.3		P	90 - 110
2217284	Sulfate	98.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392169

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217285	Ammonia-N	97.2	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392170

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217295	Ammonia-N	97.2	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392340

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217285	Kjeldahl Nitrogen	113	96.9	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392205

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217247	NO2NO3-N	96.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392268

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217204	Total-P	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392086

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217297	O-Phosphate-P	92.2	90.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P392301

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217721	Fluoride	94.7	93.6	P/F	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P392212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217358	Organic Carbon	102	102	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392093

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217238	Turbidity	3.96	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392094

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217284	Turbidity	4.99	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P392079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216900	Barium	0.276	Spike	P	0 - 20
2216900	Calcium	0.518	Spike	P	0 - 20
2216900	Iron	0.543	Spike	P	0 - 20
2216900	Magnesium	0.325	Spike	P	0 - 20
2216900	Potassium	0.543	Spike	P	0 - 20
2216900	Sodium	1.02	Spike	P	0 - 20
2216900	Zinc	0.389	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216900	Aluminum	2.42	Spike	P	0 - 20
2216900	Antimony	2.14	Spike	P	0 - 20
2216900	Arsenic	2.00	Spike	P	0 - 20
2216900	Boron	3.46	Spike	P	0 - 20
2216900	Cadmium	3.13	Spike	P	0 - 20
2216900	Chromium	2.48	Spike	P	0 - 20
2216900	Copper	0.774	Spike	P	0 - 20
2216900	Lead	2.74	Spike	P	0 - 20
2216900	Nickel	2.58	Spike	P	0 - 20
2216900	Selenium	3.43	Spike	P	0 - 20
2216900	Silver	1.61	Spike	P	0 - 20
2216900	Thallium	3.35	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392250

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217238	Chloride	0.559	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392252

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217238	Sulfate	0.405	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392169

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217285	Ammonia-N	1.29	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392170

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217295	Ammonia-N	0.518	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392340

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217285	Kjeldahl Nitrogen	9.61	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217247	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217204	Total-P	0.437	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392269

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217286	Total-P	0.293	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217297	O-Phosphate-P	1.86	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B-2011
Batch ID: P392193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217284	Color (true)	0.649	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P392571

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218508	Total Alkalinity	0.00832	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P392619

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217242	TDS	3.31	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P392301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217721	Fluoride	0.463	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P392212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217358	Organic Carbon	0.142	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A102937
Included Lab Sample IDs: 2217287, 2217288

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A102938
Included Lab Sample IDs: 2217283, 2217284

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A102971
Included Lab Sample IDs: 2217285, 2217286

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	100	P/P	90 - 110
Ammonia-N	98.9	98.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A102976
Included Lab Sample IDs: 2217307, 2217308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	103	P/P	90 - 110
Calcium	101	102	P/P	90 - 110
Iron	101	104	P/P	90 - 110
Magnesium	100	103	P/P	90 - 110
Potassium	100	103	P/P	90 - 110
Sodium	101	103	P/P	90 - 110
Zinc	98.2	98.6	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A102980
Included Lab Sample IDs: 2217283, 2217284

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	102	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A102983
Included Lab Sample IDs: 2217285, 2217286

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	98.5	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A102985
Included Lab Sample IDs: 2217285, 2217286

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	102	95.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A103007
Included Lab Sample IDs: 2217283, 2217284

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	99.5	P/P	90 - 110
Chloride	99.5	100	P/P	90 - 110
Sulfate	99.0	100	P/P	90 - 110
Sulfate	100	99.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A103018
Included Lab Sample IDs: 2217283, 2217284

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A103032
Included Lab Sample IDs: 2217285, 2217286

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	99.6	P/P	85 - 115

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A103044
Included Lab Sample IDs: 2217285, 2217286

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	104	P/P	90 - 110
Kjeldahl Nitrogen	104	106	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A103127
Included Lab Sample IDs: 2217283, 2217284

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	93.7	97.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A103128
Included Lab Sample IDs: 2217307, 2217308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.9	98.7	P/P	90 - 110
Antimony	96.4	96.8	P/P	90 - 110
Arsenic	99.6	99.9	P/P	90 - 110
Boron	103	106	P/P	90 - 110
Cadmium	100	100	P/P	90 - 110
Chromium	99.0	98.6	P/P	90 - 110
Copper	95.6	94.7	P/P	90 - 110
Lead	105	105	P/P	90 - 110
Nickel	95.1	94.9	P/P	90 - 110
Selenium	99.9	100	P/P	90 - 110
Thallium	99.8	99.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A103145
Included Lab Sample IDs: 2217307, 2217308

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

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						3.96	
	Turbidity						4.99	
EPA 200.7 Rev. 4.4	Barium	105	106	106	106			0.276
	Calcium	104	103					0.518
	Iron	107	109	109	109			0.543
	Magnesium	108	107	108	108			0.325
	Potassium	103	104	104	107			0.543
	Sodium	106	105	107	111			1.02
	Zinc	100	99.9	100	98.4			0.389
EPA 200.8 Rev. 5.4	Aluminum	98.8	98.1	101	104			2.42
	Antimony	100	99.0	101	101			2.14
	Arsenic	103	100	102	101			2.00
	Boron	99.8	98.5	103	98.1			3.46
	Cadmium	101	99.3	102	102			3.13
	Chromium	97.7	97.4	99.9	97.6			2.48
	Copper	101	98.2	99.0	95.3			0.774
	Lead	105	104	107	106			2.74
	Nickel	102	98.5	101	99.1			2.58
	Selenium	102	96.3	99.6	97.9			3.43
	Silver	115	109	111	111			1.61
	Thallium	99.4	99.8	103	105			3.35
EPA 300.0 Rev. 2.1	Chloride	101	99.4	98.8			0.559	
	Sulfate	98.3	99.3	98.3			0.405	
EPA 350.1 Rev. 2.0	Ammonia-N	99.0	97.2	99.2				1.29
	Ammonia-N	99.8	97.2	98.0				0.518
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.2	113	96.9				9.61
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	96.0					0.0
EPA 365.1 Rev. 2.0	Total-P	102	101	101				0.437
	Total-P	102						0.293
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	92.2	90.5				1.86
SM 2120 B-2011	Color (true)	101					0.649	
SM 2320 B-2011	Total Alkalinity	96.8					0.0083	
SM 2540 C-2011	TDS						3.31	
SM 4500 F-C-2011	Fluoride	97.2	94.7	93.6				0.463
SM 5310 B-2011	Organic Carbon	101	102	102				0.142

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2217283, 2217284
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2217307, 2217308
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2217307, 2217308
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2217283, 2217284
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2217283, 2217284
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2217285, 2217286
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2217285, 2217286
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2217285, 2217286
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2217285, 2217286
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2217287, 2217288
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2217283, 2217284

Reference Method Descriptions

Method	Description	Associated Samples
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2217283, 2217284
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2217307, 2217308
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2217283, 2217284
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2217283, 2217284
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2217283, 2217284
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2217285, 2217286

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	01/07/2021			01/07/2021 15:36	Yen Ta	2217283, 2217284
EPA 200.7 Rev. 4.4	01/07/2021	01/07/2021 16:40	Elliott D. Healy	01/08/2021 20:37	Betina Topolski	2217307
	01/07/2021	01/07/2021 16:40	Elliott D. Healy	01/08/2021 20:44	Betina Topolski	2217308
EPA 200.8 Rev. 5.4	01/07/2021	01/07/2021 16:40	Elliott D. Healy	01/19/2021 15:40	Alexander Thompson	2217307
	01/07/2021	01/07/2021 16:40	Elliott D. Healy	01/19/2021 15:47	Alexander Thompson	2217308
	01/07/2021	01/07/2021 16:40	Elliott D. Healy	01/20/2021 17:08	Alexander Thompson	2217307
	01/07/2021	01/07/2021 16:40	Elliott D. Healy	01/20/2021 17:12	Alexander Thompson	2217308
EPA 300.0 Rev. 2.1	01/07/2021			01/11/2021 19:55	Lipi Saha	2217284
	01/07/2021			01/11/2021 22:20	Lipi Saha	2217283
EPA 350.1 Rev. 2.0	01/07/2021			01/10/2021 10:56	Ping Hua	2217285
	01/07/2021			01/10/2021 11:28	Ping Hua	2217286
EPA 351.2 Rev. 2.0	01/07/2021	01/13/2021 12:08	Yen Ta	01/13/2021 18:23	Julia Storbeck	2217285
	01/07/2021	01/13/2021 12:08	Yen Ta	01/13/2021 18:43	Julia Storbeck	2217286
EPA 353.2 Rev. 2.0	01/07/2021			01/11/2021 09:51	Beverly Y. Sanders	2217285
	01/07/2021			01/11/2021 09:52	Beverly Y. Sanders	2217286
EPA 365.1 Rev. 2.0	01/07/2021	01/12/2021 15:27	Shengyu Wang	01/13/2021 13:12	Benjamin T. Nordmann	2217285
	01/07/2021	01/12/2021 15:27	Shengyu Wang	01/13/2021 13:16	Benjamin T. Nordmann	2217286
EPA 365.1 Rev. 2.0 dissolved	01/07/2021			01/07/2021 16:12	Blanca Fach	2217287, 2217288
SM 2120 B-2011	01/07/2021			01/07/2021 16:52	Benjamin T. Nordmann	2217283
	01/07/2021			01/07/2021 16:53	Benjamin T. Nordmann	2217284
SM 2320 B-2011	01/07/2021			01/15/2021 01:37	Dale L. Simmons	2217283
	01/07/2021			01/15/2021 01:48	Dale L. Simmons	2217284
SM 2340B	01/07/2021			01/08/2021 20:37	Betina Topolski	2217307
	01/07/2021			01/08/2021 20:44	Betina Topolski	2217308
SM 2540 C-2011	01/07/2021			01/12/2021 15:25	Yijie Li	2217283, 2217284
SM 2540 D-2011	01/07/2021			01/12/2021 15:25	Yijie Li	2217283, 2217284
SM 4500 F-C-2011	01/07/2021			01/12/2021 13:11	Dale L. Simmons	2217283
	01/07/2021			01/12/2021 13:24	Dale L. Simmons	2217284
SM 5310 B-2011	01/07/2021			01/09/2021 06:00	Madeline Gruver	2217285
	01/07/2021			01/09/2021 06:12	Madeline Gruver	2217286