

Chemical Analysis Report

SW-DIST-2020-07-02-01

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

Event Description: **Run 13**
Request ID: **RQ-2020-06-29-04**
Customer: **SW-DIST**
Project ID: **SMP**

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Date Certified: 27-JUL-2020 15:46



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: Scott Lake West

Collection Date/Time: 07/01/2020 10:05

Field ID: G2SW0134

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2180427	EPA 180.1 Rev. 2.0	Turbidity	15	A	NTU	P384011	
	EPA 300.0 Rev. 2.1	Chloride	29		mg Cl/L	P384896	
	SM 2120 B-2011	Color (true)	11	AJ	PCU	P384021	RPD
	SM 2320 B-2011	Total Alkalinity	55		mg CaCO3/L	P384611	
	SM 2540 C-2011	TDS	160		mg/L	P384664	
	SM 2540 D-2011	TSS	28		mg/L	P384167	
	SM 4500 F-C-2011	Fluoride	0.34		mg F/L	P384389	
2180428	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P384039	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.0		mg N/L	P384277	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P384116	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P384400	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P384264	
2180429	EPA 300.0 Rev. 2.1 dissolved	Sulfate	9.9		mg SO4/L	P384560	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384086	
2180439	EPA 200.7 Rev. 4.4	Barium	7.6		ug/L	P384078	
		Calcium	23.4		mg/L	P384078	
		Iron	33	I	ug/L	P384078	
		Magnesium	5.14		mg/L	P384078	
		Potassium	3.1		mg/L	P384078	
		Sodium	14.2		mg/L	P384078	
		Zinc	5.0	U	ug/L	P384078	
	EPA 200.8 Rev. 5.4	Aluminum	80		ug/L	P384078	
		Antimony	0.13	I	ug/L	P384078	
		Arsenic	4.05		ug/L	P384078	
		Boron**	35.2		ug/L	P384078	
		Cadmium	0.020	U	ug/L	P384078	
		Chromium	0.40	U	ug/L	P384078	
		Copper	1.46		ug/L	P384078	
		Lead	0.26	I	ug/L	P384078	
		Nickel	0.50	U	ug/L	P384078	
		Selenium	0.20	U	ug/L	P384078	
		Silver	0.010	U	ug/L	P384078	
		Thallium	0.10	U	ug/L	P384078	
	SM 2340B	Hardness	79.7		mg/L	P384078	

Ref. Method and Comment:

SM 2120 B-2011: The sample was analyzed multiple times with inconsistent results with respect to color analysis. Refer to the Lab Analysis Report for an explanation of QC Codes.

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Beulah SW

Collection Date/Time: 07/01/2020 11:00

Field ID: G2SW0053

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2180430	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P384011	
	EPA 300.0 Rev. 2.1	Chloride	4.4		mg Cl/L	P384896	
	SM 2120 B-2011	Color (true)	8.6		PCU	P384016	
	SM 2320 B-2011	Total Alkalinity	56		mg CaCO3/L	P384611	
	SM 2540 C-2011	TDS	85		mg/L	P384664	
	SM 2540 D-2011	TSS	5	I	mg/L	P384167	
	SM 4500 F-C-2011	Fluoride	0.27		mg F/L	P384389	
2180432	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P384039	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77		mg N/L	P384277	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P384116	
	EPA 365.1 Rev. 2.0	Total-P	0.056		mg P/L	P384400	
	SM 5310 B-2011	Organic Carbon	8.3		mg C/L	P384264	
2180434	EPA 300.0 Rev. 2.1 dissolved	Sulfate	2.5		mg SO4/L	P384560	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384086	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Van @ Center

Collection Date/Time: 07/01/2020 11:55

Field ID: G4SW0106

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2180431	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P384011	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P384896	
	SM 2120 B-2011	Color (true)	69	A	PCU	P384016	
	SM 2320 B-2011	Total Alkalinity	9.7		mg CaCO3/L	P384611	
	SM 2540 C-2011	TDS	127	A	mg/L	P384664	
	SM 2540 D-2011	TSS	3	IA	mg/L	P384167	
	SM 4500 F-C-2011	Fluoride	0.30		mg F/L	P384389	
2180433	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P384039	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.91		mg N/L	P384277	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P384116	
	EPA 365.1 Rev. 2.0	Total-P	0.055		mg P/L	P384400	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P384264	
2180435	EPA 300.0 Rev. 2.1 dissolved	Sulfate	23		mg SO4/L	P384531	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384087	

Ref. Method and Comment:

SM 2540 D-2011: 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: P384011

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P384078

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: P384078

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: P384896

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P384531

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P384560

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: P384039

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384277

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384116

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384400

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384086

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384087

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

Reference Method: SM 2120 B-2011
Batch ID: P384016

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B-2011
Batch ID: P384021

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P384611

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: P384664

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P384167

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P384389

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P384264

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: P384078

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	104		P	85 - 115
Iron	106		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	100		P	85 - 115
Sodium	101		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P384078

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	93.5		P	85 - 115
Antimony	95.0		P	85 - 115
Arsenic	94.9		P	85 - 115
Boron	98.1		P	85 - 115
Cadmium	95.4		P	85 - 115
Chromium	99.0		P	85 - 115
Copper	95.4		P	85 - 115
Lead	94.5		P	85 - 115
Nickel	93.4		P	85 - 115
Selenium	94.9		P	85 - 115
Silver	99.0		P	85 - 115
Thallium	96.0		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384896

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P384531

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P384560

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384039

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384277

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384116

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: P384400

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384086

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384087

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

Reference Method: SM 2120 B-2011
Batch ID: P384016

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.1		P	85 - 115

Reference Method: SM 2120 B-2011
Batch ID: P384021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.4		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P384611

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.5		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P384389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	90 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P384264

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P384078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180579	Barium	107	107	P/P	80 - 120
2180579	Calcium	105		P	80 - 120
2180579	Iron	106	105	P/P	80 - 120
2180579	Magnesium	108	106	P/P	80 - 120
2180579	Potassium	105	103	P/P	80 - 120
2180579	Sodium	100	98.6	P/P	80 - 120
2180579	Zinc	107	107	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P384078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180579	Aluminum	89.1	89.1	P/P	80 - 120
2180579	Antimony	93.3	94.3	P/P	80 - 120
2180579	Arsenic	92.5	92.3	P/P	80 - 120
2180579	Boron	99.3	101	P/P	80 - 120
2180579	Cadmium	96.0	95.8	P/P	80 - 120
2180579	Chromium	97.9	97.9	P/P	80 - 120
2180579	Copper	93.9	93.3	P/P	80 - 120
2180579	Lead	94.4	94.9	P/P	80 - 120
2180579	Nickel	91.9	97.2	P/P	80 - 120
2180579	Selenium	91.1	90.2	P/P	80 - 120
2180579	Silver	97.4	98.3	P/P	80 - 120
2180579	Thallium	99.5	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180294	Chloride	98.6		P	90 - 110
2180401	Chloride	99.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P384531

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2181410	Sulfate	100		P	90 - 110
2181584	Sulfate	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P384560

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180449	Sulfate	102		P	90 - 110
2180537	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384039

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180432	Ammonia-N	98.6	99.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384277

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180451	Kjeldahl Nitrogen	109	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384116

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180368	NO2NO3-N	98.0	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180368	Total-P	107	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384086

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180353	O-Phosphate-P	96.0	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384087

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180435	O-Phosphate-P	98.0	99.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P384389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180449	Fluoride	98.7	98.2	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P384264

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180452	Organic Carbon	101	103	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P384011

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180427	Turbidity	5.48	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P384078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180579	Barium	0.0271	Spike	P	0 - 20
2180579	Calcium	0.694	Spike	P	0 - 20
2180579	Iron	0.736	Spike	P	0 - 20
2180579	Magnesium	1.49	Spike	P	0 - 20
2180579	Potassium	2.08	Spike	P	0 - 20
2180579	Sodium	1.30	Spike	P	0 - 20
2180579	Zinc	0.237	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P384078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180579	Aluminum	0.0230	Spike	P	0 - 20
2180579	Antimony	1.07	Spike	P	0 - 20
2180579	Arsenic	0.204	Spike	P	0 - 20
2180579	Boron	1.73	Spike	P	0 - 20
2180579	Cadmium	0.220	Spike	P	0 - 20
2180579	Chromium	0.0241	Spike	P	0 - 20
2180579	Copper	0.635	Spike	P	0 - 20
2180579	Lead	0.547	Spike	P	0 - 20
2180579	Nickel	5.68	Spike	P	0 - 20
2180579	Selenium	0.945	Spike	P	0 - 20
2180579	Silver	0.952	Spike	P	0 - 20
2180579	Thallium	1.42	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P384896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180294	Chloride	0.142	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1 dissolved
 Batch ID: P384531

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2181584	Sulfate	0.587	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P384560

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180449	Sulfate	0.270	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384039

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180432	Ammonia-N	0.360	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384277

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180451	Kjeldahl Nitrogen	0.0161	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384116

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180368	NO2NO3-N	0.284	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384400

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180368	Total-P	1.22	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180353	O-Phosphate-P	1.04	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384087

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180435	O-Phosphate-P	1.22	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P384016

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180431	Color (true)	1.32	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
 Batch ID: P384021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180427	Color (true)	49.7	Sample	F	0 - 20

Reference Method: SM 2320 B-2011
 Batch ID: P384611

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180449	Total Alkalinity	0.158	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
 Batch ID: P384664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180431	TDS	3.15	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
 Batch ID: P384389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180449	Fluoride	0.462	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
 Batch ID: P384264

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180452	Organic Carbon	1.09	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A99661

Included Lab Sample IDs: 2180427, 2180430, 2180431

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

Reference Method: SM 2120 B-2011

Run ID: A99662

Included Lab Sample IDs: 2180427, 2180430, 2180431

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	90 - 115
Color (true)	99.8	101	P/P	90 - 115

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A99668

Included Lab Sample IDs: 2180428, 2180432, 2180433

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.5	P/P	90 - 110
Ammonia-N	99.5	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A99692

Included Lab Sample IDs: 2180429, 2180434, 2180435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A99705

Included Lab Sample IDs: 2180428, 2180432, 2180433

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

Reference Method: SM 5310 B-2011

Run ID: A99754

Included Lab Sample IDs: 2180428, 2180432, 2180433

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.0	102	P/P	90 - 110
Organic Carbon	99.1	99.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A99759

Included Lab Sample IDs: 2180439

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	104	P/P	90 - 110
Calcium	105	108	P/P	90 - 110
Iron	103	105	P/P	90 - 110
Magnesium	103	106	P/P	90 - 110
Potassium	99.3	102	P/P	90 - 110
Sodium	101	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A99759

Included Lab Sample IDs: 2180439

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

Reference Method: SM 4500 F-C-2011

Run ID: A99792

Included Lab Sample IDs: 2180427, 2180430, 2180431

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A99796

Included Lab Sample IDs: 2180428, 2180432, 2180433

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	99.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A99818

Included Lab Sample IDs: 2180439

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	91.6	93.2	P/P	90 - 110
Antimony	93.6	95.9	P/P	90 - 110
Arsenic	92.1	91.9	P/P	90 - 110
Cadmium	94.4	96.7	P/P	90 - 110
Chromium	95.0	96.9	P/P	90 - 110
Copper	91.6	91.1	P/P	90 - 110
Lead	94.5	94.3	P/P	90 - 110
Nickel	91.3	91.4	P/P	90 - 110
Selenium	95.7	97.0	P/P	90 - 110
Silver	95.6	96.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A99826

Included Lab Sample IDs: 2180428, 2180432, 2180433

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved

Run ID: A99836

Included Lab Sample IDs: 2180435

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved

Run ID: A99856

Included Lab Sample IDs: 2180429, 2180434

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1 dissolved

Run ID: A99856

Included Lab Sample IDs: 2180429, 2180434

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	99.5	99.3	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A99877

Included Lab Sample IDs: 2180427, 2180430, 2180431

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.6	99.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A99899

Included Lab Sample IDs: 2180439

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	97.7	97.8	P/P	90 - 110
Thallium	92.4	91.1	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A99978

Included Lab Sample IDs: 2180427, 2180430, 2180431

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	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
EPA 180.1 Rev. 2.0	Turbidity					5.48
EPA 200.7 Rev. 4.4	Barium	104	107	107		0.0271
	Calcium	104	105			0.694
	Iron	106	106	105		0.736
	Magnesium	107	108	106		1.49
	Potassium	100	105	103		2.08
	Sodium	101	100	98.6		1.30
	Zinc	104	107	107		0.237
EPA 200.8 Rev. 5.4	Aluminum	93.5	89.1	89.1		0.0230
	Antimony	95.0	93.3	94.3		1.07
	Arsenic	94.9	92.5	92.3		0.204
	Boron	98.1	99.3	101		1.73
	Cadmium	95.4	96.0	95.8		0.220
	Chromium	99.0	97.9	97.9		0.0241
	Copper	95.4	93.9	93.3		0.635
	Lead	94.5	94.4	94.9		0.547
	Nickel	93.4	91.9	97.2		5.68
	Selenium	94.9	91.1	90.2		0.945
	Silver	99.0	97.4	98.3		0.952
	Thallium	96.0	99.5	101		1.42
EPA 300.0 Rev. 2.1	Chloride	97.4	98.6	99.1		0.142
EPA 300.0 Rev. 2.1 dissolved	Sulfate	101	101	100		0.587
	Sulfate	100	102	102		0.270
EPA 350.1 Rev. 2.0	Ammonia-N	102	98.6	99.0		0.360
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	109	109		0.0161
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.0	97.5		0.284
EPA 365.1 Rev. 2.0	Total-P	108	107	105		1.22
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	96.0	97.0		1.04
	O-Phosphate-P	99.0	98.0	99.2		1.22
SM 2120 B-2011	Color (true)	98.1				1.32
	Color (true)	99.4				49.7
SM 2320 B-2011	Total Alkalinity	99.5				0.158
SM 2540 C-2011	TDS					3.15
SM 4500 F-C-2011	Fluoride	100	98.7	98.2		0.462
SM 5310 B-2011	Organic Carbon	100	101	103		1.09

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2180427, 2180430, 2180431
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2180439
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2180439
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2180427, 2180430, 2180431
EPA 300.0 Rev. 2.1 dissolved	Sulfate, dissolved, in filtered, aqueous matrices	2180429, 2180434, 2180435
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2180428, 2180432, 2180433
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2180428, 2180432, 2180433
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2180428, 2180432, 2180433
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2180428, 2180432, 2180433
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2180429, 2180434, 2180435
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2180427, 2180430, 2180431

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2180427, 2180430, 2180431
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2180439
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2180427, 2180430, 2180431
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2180427, 2180430, 2180431
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2180427, 2180430, 2180431
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2180428, 2180432, 2180433

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	07/02/2020			07/02/2020 14:42	Yen Ta	2180427, 2180430, 2180431
EPA 200.7 Rev. 4.4	07/02/2020	07/06/2020 13:00	Elliott D. Healy	07/08/2020 18:05	Betina Topolski	2180439
EPA 200.8 Rev. 5.4	07/02/2020	07/06/2020 13:00	Elliott D. Healy	07/10/2020 16:57	Justin Cutchin	2180439
	07/02/2020	07/06/2020 13:00	Elliott D. Healy	07/15/2020 17:37	Alexander Thompson	2180439
EPA 300.0 Rev. 2.1	07/02/2020			07/16/2020 23:53	Julia Storbeck	2180427
	07/02/2020			07/17/2020 00:05	Julia Storbeck	2180430
	07/02/2020			07/17/2020 00:17	Julia Storbeck	2180431
EPA 300.0 Rev. 2.1 dissolved	07/02/2020			07/09/2020 05:35	Elliott Rodriguez	2180429
	07/02/2020			07/09/2020 05:47	Elliott Rodriguez	2180434
	07/02/2020			07/10/2020 19:55	Julia Storbeck	2180435
EPA 350.1 Rev. 2.0	07/02/2020			07/05/2020 20:39	Ping Hua	2180432
	07/02/2020			07/05/2020 20:56	Ping Hua	2180428
	07/02/2020			07/05/2020 20:57	Ping Hua	2180433
EPA 351.2 Rev. 2.0	07/02/2020	07/09/2020 09:20	Sima Feizi	07/10/2020 13:09	Jhamieka S. Greenwood	2180428
	07/02/2020	07/09/2020 09:20	Sima Feizi	07/10/2020 13:10	Jhamieka S. Greenwood	2180432
	07/02/2020	07/09/2020 09:20	Sima Feizi	07/10/2020 13:12	Jhamieka S. Greenwood	2180433
EPA 353.2 Rev. 2.0	07/02/2020			07/07/2020 08:59	Beverly Y. Sanders	2180428
	07/02/2020			07/07/2020 09:00	Beverly Y. Sanders	2180432
	07/02/2020			07/07/2020 09:01	Beverly Y. Sanders	2180433
EPA 365.1 Rev. 2.0	07/02/2020	07/10/2020 13:26	Yen Ta	07/13/2020 10:38	Benjamin T. Nordmann	2180428
	07/02/2020	07/10/2020 13:26	Yen Ta	07/13/2020 10:39	Benjamin T. Nordmann	2180432
	07/02/2020	07/10/2020 13:26	Yen Ta	07/13/2020 10:40	Benjamin T. Nordmann	2180433
EPA 365.1 Rev. 2.0 dissolved	07/02/2020			07/02/2020 17:08	Carlos Miranda	2180429
	07/02/2020			07/02/2020 17:09	Carlos Miranda	2180434
	07/02/2020			07/02/2020 17:12	Carlos Miranda	2180435
SM 2120 B-2011	07/02/2020			07/02/2020 16:00	Madeline Gruver	2180430
	07/02/2020			07/02/2020 16:01	Madeline Gruver	2180431
	07/02/2020			07/02/2020 16:26	Madeline Gruver	2180427
SM 2320 B-2011	07/02/2020			07/13/2020 22:33	Dale L. Simmons	2180427
	07/02/2020			07/13/2020 22:42	Dale L. Simmons	2180430
	07/02/2020			07/13/2020 22:53	Dale L. Simmons	2180431
SM 2340B	07/02/2020			07/08/2020 18:05	Betina Topolski	2180439
SM 2540 C-2011	07/02/2020			07/06/2020 19:14	Madeline Gruver	2180427, 2180430, 2180431
SM 2540 D-2011	07/02/2020			07/06/2020 19:14	Madeline Gruver	2180427, 2180430, 2180431
SM 4500 F-C-2011	07/02/2020			07/09/2020 02:48	Dale L. Simmons	2180427
	07/02/2020			07/09/2020 03:00	Dale L. Simmons	2180430
	07/02/2020			07/09/2020 03:13	Dale L. Simmons	2180431
SM 5310 B-2011	07/02/2020			07/08/2020 16:43	David Boose	2180428
	07/02/2020			07/08/2020 17:20	David Boose	2180432
	07/02/2020			07/08/2020 17:34	David Boose	2180433