

Chemical Analysis Report

NW-DIST-2020-07-02-02

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

Event Description: **Bay Walton County Run**
Request ID: **RQ-2020-07-06-56**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 23-JUL-2020 21:33

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited 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: Pine Log Creek upstream of Hwy 79

Collection Date/Time: 07/01/2020 10:48

Field ID: G3NW0153

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2180562	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P384013	
	EPA 300.0 Rev. 2.1	Chloride	2.8		mg Cl/L	P384558	
		Sulfate	1.0		mg SO4/L	P384560	
		Color (true)	78		PCU	P384019	
	SM 2320 B-2011	Total Alkalinity	10		mg CaCO3/L	P384612	
	SM 2540 C-2011	TDS	37		mg/L	P384665	
	SM 2540 D-2011	TSS	2	I	mg/L	P384168	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P384389	
2180563	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P384435	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.27		mg N/L	P384278	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.01	I	mg N/L	P384118	
	EPA 365.1 Rev. 2.0	Total-P	0.008		mg P/L	P384246	
	SM 5310 B-2011	Organic Carbon	6.5		mg C/L	P384264	
2180564	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384088	
2180579	EPA 200.7 Rev. 4.4	Barium	6.5		ug/L	P384078	
		Calcium	5.50		mg/L	P384078	
		Iron	200		ug/L	P384078	
		Magnesium	0.60		mg/L	P384078	
		Potassium	0.30	U	mg/L	P384078	
		Sodium	1.7	I	mg/L	P384078	
		Zinc	5.0	U	ug/L	P384078	
	EPA 200.8 Rev. 5.4	Aluminum	100		ug/L	P384078	
		Antimony	0.050	U	ug/L	P384078	
		Arsenic	0.28		ug/L	P384078	
		Boron**	10.4		ug/L	P384078	
		Cadmium	0.020	U	ug/L	P384078	
		Chromium	0.40	U	ug/L	P384078	
		Copper	0.40	U	ug/L	P384078	
		Lead	0.20	U	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	
		Hardness	16.2		mg/L	P384078	

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: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Little Black Creek upstream of Black Creek

Collection Date/Time: 07/01/2020 11:41

Field ID: G3NW0200

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2180565	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P384013	
	EPA 300.0 Rev. 2.1	Chloride	2.9		mg Cl/L	P384558	
		Sulfate	0.70		mg SO4/L	P384560	
	SM 2120 B-2011	Color (true)	53		PCU	P384019	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P384612	
	SM 2540 C-2011	TDS	21	I	mg/L	P384666	
	SM 2540 D-2011	TSS	2	U	mg/L	P384168	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P384389	
2180567	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P384435	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.21		mg N/L	P384278	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.051		mg N/L	P384118	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P384246	
	SM 5310 B-2011	Organic Carbon	3.3		mg C/L	P384264	
2180569	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384088	

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: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Black Creek upstream of Hwy 20

Collection Date/Time: 07/01/2020 12:01

Field ID: G3NW0148

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2180566	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P384013	
	EPA 300.0 Rev. 2.1	Chloride	2.8		mg Cl/L	P384558	
		Sulfate	1.4		mg SO4/L	P384560	
	SM 2120 B-2011	Color (true)	69	A	PCU	P384019	
	SM 2320 B-2011	Total Alkalinity	1.3	I	mg CaCO3/L	P384612	
	SM 2540 C-2011	TDS	26		mg/L	P384666	
	SM 2540 D-2011	TSS	2	I	mg/L	P384168	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P384390	
2180568	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P384435	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.27		mg N/L	P384278	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.029		mg N/L	P384118	
	EPA 365.1 Rev. 2.0	Total-P	0.009		mg P/L	P384246	
	SM 5310 B-2011	Organic Carbon	4.0		mg C/L	P384265	
2180570	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384088	

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: Batch matrix spike recoveries are unavailable 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: P384013

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: P384558

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

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

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384435

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384278

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384118

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384246

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384088

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

Reference Method: SM 2120 B-2011
Batch ID: P384019

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P384612

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

Reference Method: SM 2540 C-2011
Batch ID: P384665

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P384666

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P384168

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

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

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-2011
Batch ID: P384390

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

Reference Method: SM 5310 B-2011
Batch ID: P384265

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: P384558

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

Reference Method: EPA 300.0 Rev. 2.1
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: P384435

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384278

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384118

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: P384246

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384088

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.3		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P384019

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.7		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P384612

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.1		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

Reference Method: SM 4500 F-C-2011
Batch ID: P384390

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	90 - 106

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

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

Reference Method: SM 5310 B-2011
Batch ID: P384265

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	104		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: P384558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180449	Chloride	103		P	90 - 110
2180537	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
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: P384435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180538	Ammonia-N	100	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384118

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180526	NO2NO3-N	98.5	98.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384246

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180531	Total-P	103	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384088

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180509	O-Phosphate-P	92.2	91.9	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 4500 F-C-2011
Batch ID: P384390

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180804	Fluoride	96.9	97.6	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

Reference Method: SM 5310 B-2011
Batch ID: P384265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180682	Organic Carbon	103	105	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P384013

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180525	Turbidity	1.42	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: P384558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180449	Chloride	0.0178	Sample	P	0 - 20

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

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

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180538	Ammonia-N	0.986	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384278

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180505	Kjeldahl Nitrogen	1.17	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180526	NO2NO3-N	0.509	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384246

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180531	Total-P	1.12	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384088

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180509	O-Phosphate-P	0.326	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P384019

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180566	Color (true)	0.393	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P384612

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2181423	Total Alkalinity	0.0372	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P384665

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180449	TDS	3.23	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
 Batch ID: P384666

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180504	TDS	8.86	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 4500 F-C-2011
 Batch ID: P384390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180804	Fluoride	0.461	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

Reference Method: SM 5310 B-2011
 Batch ID: P384265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180682	Organic Carbon	2.26	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: 2180562, 2180565, 2180566

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: 2180562, 2180565, 2180566

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A99692

Included Lab Sample IDs: 2180564, 2180569, 2180570

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	97.1	P/P	90 - 110
O-Phosphate-P	99.5	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A99705

Included Lab Sample IDs: 2180563, 2180567, 2180568

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: 2180563, 2180567, 2180568

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	102	99.8	P/P	90 - 110
Organic Carbon	99.8	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A99759

Included Lab Sample IDs: 2180579

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
Zinc	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A99781

Included Lab Sample IDs: 2180563, 2180567, 2180568

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

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-2011

Run ID: A99792

Included Lab Sample IDs: 2180562, 2180565, 2180566

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	98.6	P/P	90 - 110
Fluoride	98.6	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A99805

Included Lab Sample IDs: 2180563, 2180567, 2180568

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A99808

Included Lab Sample IDs: 2180563, 2180567, 2180568

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A99818

Included Lab Sample IDs: 2180579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	91.8	91.6	P/P	90 - 110
Antimony	91.6	93.6	P/P	90 - 110
Arsenic	93.0	92.1	P/P	90 - 110
Cadmium	92.6	94.4	P/P	90 - 110
Chromium	93.6	95.0	P/P	90 - 110
Copper	93.3	91.6	P/P	90 - 110
Lead	93.0	94.5	P/P	90 - 110
Nickel	93.0	91.3	P/P	90 - 110
Selenium	93.8	95.7	P/P	90 - 110
Silver	94.3	95.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A99856

Included Lab Sample IDs: 2180562, 2180565, 2180566

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.9	99.5	P/P	90 - 110
Sulfate	99.1	99.5	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A99877

Included Lab Sample IDs: 2180562, 2180565, 2180566

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.6	99.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A99899

Included Lab Sample IDs: 2180579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	95.8	97.7	P/P	90 - 110
Thallium	90.1	92.4	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
EPA 180.1 Rev. 2.0	Turbidity				1.42	
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	101	103	102	0.0178	
	Sulfate	100	102	102	0.270	
EPA 350.1 Rev. 2.0	Ammonia-N	103	100	99.0		0.986
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102				1.17
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.5	98.0		0.509
EPA 365.1 Rev. 2.0	Total-P	103	103	101		1.12
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	92.2	91.9		0.326
SM 2120 B-2011	Color (true)	99.7			0.393	
SM 2320 B-2011	Total Alkalinity	99.1			0.0372	
SM 2540 C-2011	TDS				3.23	
	TDS				8.86	
SM 4500 F-C-2011	Fluoride	100	98.7	98.2		0.462
	Fluoride	101	96.9	97.6		0.461
SM 5310 B-2011	Organic Carbon	100	101	103		1.09
	Organic Carbon	104	103	105		2.26

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2180562, 2180565, 2180566
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2180579
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2180579
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2180562, 2180565, 2180566
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2180562, 2180565, 2180566
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2180563, 2180567, 2180568
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2180563, 2180567, 2180568
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2180563, 2180567, 2180568
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2180563, 2180567, 2180568
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2180564, 2180569, 2180570
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2180562, 2180565, 2180566

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2180562, 2180565, 2180566
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2180579
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2180562, 2180565, 2180566
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2180562, 2180565, 2180566
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2180562, 2180565, 2180566
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2180563, 2180567, 2180568

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	2180562, 2180565, 2180566
EPA 200.7 Rev. 4.4	07/02/2020	07/06/2020 13:00	Elliott D. Healy	07/08/2020 18:27	Betina Topolski	2180579
EPA 200.8 Rev. 5.4	07/02/2020	07/06/2020 13:00	Elliott D. Healy	07/10/2020 15:22	Justin Cutchin	2180579
	07/02/2020	07/06/2020 13:00	Elliott D. Healy	07/15/2020 16:55	Alexander Thompson	2180579
EPA 300.0 Rev. 2.1	07/02/2020			07/09/2020 03:58	Elliott Rodriguez	2180562
	07/02/2020			07/09/2020 04:10	Elliott Rodriguez	2180565
	07/02/2020			07/09/2020 04:23	Elliott Rodriguez	2180566
EPA 350.1 Rev. 2.0	07/02/2020			07/11/2020 14:23	Ping Hua	2180563
	07/02/2020			07/11/2020 14:24	Ping Hua	2180567
	07/02/2020			07/11/2020 14:26	Ping Hua	2180568
EPA 351.2 Rev. 2.0	07/02/2020	07/09/2020 09:20	Sima Feizi	07/10/2020 14:53	Jhamieka S. Greenwood	2180563
	07/02/2020	07/09/2020 09:20	Sima Feizi	07/10/2020 14:55	Jhamieka S. Greenwood	2180567
	07/02/2020	07/09/2020 09:20	Sima Feizi	07/10/2020 14:56	Jhamieka S. Greenwood	2180568
EPA 353.2 Rev. 2.0	07/02/2020			07/07/2020 09:40	Beverly Y. Sanders	2180563
	07/02/2020			07/07/2020 09:41	Beverly Y. Sanders	2180567
	07/02/2020			07/07/2020 09:42	Beverly Y. Sanders	2180568
EPA 365.1 Rev. 2.0	07/02/2020	07/08/2020 13:48	Yen Ta	07/10/2020 08:54	Lipi Saha	2180563
	07/02/2020	07/08/2020 13:48	Yen Ta	07/10/2020 08:55	Lipi Saha	2180567
	07/02/2020	07/08/2020 13:48	Yen Ta	07/10/2020 08:56	Lipi Saha	2180568
EPA 365.1 Rev. 2.0 dissolved	07/02/2020			07/02/2020 17:39	Carlos Miranda	2180564
	07/02/2020			07/02/2020 17:44	Carlos Miranda	2180569
	07/02/2020			07/02/2020 17:45	Carlos Miranda	2180570
SM 2120 B-2011	07/02/2020			07/02/2020 16:19	Madeline Gruver	2180562
	07/02/2020			07/02/2020 16:20	Madeline Gruver	2180565
	07/02/2020			07/02/2020 16:21	Madeline Gruver	2180566
SM 2320 B-2011	07/02/2020			07/14/2020 02:40	Dale L. Simmons	2180562
	07/02/2020			07/14/2020 02:47	Dale L. Simmons	2180565
	07/02/2020			07/14/2020 02:54	Dale L. Simmons	2180566
SM 2340B	07/02/2020			07/08/2020 18:27	Betina Topolski	2180579
SM 2540 C-2011	07/02/2020			07/06/2020 19:14	Madeline Gruver	2180562, 2180565, 2180566
SM 2540 D-2011	07/02/2020			07/06/2020 19:14	Madeline Gruver	2180562, 2180565, 2180566
SM 4500 F-C-2011	07/02/2020			07/09/2020 06:04	Dale L. Simmons	2180562
	07/02/2020			07/09/2020 06:13	Dale L. Simmons	2180565
	07/02/2020			07/09/2020 08:01	Dale L. Simmons	2180566
SM 5310 B-2011	07/02/2020			07/08/2020 20:47	David Boose	2180563
	07/02/2020			07/08/2020 20:59	David Boose	2180567
	07/02/2020			07/08/2020 22:53	David Boose	2180568