Chemical Analysis Report

SW-DIST-2020-08-06-01

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

Event Description: **SMP RUN 6**
Request ID: **RQ-2020-06-08-03**
Customer: **SW-DIST**
Project ID: **SMP**

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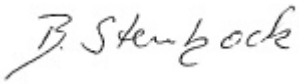
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 28-AUG-2020 15:19



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: Mobley Ditch @ 70 **Collection Date/Time: 08/05/2020 11:20**

Field ID: G3SW0056 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2188778	EPA 180.1 Rev. 2.0	Turbidity	14	A	NTU	P385743	
	EPA 300.0 Rev. 2.1	Chloride	140		mg Cl/L	P385890	
	SM 2120 B-2011	Color (true)	440		PCU	P385745	
	SM 2320 B-2011	Total Alkalinity	103		mg CaCO3/L	P385833	
	SM 2540 C-2011	TDS	469		mg/L	P386383	
	SM 2540 D-2011	TSS	17	J	mg/L	P385852	
	SM 4500 F-C-2011	Fluoride	0.22		mg F/L	P385836	
2188779	EPA 350.1 Rev. 2.0	Ammonia-N	0.67		mg N/L	P385803	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	5.5		mg N/L	P385879	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P385764	
	EPA 365.1 Rev. 2.0	Total-P	4.0		mg P/L	P385826	
	SM 5310 B-2011	Organic Carbon	42		mg C/L	P385883	
2188780	EPA 300.0 Rev. 2.1 dissolved	Sulfate	16		mg SO4/L	P385895	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	3.6		mg P/L	P385738	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The recovery of the QC standard was outside of the acceptable limit.
SM 4500 F-C-2011: Batch matrix spike recoveries are unavailable because of high 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.

Sample Location: Indian Creek @ Fruitville Rd **Collection Date/Time: 08/05/2020 10:20**

Field ID: G3SW0057 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2188775	EPA 180.1 Rev. 2.0	Turbidity	7.3		NTU	P385742	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P385890	
	SM 2120 B-2011	Color (true)	150		PCU	P385745	
	SM 2320 B-2011	Total Alkalinity	41	A	mg CaCO3/L	P385833	
	SM 2540 C-2011	TDS	180	A	mg/L	P386383	
	SM 2540 D-2011	TSS	2	I AJ	mg/L	P385852	
	SM 4500 F-C-2011	Fluoride	0.49		mg F/L	P385836	
2188776	EPA 350.1 Rev. 2.0	Ammonia-N	0.093		mg N/L	P385803	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P385879	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P385764	
	EPA 365.1 Rev. 2.0	Total-P	1.0		mg P/L	P385824	
	SM 5310 B-2011	Organic Carbon	18		mg C/L	P385883	
2188777	EPA 300.0 Rev. 2.1 dissolved	Sulfate	45		mg SO4/L	P385895	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.81		mg P/L	P385738	
2188787	EPA 200.7 Rev. 4.4	Barium	4.0	I	ug/L	P385736	
		Calcium	24.1		mg/L	P385736	
		Iron	2.40E+03		ug/L	P385736	
		Magnesium	9.12		mg/L	P385736	
		Potassium	2.7		mg/L	P385736	
		Sodium	9.1		mg/L	P385736	
		Zinc	5.0	U	ug/L	P385736	
	EPA 200.8 Rev. 5.4	Aluminum	152		ug/L	P385736	
		Antimony	0.069	I	ug/L	P385736	
		Arsenic	2.67		ug/L	P385736	
		Boron**	37.0		ug/L	P385736	
		Cadmium	0.020	U	ug/L	P385736	
		Chromium	1.2	I	ug/L	P385736	
		Copper	0.48	I	ug/L	P385736	
		Lead	0.20	U	ug/L	P385736	
		Nickel	0.50	U	ug/L	P385736	
		Selenium	0.20	U	ug/L	P385736	
		Silver	0.010	U	ug/L	P385736	
		Thallium	0.10	U	ug/L	P385736	
	SM 2340B	Hardness	97.7		mg/L	P385736	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The recovery of the QC standard was outside of the acceptable limit.
SM 4500 F-C-2011: 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: P385742

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P385743

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385736

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: P385736

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: P385890

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P385895

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: P385803

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385879

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385764

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385824

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385826

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385738

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

Reference Method: SM 2120 B-2011
Batch ID: P385745

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P385833

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

Reference Method: SM 2540 C-2011
Batch ID: P386383

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P385852

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P385836

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P385883

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: P385736

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	104		P	85 - 115
Iron	102		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	100		P	85 - 115
Sodium	98.1		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385736

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.8		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	101		P	85 - 115
Boron	104		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	102		P	85 - 115
Copper	98.1		P	85 - 115
Lead	105		P	85 - 115
Nickel	98.3		P	85 - 115
Selenium	99.3		P	85 - 115
Silver	110		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385890

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P385895

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385803

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385879

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: P385764

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385824

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385826

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385738

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.6		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P385745

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

Reference Method: SM 2320 B-2011
Batch ID: P385833

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P385836

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.4		P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P385883

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: P385736

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189012	Barium	106	104	P/P	80 - 120
2189012	Calcium	105	105	P/P	80 - 120
2189012	Iron	105	101	P/P	80 - 120
2189012	Magnesium	104	101	P/P	80 - 120
2189012	Potassium	101	98.6	P/P	80 - 120
2189012	Sodium	97.7	101	P/P	80 - 120
2189012	Zinc	109	107	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385736

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189012	Aluminum	100	99.2	P/P	80 - 120
2189012	Antimony	103	104	P/P	80 - 120
2189012	Arsenic	101	100	P/P	80 - 120
2189012	Boron	103	102	P/P	80 - 120
2189012	Cadmium	99.3	101	P/P	80 - 120
2189012	Chromium	103	102	P/P	80 - 120
2189012	Copper	98.9	99.5	P/P	80 - 120
2189012	Lead	105	105	P/P	80 - 120
2189012	Nickel	97.4	97.2	P/P	80 - 120
2189012	Selenium	97.6	98.5	P/P	80 - 120
2189012	Silver	109	109	P/P	80 - 120
2189012	Thallium	101	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385890

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188563	Chloride	101		P	90 - 110
2188897	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P385895

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188563	Sulfate	102		P	90 - 110
2188897	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385803

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188772	Ammonia-N	97.4	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385879

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188772	Kjeldahl Nitrogen	103	99.9	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385764

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188685	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385824

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188589	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188773	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: SM 5310 B-2011
Batch ID: P385883

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188901	Organic Carbon	102	102	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P385742

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188757	Turbidity	0.635	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P385743

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188778	Turbidity	2.17	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385736

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189012	Barium	1.60	Spike	P	0 - 20
2189012	Calcium	0.0287	Spike	P	0 - 20
2189012	Iron	3.45	Spike	P	0 - 20
2189012	Magnesium	2.15	Spike	P	0 - 20
2189012	Potassium	2.17	Spike	P	0 - 20
2189012	Sodium	1.94	Spike	P	0 - 20
2189012	Zinc	1.49	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385736

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189012	Aluminum	1.08	Spike	P	0 - 20
2189012	Antimony	1.14	Spike	P	0 - 20
2189012	Arsenic	0.413	Spike	P	0 - 20
2189012	Boron	0.384	Spike	P	0 - 20
2189012	Cadmium	1.43	Spike	P	0 - 20
2189012	Chromium	0.316	Spike	P	0 - 20
2189012	Copper	0.664	Spike	P	0 - 20
2189012	Lead	0.439	Spike	P	0 - 20
2189012	Nickel	0.264	Spike	P	0 - 20
2189012	Selenium	0.868	Spike	P	0 - 20
2189012	Silver	0.659	Spike	P	0 - 20
2189012	Thallium	1.06	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385890

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188563	Chloride	0.540	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Batch ID: P385895

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188563	Sulfate	0.438	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P385803

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188772	Ammonia-N	0.684	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P385879

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188772	Kjeldahl Nitrogen	1.52	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385764

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188685	NO2NO3-N	0.482	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385824

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188589	Total-P	0.0337	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385826

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188779	Total-P	0.919	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385738

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188773	O-Phosphate-P	0.0816	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P385745

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188794	Color (true)	0.260	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P385833

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188775	Total Alkalinity	0.0281	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P386383

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188775	TDS	2.77	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P385836

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188775	Fluoride	0.966	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P385883

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188901	Organic Carbon	0.0306	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: A100321
Included Lab Sample IDs: 2188777, 2188780

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	99.1	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A100322
Included Lab Sample IDs: 2188775, 2188778

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	102	P/P	95 - 105
Turbidity	102	102	P/P	95 - 105

Reference Method: SM 2120 B-2011
Run ID: A100323
Included Lab Sample IDs: 2188775, 2188778

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A100340
Included Lab Sample IDs: 2188776, 2188779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A100352
Included Lab Sample IDs: 2188776, 2188779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.6	98.6	P/P	90 - 110
Ammonia-N	98.8	99.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100358
Included Lab Sample IDs: 2188787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	106	106	P/P	90 - 110
Arsenic	103	103	P/P	90 - 110
Boron	106	107	P/P	90 - 110
Cadmium	103	103	P/P	90 - 110
Chromium	103	104	P/P	90 - 110
Copper	102	101	P/P	90 - 110
Lead	104	105	P/P	90 - 110
Nickel	103	103	P/P	90 - 110
Selenium	104	103	P/P	90 - 110
Thallium	99.8	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A100361
Included Lab Sample IDs: 2188787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	102	P/P	90 - 110
Calcium	101	102	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	99.7	99.2	P/P	90 - 110
Sodium	99.7	98.4	P/P	90 - 110
Zinc	105	105	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A100371
Included Lab Sample IDs: 2188775, 2188778

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A100371
Included Lab Sample IDs: 2188775, 2188778

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100376
Included Lab Sample IDs: 2188787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.6	97.4	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A100385
Included Lab Sample IDs: 2188776, 2188779

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100386
Included Lab Sample IDs: 2188775, 2188778

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

Reference Method: EPA 300.0 Rev. 2.1 dissolved
Run ID: A100386
Included Lab Sample IDs: 2188777, 2188780

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A100396
Included Lab Sample IDs: 2188776, 2188779

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A100416
Included Lab Sample IDs: 2188776

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.6	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A100417
Included Lab Sample IDs: 2188779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	98.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100422
Included Lab Sample IDs: 2188787

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	103	103	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					0.635	
	Turbidity					2.17	
EPA 200.7 Rev. 4.4	Barium	101	106	104			1.60
	Calcium	104	105	105			0.0287
	Iron	102	105	101			3.45
	Magnesium	103	104	101			2.15
	Potassium	100	101	98.6			2.17
	Sodium	98.1	97.7	101			1.94
	Zinc	105	109	107			1.49
EPA 200.8 Rev. 5.4	Aluminum	99.8	100	99.2			1.08
	Antimony	103	103	104			1.14
	Arsenic	101	101	100			0.413
	Boron	104	103	102			0.384
	Cadmium	102	99.3	101			1.43
	Chromium	102	103	102			0.316
	Copper	98.1	98.9	99.5			0.664
	Lead	105	105	105			0.439
	Nickel	98.3	97.4	97.2			0.264
	Selenium	99.3	97.6	98.5			0.868
	Silver	110	109	109			0.659
	Thallium	101	101	102			1.06
EPA 300.0 Rev. 2.1	Chloride	102	101	103		0.540	
EPA 300.0 Rev. 2.1 dissolved	Sulfate	104	102	103		0.438	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	97.4	96.4			0.684
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	103	99.9			1.52
EPA 353.2 Rev. 2.0	NO2NO3-N	102	104	104			0.482
EPA 365.1 Rev. 2.0	Total-P	99.9	102	102			0.0337
	Total-P	101					0.919
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.6	100	100			0.0816
SM 2120 B-2011	Color (true)	101				0.260	
SM 2320 B-2011	Total Alkalinity	101				0.0281	
SM 2540 C-2011	TDS					2.77	
SM 4500 F-C-2011	Fluoride	98.4					0.966
SM 5310 B-2011	Organic Carbon	100	102	102			0.0306

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2188775, 2188778
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2188787
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2188787
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2188775, 2188778
EPA 300.0 Rev. 2.1 dissolved	Sulfate, dissolved, in filtered, aqueous matrices	2188777, 2188780
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2188776, 2188779
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2188776, 2188779
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2188776, 2188779
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2188776, 2188779
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2188777, 2188780
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2188775, 2188778
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2188775, 2188778

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2188787
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2188775, 2188778
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2188775, 2188778
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2188775, 2188778
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2188776, 2188779

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	08/06/2020			08/06/2020 16:18	Blanca Fach	2188775, 2188778
EPA 200.7 Rev. 4.4	08/06/2020	08/06/2020 16:25	Elliott D. Healy	08/07/2020 16:47	Betina Topolski	2188787
EPA 200.8 Rev. 5.4	08/06/2020	08/06/2020 16:25	Elliott D. Healy	08/09/2020 17:49	Alexander Thompson	2188787
	08/06/2020	08/06/2020 16:25	Elliott D. Healy	08/10/2020 14:19	Alexander Thompson	2188787
	08/06/2020	08/06/2020 16:25	Elliott D. Healy	08/12/2020 16:33	Alexander Thompson	2188787
EPA 300.0 Rev. 2.1	08/06/2020			08/08/2020 14:21	Julia Storbeck	2188775
	08/06/2020			08/08/2020 14:33	Julia Storbeck	2188778
EPA 300.0 Rev. 2.1 dissolved	08/06/2020			08/08/2020 16:34	Julia Storbeck	2188777
	08/06/2020			08/08/2020 16:46	Julia Storbeck	2188780
EPA 350.1 Rev. 2.0	08/06/2020			08/08/2020 14:24	Ping Hua	2188776
	08/06/2020			08/08/2020 15:42	Ping Hua	2188779
EPA 351.2 Rev. 2.0	08/06/2020	08/11/2020 09:50	Sima Feizi	08/12/2020 13:14	Jhamieka S. Greenwood	2188776
	08/06/2020	08/11/2020 09:50	Sima Feizi	08/12/2020 16:16	Jhamieka S. Greenwood	2188779
EPA 353.2 Rev. 2.0	08/06/2020			08/07/2020 09:35	Beverly Y. Sanders	2188776
	08/06/2020			08/07/2020 09:36	Beverly Y. Sanders	2188779
EPA 365.1 Rev. 2.0	08/06/2020	08/10/2020 11:00	Shengyu Wang	08/11/2020 13:27	Benjamin T. Nordmann	2188776
	08/06/2020	08/10/2020 11:00	Shengyu Wang	08/11/2020 13:28	Benjamin T. Nordmann	2188779
EPA 365.1 Rev. 2.0 dissolved	08/06/2020			08/06/2020 16:24	Samantha Davila	2188777
	08/06/2020			08/06/2020 16:25	Samantha Davila	2188780
SM 2120 B-2011	08/06/2020			08/06/2020 15:55	Madeline Gruver	2188775
	08/06/2020			08/06/2020 16:34	Madeline Gruver	2188778
SM 2320 B-2011	08/06/2020			08/07/2020 14:40	Dale L. Simmons	2188775
	08/06/2020			08/07/2020 15:01	Dale L. Simmons	2188778
SM 2340B	08/06/2020			08/07/2020 16:47	Betina Topolski	2188787
SM 2540 C-2011	08/06/2020			08/07/2020 17:33	Madeline Gruver	2188775, 2188778
SM 2540 D-2011	08/06/2020			08/07/2020 18:09	Madeline Gruver	2188775, 2188778
SM 4500 F-C-2011	08/06/2020			08/07/2020 14:31	Dale L. Simmons	2188775
	08/06/2020			08/07/2020 15:01	Dale L. Simmons	2188778
SM 5310 B-2011	08/06/2020			08/10/2020 21:45	David Boose	2188776
	08/06/2020			08/10/2020 22:00	David Boose	2188779