Chemical Analysis Report

NE-DIST-2020-08-07-02

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

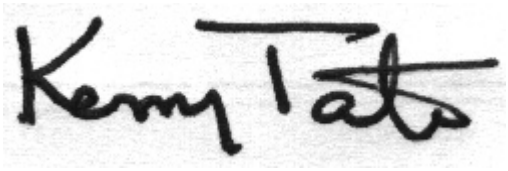
Event Description: **Nassau North**
Request ID: **RQ-2020-08-03-27**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256
Attn: Jeremy Parrish

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 31-AUG-2020 12:32



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: St. Marys River at Tracy Ferry Bt. Rmp **Collection Date/Time: 08/06/2020 10:30**

Field ID: G4NE0296 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2189150	EPA 180.1 Rev. 2.0	Turbidity	6.0		NTU	P385792	
	EPA 300.0 Rev. 2.1	Chloride	6.9		mg Cl/L	P385891	
		Sulfate	1.1		mg SO4/L	P385896	
	SM 2120 B-2011	Color (true)	510		PCU	P385795	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P385856	RPD
	SM 2540 C-2011	TDS	113		mg/L	P386179	
	SM 2540 D-2011	TSS	5	I	mg/L	P386220	
	SM 4500 F-C-2011	Fluoride	0.040	I	mg F/L	P385858	
2189151	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P386693	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P386136	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.028		mg N/L	P385821	
	EPA 365.1 Rev. 2.0	Total-P	0.042		mg P/L	P385869	
	SM 5310 B-2011	Organic Carbon	42		mg C/L	P385884	
2189152	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.019		mg P/L	P385788	
2189192	EPA 200.7 Rev. 4.4	Barium	19.4		ug/L	P385832	
		Calcium	3.82		mg/L	P385832	
		Iron	1.60E+03		ug/L	P385832	
		Magnesium	1.28		mg/L	P385832	
		Potassium	0.48	I	mg/L	P385832	
		Sodium	4.4		mg/L	P385832	
		Zinc	5.0	U	ug/L	P385832	
	EPA 200.8 Rev. 5.4	Aluminum	791		ug/L	P385832	
		Antimony	0.061	I	ug/L	P385832	
		Arsenic	0.68		ug/L	P385832	
		Boron**	17.8		ug/L	P385832	
		Cadmium	0.020	U	ug/L	P385832	
		Chromium	0.95	I	ug/L	P385832	
		Copper	0.41	I	ug/L	P385832	
		Lead	1.03		ug/L	P385832	
		Nickel	0.88	I	ug/L	P385832	
		Selenium	0.20	U	ug/L	P385832	
		Silver	0.010	U	ug/L	P385832	
		Thallium	0.10	U	ug/L	P385832	
	SM 2340B	Hardness	14.8		mg/L	P385832	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 08/15/2020.

Sample Location: Pigeon Creek at Us 1 **Collection Date/Time: 08/06/2020 11:50**

Field ID: 19010099 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2189153	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P385792	
	EPA 300.0 Rev. 2.1	Chloride	9.9		mg Cl/L	P385891	
		Sulfate	3.4		mg SO4/L	P385896	
	SM 2120 B-2011	Color (true)	220		PCU	P385795	
	SM 2320 B-2011	Total Alkalinity	3.1		mg CaCO3/L	P385856	RPD
	SM 2540 C-2011	TDS	80		mg/L	P386179	
	SM 2540 D-2011	TSS	2	I	mg/L	P386220	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P385858	
2189155	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P386693	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P386136	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.020		mg N/L	P385822	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P385870	
	SM 5310 B-2011	Organic Carbon	20		mg C/L	P385884	
2189157	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.009	I	mg P/L	P385788	

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: Creek Draining Former Hampton Lake 100m Above Rd **Collection Date/Time: 08/06/2020 11:30**

Field ID: G4NE0292 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2189154	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P385792	
	EPA 300.0 Rev. 2.1	Chloride	9.3		mg Cl/L	P385891	
		Sulfate	4.2		mg SO4/L	P385896	
	SM 2120 B-2011	Color (true)	230		PCU	P385795	
	SM 2320 B-2011	Total Alkalinity	2.7		mg CaCO3/L	P385856	RPD
	SM 2540 C-2011	TDS	85		mg/L	P386179	
	SM 2540 D-2011	TSS	2	U	mg/L	P386220	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P385858	
2189156	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P386693	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P386136	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P385822	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P385870	
	SM 5310 B-2011	Organic Carbon	21		mg C/L	P385884	
2189158	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P385788	

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: P385792

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385832

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: P385832

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: P385891

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385896

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386693

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: P386136

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385821

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385822

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385869

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385870

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385788

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

Reference Method: SM 2120 B-2011
Batch ID: P385795

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P385856

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

Reference Method: SM 2540 C-2011
Batch ID: P386179

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P386220

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P385858

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P385884

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: P385832

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	98.7		P	85 - 115
Calcium	102		P	85 - 115
Iron	104		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	99.5		P	85 - 115
Sodium	103		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385832

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	102		P	85 - 115
Boron	106		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	104		P	85 - 115
Copper	99.5		P	85 - 115
Lead	109		P	85 - 115
Nickel	101		P	85 - 115
Selenium	98.4		P	85 - 115
Silver	108		P	85 - 115
Thallium	108		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385891

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385896

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386693

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386136

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385821

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	95.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385822

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385869

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385870

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: P385788

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

Reference Method: SM 2120 B-2011
Batch ID: P385795

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

Reference Method: SM 2320 B-2011
Batch ID: P385856

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P385858

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

Reference Method: SM 5310 B-2011
Batch ID: P385884

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385832

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189242	Barium	103	103	P/P	80 - 120
2189242	Calcium	103		P	80 - 120
2189242	Iron	109	106	P/P	80 - 120
2189242	Magnesium	108	105	P/P	80 - 120
2189242	Potassium	106	103	P/P	80 - 120
2189242	Sodium	104		P	80 - 120
2189242	Zinc	106	105	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385832

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189242	Aluminum	96.7	96.5	P/P	80 - 120
2189242	Antimony	101	101	P/P	80 - 120
2189242	Arsenic	101	101	P/P	80 - 120
2189242	Boron	100	96.8	P/P	80 - 120
2189242	Cadmium	102	102	P/P	80 - 120
2189242	Chromium	102	103	P/P	80 - 120
2189242	Copper	102	101	P/P	80 - 120
2189242	Lead	108	109	P/P	80 - 120
2189242	Nickel	101	100	P/P	80 - 120
2189242	Selenium	98.8	97.7	P/P	80 - 120
2189242	Silver	109	106	P/P	80 - 120
2189242	Thallium	110	112	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385891

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188987	Chloride	102		P	90 - 110
2189101	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2188987	Sulfate	103		P	90 - 110
2189101	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386693

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189102	Ammonia-N	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386136

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189206	Kjeldahl Nitrogen	109	106	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385821

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189090	NO2NO3-N	95.0	95.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385822

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189156	NO2NO3-N	90.5	91.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189090	Total-P	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385870

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189155	Total-P	104	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385788

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189103	O-Phosphate-P	96.9	96.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P385858

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189203	Fluoride	98.8	98.8	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P385884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2189164	Organic Carbon	100	102	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P385792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189101	Turbidity	1.66	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P385832

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189242	Barium	0.291	Spike	P	0 - 20
2189242	Calcium	0.444	Spike	P	0 - 20
2189242	Iron	2.04	Spike	P	0 - 20
2189242	Magnesium	1.77	Spike	P	0 - 20
2189242	Potassium	2.08	Spike	P	0 - 20
2189242	Sodium	1.96	Spike	P	0 - 20
2189242	Zinc	0.178	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P385832

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189242	Aluminum	0.138	Spike	P	0 - 20
2189242	Antimony	0.0724	Spike	P	0 - 20
2189242	Arsenic	0.168	Spike	P	0 - 20
2189242	Boron	2.92	Spike	P	0 - 20
2189242	Cadmium	0.457	Spike	P	0 - 20
2189242	Chromium	0.364	Spike	P	0 - 20
2189242	Copper	0.919	Spike	P	0 - 20
2189242	Lead	0.684	Spike	P	0 - 20
2189242	Nickel	1.02	Spike	P	0 - 20
2189242	Selenium	1.12	Spike	P	0 - 20
2189242	Silver	2.09	Spike	P	0 - 20
2189242	Thallium	2.05	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385891

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188987	Chloride	0.277	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P385896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2188987	Sulfate	0.935	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386693

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189102	Ammonia-N	0.655	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386136

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189206	Kjeldahl Nitrogen	1.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385821

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189090	NO2NO3-N	0.525	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P385822

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189156	NO2NO3-N	0.525	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189090	Total-P	0.214	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P385870

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189155	Total-P	2.18	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P385788

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189103	O-Phosphate-P	0.0940	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P385795

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189137	Color (true)	1.24	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P385856

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189203	Total Alkalinity	9.81	Sample	F	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P386179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189172	TDS	2.67	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P385858

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189203	Fluoride	0.0	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P385884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2189164	Organic Carbon	1.72	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: A100348
Included Lab Sample IDs: 2189152, 2189157, 2189158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.4	98.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A100349
Included Lab Sample IDs: 2189150, 2189153, 2189154

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	102	P/P	95 - 105

Reference Method: SM 2120 B-2011
Run ID: A100351
Included Lab Sample IDs: 2189150, 2189153, 2189154

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	104	105	P/P	90 - 115
Color (true)	105	104	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A100367
Included Lab Sample IDs: 2189151, 2189155, 2189156

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.0	98.5	P/P	90 - 110
NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A100379
Included Lab Sample IDs: 2189150, 2189153, 2189154

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.6	99.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A100379
Included Lab Sample IDs: 2189150, 2189153, 2189154

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

Reference Method: SM 5310 B-2011
Run ID: A100385
Included Lab Sample IDs: 2189151, 2189155, 2189156

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100386
Included Lab Sample IDs: 2189150, 2189153, 2189154

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100386
Included Lab Sample IDs: 2189150, 2189153, 2189154

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A100399
Included Lab Sample IDs: 2189192

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	99.2	P/P	90 - 110
Calcium	100	101	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	100	101	P/P	90 - 110
Potassium	101	102	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Zinc	101	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A100427
Included Lab Sample IDs: 2189151, 2189155, 2189156

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.0	97.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100477
Included Lab Sample IDs: 2189192

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	101	P/P	90 - 110
Antimony	105	105	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Boron	104	104	P/P	90 - 110
Cadmium	102	101	P/P	90 - 110
Chromium	101	100	P/P	90 - 110
Copper	98.0	97.2	P/P	90 - 110
Lead	106	108	P/P	90 - 110
Nickel	99.6	98.7	P/P	90 - 110
Selenium	102	101	P/P	90 - 110
Thallium	104	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100483
Included Lab Sample IDs: 2189192

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	105	106	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A100512
Included Lab Sample IDs: 2189151, 2189155, 2189156

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	94.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A100705
Included Lab Sample IDs: 2189151, 2189155, 2189156

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

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					1.66	
EPA 200.7 Rev. 4.4	Barium	98.7	103	103			0.291
	Calcium	102	103				0.444
	Iron	104	109	106			2.04
	Magnesium	104	108	105			1.77
	Potassium	99.5	106	103			2.08
	Sodium	103	104				1.96
	Zinc	100	106	105			0.178
EPA 200.8 Rev. 5.4	Aluminum	100	96.7	96.5			0.138
	Antimony	104	101	101			0.0724
	Arsenic	102	101	101			0.168
	Boron	106	100	96.8			2.92
	Cadmium	103	102	102			0.457
	Chromium	104	102	103			0.364
	Copper	99.5	102	101			0.919
	Lead	109	108	109			0.684
	Nickel	101	101	100			1.02
	Selenium	98.4	98.8	97.7			1.12
	Silver	108	109	106			2.09
	Thallium	108	110	112			2.05
EPA 300.0 Rev. 2.1	Chloride	103	102	103		0.277	
	Sulfate	104	103	104		0.935	
EPA 350.1 Rev. 2.0	Ammonia-N	100	102	101			0.655
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	109	106			1.94
EPA 353.2 Rev. 2.0	NO2NO3-N	95.0	95.0	95.5			0.525
	NO2NO3-N	97.5	90.5	91.0			0.525
EPA 365.1 Rev. 2.0	Total-P	104	103	103			0.214
	Total-P	103	104	107			2.18
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	96.9	96.8			0.0940
SM 2120 B-2011	Color (true)	101				1.24	
SM 2320 B-2011	Total Alkalinity	102				9.81	
SM 2540 C-2011	TDS					2.67	
SM 4500 F-C-2011	Fluoride	100	98.8	98.8			0.0
SM 5310 B-2011	Organic Carbon	102	100	102			1.72

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2189150, 2189153, 2189154
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2189192
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2189192
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2189150, 2189153, 2189154
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2189150, 2189153, 2189154
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2189151, 2189155, 2189156
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2189151, 2189155, 2189156
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2189151, 2189155, 2189156
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2189151, 2189155, 2189156
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2189152, 2189157, 2189158
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2189150, 2189153, 2189154
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2189150, 2189153, 2189154

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2189192
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2189150, 2189153, 2189154
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2189150, 2189153, 2189154
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2189150, 2189153, 2189154
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2189151, 2189155, 2189156

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	08/07/2020			08/07/2020 15:13	Blanca Fach	2189150, 2189153, 2189154
EPA 200.7 Rev. 4.4	08/07/2020	08/10/2020 12:50	Elliott D. Healy	08/11/2020 18:00	Betina Topolski	2189192
EPA 200.8 Rev. 5.4	08/07/2020	08/10/2020 12:50	Elliott D. Healy	08/14/2020 17:34	Alexander Thompson	2189192
	08/07/2020	08/10/2020 12:50	Elliott D. Healy	08/15/2020 23:08	Alexander Thompson	2189192
EPA 300.0 Rev. 2.1	08/07/2020			08/08/2020 22:01	Julia Storbeck	2189150
	08/07/2020			08/08/2020 22:37	Julia Storbeck	2189153
	08/07/2020			08/08/2020 22:49	Julia Storbeck	2189154
EPA 350.1 Rev. 2.0	08/07/2020			08/27/2020 15:20	Virginia P. Brown	2189151
	08/07/2020			08/27/2020 15:21	Virginia P. Brown	2189155
	08/07/2020			08/27/2020 15:23	Virginia P. Brown	2189156
EPA 351.2 Rev. 2.0	08/07/2020	08/17/2020 14:20	David Boose	08/18/2020 11:34	Jhamieka S. Greenwood	2189151
	08/07/2020	08/17/2020 14:20	David Boose	08/18/2020 11:35	Jhamieka S. Greenwood	2189155
	08/07/2020	08/17/2020 14:20	David Boose	08/18/2020 11:37	Jhamieka S. Greenwood	2189156
EPA 353.2 Rev. 2.0	08/07/2020			08/10/2020 08:36	Beverly Y. Sanders	2189151
	08/07/2020			08/10/2020 08:43	Beverly Y. Sanders	2189156
	08/07/2020			08/10/2020 08:49	Beverly Y. Sanders	2189155
EPA 365.1 Rev. 2.0	08/07/2020	08/11/2020 11:28	Yen Ta	08/13/2020 08:31	Lipi Saha	2189151
	08/07/2020	08/11/2020 11:28	Yen Ta	08/13/2020 08:33	Lipi Saha	2189155
	08/07/2020	08/11/2020 11:28	Yen Ta	08/13/2020 08:34	Lipi Saha	2189156
EPA 365.1 Rev. 2.0 dissolved	08/07/2020			08/07/2020 15:30	Samantha Davila	2189152
	08/07/2020			08/07/2020 15:31	Samantha Davila	2189157
	08/07/2020			08/07/2020 15:32	Samantha Davila	2189158
SM 2120 B-2011	08/07/2020			08/07/2020 19:04	Julia Storbeck	2189150, 2189153
	08/07/2020			08/07/2020 19:07	Julia Storbeck	2189154
SM 2320 B-2011	08/07/2020			08/10/2020 19:20	Dale L. Simmons	2189150
	08/07/2020			08/10/2020 19:30	Dale L. Simmons	2189153
	08/07/2020			08/10/2020 19:41	Dale L. Simmons	2189154
SM 2340B	08/07/2020			08/11/2020 18:00	Betina Topolski	2189192
SM 2540 C-2011	08/07/2020			08/12/2020 15:12	Yijie Li	2189150, 2189153, 2189154
SM 2540 D-2011	08/07/2020			08/12/2020 15:12	Yijie Li	2189150, 2189153, 2189154
SM 4500 F-C-2011	08/07/2020			08/10/2020 19:20	Dale L. Simmons	2189150
	08/07/2020			08/10/2020 19:30	Dale L. Simmons	2189153
	08/07/2020			08/10/2020 19:41	Dale L. Simmons	2189154
SM 5310 B-2011	08/07/2020			08/11/2020 07:08	David Boose	2189151
	08/07/2020			08/11/2020 07:20	David Boose	2189155
	08/07/2020			08/11/2020 07:32	David Boose	2189156