Chemical Analysis Report

NE-DIST-2020-09-22-01

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

Event Description: **Nassau North 2020**
Request ID: **RQ-2020-09-28-10**
Customer: **NE-DIST**
Project ID: **SMP**

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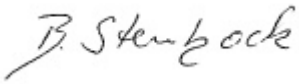
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 07-OCT-2020 18:31



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: Mills Creek At Us 301/us1 **Collection Date/Time: 09/21/2020 09:45**

Field ID: 19020048 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2197298	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P387700	
	EPA 300.0 Rev. 2.1	Chloride	9.5		mg Cl/L	P388029	
		Sulfate	1.4		mg SO4/L	P388031	
	SM 2120 B-2011	Color (true)	450		PCU	P387705	
	SM 2320 B-2011	Total Alkalinity	3.1		mg CaCO3/L	P387796	
	SM 2540 C-2011	TDS	79		mg/L	P388009	
	SM 2540 D-2011	TSS	2	U	mg/L	P387960	
	SM 4500 F-C-2011	Fluoride	0.044	I	mg F/L	P387798	
2197299	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P387884	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P387916	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P387743	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P387919	MS
	SM 5310 B-2011	Organic Carbon	40		mg C/L	P387837	
2197300	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P387713	
2197315	EPA 200.7 Rev. 4.4	Barium	22.8		ug/L	P387692	
		Calcium	4.90		mg/L	P387692	
		Iron	1.93E+03		ug/L	P387692	
		Magnesium	1.29		mg/L	P387692	
		Potassium	1.2		mg/L	P387692	
		Sodium	5.9		mg/L	P387692	
		Zinc	5.0	U	ug/L	P387692	
	EPA 200.8 Rev. 5.4	Aluminum	678		ug/L	P387692	
		Antimony	0.050	U	ug/L	P387692	
		Arsenic	0.55		ug/L	P387692	
		Beryllium	0.050		ug/L	P387692	
		Boron**	20.8		ug/L	P387692	
		Cadmium	0.020	U	ug/L	P387692	
		Chromium	0.97	I	ug/L	P387692	
		Copper	0.40	U	ug/L	P387692	
		Lead	0.54		ug/L	P387692	
		Nickel	0.82	I	ug/L	P387692	
		Selenium	0.20	U	ug/L	P387692	
		Silver	0.010	U	ug/L	P387692	
		Thallium	0.10	U	ug/L	P387692	
	SM 2340B	Hardness	17.6		mg/L	P387692	

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.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 10/03/2020.

Sample Location: Pigeon Creek At Us 1 **Collection Date/Time: 09/21/2020 10:40**

Field ID: 19010099 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2197301	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P387700	
	EPA 300.0 Rev. 2.1	Chloride	8.4		mg Cl/L	P388029	
		Sulfate	1.4		mg SO4/L	P388031	
	SM 2120 B-2011	Color (true)	410		PCU	P387705	
	SM 2320 B-2011	Total Alkalinity	1.6	I	mg CaCO3/L	P387796	
	SM 2540 C-2011	TDS	63		mg/L	P388009	
	SM 2540 D-2011	TSS	3	I	mg/L	P387960	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P387798	
2197303	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P387884	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.79		mg N/L	P387773	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.025		mg N/L	P387743	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P387919	MS
	SM 5310 B-2011	Organic Carbon	30		mg C/L	P387837	
2197305	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.01	I	mg P/L	P387713	

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: 09/21/2020 11:00**

Field ID: G4NE0292 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2197302	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P387700	
	EPA 300.0 Rev. 2.1	Chloride	8.1		mg Cl/L	P388029	
		Sulfate	1.5		mg SO4/L	P388031	
	SM 2120 B-2011	Color (true)	370		PCU	P387705	
	SM 2320 B-2011	Total Alkalinity	3.1		mg CaCO3/L	P387796	
	SM 2540 C-2011	TDS	66		mg/L	P388009	
	SM 2540 D-2011	TSS	2	U	mg/L	P387960	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P387798	
2197304	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P387884	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.83		mg N/L	P387773	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.024		mg N/L	P387743	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P387919	MS
	SM 5310 B-2011	Organic Carbon	29		mg C/L	P387837	
2197306	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P387713	

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: P387700

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387692

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: P387692

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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: P388029

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388031

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387884

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: P387773

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387916

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387743

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387919

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387713

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

Reference Method: SM 2120 B-2011
Batch ID: P387705

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P387796

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

Reference Method: SM 2540 C-2011
Batch ID: P388009

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P387960

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P387798

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P387837

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: P387692

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	105		P	85 - 115
Calcium	108		P	85 - 115
Iron	110		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	105		P	85 - 115
Sodium	98.4		P	85 - 115
Zinc	99.4		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387692

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	100		P	85 - 115
Beryllium	97.0		P	85 - 115
Boron	98.9		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	102		P	85 - 115
Copper	103		P	85 - 115
Lead	101		P	85 - 115
Nickel	102		P	85 - 115
Selenium	97.6		P	85 - 115
Silver	98.9		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388029

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388031

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387884

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	92.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387773

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387916

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387743

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387919

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387713

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

Reference Method: SM 2120 B-2011
Batch ID: P387705

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	95.3		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P387796

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.6		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P387798

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P387837

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387692

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196364	Barium	103		P	80 - 120
2196364	Calcium	102		P	80 - 120
2196364	Iron	106		P	80 - 120
2196364	Magnesium	102		P	80 - 120
2196364	Potassium	101		P	80 - 120
2196364	Sodium	103		P	80 - 120
2196364	Zinc	99.2		P	80 - 120
2197193	Barium	106	106	P/P	80 - 120
2197193	Calcium	112	108	P/P	80 - 120
2197193	Iron	111	110	P/P	80 - 120
2197193	Magnesium	111	109	P/P	80 - 120
2197193	Potassium	114	111	P/P	80 - 120
2197193	Sodium	104		P	80 - 120
2197193	Zinc	102	100	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387692

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196364	Aluminum	99.7		P	80 - 120
2196364	Antimony	103		P	80 - 120
2196364	Arsenic	100		P	80 - 120
2196364	Beryllium	97.8		P	80 - 120
2196364	Boron	105		P	80 - 120
2196364	Cadmium	101		P	80 - 120
2196364	Chromium	104		P	80 - 120
2196364	Copper	98.6		P	80 - 120
2196364	Lead	101		P	80 - 120
2196364	Nickel	99.5		P	80 - 120
2196364	Selenium	94.2		P	80 - 120
2196364	Silver	117		P	80 - 120
2196364	Thallium	103		P	80 - 120
2197193	Aluminum	98.9	99.2	P/P	80 - 120
2197193	Antimony	103	104	P/P	80 - 120
2197193	Arsenic	99.4	99.3	P/P	80 - 120
2197193	Beryllium	94.6	97.7	P/P	80 - 120
2197193	Boron	100	98.5	P/P	80 - 120
2197193	Cadmium	101	101	P/P	80 - 120
2197193	Chromium	103	102	P/P	80 - 120
2197193	Copper	101	101	P/P	80 - 120
2197193	Lead	99.9	101	P/P	80 - 120
2197193	Nickel	100	100	P/P	80 - 120
2197193	Selenium	96.0	95.6	P/P	80 - 120
2197193	Silver	98.5	98.6	P/P	80 - 120
2197193	Thallium	102	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388029

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196930	Chloride	103		P	90 - 110
2197208	Chloride	100		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388031

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2196930	Sulfate	98.1		P	90 - 110
2197208	Sulfate	97.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197330	Ammonia-N	100	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387773

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197323	Kjeldahl Nitrogen	110	109	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387743

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197329	NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387919

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197217	Total-P	110	111	P/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387713

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197332	O-Phosphate-P	98.4	99.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P387798

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197275	Fluoride	99.8	98.6	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P387837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197335	Organic Carbon	99.4	97.9	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P387700

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197247	Turbidity	1.94	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197193	Barium	0.892	Spike	P	0 - 20
2197193	Calcium	2.28	Spike	P	0 - 20
2197193	Iron	0.994	Spike	P	0 - 20
2197193	Magnesium	1.28	Spike	P	0 - 20
2197193	Potassium	2.71	Spike	P	0 - 20
2197193	Sodium	3.35	Spike	P	0 - 20
2197193	Zinc	2.05	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197193	Aluminum	0.262	Spike	P	0 - 20
2197193	Antimony	0.385	Spike	P	0 - 20
2197193	Arsenic	0.131	Spike	P	0 - 20
2197193	Beryllium	3.27	Spike	P	0 - 20
2197193	Boron	1.35	Spike	P	0 - 20
2197193	Cadmium	0.0458	Spike	P	0 - 20
2197193	Chromium	0.497	Spike	P	0 - 20
2197193	Copper	0.364	Spike	P	0 - 20
2197193	Lead	0.996	Spike	P	0 - 20
2197193	Nickel	0.285	Spike	P	0 - 20
2197193	Selenium	0.450	Spike	P	0 - 20
2197193	Silver	0.124	Spike	P	0 - 20
2197193	Thallium	1.63	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196930	Chloride	0.734	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388031

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196930	Sulfate	0.446	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197330	Ammonia-N	1.43	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197323	Kjeldahl Nitrogen	0.595	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387916

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197656	Kjeldahl Nitrogen	3.33	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387743

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197329	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197217	Total-P	1.44	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387713

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197332	O-Phosphate-P	0.810	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P387705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197275	Color (true)	0.0772	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P387796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197275	Total Alkalinity	3.16	Sample	P	0 - 8.1

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2011
Batch ID: P388009

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197212	TDS	5.28	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P387798

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197275	Fluoride	0.983	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P387837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197335	Organic Carbon	0.897	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: A101139
Included Lab Sample IDs: 2197298, 2197301, 2197302

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

Reference Method: SM 2120 B-2011
Run ID: A101140
Included Lab Sample IDs: 2197298, 2197301, 2197302

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.2	98.1	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A101150
Included Lab Sample IDs: 2197300, 2197305, 2197306

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A101159
Included Lab Sample IDs: 2197299, 2197303, 2197304

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A101178
Included Lab Sample IDs: 2197298, 2197301, 2197302

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.6	98.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A101178
Included Lab Sample IDs: 2197298, 2197301, 2197302

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

Reference Method: SM 5310 B-2011
Run ID: A101194
Included Lab Sample IDs: 2197299, 2197303, 2197304

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.9	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101208
Included Lab Sample IDs: 2197303, 2197304

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.1	95.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A101210
Included Lab Sample IDs: 2197299, 2197303, 2197304

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A101217
Included Lab Sample IDs: 2197315

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	103	P/P	90 - 110
Calcium	99.9	101	P/P	90 - 110
Iron	102	104	P/P	90 - 110
Magnesium	100	102	P/P	90 - 110
Potassium	99.6	102	P/P	90 - 110
Sodium	103	105	P/P	90 - 110
Zinc	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101254
Included Lab Sample IDs: 2197299

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.6	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A101281
Included Lab Sample IDs: 2197298, 2197301, 2197302

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	P/P	90 - 110
Sulfate	99.5	99.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101310
Included Lab Sample IDs: 2197299, 2197303, 2197304

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	93.2	93.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101342
Included Lab Sample IDs: 2197315

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.1	98.2	P/P	90 - 110
Antimony	105	105	P/P	90 - 110
Arsenic	97.2	97.6	P/P	90 - 110
Beryllium	99.5	99.1	P/P	90 - 110
Boron	100	101	P/P	90 - 110
Cadmium	99.3	100	P/P	90 - 110
Chromium	101	102	P/P	90 - 110
Copper	96.5	96.6	P/P	90 - 110
Lead	101	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101342
Included Lab Sample IDs: 2197315

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	96.7	96.8	P/P	90 - 110
Selenium	95.3	95.1	P/P	90 - 110
Thallium	99.1	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101367
Included Lab Sample IDs: 2197315

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	96.9	98.8	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						1.94	
EPA 200.7 Rev. 4.4	Barium	105	103	106	106			0.892
	Calcium	108	102	112	108			2.28
	Iron	110	106	111	110			0.994
	Magnesium	109	102	111	109			1.28
	Potassium	105	101	114	111			2.71
	Sodium	98.4	103	104				3.35
	Zinc	99.4	99.2	102	100			2.05
EPA 200.8 Rev. 5.4	Aluminum	100	98.9	99.2	99.7			0.262
	Antimony	103	103	104	103			0.385
	Arsenic	100	99.4	99.3	100			0.131
	Beryllium	97.0	94.6	97.7	97.8			3.27
	Boron	98.9	100	98.5	105			1.35
	Cadmium	102	101	101	101			0.0458
	Chromium	102	103	102	104			0.497
	Copper	103	101	101	98.6			0.364
	Lead	101	99.9	101	101			0.996
	Nickel	102	100	100	99.5			0.285
	Selenium	97.6	96.0	95.6	94.2			0.450
	Silver	98.9	98.5	98.6	117			0.124
	Thallium	102	102	103	103			1.63
EPA 300.0 Rev. 2.1	Chloride	102	103	100			0.734	
	Sulfate	99.2	98.1	97.8			0.446	
EPA 350.1 Rev. 2.0	Ammonia-N	92.6	100	97.2				1.43
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	110	109				0.595
	Kjeldahl Nitrogen	105						3.33
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.5	99.5				0.0
EPA 365.1 Rev. 2.0	Total-P	108	110	111				1.44
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.4	99.2				0.810
SM 2120 B-2011	Color (true)	95.3					0.0772	
SM 2320 B-2011	Total Alkalinity	99.6					3.16	
SM 2540 C-2011	TDS						5.28	
SM 4500 F-C-2011	Fluoride	99.3	99.8	98.6				0.983
SM 5310 B-2011	Organic Carbon	97.8	99.4	97.9				0.897

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2197298, 2197301, 2197302
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2197315
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2197315
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2197298, 2197301, 2197302
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2197298, 2197301, 2197302
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2197299, 2197303, 2197304
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2197299, 2197303, 2197304
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2197299, 2197303, 2197304
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2197299, 2197303, 2197304
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2197300, 2197305, 2197306
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2197298, 2197301, 2197302
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2197298, 2197301, 2197302

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2197315
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2197298, 2197301, 2197302
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2197298, 2197301, 2197302
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2197298, 2197301, 2197302
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2197299, 2197303, 2197304

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	09/22/2020			09/22/2020 16:38	Yen Ta	2197298, 2197301, 2197302
EPA 200.7 Rev. 4.4	09/22/2020	09/22/2020 14:45	Elliott D. Healy	09/25/2020 16:06	Betina Topolski	2197315
EPA 200.8 Rev. 5.4	09/22/2020	09/22/2020 14:45	Elliott D. Healy	10/02/2020 18:33	Alexander Thompson	2197315
	09/22/2020	09/22/2020 14:45	Elliott D. Healy	10/05/2020 14:39	Alexander Thompson	2197315
EPA 300.0 Rev. 2.1	09/22/2020			09/29/2020 20:45	Elliott Rodriguez	2197298
	09/22/2020			09/29/2020 20:58	Elliott Rodriguez	2197301
	09/22/2020			09/29/2020 21:11	Elliott Rodriguez	2197302
EPA 350.1 Rev. 2.0	09/22/2020			09/26/2020 12:25	Ping Hua	2197299
	09/22/2020			09/26/2020 12:27	Ping Hua	2197303
	09/22/2020			09/26/2020 12:28	Ping Hua	2197304
EPA 351.2 Rev. 2.0	09/22/2020	09/23/2020 17:26	David Boose	09/25/2020 15:17	Elliott Rodriguez	2197303
	09/22/2020	09/23/2020 17:26	David Boose	09/25/2020 15:18	Elliott Rodriguez	2197304
	09/22/2020	09/28/2020 01:45	Elliott Rodriguez	09/29/2020 11:07	Elliott Rodriguez	2197299
EPA 353.2 Rev. 2.0	09/22/2020			09/23/2020 11:03	Beverly Y. Sanders	2197299
	09/22/2020			09/23/2020 11:05	Beverly Y. Sanders	2197303
	09/22/2020			09/23/2020 11:06	Beverly Y. Sanders	2197304
EPA 365.1 Rev. 2.0	09/22/2020	09/28/2020 12:44	Yen Ta	10/01/2020 12:54	Lipi Saha	2197299
	09/22/2020	09/28/2020 12:44	Yen Ta	10/01/2020 12:55	Lipi Saha	2197303
	09/22/2020	09/28/2020 12:44	Yen Ta	10/01/2020 12:56	Lipi Saha	2197304
EPA 365.1 Rev. 2.0 dissolved	09/22/2020			09/22/2020 16:16	Virginia P. Brown	2197300
	09/22/2020			09/22/2020 16:17	Virginia P. Brown	2197305
	09/22/2020			09/22/2020 16:18	Virginia P. Brown	2197306
SM 2120 B-2011	09/22/2020			09/22/2020 16:26	Benjamin T. Nordmann	2197298, 2197301
	09/22/2020			09/22/2020 16:27	Benjamin T. Nordmann	2197302
SM 2320 B-2011	09/22/2020			09/23/2020 17:27	Dale L. Simmons	2197298
	09/22/2020			09/23/2020 17:36	Dale L. Simmons	2197301
	09/22/2020			09/23/2020 17:47	Dale L. Simmons	2197302
SM 2340B	09/22/2020			09/25/2020 16:06	Betina Topolski	2197315
SM 2540 C-2011	09/22/2020			09/23/2020 14:41	Yijie Li	2197298, 2197301, 2197302
SM 2540 D-2011	09/22/2020			09/23/2020 14:41	Yijie Li	2197298, 2197301, 2197302
SM 4500 F-C-2011	09/22/2020			09/23/2020 17:27	Dale L. Simmons	2197298
	09/22/2020			09/23/2020 17:36	Dale L. Simmons	2197301
	09/22/2020			09/23/2020 17:47	Dale L. Simmons	2197302
SM 5310 B-2011	09/22/2020			09/25/2020 01:53	Madeline Gruver	2197299
	09/22/2020			09/25/2020 02:06	Madeline Gruver	2197303
	09/22/2020			09/25/2020 02:18	Madeline Gruver	2197304