Chemical Analysis Report

NE-DIST-2020-09-29-01

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

Event Description: **Callahan**
Request ID: **RQ-2020-10-05-29**
Customer: **NE-DIST**
Project ID: **SMP**

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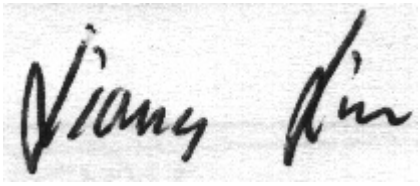
Date Certified: 19-OCT-2020 13:43



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: 09/28/2020 10:55**

Field ID: 19020048 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2198849	EPA 180.1 Rev. 2.0	Turbidity	3.4	A	NTU	P387977	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P388095	
		Sulfate	0.92		mg SO4/L	P388098	
	SM 2120 B-2011	Color (true)	500		PCU	P387993	
	SM 2320 B-2011	Total Alkalinity	5.0		mg CaCO3/L	P388087	
	SM 2540 C-2011	TDS	87		mg/L	P388478	
	SM 2540 D-2011	TSS	4	I	mg/L	P388467	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P388090	
2198850	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P388172	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P388116	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388006	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P388099	
	SM 5310 B-2011	Organic Carbon	44		mg C/L	P388190	
2198851	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.009	I	mg P/L	P387986	
2198864	EPA 200.7 Rev. 4.4	Barium	25.7		ug/L	P388048	
		Calcium	5.55		mg/L	P388048	
		Iron	2.99E+03		ug/L	P388048	
		Magnesium	1.56		mg/L	P388048	
		Potassium	1.6		mg/L	P388048	
		Sodium	6.7		mg/L	P388048	
		Zinc	5.0	U	ug/L	P388048	
	EPA 200.8 Rev. 5.4	Aluminum	688		ug/L	P388048	
		Antimony	0.050	U	ug/L	P388048	
		Arsenic	0.77		ug/L	P388048	
		Beryllium	0.051		ug/L	P388048	
		Boron**	22.2		ug/L	P388048	
		Cadmium	0.020	U	ug/L	P388048	
		Chromium	0.96	I	ug/L	P388048	
		Copper	0.40	U	ug/L	P388048	
		Lead	0.77		ug/L	P388048	
		Nickel	0.89	I	ug/L	P388048	
		Selenium	0.20	U	ug/L	P388048	
		Silver	0.010	U	ug/L	P388048	
		Thallium	0.10	U	ug/L	P388048	
	SM 2340B	Hardness	20.3		mg/L	P388048	

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 10/07/2020.

Sample Location: Cushing CR @ Stratton Rd. **Collection Date/Time: 09/28/2020 10:30**

Field ID: NE400002 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2198852	EPA 180.1 Rev. 2.0	Turbidity	4.9		NTU	P387977	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P388095	
		Sulfate	7.0		mg SO4/L	P388098	
	SM 2120 B-2011	Color (true)	620		PCU	P387993	
	SM 2320 B-2011	Total Alkalinity	30		mg CaCO3/L	P388087	
	SM 2540 C-2011	TDS	161		mg/L	P388478	
	SM 2540 D-2011	TSS	2	I	mg/L	P388467	
	SM 4500 F-C-2011	Fluoride	0.078	I	mg F/L	P388090	
2198854	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P388173	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P388116	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.051		mg N/L	P388006	
	EPA 365.1 Rev. 2.0	Total-P	0.075		mg P/L	P388099	
	SM 5310 B-2011	Organic Carbon	49		mg C/L	P388190	
2198856	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.038		mg P/L	P387986	

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: Alligator CR at Hobbs Landing **Collection Date/Time: 09/28/2020 09:55**

Field ID: G4NE0280 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2198853	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P387977	
	EPA 300.0 Rev. 2.1	Chloride	22		mg Cl/L	P388095	
		Sulfate	3.5		mg SO4/L	P388098	
	SM 2120 B-2011	Color (true)	530		PCU	P387993	
	SM 2320 B-2011	Total Alkalinity	35		mg CaCO3/L	P388087	
	SM 2540 C-2011	TDS	167		mg/L	P388478	
	SM 2540 D-2011	TSS	3	I	mg/L	P388467	
	SM 4500 F-C-2011	Fluoride	0.070	I	mg F/L	P388090	
2198855	EPA 350.1 Rev. 2.0	Ammonia-N	0.055		mg N/L	P388173	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P388116	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P388006	
	EPA 365.1 Rev. 2.0	Total-P	0.24		mg P/L	P388099	
	SM 5310 B-2011	Organic Carbon	49		mg C/L	P388190	
2198857	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.15		mg P/L	P387986	

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: P387977

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388048

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: P388048

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: P388095

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388098

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388172

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388173

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388116

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388006

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388099

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387986

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

Reference Method: SM 2120 B-2011
Batch ID: P387993

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P388087

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

Reference Method: SM 2540 C-2011
Batch ID: P388478

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P388467

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P388090

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P388190

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: P388048

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	98.8		P	85 - 115
Calcium	105		P	85 - 115
Iron	105		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	102		P	85 - 115
Sodium	105		P	85 - 115
Zinc	94.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388048

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	101		P	85 - 115
Beryllium	94.8		P	85 - 115
Boron	97.0		P	85 - 115
Cadmium	98.8		P	85 - 115
Chromium	101		P	85 - 115
Copper	102		P	85 - 115
Lead	97.1		P	85 - 115
Nickel	102		P	85 - 115
Selenium	101		P	85 - 115
Silver	96.7		P	85 - 115
Thallium	98.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388095

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388098

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388172

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388173

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388116

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388006

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: P388099

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	109		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387986

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

Reference Method: SM 2120 B-2011
Batch ID: P387993

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	94.8		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P388087

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.2		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P388090

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.3		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P388190

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388048

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198834	Barium	106	107	P/P	80 - 120
2198834	Calcium	108	110	P/P	80 - 120
2198834	Iron	108	110	P/P	80 - 120
2198834	Magnesium	107	109	P/P	80 - 120
2198834	Potassium	107	109	P/P	80 - 120
2198834	Sodium	102	105	P/P	80 - 120
2198834	Zinc	100	102	P/P	80 - 120
2198880	Barium	108		P	80 - 120
2198880	Calcium	110		P	80 - 120
2198880	Iron	110		P	80 - 120
2198880	Magnesium	108		P	80 - 120
2198880	Potassium	107		P	80 - 120
2198880	Sodium	108		P	80 - 120
2198880	Zinc	103		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388048

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198834	Aluminum	101	99.2	P/P	80 - 120
2198834	Antimony	103	101	P/P	80 - 120
2198834	Arsenic	103	101	P/P	80 - 120
2198834	Beryllium	92.5	94.7	P/P	80 - 120
2198834	Boron	96.3	96.9	P/P	80 - 120
2198834	Cadmium	102	100	P/P	80 - 120
2198834	Chromium	103	101	P/P	80 - 120
2198834	Copper	105	103	P/P	80 - 120
2198834	Lead	99.7	98.3	P/P	80 - 120
2198834	Nickel	106	103	P/P	80 - 120
2198834	Selenium	103	101	P/P	80 - 120
2198834	Silver	99.1	96.2	P/P	80 - 120
2198834	Thallium	102	102	P/P	80 - 120
2198880	Aluminum	100		P	80 - 120
2198880	Antimony	102		P	80 - 120
2198880	Arsenic	100		P	80 - 120
2198880	Beryllium	93.7		P	80 - 120
2198880	Boron	100		P	80 - 120
2198880	Cadmium	100		P	80 - 120
2198880	Chromium	101		P	80 - 120
2198880	Copper	100		P	80 - 120
2198880	Lead	97.8		P	80 - 120
2198880	Nickel	99.8		P	80 - 120
2198880	Selenium	98.0		P	80 - 120
2198880	Silver	97.1		P	80 - 120
2198880	Thallium	101		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388095

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198849	Chloride	107	103	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198849	Sulfate	104	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198828	Ammonia-N	102	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388173

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198889	Ammonia-N	102	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388116

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198883	Kjeldahl Nitrogen	107	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388006

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198804	NO2NO3-N	100	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388099

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198828	Total-P	103	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387986

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198662	O-Phosphate-P	103	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P388090

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198231	Fluoride	97.6	98.2	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P388190

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2198842	Organic Carbon	104	107	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P387977

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198849	Turbidity	10.1	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P388048

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198834	Barium	0.648	Spike	P	0 - 20
2198834	Calcium	1.71	Spike	P	0 - 20
2198834	Iron	2.09	Spike	P	0 - 20
2198834	Magnesium	2.19	Spike	P	0 - 20
2198834	Potassium	1.62	Spike	P	0 - 20
2198834	Sodium	2.26	Spike	P	0 - 20
2198834	Zinc	1.23	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P388048

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198834	Aluminum	1.09	Spike	P	0 - 20
2198834	Antimony	2.42	Spike	P	0 - 20
2198834	Arsenic	1.50	Spike	P	0 - 20
2198834	Beryllium	2.32	Spike	P	0 - 20
2198834	Boron	0.516	Spike	P	0 - 20
2198834	Cadmium	1.68	Spike	P	0 - 20
2198834	Chromium	2.42	Spike	P	0 - 20
2198834	Copper	1.75	Spike	P	0 - 20
2198834	Lead	1.38	Spike	P	0 - 20
2198834	Nickel	2.17	Spike	P	0 - 20
2198834	Selenium	1.31	Spike	P	0 - 20
2198834	Silver	3.04	Spike	P	0 - 20
2198834	Thallium	0.0750	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388095

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198849	Chloride	2.36	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198849	Sulfate	2.94	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198828	Ammonia-N	1.41	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P388173

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198889	Ammonia-N	1.50	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P388116

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198883	Kjeldahl Nitrogen	1.32	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P388006

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198804	NO2NO3-N	0.335	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P388099

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198828	Total-P	3.18	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387986

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198662	O-Phosphate-P	1.27	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P387993

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198827	Color (true)	9.32	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P388087

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198231	Total Alkalinity	2.24	Sample	P	0 - 8.1

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2011
Batch ID: P388478

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198773	TDS	2.55	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P388090

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198231	Fluoride	0.514	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P388190

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2198842	Organic Carbon	1.66	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: A101259
Included Lab Sample IDs: 2198849, 2198852, 2198853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A101263
Included Lab Sample IDs: 2198851, 2198856, 2198857

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.7	P/P	90 - 110
O-Phosphate-P	99.7	99.6	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A101265
Included Lab Sample IDs: 2198849, 2198852, 2198853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	95.6	97.6	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A101272
Included Lab Sample IDs: 2198850, 2198854, 2198855

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A101281
Included Lab Sample IDs: 2198849, 2198852, 2198853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	107	108	P/P	90 - 110
Sulfate	105	106	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A101307
Included Lab Sample IDs: 2198849, 2198852, 2198853

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

Reference Method: SM 4500 F-C-2011
Run ID: A101307
Included Lab Sample IDs: 2198849, 2198852, 2198853

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101338
Included Lab Sample IDs: 2198850, 2198854, 2198855

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101338
Included Lab Sample IDs: 2198850, 2198854, 2198855

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.3	92.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A101343
Included Lab Sample IDs: 2198850, 2198854, 2198855

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	98.9	P/P	90 - 110
Ammonia-N	98.9	99.1	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A101348
Included Lab Sample IDs: 2198850, 2198854, 2198855

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101358
Included Lab Sample IDs: 2198850, 2198854, 2198855

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	99.7	P/P	90 - 110
Total-P	99.7	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A101368
Included Lab Sample IDs: 2198864

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.7	97.5	P/P	90 - 110
Antimony	102	102	P/P	90 - 110
Arsenic	97.8	95.7	P/P	90 - 110
Beryllium	94.7	94.8	P/P	90 - 110
Boron	95.5	99.1	P/P	90 - 110
Cadmium	96.7	96.3	P/P	90 - 110
Chromium	96.9	97.3	P/P	90 - 110
Copper	99.1	95.3	P/P	90 - 110
Lead	97.9	96.1	P/P	90 - 110
Nickel	99.6	95.5	P/P	90 - 110
Selenium	96.9	95.9	P/P	90 - 110
Silver	97.1	96.4	P/P	90 - 110
Thallium	95.3	93.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A101466
Included Lab Sample IDs: 2198864

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	103	P/P	90 - 110
Calcium	101	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A101466
Included Lab Sample IDs: 2198864

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

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						10.1	
EPA 200.7 Rev. 4.4	Barium	98.8	106	107	108			0.648
	Calcium	105	108	110	110			1.71
	Iron	105	108	110	110			2.09
	Magnesium	104	107	109	108			2.19
	Potassium	102	107	109	107			1.62
	Sodium	105	102	105	108			2.26
	Zinc	94.0	100	102	103			1.23
EPA 200.8 Rev. 5.4	Aluminum	101	101	99.2	100			1.09
	Antimony	102	103	101	102			2.42
	Arsenic	101	103	101	100			1.50
	Beryllium	94.8	92.5	94.7	93.7			2.32
	Boron	97.0	96.3	96.9	100			0.516
	Cadmium	98.8	102	100	100			1.68
	Chromium	101	103	101	101			2.42
	Copper	102	105	103	100			1.75
	Lead	97.1	99.7	98.3	97.8			1.38
	Nickel	102	106	103	99.8			2.17
	Selenium	101	103	101	98.0			1.31
	Silver	96.7	99.1	96.2	97.1			3.04
	Thallium	98.8	102	102	101			0.0750
EPA 300.0 Rev. 2.1	Chloride	105	107	103				2.36
	Sulfate	102	104	101				2.94
EPA 350.1 Rev. 2.0	Ammonia-N	101	102	103				1.41
	Ammonia-N	101	102	99.5				1.50
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	107	105				1.32
EPA 353.2 Rev. 2.0	NO2NO3-N	102	100	99.4				0.335
EPA 365.1 Rev. 2.0	Total-P	109	103	106				3.18
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	103	102				1.27
SM 2120 B-2011	Color (true)	94.8					9.32	
SM 2320 B-2011	Total Alkalinity	99.2					2.24	
SM 2540 C-2011	TDS						2.55	
SM 4500 F-C-2011	Fluoride	97.3	97.6	98.2				0.514
SM 5310 B-2011	Organic Carbon	101	104	107				1.66

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2198849, 2198852, 2198853
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2198864
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2198864
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2198849, 2198852, 2198853
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2198849, 2198852, 2198853
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2198850, 2198854, 2198855
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2198850, 2198854, 2198855
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2198850, 2198854, 2198855
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2198850, 2198854, 2198855
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2198851, 2198856, 2198857
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2198849, 2198852, 2198853
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2198849, 2198852, 2198853

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2198864
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2198849, 2198852, 2198853
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2198849, 2198852, 2198853
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2198849, 2198852, 2198853
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2198850, 2198854, 2198855

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	09/29/2020			09/29/2020 15:34	Yen Ta	2198849, 2198852, 2198853
EPA 200.7 Rev. 4.4	09/29/2020	09/30/2020 15:30	Elliott D. Healy	10/09/2020 14:08	Betina Topolski	2198864
EPA 200.8 Rev. 5.4	09/29/2020	09/30/2020 15:30	Elliott D. Healy	10/05/2020 20:15	Alexander Thompson	2198864
EPA 300.0 Rev. 2.1	09/29/2020			10/01/2020 07:37	Lipi Saha	2198849
	09/29/2020			10/01/2020 08:16	Lipi Saha	2198852
	09/29/2020			10/01/2020 08:30	Lipi Saha	2198853
EPA 350.1 Rev. 2.0	09/29/2020			10/03/2020 13:45	Ping Hua	2198850
	09/29/2020			10/03/2020 14:03	Ping Hua	2198854
	09/29/2020			10/03/2020 14:04	Ping Hua	2198855
EPA 351.2 Rev. 2.0	09/29/2020	10/01/2020 14:05	David Boose	10/02/2020 13:24	Elliott Rodriguez	2198850
	09/29/2020	10/01/2020 14:05	David Boose	10/02/2020 13:26	Elliott Rodriguez	2198854
	09/29/2020	10/01/2020 14:05	David Boose	10/02/2020 13:27	Elliott Rodriguez	2198855
EPA 353.2 Rev. 2.0	09/29/2020			09/30/2020 09:58	Beverly Y. Sanders	2198850
	09/29/2020			09/30/2020 09:59	Beverly Y. Sanders	2198854
	09/29/2020			09/30/2020 10:01	Beverly Y. Sanders	2198855
EPA 365.1 Rev. 2.0	09/29/2020	10/01/2020 12:32	Yen Ta	10/05/2020 08:52	Benjamin T. Nordmann	2198850
	09/29/2020	10/01/2020 12:32	Yen Ta	10/05/2020 08:55	Benjamin T. Nordmann	2198854
	09/29/2020	10/01/2020 12:32	Yen Ta	10/05/2020 08:56	Benjamin T. Nordmann	2198855
EPA 365.1 Rev. 2.0 dissolved	09/29/2020			09/29/2020 15:52	Virginia P. Brown	2198851
	09/29/2020			09/29/2020 15:57	Virginia P. Brown	2198856
	09/29/2020			09/29/2020 15:58	Virginia P. Brown	2198857
SM 2120 B-2011	09/29/2020			09/29/2020 16:53	Benjamin T. Nordmann	2198849
	09/29/2020			09/29/2020 16:54	Benjamin T. Nordmann	2198852
	09/29/2020			09/29/2020 16:55	Benjamin T. Nordmann	2198853
SM 2320 B-2011	09/29/2020			09/30/2020 23:47	Dale L. Simmons	2198849
	09/29/2020			10/01/2020 00:00	Dale L. Simmons	2198852
	09/29/2020			10/01/2020 00:11	Dale L. Simmons	2198853
SM 2340B	09/29/2020			10/09/2020 14:08	Betina Topolski	2198864
SM 2540 C-2011	09/29/2020			10/01/2020 15:15	Yijie Li	2198849, 2198852, 2198853
SM 2540 D-2011	09/29/2020			10/01/2020 15:15	Yijie Li	2198849, 2198852, 2198853
SM 4500 F-C-2011	09/29/2020			09/30/2020 23:47	Dale L. Simmons	2198849
	09/29/2020			10/01/2020 00:00	Dale L. Simmons	2198852
	09/29/2020			10/01/2020 00:11	Dale L. Simmons	2198853
SM 5310 B-2011	09/29/2020			10/02/2020 16:06	Lauren Lees	2198850
	09/29/2020			10/02/2020 16:18	Lauren Lees	2198854
	09/29/2020			10/02/2020 16:31	Lauren Lees	2198855