Chemical Analysis Report

NW-DIST-2020-09-02-02

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

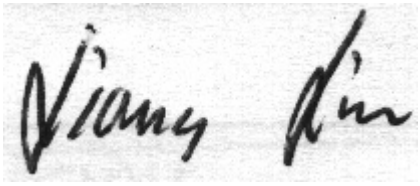
Event Description: **Holmes Run**
Request ID: **RQ-2020-08-24-19**
Customer: **NW-DIST**
Project ID: **SMP**

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

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: Liang Lin, Environmental Administrator

Date Certified: 24-SEP-2020 15:18



NON-CONFORMANCE REPORT INCLUDED

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: Baggett Creek Upstream of Hwy 90 **Collection Date/Time: 08/31/2020 14:00**

Field ID: G4NW0336 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193926	EPA 180.1 Rev. 2.0	Turbidity	6.8	Q	NTU	P386932	
	EPA 300.0 Rev. 2.1	Chloride	3.4		mg Cl/L	P387637	
		Sulfate	0.64		mg SO4/L	P387639	
	SM 2120 B-2011	Color (true)	74	Q	PCU	P386937	
	SM 2320 B-2011	Total Alkalinity	6.9		mg CaCO3/L	P387129	
	SM 2540 C-2011	TDS	45		mg/L	P387204	
	SM 2540 D-2011	TSS	8	I A	mg/L	P387184	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P386982	
2193927	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P387291	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.30		mg N/L	P386954	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P387072	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P386970	
	SM 5310 B-2011	Organic Carbon	6.0		mg C/L	P387200	
2193928	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P386903	
2193931	EPA 200.7 Rev. 4.4	Barium	26.7		ug/L	P386921	
		Calcium	2.83		mg/L	P386921	
		Iron	1.22E+03		ug/L	P386921	
		Magnesium	1.27		mg/L	P386921	
		Potassium	0.57	I	mg/L	P386921	
		Sodium	2.7		mg/L	P386921	
		Zinc	5.0	U	ug/L	P386921	
	EPA 200.8 Rev. 5.4	Aluminum	286		ug/L	P386921	
		Antimony	0.050	U	ug/L	P386921	
		Arsenic	0.53		ug/L	P386921	
		Boron**	11.8		ug/L	P386921	
		Cadmium	0.020	U	ug/L	P386921	
		Chromium	0.41	I	ug/L	P386921	
		Copper	0.40	U	ug/L	P386921	
		Lead	0.41		ug/L	P386921	
		Nickel	0.50	U	ug/L	P386921	
		Selenium	0.20	U	ug/L	P386921	
		Silver	0.010	U	ug/L	P386921	
		Thallium	0.10	U	ug/L	P386921	
	SM 2340B	Hardness	12.3		mg/L	P386921	

Ref. Method and Comment:
EPA 180.1 Rev. 2.0: The sample expired prior to receipt.
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 2120 B-2011: The sample expired prior to receipt.
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired prior to receipt.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Non-Conformance Report

NCR ID: 8408

Event(s)	Job(s)	Sample(s)	Test(s)
NW-DIST-2020-09-02-02			

NCR Type: SHIPPING/RECEIVING **NCR Category: Samples arrived late**

Observation: Samples arrived one day late by FedEx, samples received within the acceptable temperature range.

Resolution: Samples will be qualified as appropriate.
Customer has been notified.
Biology and Chemistry supervisors were notified.

Authorized by/Date: Joshua Ayres 9/8/2020

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386932

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386921

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: P386921

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: P387637

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387639

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387291

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: P386954

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387072

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386970

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386903

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

Reference Method: SM 2120 B-2011
Batch ID: P386937

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P387129

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

Reference Method: SM 2540 C-2011
Batch ID: P387204

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P387184

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P386982

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P387200

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: P386921

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	107		P	85 - 115
Calcium	108		P	85 - 115
Iron	107		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	106		P	85 - 115
Sodium	109		P	85 - 115
Zinc	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386921

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.3		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	99.7		P	85 - 115
Boron	94.6		P	85 - 115
Cadmium	99.0		P	85 - 115
Chromium	107		P	85 - 115
Copper	97.7		P	85 - 115
Lead	101		P	85 - 115
Nickel	98.7		P	85 - 115
Selenium	98.9		P	85 - 115
Silver	103		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387637

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	93.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387639

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	93.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387291

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386954

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.2		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387072

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386970

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386903

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.4		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P386937

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.3		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P387129

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

Reference Method: SM 4500 F-C-2011
Batch ID: P386982

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.7		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P387200

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386921

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193868	Barium	107		P	75 - 125
2193868	Iron	106		P	75 - 125
2193868	Magnesium	105		P	75 - 125
2193868	Potassium	104		P	75 - 125
2193868	Sodium	104		P	75 - 125
2193868	Zinc	104		P	75 - 125
2193931	Barium	111	108	P/P	80 - 120
2193931	Calcium	110	106	P/P	80 - 120
2193931	Iron	109	109	P/P	80 - 120
2193931	Magnesium	108	107	P/P	80 - 120
2193931	Potassium	104	105	P/P	80 - 120
2193931	Sodium	100	98.5	P/P	80 - 120
2193931	Zinc	111	108	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386921

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193868	Aluminum	90.2		P	75 - 125
2193868	Antimony	106		P	75 - 125
2193868	Arsenic	99.1		P	75 - 125
2193868	Boron	95.9		P	75 - 125
2193868	Cadmium	103		P	75 - 125
2193868	Chromium	107		P	75 - 125
2193868	Copper	93.5		P	75 - 125
2193868	Lead	101		P	75 - 125
2193868	Nickel	94.1		P	75 - 125
2193868	Selenium	95.5		P	75 - 125
2193868	Silver	101		P	75 - 125
2193868	Thallium	105		P	75 - 125
2193931	Aluminum	95.9	96.5	P/P	80 - 120
2193931	Antimony	101	102	P/P	80 - 120
2193931	Arsenic	99.8	99.0	P/P	80 - 120
2193931	Boron	92.0	94.3	P/P	80 - 120
2193931	Cadmium	98.2	99.5	P/P	80 - 120
2193931	Chromium	106	107	P/P	80 - 120
2193931	Copper	99.1	100	P/P	80 - 120
2193931	Lead	100	103	P/P	80 - 120
2193931	Nickel	98.9	98.3	P/P	80 - 120
2193931	Selenium	98.9	97.6	P/P	80 - 120
2193931	Silver	101	102	P/P	80 - 120
2193931	Thallium	102	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387637

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193961	Chloride	96.2		P	90 - 110
2193993	Chloride	93.7		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387639

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193961	Sulfate	95.6		P	90 - 110
2193993	Sulfate	94.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193927	Ammonia-N	97.8	95.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386954

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193720	Kjeldahl Nitrogen	103	95.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387072

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193966	NO2NO3-N	98.5	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193927	Total-P	109	109	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386903

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193521	O-Phosphate-P	97.8	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P386982

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193452	Fluoride	95.4	94.3	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P387200

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2194023	Organic Carbon	95.1	96.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386932

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194075	Turbidity	2.78	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386921

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193931	Barium	2.75	Spike	P	0 - 20
2193931	Calcium	2.31	Spike	P	0 - 20
2193931	Iron	0.430	Spike	P	0 - 20
2193931	Magnesium	0.768	Spike	P	0 - 20
2193931	Potassium	0.0377	Spike	P	0 - 20
2193931	Sodium	0.939	Spike	P	0 - 20
2193931	Zinc	2.55	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386921

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193931	Aluminum	0.463	Spike	P	0 - 20
2193931	Antimony	0.526	Spike	P	0 - 20
2193931	Arsenic	0.770	Spike	P	0 - 20
2193931	Boron	2.16	Spike	P	0 - 20
2193931	Cadmium	1.28	Spike	P	0 - 20
2193931	Chromium	0.711	Spike	P	0 - 20
2193931	Copper	1.09	Spike	P	0 - 20
2193931	Lead	2.35	Spike	P	0 - 20
2193931	Nickel	0.552	Spike	P	0 - 20
2193931	Selenium	1.39	Spike	P	0 - 20
2193931	Silver	0.856	Spike	P	0 - 20
2193931	Thallium	2.18	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387637

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193993	Chloride	0.413	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193927	Ammonia-N	1.67	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386954

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193720	Kjeldahl Nitrogen	5.92	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387072

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193966	NO2NO3-N	1.53	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193927	Total-P	0.241	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386903

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193521	O-Phosphate-P	0.204	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P386937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194178	Color (true)	2.61	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P387129

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193452	Total Alkalinity	4.67	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P387204

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193613	TDS	3.79	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P386982

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193452	Fluoride	0.929	Spike	P	0 - 2.8

Quality Assurance Report
Precision

Reference Method: SM 5310 B-2011
Batch ID: P387200

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2194023	Organic Carbon	1.40	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: A100802
Included Lab Sample IDs: 2193928

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A100810
Included Lab Sample IDs: 2193926

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

Reference Method: SM 2120 B-2011
Run ID: A100812
Included Lab Sample IDs: 2193926

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.2	97.8	P/P	90 - 115

Reference Method: SM 4500 F-C-2011
Run ID: A100824
Included Lab Sample IDs: 2193926

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	97.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A100837
Included Lab Sample IDs: 2193931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	106	105	P/P	90 - 110
Calcium	105	106	P/P	90 - 110
Iron	107	108	P/P	90 - 110
Magnesium	105	105	P/P	90 - 110
Potassium	105	104	P/P	90 - 110
Sodium	105	104	P/P	90 - 110
Zinc	106	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A100845
Included Lab Sample IDs: 2193927

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A100850
Included Lab Sample IDs: 2193927

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.1	105	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-2011
Run ID: A100873
Included Lab Sample IDs: 2193926

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.0	102	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A100906
Included Lab Sample IDs: 2193927

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.4	94.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A100944
Included Lab Sample IDs: 2193927

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	96.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100965
Included Lab Sample IDs: 2193931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.2	97.5	P/P	90 - 110
Antimony	106	106	P/P	90 - 110
Arsenic	99.7	99.6	P/P	90 - 110
Boron	93.9	94.8	P/P	90 - 110
Cadmium	98.1	97.6	P/P	90 - 110
Chromium	103	105	P/P	90 - 110
Copper	99.7	97.6	P/P	90 - 110
Lead	99.2	99.6	P/P	90 - 110
Nickel	99.3	98.4	P/P	90 - 110
Selenium	98.2	98.7	P/P	90 - 110
Silver	104	103	P/P	90 - 110
Thallium	97.5	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A100971
Included Lab Sample IDs: 2193927

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	97.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100980
Included Lab Sample IDs: 2193926

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	100	P/P	90 - 110
Sulfate	99.7	99.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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						2.78	
EPA 200.7 Rev. 4.4	Barium	107	111	108	107			2.75
	Calcium	108	110	106				2.31
	Iron	107	109	109	106			0.430
	Magnesium	106	108	107	105			0.768
	Potassium	106	104	105	104			0.0377
	Sodium	109	100	98.5	104			0.939
	Zinc	106	111	108	104			2.55
EPA 200.8 Rev. 5.4	Aluminum	95.3	95.9	96.5	90.2			0.463
	Antimony	104	106	101	102			0.526
	Arsenic	99.7	99.8	99.0	99.1			0.770
	Boron	94.6	92.0	94.3	95.9			2.16
	Cadmium	99.0	98.2	99.5	103			1.28
	Chromium	107	107	106	107			0.711
	Copper	97.7	99.1	100	93.5			1.09
	Lead	101	100	103	101			2.35
	Nickel	98.7	98.9	98.3	94.1			0.552
	Selenium	98.9	98.9	97.6	95.5			1.39
	Silver	103	101	102	101			0.856
	Thallium	102	102	104	105			2.18
EPA 300.0 Rev. 2.1	Chloride	93.6	93.7	96.2			0.413	
	Sulfate	93.6	94.2	95.6				
EPA 350.1 Rev. 2.0	Ammonia-N	102	97.8	95.8				1.67
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.2	103	95.2				5.92
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	98.5	97.0				1.53
EPA 365.1 Rev. 2.0	Total-P	107	109	109				0.241
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	97.8	98.0				0.204
SM 2120 B-2011	Color (true)	98.3					2.61	
SM 2320 B-2011	Total Alkalinity	101					4.67	
SM 2540 C-2011	TDS						3.79	
SM 4500 F-C-2011	Fluoride	98.7	95.4	94.3				0.929
SM 5310 B-2011	Organic Carbon	95.4	95.1	96.8				1.40

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2193926
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2193931
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2193931
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2193926
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2193926
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2193927
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2193927
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2193927
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2193927
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2193928
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2193926
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2193926
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2193931
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2193926

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2193926
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2193926
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2193927

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	09/02/2020			09/03/2020 14:41	Yen Ta	2193926
EPA 200.7 Rev. 4.4	09/02/2020	09/03/2020 15:00	Elliott D. Healy	09/04/2020 23:19	Betina Topolski	2193931
EPA 200.8 Rev. 5.4	09/02/2020	09/03/2020 15:00	Elliott D. Healy	09/14/2020 14:50	Alexander Thompson	2193931
EPA 300.0 Rev. 2.1	09/02/2020			09/18/2020 15:55	Lipi Saha	2193926
EPA 350.1 Rev. 2.0	09/02/2020			09/12/2020 12:46	Ping Hua	2193927
EPA 351.2 Rev. 2.0	09/02/2020	09/04/2020 11:25	David Boose	09/08/2020 11:13	Elliott Rodriguez	2193927
EPA 353.2 Rev. 2.0	09/02/2020			09/08/2020 10:51	Beverly Y. Sanders	2193927
EPA 365.1 Rev. 2.0	09/02/2020	09/04/2020 11:45	Yen Ta	09/11/2020 14:37	Lipi Saha	2193927
EPA 365.1 Rev. 2.0 dissolved	09/02/2020			09/02/2020 20:00	Virginia P. Brown	2193928
SM 2120 B-2011	09/02/2020			09/03/2020 16:12	Benjamin T. Nordmann	2193926
SM 2320 B-2011	09/02/2020			09/09/2020 07:45	Dale L. Simmons	2193926
SM 2340B	09/02/2020			09/04/2020 23:19	Betina Topolski	2193931
SM 2540 C-2011	09/02/2020			09/03/2020 15:01	Yijie Li	2193926
SM 2540 D-2011	09/02/2020			09/03/2020 15:01	Yijie Li	2193926
SM 4500 F-C-2011	09/02/2020			09/03/2020 17:34	Dale L. Simmons	2193926
SM 5310 B-2011	09/02/2020			09/10/2020 02:11	David Boose	2193927