

Chemical Analysis Report

NE-DIST-2020-12-01-01

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

Event Description: **Callahan makeup**
Request ID: **RQ-2020-11-30-38**
Customer: **NE-DIST**
Project ID: **SMP**

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

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

Certified by: Colin Wright, Program Administrator

Date Certified: 22-DEC-2020 10:12

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular background.

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: Unnamed Branch Above Alligator Cr.

Collection Date/Time: 11/30/2020 10:30

Field ID: G4NE0288

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2209681	EPA 180.1 Rev. 2.0	Turbidity	7.7		NTU	P390575	
	EPA 300.0 Rev. 2.1	Chloride	28		mg Cl/L	P390744	
		Sulfate	8.1		mg SO4/L	P390746	
		Color (true)	310		PCU	P390566	
	SM 2320 B-2011	Total Alkalinity	107		mg CaCO3/L	P390627	
	SM 2540 C-2011	TDS	234		mg/L	P391143	
	SM 2540 D-2011	TSS	5	I	mg/L	P390952	
	SM 4500 F-C-2011	Fluoride	0.16		mg F/L	P390629	
2209682	EPA 350.1 Rev. 2.0	Ammonia-N	0.027		mg N/L	P391075	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P390710	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.041		mg N/L	P390594	
	EPA 365.1 Rev. 2.0	Total-P	0.42		mg P/L	P390665	
	SM 5310 B-2011	Organic Carbon	33		mg C/L	P390753	
2209683	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.33		mg P/L	P390578	MS
2209690	EPA 200.7 Rev. 4.4	Barium	28.9		ug/L	P390569	
		Calcium	29.7		mg/L	P390569	
		Iron	1.21E+03		ug/L	P390569	
		Magnesium	13.5		mg/L	P390569	
		Potassium	6.8		mg/L	P390569	
		Sodium	18.6		mg/L	P390569	
		Zinc	5.0	U	ug/L	P390569	
	EPA 200.8 Rev. 5.4	Aluminum	296		ug/L	P390569	
		Antimony	0.050	U	ug/L	P390569	
		Arsenic	0.87		ug/L	P390569	
		Boron**	27.7		ug/L	P390569	
		Cadmium	0.020	U	ug/L	P390569	
		Chromium	0.69	I	ug/L	P390569	
		Copper	0.40	U	ug/L	P390569	
		Lead	0.28	I	ug/L	P390569	
		Nickel	0.86	I	ug/L	P390569	
		Selenium	0.25	I	ug/L	P390569	
		Silver	0.010	U	ug/L	P390569	
		Thallium	0.10	U	ug/L	P390569	
		Hardness	130		mg/L	P390569	
	SM 2340B						

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.

Sample Location: Cushing Cr @ Stratton Rd

Collection Date/Time: 11/30/2020 12:00

Field ID: NE400002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2209678	EPA 180.1 Rev. 2.0	Turbidity	6.4		NTU	P390575	
	EPA 300.0 Rev. 2.1	Chloride	26		mg Cl/L	P391016	
		Sulfate	8.6		mg SO4/L	P391017	
	SM 2120 B-2011	Color (true)	300		PCU	P390566	
	SM 2320 B-2011	Total Alkalinity	57		mg CaCO3/L	P390627	
	SM 2540 C-2011	TDS	176		mg/L	P391143	
	SM 2540 D-2011	TSS	2	I	mg/L	P390952	
	SM 4500 F-C-2011	Fluoride	0.10		mg F/L	P390629	
2209679	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P390725	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P390710	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.023		mg N/L	P390594	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P390665	
	SM 5310 B-2011	Organic Carbon	27		mg C/L	P390753	
2209680	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.094		mg P/L	P390578	MS

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.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P390575

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390569

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: P390569

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: P390744

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390746

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391016

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391017

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390725

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391075

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390710

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390594

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390665

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390578

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

Reference Method: SM 2120 B-2011
Batch ID: P390566

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P390627

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P391143

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P390952

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P390629

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P390753

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: P390569

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	105		P	85 - 115
Calcium	103		P	85 - 115
Iron	105		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	100		P	85 - 115
Sodium	107		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390569

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	103		P	85 - 115
Boron	95.4		P	85 - 115
Cadmium	98.7		P	85 - 115
Chromium	100		P	85 - 115
Copper	101		P	85 - 115
Lead	98.3		P	85 - 115
Nickel	99.4		P	85 - 115
Selenium	102		P	85 - 115
Silver	105		P	85 - 115
Thallium	99.1		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390744

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390746

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391016

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391017

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.1		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390725

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391075

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390710

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390594

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	101		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390665

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390578

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

Reference Method: SM 2120 B-2011
Batch ID: P390566

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P390627

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.3		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P390629

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	90 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P390753

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390569

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209578	Barium	105	101	P/P	80 - 120
2209578	Calcium	102		P	80 - 120
2209578	Iron	109	103	P/P	80 - 120
2209578	Magnesium	105	98.6	P/P	80 - 120
2209578	Potassium	102	97.9	P/P	80 - 120
2209578	Sodium	108	106	P/P	80 - 120
2209578	Zinc	99.7	96.5	P/P	80 - 120
2209746	Barium	104		P	80 - 120
2209746	Calcium	96.6		P	80 - 120
2209746	Iron	108		P	80 - 120
2209746	Magnesium	97.4		P	80 - 120
2209746	Potassium	104		P	80 - 120
2209746	Sodium	103		P	80 - 120
2209746	Zinc	97.5		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390569

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209578	Aluminum	101	99.4	P/P	80 - 120
2209578	Antimony	101	103	P/P	80 - 120
2209578	Arsenic	104	103	P/P	80 - 120
2209578	Boron	100	99.1	P/P	80 - 120
2209578	Cadmium	99.6	102	P/P	80 - 120
2209578	Chromium	101	102	P/P	80 - 120
2209578	Copper	96.3	96.1	P/P	80 - 120
2209578	Lead	97.7	97.3	P/P	80 - 120
2209578	Nickel	98.7	98.6	P/P	80 - 120
2209578	Selenium	102	102	P/P	80 - 120
2209578	Silver	103	104	P/P	80 - 120
2209578	Thallium	101	101	P/P	80 - 120
2209746	Aluminum	97.0		P	80 - 120
2209746	Antimony	105		P	80 - 120
2209746	Arsenic	104		P	80 - 120
2209746	Boron	96.8		P	80 - 120
2209746	Cadmium	101		P	80 - 120
2209746	Chromium	102		P	80 - 120
2209746	Copper	97.4		P	80 - 120
2209746	Lead	97.2		P	80 - 120
2209746	Nickel	98.4		P	80 - 120
2209746	Selenium	103		P	80 - 120
2209746	Silver	105		P	80 - 120
2209746	Thallium	101		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390744

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209572	Chloride	102		P	90 - 110
2209782	Chloride	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390746

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209572	Sulfate	102		P	90 - 110
2209782	Sulfate	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391016

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211305	Chloride	99.0		P	90 - 110
2211680	Chloride	97.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391017

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211305	Sulfate	99.6		P	90 - 110
2211680	Sulfate	98.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390725

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209710	Ammonia-N	97.6	95.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391075

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210395	Ammonia-N	95.8	97.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209574	NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390665

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209604	Total-P	105	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390578

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209596	O-Phosphate-P	89.5	89.5	F/F	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P390629

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209572	Fluoride	102	99.3	P/P	94 - 107

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P390753

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209871	Organic Carbon	101	100	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P390575

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209573	Turbidity	9.13	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209578	Barium	3.26	Spike	P	0 - 20
2209578	Calcium	1.31	Spike	P	0 - 20
2209578	Iron	5.13	Spike	P	0 - 20
2209578	Magnesium	4.36	Spike	P	0 - 20
2209578	Potassium	4.22	Spike	P	0 - 20
2209578	Sodium	1.16	Spike	P	0 - 20
2209578	Zinc	3.24	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209578	Aluminum	1.06	Spike	P	0 - 20
2209578	Antimony	1.87	Spike	P	0 - 20
2209578	Arsenic	0.822	Spike	P	0 - 20
2209578	Boron	1.05	Spike	P	0 - 20
2209578	Cadmium	1.98	Spike	P	0 - 20
2209578	Chromium	0.653	Spike	P	0 - 20
2209578	Copper	0.118	Spike	P	0 - 20
2209578	Lead	0.361	Spike	P	0 - 20
2209578	Nickel	0.0924	Spike	P	0 - 20
2209578	Selenium	0.400	Spike	P	0 - 20
2209578	Silver	1.33	Spike	P	0 - 20
2209578	Thallium	0.118	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390744

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209572	Chloride	1.25	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P390746

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209572	Sulfate	0.856	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391016

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211680	Chloride	0.649	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391017

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211680	Sulfate	0.178	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P390725

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209710	Ammonia-N	1.75	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391075

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210395	Ammonia-N	1.09	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390710

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209694	Kjeldahl Nitrogen	7.62	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209574	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390665

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209604	Total-P	1.64	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390578

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209596	O-Phosphate-P	0.0	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
Batch ID: P390566

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209572	Color (true)	3.78	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P390627

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209572	Total Alkalinity	0.572	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P391143

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209594	TDS	6.35	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P390629

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209572	Fluoride	2.01	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P390753

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209871	Organic Carbon	0.290	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B-2011

Run ID: A102353

Included Lab Sample IDs: 2209678, 2209681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	103	104	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A102354

Included Lab Sample IDs: 2209678, 2209681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	103	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A102355

Included Lab Sample IDs: 2209680, 2209683

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	99.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A102364

Included Lab Sample IDs: 2209679, 2209682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A102378

Included Lab Sample IDs: 2209678, 2209681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	98.7	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A102378

Included Lab Sample IDs: 2209678, 2209681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	105	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A102409

Included Lab Sample IDs: 2209681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Sulfate	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A102421

Included Lab Sample IDs: 2209679, 2209682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	106	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A102429

Included Lab Sample IDs: 2209679

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.1	98.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102430

Included Lab Sample IDs: 2209690

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	100	P/P	90 - 110
Antimony	97.6	96.9	P/P	90 - 110
Arsenic	103	102	P/P	90 - 110
Boron	102	103	P/P	90 - 110
Cadmium	101	99.0	P/P	90 - 110
Copper	99.4	97.7	P/P	90 - 110
Lead	98.3	98.2	P/P	90 - 110
Nickel	99.0	96.8	P/P	90 - 110
Selenium	104	102	P/P	90 - 110
Silver	99.9	98.5	P/P	90 - 110
Thallium	98.1	97.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A102434

Included Lab Sample IDs: 2209690

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	104	104	P/P	90 - 110
Calcium	102	102	P/P	90 - 110
Iron	104	104	P/P	90 - 110
Magnesium	100	100	P/P	90 - 110
Potassium	99.6	99.3	P/P	90 - 110
Sodium	104	105	P/P	90 - 110
Zinc	101	101	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A102441

Included Lab Sample IDs: 2209679, 2209682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	99.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A102455

Included Lab Sample IDs: 2209678

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.6	100	P/P	90 - 110
Sulfate	99.1	99.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102482

Included Lab Sample IDs: 2209690

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	97.9	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A102501

Included Lab Sample IDs: 2209679, 2209682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.3	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A102553

Included Lab Sample IDs: 2209682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.2	96.8	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					9.13	
EPA 200.7 Rev. 4.4	Barium	105	105	101	104		3.26
	Calcium	103	102	96.6			1.31
	Iron	105	109	103	108		5.13
	Magnesium	104	105	98.6	97.4		4.36
	Potassium	100	102	97.9	104		4.22
	Sodium	107	108	106	103		1.16
	Zinc	101	99.7	96.5	97.5		3.24
EPA 200.8 Rev. 5.4	Aluminum	101	101	99.4	97.0		1.06
	Antimony	100	101	103	105		1.87
	Arsenic	103	104	103	104		0.822
	Boron	95.4	100	99.1	96.8		1.05
	Cadmium	98.7	99.6	102	101		1.98
	Chromium	100	101	102	102		0.653
	Copper	101	96.3	96.1	97.4		0.118
	Lead	98.3	97.7	97.3	97.2		0.361
	Nickel	99.4	98.7	98.6	98.4		0.0924
	Selenium	102	102	102	103		0.400
	Silver	105	103	104	105		1.33
	Thallium	99.1	101	101	101		0.118
EPA 300.0 Rev. 2.1	Chloride	101	102	101		1.25	
	Chloride	98.3	97.7	99.0		0.649	
	Sulfate	102	102	102		0.856	
	Sulfate	99.1	98.0	99.6		0.178	
EPA 350.1 Rev. 2.0	Ammonia-N	97.6	97.6	95.8			1.75
	Ammonia-N	98.2	95.8	97.0			1.09
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101					7.62
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	99.5	99.5			0.0
EPA 365.1 Rev. 2.0	Total-P	104	105	108			1.64
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	89.5	89.5			0.0
SM 2120 B-2011	Color (true)	102				3.78	
SM 2320 B-2011	Total Alkalinity	99.3				0.572	
SM 2540 C-2011	TDS					6.35	
SM 4500 F-C-2011	Fluoride	98.8	102	99.3			2.01
SM 5310 B-2011	Organic Carbon	98.7	101	100			0.290

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2209678, 2209681
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2209690
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2209690
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2209678, 2209681
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2209678, 2209681
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2209679, 2209682
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2209679, 2209682
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2209679, 2209682
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2209679, 2209682
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2209680, 2209683
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2209678, 2209681

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2209678, 2209681
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2209690
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2209678, 2209681
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2209678, 2209681
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2209678, 2209681
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2209679, 2209682

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	12/01/2020			12/01/2020 16:17	Yen Ta	2209678, 2209681
EPA 200.7 Rev. 4.4	12/01/2020	12/01/2020 16:00	Elliott D. Healy	12/04/2020 15:28	Betina Topolski	2209690
EPA 200.8 Rev. 5.4	12/01/2020	12/01/2020 16:00	Elliott D. Healy	12/04/2020 14:52	Alexander Thompson	2209690
	12/01/2020	12/01/2020 16:00	Elliott D. Healy	12/08/2020 14:14	Alexander Thompson	2209690
EPA 300.0 Rev. 2.1	12/01/2020			12/04/2020 15:38	Lipi Saha	2209681
	12/01/2020			12/10/2020 21:41	Lipi Saha	2209678
EPA 350.1 Rev. 2.0	12/01/2020			12/05/2020 15:15	Ping Hua	2209679
	12/01/2020			12/13/2020 11:25	Ping Hua	2209682
EPA 351.2 Rev. 2.0	12/01/2020	12/04/2020 13:24	David Boose	12/09/2020 15:02	Julia Storbeck	2209679
	12/01/2020	12/04/2020 13:24	David Boose	12/09/2020 15:03	Julia Storbeck	2209682
EPA 353.2 Rev. 2.0	12/01/2020			12/02/2020 10:04	Beverly Y. Sanders	2209679
	12/01/2020			12/02/2020 10:05	Beverly Y. Sanders	2209682
EPA 365.1 Rev. 2.0	12/01/2020	12/03/2020 13:21	Yen Ta	12/04/2020 13:19	Benjamin T. Nordmann	2209679
	12/01/2020	12/03/2020 13:21	Yen Ta	12/04/2020 13:20	Benjamin T. Nordmann	2209682
EPA 365.1 Rev. 2.0 dissolved	12/01/2020			12/01/2020 16:16	Blanca Fach	2209680
	12/01/2020			12/01/2020 16:17	Blanca Fach	2209683
SM 2120 B-2011	12/01/2020			12/01/2020 15:09	Benjamin T. Nordmann	2209678
	12/01/2020			12/01/2020 15:10	Benjamin T. Nordmann	2209681
SM 2320 B-2011	12/01/2020			12/02/2020 17:47	Dale L. Simmons	2209678
	12/01/2020			12/02/2020 18:00	Dale L. Simmons	2209681
SM 2340B	12/01/2020			12/04/2020 15:28	Betina Topolski	2209690
SM 2540 C-2011	12/01/2020			12/04/2020 15:10	Yijie Li	2209678, 2209681
SM 2540 D-2011	12/01/2020			12/04/2020 15:10	Yijie Li	2209678, 2209681
SM 4500 F-C-2011	12/01/2020			12/02/2020 17:47	Dale L. Simmons	2209678
	12/01/2020			12/02/2020 18:00	Dale L. Simmons	2209681
SM 5310 B-2011	12/01/2020			12/03/2020 20:09	Madeline Gruver	2209679
	12/01/2020			12/03/2020 20:21	Madeline Gruver	2209682