

Chemical Analysis Report

CEN-DIST-2021-09-17-02

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

Event Description: **Florence Lake + Blank**

Request ID: **RQ-2021-09-27-16**

Customer: **CEN-DIST**

Project ID: **SMP**

Send Reports to:

FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Matthew Bearden

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: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 12-OCT-2021 09:40



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: Florence Lake @ Center

Collection Date/Time: 09/15/2021 12:43

Field ID: G3CE0012

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2276363	EPA 180.1 Rev. 2.0	Turbidity	4.5	AY	NTU	P403900	
	EPA 300.0 Rev. 2.1	Chloride	270		mg Cl/L	P404086	
		Sulfate	81	Y	mg SO4/L	P404089	
		Color (true)	390	AY	PCU	P403876	
	SM 2320 B-2011	Total Alkalinity	111	Y	mg CaCO3/L	P404044	
	SM 2540 C-2011	TDS	784	Y	mg/L	P404322	
	SM 2540 D-2011	TSS	5	IY	mg/L	P404315	
	SM 4500 F-C-2011	Fluoride	0.12		mg F/L	P404045	
2276364	EPA 350.1 Rev. 2.0	Ammonia-N	0.15	Y	mg N/L	P404119	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.2	Y	mg N/L	P403965	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.030	Y	mg N/L	P404038	
	EPA 365.1 Rev. 2.0	Total-P	0.14	Y	mg P/L	P404100	
	SM 5310 B-2011	Organic Carbon	38	Y	mg C/L	P404088	
2276365	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.079	Y	mg P/L	P403877	
2276374	EPA 200.7 Rev. 4.4	Barium	46.8		ug/L	P404091	
		Calcium	74.0		mg/L	P404091	
		Iron	1.30E+03		ug/L	P404091	
		Magnesium	25.9		mg/L	P404091	
		Manganese	25.7		ug/L	P404091	
		Potassium	4.2		mg/L	P404091	
		Sodium	146		mg/L	P404091	
		Zinc	6.7	I	ug/L	P404091	
	EPA 200.8 Rev. 5.4	Aluminum	108		ug/L	P404091	
		Antimony	0.16	I	ug/L	P404091	
		Arsenic	2.32		ug/L	P404091	
		Beryllium	0.010	U	ug/L	P404091	
		Boron**	47.4		ug/L	P404091	
		Cadmium	0.020	U	ug/L	P404091	
		Chromium	0.57	I	ug/L	P404091	
		Copper	0.40	I	ug/L	P404091	
		Lead	1.08		ug/L	P404091	
		Nickel	0.50	U	ug/L	P404091	
		Selenium	0.22	I	ug/L	P404091	
		Silver	0.010	U	ug/L	P404091	
		Thallium	0.10	U	ug/L	P404091	
		Hardness	291		mg/L	P404091	
	SM 2340B						

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
Ref. Method and Comment:							
EPA 180.1 Rev. 2.0: Sample temperature was outside the acceptable range when received at the laboratory.							
EPA 300.0 Rev. 2.1: Sulfate: Sample temperature was outside the acceptable range when received at the laboratory.							
SM 2120 B-2011: Sample temperature was outside the acceptable range when received at the laboratory.							
SM 2320 B-2011: Sample temperature was outside the acceptable range when received at the laboratory.							
SM 2540 C-2011: Sample temperature was outside the acceptable range when received at the laboratory.							
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample temperature was outside the acceptable range when received at the laboratory.							
EPA 350.1 Rev. 2.0: Sample temperature was outside the acceptable range when received at the laboratory.							
EPA 351.2 Rev. 2.0: Sample temperature was outside the acceptable range when received at the laboratory.							
EPA 353.2 Rev. 2.0: Sample temperature was outside the acceptable range when received at the laboratory.							
EPA 365.1 Rev. 2.0: Total-P: Sample temperature was outside the acceptable range when received at the laboratory.							
SM 5310 B-2011: Sample temperature was outside the acceptable range when received at the laboratory.							
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Sample temperature was outside the acceptable range when received at the laboratory.							

Non-Conformance Report

NCR ID: 9038

Event(s)

CEN-DIST-2021-09-17-02

Job(s)

Sample(s)

Test(s)

NCR Type: SHIPPING/RECEIVING

NCR Category: Samples arrived late

Observation: Samples arrived late, samples received outside the acceptable temperature range.

Resolution: Samples will be qualified as appropriate.

Authorized by/Date: Joshua Ayres 9/22/2021

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: P403900

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P404091

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
Manganese	1.0	U	ug/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: P404091

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: P404086

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P404089

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P404119

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: P403965

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404038

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404100

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403877

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

Reference Method: SM 2120 B-2011
Batch ID: P403876

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P404044

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-2011
Batch ID: P404322

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P404315

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P404045

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: P404088

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: P404091

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	101		P	85 - 115
Iron	109		P	85 - 115
Magnesium	112		P	85 - 115
Manganese	102		P	85 - 115
Potassium	105		P	85 - 115
Sodium	99.9		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P404091

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.8		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	99.4		P	85 - 115
Beryllium	94.1		P	85 - 115
Boron	101		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	97.3		P	85 - 115
Copper	97.2		P	85 - 115
Lead	97.2		P	85 - 115
Nickel	97.4		P	85 - 115
Selenium	97.7		P	85 - 115
Silver	100		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P404086

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P404089

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P404119

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: P403965

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.1		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404038

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404100

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: P403877

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

Reference Method: SM 2120 B-2011
Batch ID: P403876

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.5		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P404044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P404045

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.6		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P404088

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P404091

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276759	Barium	100		P	80 - 120
2276759	Calcium	99.1		P	80 - 120
2276759	Iron	105		P	80 - 120
2276759	Magnesium	100		P	80 - 120
2276759	Manganese	100		P	80 - 120
2276759	Potassium	102		P	80 - 120
2276759	Sodium	99.9		P	80 - 120
2276759	Zinc	102		P	80 - 120
2276979	Barium	101	103	P/P	80 - 120
2276979	Calcium	102		P	80 - 120
2276979	Iron	111	110	P/P	80 - 120
2276979	Magnesium	111	111	P/P	80 - 120
2276979	Manganese	102	103	P/P	80 - 120
2276979	Potassium	104	103	P/P	80 - 120
2276979	Sodium	101		P	80 - 120
2276979	Zinc	90.2	92.2	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P404091

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276759	Aluminum	95.1		P	80 - 120
2276759	Antimony	101		P	80 - 120
2276759	Arsenic	97.2		P	80 - 120
2276759	Beryllium	90.2		P	80 - 120
2276759	Boron	98.7		P	80 - 120
2276759	Cadmium	99.2		P	80 - 120
2276759	Chromium	96.0		P	80 - 120
2276759	Copper	90.9		P	80 - 120
2276759	Lead	94.6		P	80 - 120
2276759	Nickel	93.0		P	80 - 120
2276759	Selenium	94.5		P	80 - 120
2276759	Silver	96.6		P	80 - 120
2276759	Thallium	101		P	80 - 120
2276979	Aluminum	99.4	98.7	P/P	80 - 120
2276979	Antimony	105	104	P/P	80 - 120
2276979	Arsenic	102	102	P/P	80 - 120
2276979	Beryllium	95.1	94.0	P/P	80 - 120
2276979	Boron	102	99.9	P/P	80 - 120
2276979	Cadmium	102	99.7	P/P	80 - 120
2276979	Chromium	101	101	P/P	80 - 120
2276979	Copper	98.6	97.7	P/P	80 - 120
2276979	Lead	98.7	97.8	P/P	80 - 120
2276979	Nickel	98.0	98.4	P/P	80 - 120
2276979	Selenium	99.0	99.0	P/P	80 - 120
2276979	Silver	99.9	99.1	P/P	80 - 120
2276979	Thallium	109	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P404086

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P404086

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276465	Chloride	98.7		P	90 - 110
2276741	Chloride	96.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P404089

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276465	Sulfate	98.4		P	90 - 110
2276741	Sulfate	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P404119

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276524	Ammonia-N	96.8	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403965

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276330	Kjeldahl Nitrogen	105	94.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404038

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276341	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404100

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276403	Total-P	107	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403877

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276365	O-Phosphate-P	102	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P404045

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276523	Fluoride	100	98.4	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P404088

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276463	Organic Carbon	98.2	97.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P403900

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276363	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P404091

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276979	Barium	1.51	Spike	P	0 - 20
2276979	Calcium	0.0799	Spike	P	0 - 20
2276979	Iron	0.530	Spike	P	0 - 20
2276979	Magnesium	0.0115	Spike	P	0 - 20
2276979	Manganese	1.66	Spike	P	0 - 20
2276979	Potassium	1.13	Spike	P	0 - 20
2276979	Sodium	0.0303	Spike	P	0 - 20
2276979	Zinc	1.91	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P404091

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276979	Aluminum	0.694	Spike	P	0 - 20
2276979	Antimony	0.937	Spike	P	0 - 20
2276979	Arsenic	0.133	Spike	P	0 - 20
2276979	Beryllium	1.12	Spike	P	0 - 20
2276979	Boron	1.39	Spike	P	0 - 20
2276979	Cadmium	2.04	Spike	P	0 - 20
2276979	Chromium	0.151	Spike	P	0 - 20
2276979	Copper	0.854	Spike	P	0 - 20
2276979	Lead	0.883	Spike	P	0 - 20
2276979	Nickel	0.329	Spike	P	0 - 20
2276979	Selenium	0.00544	Spike	P	0 - 20
2276979	Silver	0.818	Spike	P	0 - 20
2276979	Thallium	3.21	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P404086

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276465	Chloride	0.574	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P404089

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276465	Sulfate	1.07	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P404119

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276524	Ammonia-N	0.884	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403965

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276330	Kjeldahl Nitrogen	8.21	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276341	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276403	Total-P	0.416	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403877

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276365	O-Phosphate-P	0.833	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P403876

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276363	Color (true)	1.05	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P404044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276523	Total Alkalinity	0.236	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P404322

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276465	TDS	5.88	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P404045

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276523	Fluoride	0.953	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P404088

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276463	Organic Carbon	0.259	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: A107854

Included Lab Sample IDs: 2276363

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.3	99.3	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A107855

Included Lab Sample IDs: 2276365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	98.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A107865

Included Lab Sample IDs: 2276363

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	102	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A107927

Included Lab Sample IDs: 2276364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	104	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A107928

Included Lab Sample IDs: 2276363

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A107928

Included Lab Sample IDs: 2276363

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A107953

Included Lab Sample IDs: 2276363

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

Reference Method: SM 5310 B-2011

Run ID: A107954

Included Lab Sample IDs: 2276364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	97.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107960

Included Lab Sample IDs: 2276364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	97.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107961

Included Lab Sample IDs: 2276364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107988

Included Lab Sample IDs: 2276364

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107991

Included Lab Sample IDs: 2276374

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.1	99.2	P/P	90 - 110
Antimony	102	102	P/P	90 - 110
Arsenic	97.7	97.5	P/P	90 - 110
Beryllium	92.8	93.7	P/P	90 - 110
Boron	98.8	102	P/P	90 - 110
Cadmium	98.4	99.7	P/P	90 - 110
Chromium	95.7	95.2	P/P	90 - 110
Copper	93.5	94.5	P/P	90 - 110
Lead	92.7	93.3	P/P	90 - 110
Nickel	92.7	93.7	P/P	90 - 110
Selenium	98.1	99.0	P/P	90 - 110
Silver	97.6	97.7	P/P	90 - 110
Thallium	98.8	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107992

Included Lab Sample IDs: 2276374

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	97.1	98.0	P/P	90 - 110
Calcium	101	102	P/P	90 - 110
Iron	101	102	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Manganese	101	102	P/P	90 - 110
Potassium	100	102	P/P	90 - 110
Sodium	100	102	P/P	90 - 110
Zinc	100	100	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					0.0	
EPA 200.7 Rev. 4.4	Barium	102	100	101	103		1.51
	Calcium	101	99.1	102			0.0799
	Iron	109	105	111	110		0.530
	Magnesium	112	100	111	111		0.0115
	Manganese	102	100	102	103		1.66
	Potassium	105	102	104	103		1.13
	Sodium	99.9	99.9	101			0.0303
	Zinc	101	102	90.2	92.2		1.91
EPA 200.8 Rev. 5.4	Aluminum	99.8	99.4	98.7	95.1		0.694
	Antimony	103	105	104	101		0.937
	Arsenic	99.4	102	102	97.2		0.133
	Beryllium	94.1	95.1	94.0	90.2		1.12
	Boron	101	102	99.9	98.7		1.39
	Cadmium	100	102	99.7	99.2		2.04
	Chromium	97.3	101	101	96.0		0.151
	Copper	97.2	98.6	97.7	90.9		0.854
	Lead	97.2	98.7	97.8	94.6		0.883
	Nickel	97.4	98.0	98.4	93.0		0.329
	Selenium	97.7	99.0	99.0	94.5		0.0054
	Silver	100	99.9	99.1	96.6		0.818
	Thallium	102	109	105	101		3.21
EPA 300.0 Rev. 2.1	Chloride	98.5	98.7	96.9		0.574	
	Sulfate	99.0	98.4	97.3		1.07	
EPA 350.1 Rev. 2.0	Ammonia-N	98.2	96.8	97.8			0.884
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.1	105	94.6			8.21
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	103	103	102			0.487
EPA 365.1 Rev. 2.0	Total-P	104	107	107			0.416
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.3	102	100			0.833
SM 2120 B-2011	Color (true)	98.5				1.05	
SM 2320 B-2011	Total Alkalinity	103				0.236	
SM 2540 C-2011	TDS					5.88	
SM 4500 F-C-2011	Fluoride	97.6	100	98.4			0.953
SM 5310 B-2011	Organic Carbon	96.6	98.2	97.8			0.259

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2276363
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2276374
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2276374
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2276363
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2276363
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2276364
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2276364
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2276364
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2276364
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2276365
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2276363
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2276363

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2276374
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2276363
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2276363
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2276363
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2276364

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	09/17/2021			09/17/2021 12:02	Khloe J Berg	2276363
EPA 200.7 Rev. 4.4	09/17/2021	09/23/2021 11:00	Emily M Philpot	09/24/2021 12:55	Josef B Mick	2276374
EPA 200.8 Rev. 5.4	09/17/2021	09/23/2021 11:00	Emily M Philpot	09/24/2021 17:32	Alexander Thompson	2276374
EPA 300.0 Rev. 2.1	09/17/2021			09/22/2021 18:51	Roberta Tatti	2276363
EPA 350.1 Rev. 2.0	09/17/2021			09/23/2021 12:11	Ping Hua	2276364
EPA 351.2 Rev. 2.0	09/17/2021	09/21/2021 10:48	Benjamin T. Nordmann	09/23/2021 10:18	Alexandra J Mattheus	2276364
EPA 353.2 Rev. 2.0	09/17/2021			09/22/2021 09:09	Beverly Y. Sanders	2276364
EPA 365.1 Rev. 2.0	09/17/2021	09/23/2021 12:05	Simonne.V. Calhoun	09/24/2021 12:03	Sarah A Nixon	2276364
EPA 365.1 Rev. 2.0 dissolved	09/17/2021			09/17/2021 12:13	James L Waggerby	2276365
SM 2120 B-2011	09/17/2021			09/17/2021 12:39	Benjamin T. Nordmann	2276363
SM 2320 B-2011	09/17/2021			09/21/2021 18:27	Dale L. Simmons	2276363
SM 2340B	09/17/2021			09/24/2021 12:55	Josef B Mick	2276374
SM 2540 C-2011	09/17/2021			09/21/2021 13:36	Yijie Li	2276363
SM 2540 D-2011	09/17/2021			09/21/2021 13:36	Yijie Li	2276363
SM 4500 F-C-2011	09/17/2021			09/21/2021 18:27	Dale L. Simmons	2276363
SM 5310 B-2011	09/17/2021			09/22/2021 17:07	Madeline Gruver	2276364