

Chemical Analysis Report

CEN-DIST-2021-09-14-01

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

Event Description: **Lake Norris and Holly**
Request ID: **RQ-2021-09-13-29**
Customer: **CEN-DIST**
Project ID: **SMP**

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Date Certified: 07-OCT-2021 10:30



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: Holly Lake at Center of Lake

Collection Date/Time: 09/13/2021 12:02

Field ID: 20020553

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2275660	EPA 180.1 Rev. 2.0	Turbidity	4.3		NTU	P403710	
	EPA 300.0 Rev. 2.1	Chloride	33		mg Cl/L	P403798	
		Sulfate	5.9		mg SO4/L	P403803	
	SM 2120 B-2011	Color (true)	71	A	PCU	P403713	
	SM 2320 B-2011	Total Alkalinity	64		mg CaCO3/L	P403815	
	SM 2540 C-2011	TDS	197		mg/L	P404173	
	SM 2540 D-2011	TSS	5	I	mg/L	P404001	
2275661	SM 4500 F-C-2011	Fluoride	0.16		mg F/L	P403816	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P403887	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P403929	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P403756	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P403800	
2275662	SM 5310 B-2011	Organic Carbon	28		mg C/L	P404048	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P403706	
2275668	EPA 200.7 Rev. 4.4	Barium	35.6		ug/L	P403690	
		Calcium	18.2		mg/L	P403690	
		Iron	59	I	ug/L	P403690	
		Magnesium	9.76		mg/L	P403690	
		Manganese	81.3		ug/L	P403690	
		Potassium	7.8		mg/L	P403690	
		Sodium	18.1		mg/L	P403690	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P403690	
		Aluminum	6.0	I	ug/L	P403690	
		Antimony	0.075	I	ug/L	P403690	
		Arsenic	0.89		ug/L	P403690	
		Beryllium	0.010	U	ug/L	P403690	
		Boron**	56.6		ug/L	P403690	
		Cadmium	0.020	U	ug/L	P403690	
		Chromium	0.40	U	ug/L	P403690	
		Copper	0.40	U	ug/L	P403690	
		Lead	0.20	U	ug/L	P403690	
		Nickel	0.50	U	ug/L	P403690	
		Selenium	0.20	U	ug/L	P403690	
		Silver	0.010	U	ug/L	P403690	
		Thallium	0.10	U	ug/L	P403690	
		Hardness	85.6		mg/L	P403690	

Ref. Method and Comment:

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: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: FB

Collection Date/Time: 09/13/2021 12:28

Field ID: FB_09132021

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2275663	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P403710	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P403798	
		Sulfate	0.20	U	mg SO4/L	P403803	
		Color (true)	2.5	U	PCU	P403713	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P403815	
	SM 2540 C-2011	TDS	15	U	mg/L	P404172	
	SM 2540 D-2011	TSS	2	U	mg/L	P404000	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P403816	
2275664	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P403887	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P403929	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P403756	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P403838	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P404048	
2275665	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P403706	
2275669	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P403690	
		Calcium	0.075	U	mg/L	P403690	
		Iron	30	U	ug/L	P403690	
		Magnesium	0.040	U	mg/L	P403690	
		Manganese	1.0	U	ug/L	P403690	
		Potassium	0.30	U	mg/L	P403690	
		Sodium	0.50	U	mg/L	P403690	
		Zinc	5.0	U	ug/L	P403690	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P403690	
		Antimony	0.050	U	ug/L	P403690	
		Arsenic	0.050	U	ug/L	P403690	
		Beryllium	0.010	U	ug/L	P403690	
		Boron**	2.0	U	ug/L	P403690	
		Cadmium	0.020	U	ug/L	P403690	
		Chromium	0.40	U	ug/L	P403690	
		Copper	0.40	U	ug/L	P403690	
		Lead	0.20	U	ug/L	P403690	
		Nickel	0.50	U	ug/L	P403690	
		Selenium	0.20	U	ug/L	P403690	
		Silver	0.010	U	ug/L	P403690	
		Thallium	0.10	U	ug/L	P403690	
		Hardness	0.35	U	mg/L	P403690	

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: P403710

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P403690

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: P403690

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: P403798

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403803

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403887

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: P403929

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403756

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403800

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403838

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403706

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

Reference Method: SM 2120 B-2011
Batch ID: P403713

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P403815

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

Reference Method: SM 2540 C-2011
Batch ID: P404172

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P404173

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P404000

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P404001

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P403816

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P404048

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: P403690

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	103		P	85 - 115
Iron	108		P	85 - 115
Magnesium	110		P	85 - 115
Manganese	104		P	85 - 115
Potassium	104		P	85 - 115
Sodium	106		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P403690

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	104		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	100		P	85 - 115
Beryllium	98.9		P	85 - 115
Boron	107		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	102		P	85 - 115
Copper	100		P	85 - 115
Lead	102		P	85 - 115
Nickel	100		P	85 - 115
Selenium	101		P	85 - 115
Silver	103		P	85 - 115
Thallium	105		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403798

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P403803

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403887

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403929

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: P403756

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403800

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403838

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: P403706

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

Reference Method: SM 2120 B-2011
Batch ID: P403713

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.6		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P403815

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P403816

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

Reference Method: SM 5310 B-2011
Batch ID: P404048

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P403690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275604	Barium	101	101	P/P	80 - 120
2275604	Calcium	101		P	80 - 120
2275604	Iron	107	106	P/P	80 - 120
2275604	Magnesium	108	105	P/P	80 - 120
2275604	Manganese	101	100	P/P	80 - 120
2275604	Potassium	104	104	P/P	80 - 120
2275604	Sodium	105	103	P/P	80 - 120
2275604	Zinc	105	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P403690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275604	Aluminum	100	99.3	P/P	80 - 120
2275604	Antimony	106	105	P/P	80 - 120
2275604	Arsenic	99.1	97.8	P/P	80 - 120
2275604	Beryllium	99.4	95.9	P/P	80 - 120
2275604	Boron	103	104	P/P	80 - 120
2275604	Cadmium	106	105	P/P	80 - 120
2275604	Chromium	104	103	P/P	80 - 120
2275604	Copper	95.2	94.7	P/P	80 - 120
2275604	Lead	99.8	102	P/P	80 - 120
2275604	Nickel	97.9	94.9	P/P	80 - 120
2275604	Selenium	99.4	98.5	P/P	80 - 120
2275604	Silver	103	101	P/P	80 - 120
2275604	Thallium	104	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403798

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275508	Chloride	98.6		P	90 - 110
2275583	Chloride	97.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403803

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275508	Sulfate	98.6		P	90 - 110
2275583	Sulfate	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P403887

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275587	Ammonia-N	98.6	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P403929

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275678	Kjeldahl Nitrogen	92.1	89.0	P/F	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275678	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403838

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275892	Total-P	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403706

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275589	O-Phosphate-P	98.0	98.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P403816

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275592	Fluoride	98.6	97.5	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P404048

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275817	Organic Carbon	98.8	99.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P403710

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275649	Turbidity	4.12	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P403690

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275604	Barium	0.825	Spike	P	0 - 20
2275604	Calcium	0.678	Spike	P	0 - 20
2275604	Iron	1.51	Spike	P	0 - 20
2275604	Magnesium	1.37	Spike	P	0 - 20
2275604	Manganese	0.707	Spike	P	0 - 20
2275604	Potassium	0.196	Spike	P	0 - 20
2275604	Sodium	1.38	Spike	P	0 - 20
2275604	Zinc	1.41	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P403690

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275604	Aluminum	0.983	Spike	P	0 - 20
2275604	Antimony	1.39	Spike	P	0 - 20
2275604	Arsenic	1.31	Spike	P	0 - 20
2275604	Beryllium	3.65	Spike	P	0 - 20
2275604	Boron	0.703	Spike	P	0 - 20
2275604	Cadmium	0.538	Spike	P	0 - 20
2275604	Chromium	1.06	Spike	P	0 - 20
2275604	Copper	0.595	Spike	P	0 - 20
2275604	Lead	2.30	Spike	P	0 - 20
2275604	Nickel	3.12	Spike	P	0 - 20
2275604	Selenium	0.961	Spike	P	0 - 20
2275604	Silver	1.99	Spike	P	0 - 20
2275604	Thallium	0.747	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403798

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275508	Chloride	0.478	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P403803

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275508	Sulfate	4.12	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403887

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275587	Ammonia-N	0.808	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403929

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275678	Kjeldahl Nitrogen	1.82	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275678	NO2NO3-N	0.324	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403800

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275908	Total-P	0.831	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403838

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275892	Total-P	0.283	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275589	O-Phosphate-P	0.914	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P403713

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275660	Color (true)	2.20	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P403815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275592	Total Alkalinity	1.38	Sample	P	0 - 5.2

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P404172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275509	TDS	7.41	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
Batch ID: P404173

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275585	TDS	1.80	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P403816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275592	Fluoride	0.967	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P404048

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275817	Organic Carbon	0.208	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: A107781

Included Lab Sample IDs: 2275662, 2275665

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	99.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A107782

Included Lab Sample IDs: 2275660, 2275663

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

Reference Method: SM 2120 B-2011

Run ID: A107783

Included Lab Sample IDs: 2275660, 2275663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	100	P/P	90 - 115

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A107789

Included Lab Sample IDs: 2275660, 2275663

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A107801

Included Lab Sample IDs: 2275661, 2275664

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

Reference Method: SM 2320 B-2011

Run ID: A107822

Included Lab Sample IDs: 2275660, 2275663

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.1	103	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A107822

Included Lab Sample IDs: 2275660, 2275663

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107838

Included Lab Sample IDs: 2275668, 2275669

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107838

Included Lab Sample IDs: 2275668, 2275669

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	102	P/P	90 - 110
Antimony	101	102	P/P	90 - 110
Antimony	98.6	101	P/P	90 - 110
Arsenic	95.2	94.0	P/P	90 - 110
Arsenic	97.1	95.2	P/P	90 - 110
Beryllium	93.3	91.9	P/P	90 - 110
Beryllium	96.1	93.3	P/P	90 - 110
Boron	102	105	P/P	90 - 110
Boron	105	106	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Cadmium	99.2	101	P/P	90 - 110
Chromium	96.7	98.7	P/P	90 - 110
Chromium	98.7	99.4	P/P	90 - 110
Copper	92.5	91.8	P/P	90 - 110
Copper	96.3	92.5	P/P	90 - 110
Lead	96.3	97.2	P/P	90 - 110
Lead	97.2	97.1	P/P	90 - 110
Nickel	92.5	91.1	P/P	90 - 110
Nickel	96.5	92.5	P/P	90 - 110
Selenium	97.1	98.3	P/P	90 - 110
Selenium	97.2	97.1	P/P	90 - 110
Silver	94.9	95.8	P/P	90 - 110
Silver	95.8	96.3	P/P	90 - 110
Thallium	102	99.9	P/P	90 - 110
Thallium	99.6	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107840

Included Lab Sample IDs: 2275668, 2275669

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	96.4	98.5	P/P	95 - 105
Barium	98.5	99.9	P/P	90 - 110
Calcium	104	102	P/P	90 - 110
Calcium	99.5	104	P/P	95 - 105
Iron	100	105	P/P	95 - 105
Iron	105	102	P/P	90 - 110
Magnesium	100	105	P/P	95 - 105
Magnesium	105	102	P/P	90 - 110
Manganese	102	102	P/P	95 - 105
Manganese	102	104	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Potassium	98.3	102	P/P	95 - 105
Sodium	102	101	P/P	90 - 110
Sodium	98.6	102	P/P	95 - 105
Zinc	101	102	P/P	95 - 105
Zinc	102	105	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107858

Included Lab Sample IDs: 2275661, 2275664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	97.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107901

Included Lab Sample IDs: 2275661, 2275664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	108	108	P/P	90 - 110
Total-P	109	108	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107906

Included Lab Sample IDs: 2275661, 2275664

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

Reference Method: SM 5310 B-2011

Run ID: A107931

Included Lab Sample IDs: 2275661, 2275664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.0	99.4	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		LCS	Precision	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					4.12	
EPA 200.7 Rev. 4.4	Barium	104	101	101			0.825
	Calcium	103	101				0.678
	Iron	108	107	106			1.51
	Magnesium	110	108	105			1.37
	Manganese	104	101	100			0.707
	Potassium	104	104	104			0.196
	Sodium	106	105	103			1.38
	Zinc	104	105	104			1.41
EPA 200.8 Rev. 5.4	Aluminum	104	100	99.3			0.983
	Antimony	104	106	105			1.39
	Arsenic	100	99.1	97.8			1.31
	Beryllium	98.9	99.4	95.9			3.65
	Boron	107	103	104			0.703
	Cadmium	103	106	105			0.538
	Chromium	102	104	103			1.06
	Copper	100	95.2	94.7			0.595
	Lead	102	99.8	102			2.30
	Nickel	100	97.9	94.9			3.12
	Selenium	101	99.4	98.5			0.961
	Silver	103	103	101			1.99
	Thallium	105	104	105			0.747
EPA 300.0 Rev. 2.1	Chloride	98.4	98.6	97.2		0.478	
	Sulfate	98.0	98.6	99.1		4.12	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	98.6	99.4			0.808
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.1	92.1	89.0			1.82
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	102	102			0.324
EPA 365.1 Rev. 2.0	Total-P	102					0.831
	Total-P	104	106	106			0.283
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	98.0	98.9			0.914
SM 2120 B-2011	Color (true)	99.6				2.20	
SM 2320 B-2011	Total Alkalinity	101				1.38	
SM 2540 C-2011	TDS					7.41	
	TDS					1.80	
SM 4500 F-C-2011	Fluoride	99.6	98.6	97.5			0.967
SM 5310 B-2011	Organic Carbon	97.6	98.8	99.2			0.208

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2275660, 2275663
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2275668, 2275669
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2275668, 2275669
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2275660, 2275663
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2275660, 2275663
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2275661, 2275664
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2275661, 2275664
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2275661, 2275664
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2275661, 2275664
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2275662, 2275665

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2275660, 2275663
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2275660, 2275663
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2275668, 2275669
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2275660, 2275663
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2275660, 2275663
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2275660, 2275663
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2275661, 2275664

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	09/14/2021			09/14/2021 16:38	Sarah A Nixon	2275660, 2275663
EPA 200.7 Rev. 4.4	09/14/2021	09/14/2021 12:45	Elliott D. Healy	09/16/2021 12:30	Josef B Mick	2275669
	09/14/2021	09/14/2021 12:45	Elliott D. Healy	09/16/2021 14:53	Josef B Mick	2275668
EPA 200.8 Rev. 5.4	09/14/2021	09/14/2021 12:45	Elliott D. Healy	09/16/2021 16:18	Alexander Thompson	2275669
	09/14/2021	09/14/2021 12:45	Elliott D. Healy	09/16/2021 18:53	Alexander Thompson	2275668
EPA 300.0 Rev. 2.1	09/14/2021			09/15/2021 16:16	Roberta Tatti	2275660
	09/14/2021			09/15/2021 16:28	Roberta Tatti	2275663
EPA 350.1 Rev. 2.0	09/14/2021			09/17/2021 13:44	Ping Hua	2275661
	09/14/2021			09/17/2021 13:48	Ping Hua	2275664
EPA 351.2 Rev. 2.0	09/14/2021	09/20/2021 13:20	Benjamin T. Nordmann	09/21/2021 11:09	Alexandra J Mattheus	2275661
	09/14/2021	09/20/2021 13:20	Benjamin T. Nordmann	09/21/2021 11:11	Alexandra J Mattheus	2275664
EPA 353.2 Rev. 2.0	09/14/2021			09/15/2021 10:13	Beverly Y. Sanders	2275661
	09/14/2021			09/15/2021 10:14	Beverly Y. Sanders	2275664
EPA 365.1 Rev. 2.0	09/14/2021	09/16/2021 15:28	Simonne.V. Calhoun	09/20/2021 15:32	Virginia P. Brown	2275661
	09/14/2021	09/16/2021 15:28	Simonne.V. Calhoun	09/20/2021 15:49	Virginia P. Brown	2275664
EPA 365.1 Rev. 2.0 dissolved	09/14/2021			09/14/2021 15:36	Blanca Fach	2275665
	09/14/2021			09/14/2021 15:40	Blanca Fach	2275662
SM 2120 B-2011	09/14/2021			09/14/2021 17:32	Sarah A Nixon	2275660
	09/14/2021			09/14/2021 17:37	Sarah A Nixon	2275663
SM 2320 B-2011	09/14/2021			09/15/2021 17:40	Dale L. Simmons	2275660
	09/14/2021			09/15/2021 17:49	Dale L. Simmons	2275663
SM 2340B	09/14/2021			09/16/2021 12:30	Josef B Mick	2275669
	09/14/2021			09/16/2021 14:53	Josef B Mick	2275668
SM 2540 C-2011	09/14/2021			09/16/2021 15:25	Yijie Li	2275660, 2275663
SM 2540 D-2011	09/14/2021			09/16/2021 15:25	Yijie Li	2275660, 2275663
SM 4500 F-C-2011	09/14/2021			09/15/2021 17:40	Dale L. Simmons	2275660
	09/14/2021			09/15/2021 17:49	Dale L. Simmons	2275663
SM 5310 B-2011	09/14/2021			09/18/2021 05:18	Touraj Touran	2275661
	09/14/2021			09/18/2021 05:34	Touraj Touran	2275664