

Chemical Analysis Report

CEN-DIST-2021-06-15-01

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

Event Description: **Little Haw Creek / Lake Dias**
Request ID: **RQ-2021-04-12-05**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 08-JUL-2021 12:41

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored 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: Little Haw Creek @ 25m DS of SR40

Collection Date/Time: 06/14/2021 11:35

Field ID: G2CE0128

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2254880	EPA 200.7 Rev. 4.4	Barium	9.2		ug/L	P399769	
		Calcium	7.54		mg/L	P399769	
		Iron	1.30E+03		ug/L	P399769	
		Magnesium	1.33		mg/L	P399769	
		Manganese	10.3		ug/L	P399769	
		Potassium	6.6		mg/L	P399769	
		Sodium	12.6		mg/L	P399769	
	EPA 200.8 Rev. 5.4	Zinc	9.7	I	ug/L	P399769	
		Aluminum	418		ug/L	P399769	
		Antimony	0.12	I	ug/L	P399769	
		Arsenic	1.37		ug/L	P399769	
		Beryllium	0.022	I	ug/L	P399769	
		Boron**	28.0		ug/L	P399769	
		Cadmium	0.022	I	ug/L	P399769	
		Chromium	1.1	I	ug/L	P399769	
		Copper	1.81		ug/L	P399769	
		Lead	1.66		ug/L	P399769	
		Nickel	0.79	I	ug/L	P399769	
		Selenium	0.24	I	ug/L	P399769	
		Silver	0.010	U	ug/L	P399769	
		Thallium	0.10	U	ug/L	P399769	
	SM 2340B	Hardness	24.3		mg/L	P399769	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 06/21/2021.

Sample Location: Lake Dias @ Center

Collection Date/Time: 06/14/2021 11:55

Field ID: G2CE0235

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2254875	EPA 180.1 Rev. 2.0	Turbidity	4.2	A	NTU	P399734	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P399908	
		Sulfate	5.5		mg SO4/L	P399910	
	SM 2120 B-2011	Color (true)	76	A	PCU	P399728	
	SM 2320 B-2011	Total Alkalinity	23		mg CaCO3/L	P399964	
	SM 2540 C-2011	TDS	94		mg/L	P400230	
	SM 2540 D-2011	TSS	5	I	mg/L	P400045	
	SM 4500 F-C-2011	Fluoride	0.047	I	mg F/L	P399968	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P400227	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.97		mg N/L	P399934	
2254876	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P399763	
	EPA 365.1 Rev. 2.0	Total-P	0.036		mg P/L	P399997	
	SM 5310 B-2011	Organic Carbon	15		mg C/L	P400250	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P399724	
	dissolved						

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: P399734

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P399769

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: P399769

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: P399908

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399910

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400227

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: P399934

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399763

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: P399997

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399724

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

Reference Method: SM 2120 B-2011
Batch ID: P399728

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P399964

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

Reference Method: SM 2540 C-2011
Batch ID: P400230

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P400045

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P399968

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: P400250

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: P399769

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	92.7		P	80 - 120
Calcium	95.7		P	80 - 120
Iron	97.2		P	80 - 120
Magnesium	97.9		P	80 - 120
Manganese	92.2		P	80 - 120
Potassium	93.0		P	80 - 120
Sodium	95.8		P	80 - 120
Zinc	91.7		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P399769

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.9		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	104		P	85 - 115
Beryllium	97.2		P	85 - 115
Boron	98.6		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	97.5		P	85 - 115
Copper	104		P	85 - 115
Lead	109		P	85 - 115
Nickel	102		P	85 - 115
Selenium	103		P	85 - 115
Silver	101		P	85 - 115
Thallium	106		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399908

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399910

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400227

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P399934

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399763

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399997

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399724

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

Reference Method: SM 2120 B-2011
Batch ID: P399728

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.1		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P399964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P399968

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P400250

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P399769

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254909	Barium	97.1		P	80 - 120
2254909	Calcium	99.0		P	80 - 120
2254909	Iron	103		P	80 - 120
2254909	Magnesium	102		P	80 - 120
2254909	Manganese	96.7		P	80 - 120
2254909	Potassium	99.0		P	80 - 120
2254909	Sodium	101		P	80 - 120
2254909	Zinc	96.0		P	80 - 120
2255047	Barium	94.9	92.2	P/P	80 - 120
2255047	Calcium	99.0		P	80 - 120
2255047	Iron	103	98.7	P/P	80 - 120
2255047	Magnesium	98.3	91.9	P/P	80 - 120
2255047	Manganese	94.9	92.6	P/P	80 - 120
2255047	Potassium	97.6	95.4	P/P	80 - 120
2255047	Sodium	98.6	95.6	P/P	80 - 120
2255047	Zinc	91.0	88.0	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P399769

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254909	Aluminum	97.7		P	80 - 120
2254909	Antimony	104		P	80 - 120
2254909	Arsenic	103		P	80 - 120
2254909	Beryllium	87.6		P	80 - 120
2254909	Boron	99.2		P	80 - 120
2254909	Cadmium	108		P	80 - 120
2254909	Chromium	93.8		P	80 - 120
2254909	Copper	97.5		P	80 - 120
2254909	Lead	110		P	80 - 120
2254909	Nickel	95.9		P	80 - 120
2254909	Selenium	96.2		P	80 - 120
2254909	Silver	103		P	80 - 120
2254909	Thallium	111		P	80 - 120
2255047	Aluminum	99.2	98.6	P/P	80 - 120
2255047	Antimony	104	102	P/P	80 - 120
2255047	Arsenic	105	103	P/P	80 - 120
2255047	Beryllium	98.7	94.6	P/P	80 - 120
2255047	Boron	98.4	97.6	P/P	80 - 120
2255047	Cadmium	105	103	P/P	80 - 120
2255047	Chromium	102	98.3	P/P	80 - 120
2255047	Copper	102	100	P/P	80 - 120
2255047	Lead	109	108	P/P	80 - 120
2255047	Nickel	102	98.9	P/P	80 - 120
2255047	Selenium	102	99.3	P/P	80 - 120
2255047	Silver	102	99.2	P/P	80 - 120
2255047	Thallium	109	108	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P399908

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: P399908

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254844	Chloride	97.4		P	90 - 110
2255034	Chloride	98.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254844	Sulfate	98.1		P	90 - 110
2255034	Sulfate	96.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400227

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254646	Ammonia-N	97.6	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P399934

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254876	Kjeldahl Nitrogen	96.7	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399763

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254876	NO2NO3-N	98.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399997

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254931	Total-P	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399724

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254900	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P399968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254812	Fluoride	98.0	98.6	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P400250

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2254932	Organic Carbon	93.9	95.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P399734

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254875	Turbidity	0.236	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P399769

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2255047	Barium	2.81	Spike	P	0 - 20
2255047	Calcium	1.98	Spike	P	0 - 20
2255047	Iron	3.74	Spike	P	0 - 20
2255047	Magnesium	3.74	Spike	P	0 - 20
2255047	Manganese	2.41	Spike	P	0 - 20
2255047	Potassium	2.11	Spike	P	0 - 20
2255047	Sodium	2.12	Spike	P	0 - 20
2255047	Zinc	3.27	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P399769

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2255047	Aluminum	0.577	Spike	P	0 - 20
2255047	Antimony	2.56	Spike	P	0 - 20
2255047	Arsenic	1.46	Spike	P	0 - 20
2255047	Beryllium	4.20	Spike	P	0 - 20
2255047	Boron	0.785	Spike	P	0 - 20
2255047	Cadmium	1.97	Spike	P	0 - 20
2255047	Chromium	3.22	Spike	P	0 - 20
2255047	Copper	2.33	Spike	P	0 - 20
2255047	Lead	0.914	Spike	P	0 - 20
2255047	Nickel	3.40	Spike	P	0 - 20
2255047	Selenium	2.22	Spike	P	0 - 20
2255047	Silver	2.67	Spike	P	0 - 20
2255047	Thallium	0.627	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P399908

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254844	Chloride	0.164	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P399910

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254844	Sulfate	1.13	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400227

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254646	Ammonia-N	1.06	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P399934

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254876	Kjeldahl Nitrogen	0.864	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399763

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254876	NO2NO3-N	0.509	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399997

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254931	Total-P	1.06	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254900	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P399728

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254875	Color (true)	0.225	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P399964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254812	Total Alkalinity	0.966	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P400230

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254930	TDS	6.57	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P399968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254812	Fluoride	0.454	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P400250

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2254932	Organic Carbon	0.935	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: A106081

Included Lab Sample IDs: 2254877

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	98.7	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A106082

Included Lab Sample IDs: 2254875

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.6	100	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A106084

Included Lab Sample IDs: 2254875

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A106098

Included Lab Sample IDs: 2254876

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A106105

Included Lab Sample IDs: 2254875

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A106153

Included Lab Sample IDs: 2254880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	99.8	P/P	90 - 110
Calcium	102	102	P/P	90 - 110
Iron	103	104	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Manganese	101	100	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Zinc	100	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A106155

Included Lab Sample IDs: 2254880

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A106155

Included Lab Sample IDs: 2254880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	104	104	P/P	90 - 110
Arsenic	106	106	P/P	90 - 110
Beryllium	102	103	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	99.4	100	P/P	90 - 110
Copper	103	103	P/P	90 - 110
Nickel	104	103	P/P	90 - 110
Selenium	105	105	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Thallium	100	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A106179

Included Lab Sample IDs: 2254880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	95.4	95.3	P/P	90 - 110
Lead	107	105	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A106182

Included Lab Sample IDs: 2254875

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.4	99.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A106182

Included Lab Sample IDs: 2254875

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A106212

Included Lab Sample IDs: 2254876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.8	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A106217

Included Lab Sample IDs: 2254876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	98.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A106295

Included Lab Sample IDs: 2254876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	98.1	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A106304

Included Lab Sample IDs: 2254876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	97.1	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					0.236	
EPA 200.7 Rev. 4.4	Barium	92.7	97.1	94.9	92.2		2.81
	Calcium	95.7	99.0	99.0			1.98
	Iron	97.2	103	103	98.7		3.74
	Magnesium	97.9	102	98.3	91.9		3.74
	Manganese	92.2	96.7	94.9	92.6		2.41
	Potassium	93.0	99.0	97.6	95.4		2.11
	Sodium	95.8	101	98.6	95.6		2.12
	Zinc	91.7	96.0	91.0	88.0		3.27
EPA 200.8 Rev. 5.4	Aluminum	98.9	99.2	98.6	97.7		0.577
	Antimony	101	104	102	104		2.56
	Arsenic	104	105	103	103		1.46
	Beryllium	97.2	98.7	94.6	87.6		4.20
	Boron	98.6	98.4	97.6	99.2		0.785
	Cadmium	102	105	103	108		1.97
	Chromium	97.5	102	98.3	93.8		3.22
	Copper	104	102	100	97.5		2.33
	Lead	109	109	108	110		0.914
	Nickel	102	102	98.9	95.9		3.40
	Selenium	103	102	99.3	96.2		2.22
	Silver	101	102	99.2	103		2.67
	Thallium	106	109	108	111		0.627
EPA 300.0 Rev. 2.1	Chloride	99.4	97.4	98.8		0.164	
	Sulfate	95.9	98.1	96.9		1.13	
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	97.6	98.8			1.06
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.4	96.7	98.2			0.864
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.5	98.0			0.509
EPA 365.1 Rev. 2.0	Total-P	102	103	104			1.06
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.6	100	100			0.0
SM 2120 B-2011	Color (true)	98.1				0.225	
SM 2320 B-2011	Total Alkalinity	102				0.966	
SM 2540 C-2011	TDS					6.57	
SM 4500 F-C-2011	Fluoride	99.8	98.0	98.6			0.454
SM 5310 B-2011	Organic Carbon	96.2	93.9	95.2			0.935

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2254875
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2254880
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2254880
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2254875
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2254875
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2254876
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2254876
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2254876
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2254876
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2254877
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2254875
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2254875

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2254880
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2254875
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2254875
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2254875
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2254876

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	06/15/2021			06/15/2021 15:51	Sarah A Nixon	2254875
EPA 200.7 Rev. 4.4	06/15/2021	06/16/2021 12:15	Elliott D. Healy	06/17/2021 15:43	Betina Topolski	2254880
EPA 200.8 Rev. 5.4	06/15/2021	06/16/2021 12:15	Elliott D. Healy	06/17/2021 21:56	Alexander Thompson	2254880
	06/15/2021	06/16/2021 12:15	Elliott D. Healy	06/18/2021 15:53	Alexander Thompson	2254880
EPA 300.0 Rev. 2.1	06/15/2021			06/17/2021 21:44	Lipi Saha	2254875
EPA 350.1 Rev. 2.0	06/15/2021			06/25/2021 12:51	Ping Hua	2254876
EPA 351.2 Rev. 2.0	06/15/2021	06/18/2021 14:20	Benjamin T. Nordmann	06/21/2021 12:36	Letuzia M De Oliveira	2254876
EPA 353.2 Rev. 2.0	06/15/2021			06/16/2021 09:08	Beverly Y. Sanders	2254876
EPA 365.1 Rev. 2.0	06/15/2021	06/21/2021 16:53	Madeline Gruver	06/22/2021 14:19	Shengyu Ding	2254876
EPA 365.1 Rev. 2.0 dissolved	06/15/2021			06/15/2021 15:19	Ping Hua	2254877
SM 2120 B-2011	06/15/2021			06/15/2021 16:45	Sarah A Nixon	2254875
SM 2320 B-2011	06/15/2021			06/19/2021 04:00	Dale L. Simmons	2254875
SM 2340B	06/15/2021			06/17/2021 15:43	Betina Topolski	2254880
SM 2540 C-2011	06/15/2021			06/18/2021 15:41	Yijie Li	2254875
SM 2540 D-2011	06/15/2021			06/18/2021 15:41	Yijie Li	2254875
SM 4500 F-C-2011	06/15/2021			06/19/2021 04:00	Dale L. Simmons	2254875
SM 5310 B-2011	06/15/2021			06/24/2021 00:33	Madeline Gruver	2254876