

Chemical Analysis Report

SO-DIST-2020-09-22-01

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

Event Description: **bonnet L-49 lake lucas lvi**
Request ID: **RQ-2020-09-21-44**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
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FLDEP South District Office
2295 Victoria Ave. Suite 364
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Certified by: Colin Wright, Program Administrator

Date Certified: 06-OCT-2020 08:33

A handwritten signature in black ink, appearing to read "Colin Wright", 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: L-49

Collection Date/Time: 09/21/2020 10:00

Field ID: G4SD0190

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2197390	EPA 180.1 Rev. 2.0	Turbidity	2.8	A	NTU	P387701	
	EPA 300.0 Rev. 2.1	Chloride	100		mg Cl/L	P388030	
		Sulfate	36		mg SO4/L	P388032	
	SM 2120 B-2011	Color (true)	100	A	PCU	P387706	
	SM 2320 B-2011	Total Alkalinity	175		mg CaCO3/L	P387796	
	SM 2540 C-2011	TDS	434		mg/L	P388010	RPD
	SM 2540 D-2011	TSS	3	I	mg/L	P387961	
	SM 4500 F-C-2011	Fluoride	0.13		mg F/L	P387798	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.21		mg N/L	P387886	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P387867	
2197391	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P387744	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P387920	
	SM 5310 B-2011	Organic Carbon	20		mg C/L	P387837	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P387714	
	dissolved						

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: Bonnet Creek @ Sr 64

Collection Date/Time: 09/21/2020 11:45

Field ID: G4SD0107

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2197393	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P387701	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P388030	
		Sulfate	8.2		mg SO4/L	P388032	
		Color (true)	450		PCU	P387706	
	SM 2320 B-2011	Total Alkalinity	24		mg CaCO3/L	P387796	
	SM 2540 C-2011	TDS	138		mg/L	P388010	RPD
	SM 2540 D-2011	TSS	2	I	mg/L	P387961	
	SM 4500 F-C-2011	Fluoride	0.084	I	mg F/L	P387798	
2197394	EPA 350.1 Rev. 2.0	Ammonia-N	0.30		mg N/L	P387886	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P387867	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.31		mg N/L	P387744	
	EPA 365.1 Rev. 2.0	Total-P	1.4		mg P/L	P387920	
	SM 5310 B-2011	Organic Carbon	36		mg C/L	P387837	
2197395	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	1.3		mg P/L	P387714	
2197414	EPA 200.7 Rev. 4.4	Barium	9.4		ug/L	P387926	
		Calcium	9.70		mg/L	P387926	
		Iron	390		ug/L	P387926	
		Magnesium	4.81		mg/L	P387926	
		Potassium	12.1		mg/L	P387926	
		Sodium	9.2		mg/L	P387926	
		Zinc	5.0	U	ug/L	P387926	
	EPA 200.8 Rev. 5.4	Aluminum	248		ug/L	P387926	
		Antimony	0.050	U	ug/L	P387926	
		Arsenic	0.66		ug/L	P387926	
		Beryllium	0.022	I	ug/L	P387926	
		Boron**	31.9		ug/L	P387926	
		Cadmium	0.020	U	ug/L	P387926	
		Chromium	0.49	I	ug/L	P387926	
		Copper	1.54		ug/L	P387926	
		Lead	0.23	I	ug/L	P387926	
		Nickel	0.50	U	ug/L	P387926	
		Selenium	0.20	U	ug/L	P387926	
		Silver	0.010	U	ug/L	P387926	
		Thallium	0.10	U	ug/L	P387926	
		Hardness	44.0		mg/L	P387926	

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: FB092120

Collection Date/Time: 09/21/2020 11:55

Field ID: FB092120

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2197396	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P387701	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P388030	
		Sulfate	0.20	U	mg SO4/L	P388032	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P387706	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P387796	
	SM 2540 C-2011	TDS	15	U	mg/L	P388008	
	SM 2540 D-2011	TSS	2	U	mg/L	P387959	
2197397	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P387798	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P387886	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P387867	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P387744	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P387920	
2197398	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P387837	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P387714	
2197415	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P387926	
		Calcium	0.075	U	mg/L	P387926	
		Iron	30	U	ug/L	P387926	
		Magnesium	0.040	U	mg/L	P387926	
		Potassium	0.30	U	mg/L	P387926	
		Sodium	0.50	U	mg/L	P387926	
		Zinc	5.0	U	ug/L	P387926	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P387926	
		Antimony	0.050	U	ug/L	P387926	
		Arsenic	0.050	U	ug/L	P387926	
		Beryllium	0.010	U	ug/L	P387926	
		Boron**	5.4	I	ug/L	P387926	
		Cadmium	0.020	U	ug/L	P387926	
		Chromium	0.40	U	ug/L	P387926	
		Copper	0.40	U	ug/L	P387926	
		Lead	0.20	U	ug/L	P387926	
		Nickel	0.50	U	ug/L	P387926	
		Selenium	0.20	U	ug/L	P387926	
		Silver	0.010	U	ug/L	P387926	
		Thallium	0.10	U	ug/L	P387926	
		Hardness	0.35	U	mg/L	P387926	
	SM 2340B	Hardness	0.35	U	mg/L	P387926	

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.

EPA 200.8 Rev. 5.4: The boron result was confirmed in the undigested sample on 10/03/2020.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P387701

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387926

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: P387926

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: P388030

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388032

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387886

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: P387867

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387744

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387920

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387714

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

Reference Method: SM 2120 B-2011
Batch ID: P387706

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P387796

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

Reference Method: SM 2540 C-2011
Batch ID: P388008

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P388010

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P387959

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P387961

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P387798

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P387837

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: P387926

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.3		P	85 - 115
Calcium	107		P	85 - 115
Iron	106		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	104		P	85 - 115
Sodium	102		P	85 - 115
Zinc	94.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387926

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.4		P	80 - 120
Antimony	102		P	80 - 120
Arsenic	100		P	80 - 120
Beryllium	95.8		P	80 - 120
Boron	96.2		P	80 - 120
Cadmium	96.8		P	80 - 120
Chromium	99.7		P	80 - 120
Copper	99.0		P	80 - 120
Lead	97.4		P	80 - 120
Nickel	99.2		P	80 - 120
Selenium	99.6		P	80 - 120
Silver	96.7		P	80 - 120
Thallium	97.9		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388030

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388032

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387886

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387867

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: P387744

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: P387920

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387714

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

Reference Method: SM 2120 B-2011
Batch ID: P387706

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.5		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P387796

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

Reference Method: SM 4500 F-C-2011
Batch ID: P387798

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P387837

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387926

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197555	Barium	103	103	P/P	80 - 120
2197555	Calcium	110	103	P/P	80 - 120
2197555	Iron	111	108	P/P	80 - 120
2197555	Magnesium	109	106	P/P	80 - 120
2197555	Potassium	108	105	P/P	80 - 120
2197555	Sodium	113	107	P/P	80 - 120
2197555	Zinc	96.0	95.9	P/P	80 - 120
2197741	Barium	103		P	80 - 120
2197741	Calcium	105		P	80 - 120
2197741	Iron	113		P	80 - 120
2197741	Magnesium	111		P	80 - 120
2197741	Potassium	111		P	80 - 120
2197741	Sodium	119		P	80 - 120
2197741	Zinc	94.2		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387926

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197555	Aluminum	98.1	97.4	P/P	80 - 120
2197555	Antimony	101	101	P/P	80 - 120
2197555	Arsenic	99.3	98.9	P/P	80 - 120
2197555	Beryllium	93.3	94.4	P/P	80 - 120
2197555	Boron	95.7	95.2	P/P	80 - 120
2197555	Cadmium	96.9	96.6	P/P	80 - 120
2197555	Chromium	99.1	98.9	P/P	80 - 120
2197555	Copper	98.3	98.1	P/P	80 - 120
2197555	Lead	97.8	96.9	P/P	80 - 120
2197555	Nickel	97.8	97.7	P/P	80 - 120
2197555	Selenium	99.4	97.9	P/P	80 - 120
2197555	Silver	97.3	97.0	P/P	80 - 120
2197555	Thallium	98.5	99.4	P/P	80 - 120
2197741	Aluminum	93.9		P	80 - 120
2197741	Antimony	101		P	80 - 120
2197741	Arsenic	96.7		P	80 - 120
2197741	Beryllium	91.6		P	80 - 120
2197741	Boron	94.3		P	80 - 120
2197741	Cadmium	96.2		P	80 - 120
2197741	Chromium	96.3		P	80 - 120
2197741	Copper	95.4		P	80 - 120
2197741	Lead	94.1		P	80 - 120
2197741	Nickel	95.0		P	80 - 120
2197741	Selenium	95.8		P	80 - 120
2197741	Silver	94.8		P	80 - 120
2197741	Thallium	95.2		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388030

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197327	Chloride	103		P	90 - 110
2197587	Chloride	104		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388032

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197327	Sulfate	100		P	90 - 110
2197587	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387886

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197552	Ammonia-N	96.4	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387744

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197372	NO2NO3-N	99.2	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387920

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197329	Total-P	108	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387714

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197392	O-Phosphate-P	99.5	99.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P387798

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197275	Fluoride	99.8	98.6	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P387837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2197335	Organic Carbon	99.4	97.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P387701

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197390	Turbidity	2.52	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P387926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197555	Barium	0.228	Spike	P	0 - 20
2197555	Calcium	4.51	Spike	P	0 - 20
2197555	Iron	1.97	Spike	P	0 - 20
2197555	Magnesium	1.97	Spike	P	0 - 20
2197555	Potassium	3.66	Spike	P	0 - 20
2197555	Sodium	4.15	Spike	P	0 - 20
2197555	Zinc	0.132	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P387926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197555	Aluminum	0.688	Spike	P	0 - 20
2197555	Antimony	0.0840	Spike	P	0 - 20
2197555	Arsenic	0.402	Spike	P	0 - 20
2197555	Beryllium	1.20	Spike	P	0 - 20
2197555	Boron	0.479	Spike	P	0 - 20
2197555	Cadmium	0.379	Spike	P	0 - 20
2197555	Chromium	0.187	Spike	P	0 - 20
2197555	Copper	0.189	Spike	P	0 - 20
2197555	Lead	0.953	Spike	P	0 - 20
2197555	Nickel	0.111	Spike	P	0 - 20
2197555	Selenium	1.57	Spike	P	0 - 20
2197555	Silver	0.312	Spike	P	0 - 20
2197555	Thallium	0.952	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388030

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197327	Chloride	0.509	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P388032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197327	Sulfate	0.774	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P387886

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197552	Ammonia-N	3.24	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P387867

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197370	Kjeldahl Nitrogen	3.93	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P387744

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197372	NO2NO3-N	1.49	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P387920

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197329	Total-P	0.330	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P387714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197392	O-Phosphate-P	0.101	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P387706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197390	Color (true)	1.15	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P387796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197275	Total Alkalinity	3.16	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P388008

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2196930	TDS	0.803	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P388010

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197328	TDS	10.7	Sample	F	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P387798

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197275	Fluoride	0.983	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P387837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2197335	Organic Carbon	0.897	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A101139

Included Lab Sample IDs: 2197390, 2197393, 2197396

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

Reference Method: SM 2120 B-2011

Run ID: A101140

Included Lab Sample IDs: 2197390, 2197393, 2197396

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.2	98.1	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A101150

Included Lab Sample IDs: 2197392, 2197395, 2197398

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	97.9	P/P	90 - 110
O-Phosphate-P	99.3	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101159

Included Lab Sample IDs: 2197391, 2197394, 2197397

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

Reference Method: SM 2320 B-2011

Run ID: A101178

Included Lab Sample IDs: 2197390, 2197393, 2197396

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.6	98.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A101178

Included Lab Sample IDs: 2197390, 2197393, 2197396

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

Reference Method: SM 5310 B-2011

Run ID: A101194

Included Lab Sample IDs: 2197391, 2197394, 2197397

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	99.3	P/P	90 - 110
Organic Carbon	99.9	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101210

Included Lab Sample IDs: 2197391, 2197394, 2197397

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101210

Included Lab Sample IDs: 2197391, 2197394, 2197397

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	95.9	P/P	90 - 110
Ammonia-N	98.6	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101228

Included Lab Sample IDs: 2197391, 2197394, 2197397

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.7	94.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A101267

Included Lab Sample IDs: 2197414, 2197415

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	97.7	99.6	P/P	95 - 105
Barium	99.6	103	P/P	90 - 110
Calcium	100	104	P/P	90 - 110
Calcium	101	100	P/P	95 - 105
Iron	102	102	P/P	95 - 105
Iron	102	107	P/P	90 - 110
Magnesium	100	99.4	P/P	95 - 105
Magnesium	99.4	104	P/P	90 - 110
Potassium	98.8	104	P/P	90 - 110
Potassium	99.8	98.8	P/P	95 - 105
Sodium	102	102	P/P	95 - 105
Sodium	102	108	P/P	90 - 110
Zinc	96.2	96.6	P/P	90 - 110
Zinc	96.6	96.2	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A101281

Included Lab Sample IDs: 2197390, 2197393, 2197396

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	99.7	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101284

Included Lab Sample IDs: 2197394

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101310

Included Lab Sample IDs: 2197391, 2197397

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	93.8	94.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A101347

Included Lab Sample IDs: 2197414, 2197415

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.4	98.5	P/P	90 - 110
Aluminum	98.5	97.2	P/P	90 - 110
Antimony	105	103	P/P	90 - 110
Antimony	105	105	P/P	90 - 110
Arsenic	98.1	96.2	P/P	90 - 110
Arsenic	98.6	98.1	P/P	90 - 110
Beryllium	97.0	97.0	P/P	90 - 110
Beryllium	97.0	95.5	P/P	90 - 110
Boron	94.6	96.8	P/P	90 - 110
Boron	96.8	99.1	P/P	90 - 110
Cadmium	97.6	98.3	P/P	90 - 110
Cadmium	98.3	96.0	P/P	90 - 110
Chromium	97.8	97.1	P/P	90 - 110
Chromium	98.1	97.8	P/P	90 - 110
Copper	96.3	96.5	P/P	90 - 110
Copper	96.5	94.6	P/P	90 - 110
Lead	98.0	96.8	P/P	90 - 110
Lead	99.0	98.0	P/P	90 - 110
Nickel	96.4	95.2	P/P	90 - 110
Nickel	97.1	96.4	P/P	90 - 110
Selenium	97.3	98.6	P/P	90 - 110
Selenium	99.0	97.3	P/P	90 - 110
Silver	99.1	99.4	P/P	90 - 110
Silver	99.4	96.8	P/P	90 - 110
Thallium	94.6	93.7	P/P	90 - 110
Thallium	95.8	94.6	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					2.52	
EPA 200.7 Rev. 4.4	Barium	99.3	103	103	103		0.228
	Calcium	107	110	103	105		4.51
	Iron	106	111	108	113		1.97
	Magnesium	105	109	106	111		1.97
	Potassium	104	108	105	111		3.66
	Sodium	102	113	107	119		4.15
	Zinc	94.7	96.0	95.9	94.2		0.132
EPA 200.8 Rev. 5.4	Aluminum	98.4	98.1	97.4	93.9		0.688
	Antimony	102	101	101	101		0.0840
	Arsenic	100	99.3	98.9	96.7		0.402
	Beryllium	95.8	93.3	94.4	91.6		1.20
	Boron	96.2	95.7	95.2	94.3		0.479
	Cadmium	96.8	96.9	96.6	96.2		0.379
	Chromium	99.7	99.1	98.9	96.3		0.187
	Copper	99.0	98.3	98.1	95.4		0.189
	Lead	97.4	97.8	96.9	94.1		0.953
	Nickel	99.2	97.8	97.7	95.0		0.111
	Selenium	99.6	99.4	97.9	95.8		1.57
	Silver	96.7	97.3	97.0	94.8		0.312
	Thallium	97.9	98.5	99.4	95.2		0.952
EPA 300.0 Rev. 2.1	Chloride	101	103	104		0.509	
	Sulfate	98.8	100	98.4		0.774	
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	96.4	100			3.24
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.1					3.93
EPA 353.2 Rev. 2.0	NO2NO3-N	101	99.2	97.7			1.49
EPA 365.1 Rev. 2.0	Total-P	105	108	108			0.330
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	99.5	99.4			0.101
SM 2120 B-2011	Color (true)	96.5				1.15	
SM 2320 B-2011	Total Alkalinity	99.6				3.16	
SM 2540 C-2011	TDS					0.803	
	TDS					10.7	
SM 4500 F-C-2011	Fluoride	99.3	99.8	98.6			0.983
SM 5310 B-2011	Organic Carbon	97.8	99.4	97.9			0.897

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2197390, 2197393, 2197396
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2197414, 2197415
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2197414, 2197415
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2197390, 2197393, 2197396
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2197390, 2197393, 2197396
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2197391, 2197394, 2197397
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2197391, 2197394, 2197397
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2197391, 2197394, 2197397
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2197391, 2197394, 2197397
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2197392, 2197395, 2197398
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2197390, 2197393, 2197396
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2197390, 2197393, 2197396

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2197414, 2197415
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2197390, 2197393, 2197396
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2197390, 2197393, 2197396
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2197390, 2197393, 2197396
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2197391, 2197394, 2197397

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	09/22/2020			09/22/2020 16:38	Yen Ta	2197390, 2197393, 2197396
EPA 200.7 Rev. 4.4	09/22/2020	09/28/2020 14:35	Elliott D. Healy	09/29/2020 12:49	Betina Topolski	2197415
	09/22/2020	09/28/2020 14:35	Elliott D. Healy	09/29/2020 14:28	Betina Topolski	2197414
EPA 200.8 Rev. 5.4	09/22/2020	09/28/2020 14:35	Elliott D. Healy	10/03/2020 14:49	Alexander Thompson	2197415
	09/22/2020	09/28/2020 14:35	Elliott D. Healy	10/03/2020 16:43	Alexander Thompson	2197414
EPA 300.0 Rev. 2.1	09/22/2020			09/30/2020 00:15	Elliott Rodriguez	2197390
	09/22/2020			09/30/2020 00:28	Elliott Rodriguez	2197393
	09/22/2020			09/30/2020 00:41	Elliott Rodriguez	2197396
EPA 350.1 Rev. 2.0	09/22/2020			09/26/2020 13:40	Ping Hua	2197397
	09/22/2020			09/26/2020 15:51	Ping Hua	2197394
	09/22/2020			09/26/2020 15:59	Ping Hua	2197391
EPA 351.2 Rev. 2.0	09/22/2020	09/25/2020 11:45	David Boose	09/28/2020 11:26	Elliott Rodriguez	2197391
	09/22/2020	09/25/2020 11:45	David Boose	09/28/2020 11:28	Elliott Rodriguez	2197394
	09/22/2020	09/25/2020 11:45	David Boose	09/28/2020 11:29	Elliott Rodriguez	2197397
EPA 353.2 Rev. 2.0	09/22/2020			09/23/2020 11:26	Beverly Y. Sanders	2197391
	09/22/2020			09/23/2020 11:27	Beverly Y. Sanders	2197394
	09/22/2020			09/23/2020 11:28	Beverly Y. Sanders	2197397
EPA 365.1 Rev. 2.0	09/22/2020	09/28/2020 12:44	Yen Ta	09/29/2020 15:29	Benjamin T. Nordmann	2197394
	09/22/2020	09/28/2020 12:44	Yen Ta	10/01/2020 13:07	Lipi Saha	2197391
	09/22/2020	09/28/2020 12:44	Yen Ta	10/01/2020 13:08	Lipi Saha	2197397
EPA 365.1 Rev. 2.0 dissolved	09/22/2020			09/22/2020 16:29	Virginia P. Brown	2197392
	09/22/2020			09/22/2020 16:52	Virginia P. Brown	2197395
	09/22/2020			09/22/2020 16:55	Virginia P. Brown	2197398
SM 2120 B-2011	09/22/2020			09/22/2020 16:23	Benjamin T. Nordmann	2197390
	09/22/2020			09/22/2020 16:24	Benjamin T. Nordmann	2197396
	09/22/2020			09/22/2020 16:28	Benjamin T. Nordmann	2197393
SM 2320 B-2011	09/22/2020			09/23/2020 18:59	Dale L. Simmons	2197390
	09/22/2020			09/23/2020 19:11	Dale L. Simmons	2197393
	09/22/2020			09/23/2020 19:20	Dale L. Simmons	2197396
SM 2340B	09/22/2020			09/29/2020 12:49	Betina Topolski	2197415
	09/22/2020			09/29/2020 14:28	Betina Topolski	2197414
SM 2540 C-2011	09/22/2020			09/23/2020 14:41	Yijie Li	2197390, 2197393, 2197396
SM 2540 D-2011	09/22/2020			09/23/2020 14:41	Yijie Li	2197390, 2197393, 2197396
SM 4500 F-C-2011	09/22/2020			09/23/2020 18:59	Dale L. Simmons	2197390
	09/22/2020			09/23/2020 19:11	Dale L. Simmons	2197393
	09/22/2020			09/23/2020 19:20	Dale L. Simmons	2197396
SM 5310 B-2011	09/22/2020			09/25/2020 03:19	Madeline Gruver	2197391
	09/22/2020			09/25/2020 03:31	Madeline Gruver	2197394
	09/22/2020			09/25/2020 04:08	Madeline Gruver	2197397