Chemical Analysis Report

TLH-ROC-2020-08-24-01

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

Event Description: **Run 5**
Request ID: **RQ-2020-07-20-24**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
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2600 Blair Stone Rd
Tallahassee, FL 32399
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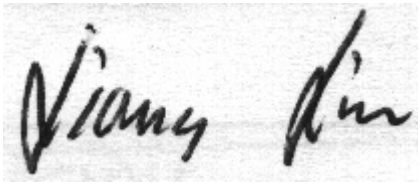
Certified by: Liang Lin, Environmental Administrator

Date Certified: 15-SEP-2020 12:42



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: Flat Creek @ Duncan Community Rd **Collection Date/Time: 08/24/2020 11:10**

Field ID: G3TLHR0007 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2191897	EPA 180.1 Rev. 2.0	Turbidity	6.6		NTU	P386525	
	EPA 300.0 Rev. 2.1	Chloride	3.2	A	mg Cl/L	P387078	
		Sulfate	0.52	A	mg SO4/L	P387079	
	SM 2120 B-2011	Color (true)	130		PCU	P386527	
	SM 2320 B-2011	Total Alkalinity	11		mg CaCO3/L	P386621	
	SM 2540 C-2011	TDS	54		mg/L	P386992	
	SM 2540 D-2011	TSS	3	I	mg/L	P386985	
	SM 4500 F-C-2011	Fluoride	0.038	I	mg F/L	P386623	
2191898	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P386833	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.75		mg N/L	P386608	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P386542	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P386551	
	SM 5310 B-2011	Organic Carbon	14		mg C/L	P386595	
2191899	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P386533	
2191902	EPA 200.7 Rev. 4.4	Barium	24.0		ug/L	P386556	
		Calcium	4.35		mg/L	P386556	
		Iron	1.26E+03		ug/L	P386556	
		Magnesium	1.43		mg/L	P386556	
		Potassium	1.7		mg/L	P386556	
		Sodium	1.6	I	mg/L	P386556	
		Zinc	5.0	U	ug/L	P386556	
	EPA 200.8 Rev. 5.4	Aluminum	298		ug/L	P386556	
		Antimony	0.050	U	ug/L	P386556	
		Arsenic	0.81		ug/L	P386556	
		Boron**	13.3		ug/L	P386556	
		Cadmium	0.020	U	ug/L	P386556	
		Chromium	0.51	I	ug/L	P386556	
		Copper	1.39		ug/L	P386556	
		Lead	0.49		ug/L	P386556	
		Nickel	0.50	U	ug/L	P386556	
		Selenium	0.20	U	ug/L	P386556	
		Silver	0.010	U	ug/L	P386556	
		Thallium	0.10	U	ug/L	P386556	
	SM 2340B	Hardness	16.8		mg/L	P386556	

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: P386525

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386556

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: P386556

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387078

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387079

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386833

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: P386608

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386542

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386551

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386533

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

Reference Method: SM 2120 B-2011
Batch ID: P386527

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P386621

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

Reference Method: SM 2540 C-2011
Batch ID: P386992

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P386985

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P386623

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: P386595

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: P386556

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	100		P	85 - 115
Calcium	105		P	85 - 115
Iron	104		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	101		P	85 - 115
Sodium	104		P	85 - 115
Zinc	97.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386556

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.3		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	104		P	85 - 115
Boron	99.8		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	106		P	85 - 115
Copper	103		P	85 - 115
Lead	109		P	85 - 115
Nickel	103		P	85 - 115
Selenium	99.3		P	85 - 115
Silver	109		P	85 - 115
Thallium	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387078

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387079

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	93.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386833

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386608

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386542

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386551

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386533

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.9		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P386527

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.3		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P386621

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

Reference Method: SM 4500 F-C-2011
Batch ID: P386623

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P386595

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386556

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191963	Barium	104	103	P/P	80 - 120
2191963	Calcium	102		P	80 - 120
2191963	Iron	108	108	P/P	80 - 120
2191963	Magnesium	102	103	P/P	80 - 120
2191963	Potassium	100	101	P/P	80 - 120
2191963	Sodium	102		P	80 - 120
2191963	Zinc	103	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386556

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191963	Aluminum	97.6	99.2	P/P	80 - 120
2191963	Antimony	104	104	P/P	80 - 120
2191963	Arsenic	107	107	P/P	80 - 120
2191963	Boron	99.0	102	P/P	80 - 120
2191963	Cadmium	104	102	P/P	80 - 120
2191963	Chromium	109	109	P/P	80 - 120
2191963	Copper	103	101	P/P	80 - 120
2191963	Lead	111	112	P/P	80 - 120
2191963	Nickel	103	101	P/P	80 - 120
2191963	Selenium	99.6	101	P/P	80 - 120
2191963	Silver	108	108	P/P	80 - 120
2191963	Thallium	110	112	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191897	Chloride	98.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191897	Sulfate	97.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386833

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191906	Ammonia-N	99.4	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386608

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191713	Kjeldahl Nitrogen	102	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386542

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191898	NO2NO3-N	97.6	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386551

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191850	Total-P	104	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386533

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191907	O-Phosphate-P	98.1	97.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P386623

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2192055	Fluoride	95.0	96.8	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P386595

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191946	Organic Carbon	102	101	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386525

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191990	Turbidity	4.34	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386556

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191963	Barium	0.818	Spike	P	0 - 20
2191963	Calcium	0.532	Spike	P	0 - 20
2191963	Iron	0.0506	Spike	P	0 - 20
2191963	Magnesium	0.745	Spike	P	0 - 20
2191963	Potassium	0.438	Spike	P	0 - 20
2191963	Sodium	0.518	Spike	P	0 - 20
2191963	Zinc	1.23	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386556

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191963	Aluminum	1.68	Spike	P	0 - 20
2191963	Antimony	0.730	Spike	P	0 - 20
2191963	Arsenic	0.251	Spike	P	0 - 20
2191963	Boron	1.89	Spike	P	0 - 20
2191963	Cadmium	2.34	Spike	P	0 - 20
2191963	Chromium	0.639	Spike	P	0 - 20
2191963	Copper	1.18	Spike	P	0 - 20
2191963	Lead	0.0644	Spike	P	0 - 20
2191963	Nickel	1.55	Spike	P	0 - 20
2191963	Selenium	1.80	Spike	P	0 - 20
2191963	Silver	0.480	Spike	P	0 - 20
2191963	Thallium	1.53	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191897	Chloride	5.22	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P387079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191897	Sulfate	1.11	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386833

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191906	Ammonia-N	0.901	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191713	Kjeldahl Nitrogen	0.483	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386542

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191898	NO2NO3-N	1.90	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191850	Total-P	2.74	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386533

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191907	O-Phosphate-P	0.204	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P386527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191905	Color (true)	2.78	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P386621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192055	Total Alkalinity	0.680	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P386992

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191848	TDS	2.00	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P386623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2192055	Fluoride	0.915	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P386595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191946	Organic Carbon	0.0720	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: A100641
Included Lab Sample IDs: 2191897

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

Reference Method: SM 2120 B-2011
Run ID: A100642
Included Lab Sample IDs: 2191897

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.6	98.5	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A100644
Included Lab Sample IDs: 2191899

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A100651
Included Lab Sample IDs: 2191898

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

Reference Method: SM 5310 B-2011
Run ID: A100665
Included Lab Sample IDs: 2191898

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.6	102	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A100675
Included Lab Sample IDs: 2191897

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

Reference Method: SM 4500 F-C-2011
Run ID: A100675
Included Lab Sample IDs: 2191897

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A100695
Included Lab Sample IDs: 2191898

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.2	95.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A100700
Included Lab Sample IDs: 2191898

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100715
Included Lab Sample IDs: 2191902

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	100	P/P	90 - 110
Arsenic	105	105	P/P	90 - 110
Boron	97.5	101	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Chromium	103	104	P/P	90 - 110
Copper	102	98.9	P/P	90 - 110
Lead	106	107	P/P	90 - 110
Nickel	102	99.6	P/P	90 - 110
Selenium	98.2	102	P/P	90 - 110
Silver	109	109	P/P	90 - 110
Thallium	103	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A100716
Included Lab Sample IDs: 2191902

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	92.1	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A100721
Included Lab Sample IDs: 2191902

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	104	105	P/P	90 - 110
Calcium	101	103	P/P	90 - 110
Iron	104	105	P/P	90 - 110
Magnesium	101	103	P/P	90 - 110
Potassium	99.9	101	P/P	90 - 110
Sodium	100	101	P/P	90 - 110
Zinc	103	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A100761
Included Lab Sample IDs: 2191898

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100847
Included Lab Sample IDs: 2191897

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A100847
Included Lab Sample IDs: 2191897

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.0	98.4	P/P	90 - 110
Sulfate	98.3	96.8	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					4.34	
EPA 200.7 Rev. 4.4	Barium	100	104	103			0.818
	Calcium	105	102				0.532
	Iron	104	108	108			0.0506
	Magnesium	102	102	103			0.745
	Potassium	101	100	101			0.438
	Sodium	104	102				0.518
	Zinc	97.9	103	101			1.23
EPA 200.8 Rev. 5.4	Aluminum	97.3	97.6	99.2			1.68
	Antimony	102	104	104			0.730
	Arsenic	104	107	107			0.251
	Boron	99.8	99.0	102			1.89
	Cadmium	101	104	102			2.34
	Chromium	106	109	109			0.639
	Copper	103	103	101			1.18
	Lead	109	111	112			0.0644
	Nickel	103	103	101			1.55
	Selenium	99.3	99.6	101			1.80
	Silver	109	108	108			0.480
	Thallium	107	110	112			1.53
EPA 300.0 Rev. 2.1	Chloride	95.2	98.8			5.22	
	Sulfate	93.9	97.6			1.11	
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.4	100			0.901
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	102	101			0.483
EPA 353.2 Rev. 2.0	NO2NO3-N	102	97.6	99.6			1.90
EPA 365.1 Rev. 2.0	Total-P	103	104	107			2.74
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	98.1	97.9			0.204
SM 2120 B-2011	Color (true)	98.3				2.78	
SM 2320 B-2011	Total Alkalinity	104				0.680	
SM 2540 C-2011	TDS					2.00	
SM 4500 F-C-2011	Fluoride	97.1	95.0	96.8			0.915
SM 5310 B-2011	Organic Carbon	100	102	101			0.0720

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2191897
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2191902
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2191902
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2191897
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2191897
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2191898
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2191898
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2191898
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2191898
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2191899
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2191897
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2191897
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2191902
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2191897

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2191897
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2191897
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2191898

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	08/24/2020			08/25/2020 16:17	Yen Ta	2191897
EPA 200.7 Rev. 4.4	08/24/2020	08/26/2020 14:10	Elliott D. Healy	08/27/2020 15:12	Betina Topolski	2191902
EPA 200.8 Rev. 5.4	08/24/2020	08/26/2020 14:10	Elliott D. Healy	08/29/2020 01:35	Alexander Thompson	2191902
	08/24/2020	08/26/2020 14:10	Elliott D. Healy	08/30/2020 00:54	Alexander Thompson	2191902
EPA 300.0 Rev. 2.1	08/24/2020			09/04/2020 07:47	Elliott Rodriguez	2191897
EPA 350.1 Rev. 2.0	08/24/2020			09/01/2020 18:48	Ping Hua	2191898
EPA 351.2 Rev. 2.0	08/24/2020	08/27/2020 09:15	Sima Feizi	08/28/2020 10:02	Virginia P. Brown	2191898
EPA 353.2 Rev. 2.0	08/24/2020			08/26/2020 09:29	Beverly Y. Sanders	2191898
EPA 365.1 Rev. 2.0	08/24/2020	08/26/2020 12:59	Yen Ta	08/28/2020 09:11	Lipi Saha	2191898
EPA 365.1 Rev. 2.0 dissolved	08/24/2020			08/25/2020 15:43	Blanca Fach	2191899
SM 2120 B-2011	08/24/2020			08/25/2020 16:00	Benjamin T. Nordmann	2191897
SM 2320 B-2011	08/24/2020			08/26/2020 17:41	Dale L. Simmons	2191897
SM 2340B	08/24/2020			08/27/2020 15:12	Betina Topolski	2191902
SM 2540 C-2011	08/24/2020			08/27/2020 15:08	Yijie Li	2191897
SM 2540 D-2011	08/24/2020			08/27/2020 15:08	Yijie Li	2191897
SM 4500 F-C-2011	08/24/2020			08/26/2020 17:41	Dale L. Simmons	2191897
SM 5310 B-2011	08/24/2020			08/26/2020 20:01	David Boose	2191898