Chemical Analysis Report

TLH-ROC-2021-06-08-02

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

Event Description: **Run 14**
Request ID: **RQ-2021-06-07-27**
Customer: **TLH-ROC**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 30-JUN-2021 11:02

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: Crystal Lake Center **Collection Date/Time: 06/08/2021 12:00**

Field ID: G3TLHR0012 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2253346	EPA 180.1 Rev. 2.0	Turbidity	0.85		NTU	P399457	
	EPA 300.0 Rev. 2.1	Chloride	2.6		mg Cl/L	P399617	
		Sulfate	3.7		mg SO4/L	P399619	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P399460	
	SM 2320 B-2011	Total Alkalinity	4.9		mg CaCO3/L	P399897	
	SM 2540 C-2011	TDS	15	I	mg/L	P399792	
	SM 2540 D-2011	TSS	3	I	mg/L	P399680	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P399899	
2253347	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P399646	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.19	I	mg N/L	P400220	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P399557	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P399850	
	SM 5310 B-2011	Organic Carbon	1.8		mg C/L	P399771	
2253348	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P399452	
2253352	EPA 200.7 Rev. 4.4	Barium	4.8		ug/L	P399514	
		Calcium	2.67		mg/L	P399514	
		Iron	30	U	ug/L	P399514	
		Magnesium	0.73		mg/L	P399514	
		Manganese	2.1	I	ug/L	P399514	
		Potassium	0.39	I	mg/L	P399514	
		Sodium	1.8	I	mg/L	P399514	
		Zinc	5.0	U	ug/L	P399514	
	EPA 200.8 Rev. 5.4	Aluminum	20		ug/L	P399514	
		Antimony	0.050	U	ug/L	P399514	
		Arsenic	0.91		ug/L	P399514	
		Beryllium	0.010	U	ug/L	P399514	
		Boron**	12.0		ug/L	P399514	
		Cadmium	0.020	U	ug/L	P399514	
		Chromium	0.40	U	ug/L	P399514	
		Copper	0.45	I	ug/L	P399514	
		Lead	0.20	U	ug/L	P399514	
		Nickel	0.50	U	ug/L	P399514	
		Selenium	0.20	U	ug/L	P399514	
		Silver	0.010	U	ug/L	P399514	
		Thallium	0.10	U	ug/L	P399514	
	SM 2340B	Hardness	9.7		mg/L	P399514	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Williford Spring **Collection Date/Time: 06/08/2021 13:20**

Field ID: G3TLHR0009 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2253340	EPA 180.1 Rev. 2.0	Turbidity	0.40		NTU	P399457	
	EPA 300.0 Rev. 2.1	Chloride	2.8		mg Cl/L	P399617	
		Sulfate	1.3		mg SO4/L	P399619	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P399460	
	SM 2320 B-2011	Total Alkalinity	66		mg CaCO3/L	P399897	
	SM 2540 C-2011	TDS	66		mg/L	P399792	
	SM 2540 D-2011	TSS	2	U	mg/L	P399680	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P399899	
2253342	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P399646	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P400220	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P399557	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P399850	
	SM 5310 B-2011	Organic Carbon	0.61	I	mg C/L	P399771	
2253344	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P399452	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Rattlesnake Lake Center **Collection Date/Time: 06/08/2021 13:55**

Field ID: G3TLHR0013 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2253341	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P399457	
	EPA 300.0 Rev. 2.1	Chloride	2.1		mg Cl/L	P399617	
		Sulfate	1.2		mg SO4/L	P399619	
	SM 2120 B-2011	Color (true)	7.4		PCU	P399460	
	SM 2320 B-2011	Total Alkalinity	0.81	I	mg CaCO3/L	P399897	
	SM 2540 C-2011	TDS	15	U	mg/L	P399792	
	SM 2540 D-2011	TSS	2	I	mg/L	P399680	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P399899	
2253343	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P399646	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25		mg N/L	P400220	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P399557	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P399850	
	SM 5310 B-2011	Organic Carbon	3.4		mg C/L	P399771	
2253345	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P399452	

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: P399457

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P399514

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: P399514

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: P399617

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399619

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399646

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: P400220

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399557

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399850

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399452

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

Reference Method: SM 2120 B-2011
Batch ID: P399460

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P399897

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

Reference Method: SM 2540 C-2011
Batch ID: P399792

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P399680

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P399899

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: P399771

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: P399514

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.5		P	85 - 115
Calcium	106		P	85 - 115
Iron	109		P	85 - 115
Magnesium	110		P	85 - 115
Manganese	101		P	85 - 115
Potassium	104		P	85 - 115
Sodium	112		P	85 - 115
Zinc	91.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P399514

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	104		P	85 - 115
Beryllium	95.7		P	85 - 115
Boron	104		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	100		P	85 - 115
Copper	103		P	85 - 115
Lead	113		P	85 - 115
Nickel	102		P	85 - 115
Selenium	105		P	85 - 115
Silver	102		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399617

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399619

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399646

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: P400220

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.6		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399557

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: P399850

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: P399452

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.6		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P399460

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

Reference Method: SM 2320 B-2011
Batch ID: P399897

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

Reference Method: SM 4500 F-C-2011
Batch ID: P399899

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P399771

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.5		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P399514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253352	Barium	103	101	P/P	80 - 120
2253352	Calcium	107	104	P/P	80 - 120
2253352	Iron	111	109	P/P	80 - 120
2253352	Magnesium	112	110	P/P	80 - 120
2253352	Manganese	104	102	P/P	80 - 120
2253352	Potassium	102	98.9	P/P	80 - 120
2253352	Sodium	106	103	P/P	80 - 120
2253352	Zinc	94.9	93.6	P/P	80 - 120
2254166	Barium	102		P	80 - 120
2254166	Calcium	107		P	80 - 120
2254166	Iron	109		P	80 - 120
2254166	Magnesium	110		P	80 - 120
2254166	Manganese	104		P	80 - 120
2254166	Potassium	108		P	80 - 120
2254166	Sodium	106		P	80 - 120
2254166	Zinc	95.4		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P399514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253352	Aluminum	106	105	P/P	80 - 120
2253352	Antimony	103	102	P/P	80 - 120
2253352	Arsenic	105	106	P/P	80 - 120
2253352	Beryllium	98.8	97.9	P/P	80 - 120
2253352	Boron	110	108	P/P	80 - 120
2253352	Cadmium	108	109	P/P	80 - 120
2253352	Chromium	105	106	P/P	80 - 120
2253352	Copper	104	106	P/P	80 - 120
2253352	Lead	112	113	P/P	80 - 120
2253352	Nickel	104	105	P/P	80 - 120
2253352	Selenium	105	105	P/P	80 - 120
2253352	Silver	102	102	P/P	80 - 120
2253352	Thallium	103	104	P/P	80 - 120
2254166	Aluminum	103		P	80 - 120
2254166	Antimony	101		P	80 - 120
2254166	Arsenic	103		P	80 - 120
2254166	Beryllium	97.3		P	80 - 120
2254166	Boron	109		P	80 - 120
2254166	Cadmium	107		P	80 - 120
2254166	Chromium	102		P	80 - 120
2254166	Copper	102		P	80 - 120
2254166	Lead	112		P	80 - 120
2254166	Nickel	101		P	80 - 120
2254166	Selenium	102		P	80 - 120
2254166	Silver	99.5		P	80 - 120
2254166	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399617

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399617

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253303	Chloride	97.8		P	90 - 110
2253358	Chloride	97.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399619

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253303	Sulfate	98.0		P	90 - 110
2253358	Sulfate	97.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253342	Ammonia-N	94.4	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400220

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2256239	Kjeldahl Nitrogen	99.5	115	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399557

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253304	NO2NO3-N	99.6	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399850

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253304	Total-P	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399452

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253344	O-Phosphate-P	99.9	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P399899

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2252615	Fluoride	101	101	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P399771

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2253343	Organic Carbon	95.5	96.1	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P399457

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253358	Turbidity	1.69	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P399514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253352	Barium	2.35	Spike	P	0 - 20
2253352	Calcium	1.20	Spike	P	0 - 20
2253352	Iron	1.80	Spike	P	0 - 20
2253352	Magnesium	1.79	Spike	P	0 - 20
2253352	Manganese	2.19	Spike	P	0 - 20
2253352	Potassium	2.70	Spike	P	0 - 20
2253352	Sodium	2.18	Spike	P	0 - 20
2253352	Zinc	1.39	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P399514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253352	Aluminum	1.12	Spike	P	0 - 20
2253352	Antimony	0.703	Spike	P	0 - 20
2253352	Arsenic	0.271	Spike	P	0 - 20
2253352	Beryllium	0.863	Spike	P	0 - 20
2253352	Boron	1.44	Spike	P	0 - 20
2253352	Cadmium	0.365	Spike	P	0 - 20
2253352	Chromium	0.412	Spike	P	0 - 20
2253352	Copper	1.25	Spike	P	0 - 20
2253352	Lead	0.456	Spike	P	0 - 20
2253352	Nickel	1.11	Spike	P	0 - 20
2253352	Selenium	0.328	Spike	P	0 - 20
2253352	Silver	0.522	Spike	P	0 - 20
2253352	Thallium	1.24	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253303	Chloride	1.12	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399619

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253303	Sulfate	0.0323	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399646

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253342	Ammonia-N	3.46	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2256239	Kjeldahl Nitrogen	7.91	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P399557

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253304	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253304	Total-P	0.488	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P399452

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253344	O-Phosphate-P	0.0884	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P399460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253357	Color (true)	10.1	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P399897

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2252615	Total Alkalinity	0.205	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P399792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2252680	TDS	0.590	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P399899

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2252615	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P399771

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2253343	Organic Carbon	0.487	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A105956
Included Lab Sample IDs: 2253340, 2253341, 2253346

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.8	100	P/P	90 - 110
Sulfate	98.1	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A105970
Included Lab Sample IDs: 2253344, 2253345, 2253348

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	98.4	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A105972
Included Lab Sample IDs: 2253340, 2253341, 2253346

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	98.5	P/P	95 - 105

Reference Method: SM 2120 B-2011
Run ID: A105973
Included Lab Sample IDs: 2253340, 2253341, 2253346

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.2	100	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A106016
Included Lab Sample IDs: 2253342, 2253343, 2253347

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A106044
Included Lab Sample IDs: 2253342, 2253343, 2253347

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	98.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A106050
Included Lab Sample IDs: 2253352

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	105	106	P/P	90 - 110
Calcium	98.5	100	P/P	90 - 110
Iron	103	104	P/P	90 - 110
Magnesium	103	104	P/P	90 - 110
Manganese	106	107	P/P	90 - 110
Potassium	100	101	P/P	90 - 110
Sodium	99.4	99.9	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2011
Run ID: A106104
Included Lab Sample IDs: 2253342, 2253343, 2253347

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.0	96.2	P/P	90 - 110
Organic Carbon	96.5	96.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A106126
Included Lab Sample IDs: 2253352

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	99.9	98.8	P/P	95 - 105

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A106130
Included Lab Sample IDs: 2253352

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	105	105	P/P	90 - 110
Arsenic	105	103	P/P	90 - 110
Beryllium	99.6	101	P/P	90 - 110
Boron	103	105	P/P	90 - 110
Cadmium	102	103	P/P	90 - 110
Chromium	97.7	101	P/P	90 - 110
Copper	102	99.4	P/P	90 - 110
Nickel	102	100	P/P	90 - 110
Selenium	104	105	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A106152
Included Lab Sample IDs: 2253340, 2253341, 2253346

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	97.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A106152
Included Lab Sample IDs: 2253340, 2253341, 2253346

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	104	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A106165
Included Lab Sample IDs: 2253342, 2253343, 2253347

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A106241
Included Lab Sample IDs: 2253352

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A106241
Included Lab Sample IDs: 2253352

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	99.1	100	P/P	90 - 110
Lead	107	108	P/P	90 - 110
Silver	98.8	99.5	P/P	90 - 110
Thallium	93.9	95.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A106324
Included Lab Sample IDs: 2253342, 2253343, 2253347

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.9	98.5	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						1.69	
EPA 200.7 Rev. 4.4	Barium	99.5	103	101	102			2.35
	Calcium	106	107	104	107			1.20
	Iron	109	111	109	109			1.80
	Magnesium	110	112	110	110			1.79
	Manganese	101	104	102	104			2.19
	Potassium	104	102	98.9	108			2.70
	Sodium	112	106	103	106			2.18
	Zinc	91.8	94.9	93.6	95.4			1.39
EPA 200.8 Rev. 5.4	Aluminum	103	106	105	103			1.12
	Antimony	102	103	102	101			0.703
	Arsenic	104	105	106	103			0.271
	Beryllium	95.7	98.8	97.9	97.3			0.863
	Boron	104	110	108	109			1.44
	Cadmium	104	108	109	107			0.365
	Chromium	100	105	106	102			0.412
	Copper	103	104	106	102			1.25
	Lead	113	112	113	112			0.456
	Nickel	102	104	105	101			1.11
	Selenium	105	105	105	102			0.328
	Silver	102	102	102	99.5			0.522
	Thallium	103	103	104	103			1.24
EPA 300.0 Rev. 2.1	Chloride	97.6	97.8	97.3			1.12	
	Sulfate	98.1	98.0	97.2			0.0323	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	94.4	98.0				3.46
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.6	99.5	115				7.91
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.6	99.6				0.0
EPA 365.1 Rev. 2.0	Total-P	104	103	103				0.488
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.6	99.9	100				0.0884
SM 2120 B-2011	Color (true)	98.3					10.1	
SM 2320 B-2011	Total Alkalinity	101					0.205	
SM 2540 C-2011	TDS						0.590	
SM 4500 F-C-2011	Fluoride	101	101	101				0.0
SM 5310 B-2011	Organic Carbon	96.5	95.5	96.1				0.487

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2253340, 2253341, 2253346
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2253352
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2253352
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2253340, 2253341, 2253346
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2253340, 2253341, 2253346
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2253342, 2253343, 2253347
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2253342, 2253343, 2253347
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2253342, 2253343, 2253347
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2253342, 2253343, 2253347
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2253344, 2253345, 2253348
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2253340, 2253341, 2253346
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2253340, 2253341, 2253346

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2253352
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2253340, 2253341, 2253346
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2253340, 2253341, 2253346
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2253340, 2253341, 2253346
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2253342, 2253343, 2253347

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	06/08/2021			06/09/2021 16:23	Yen Ta	2253340, 2253341, 2253346
EPA 200.7 Rev. 4.4	06/08/2021	06/10/2021 15:00	Elliott D. Healy	06/14/2021 20:16	Josef B Mick	2253352
	06/08/2021	06/10/2021 15:00	Elliott D. Healy	06/16/2021 16:53	Josef B Mick	2253352
EPA 200.8 Rev. 5.4	06/08/2021	06/10/2021 15:00	Elliott D. Healy	06/16/2021 18:36	McKinley C Carter	2253352
	06/08/2021	06/10/2021 15:00	Elliott D. Healy	06/23/2021 20:38	Alexander Thompson	2253352
EPA 300.0 Rev. 2.1	06/08/2021			06/11/2021 21:20	Lipi Saha	2253340
	06/08/2021			06/11/2021 21:32	Lipi Saha	2253341
	06/08/2021			06/11/2021 21:44	Lipi Saha	2253346
EPA 350.1 Rev. 2.0	06/08/2021			06/14/2021 15:08	Roberta Tatti	2253342
	06/08/2021			06/14/2021 15:10	Roberta Tatti	2253343
	06/08/2021			06/14/2021 15:11	Roberta Tatti	2253347
EPA 351.2 Rev. 2.0	06/08/2021	06/25/2021 16:59	Benjamin T. Nordmann	06/28/2021 11:51	Letuzia M De Oliveira	2253342
	06/08/2021	06/25/2021 16:59	Benjamin T. Nordmann	06/28/2021 11:52	Letuzia M De Oliveira	2253343
	06/08/2021	06/25/2021 16:59	Benjamin T. Nordmann	06/28/2021 11:54	Letuzia M De Oliveira	2253347
EPA 353.2 Rev. 2.0	06/08/2021			06/11/2021 10:59	Beverly Y. Sanders	2253342
	06/08/2021			06/11/2021 11:01	Beverly Y. Sanders	2253343
	06/08/2021			06/11/2021 11:02	Beverly Y. Sanders	2253347
EPA 365.1 Rev. 2.0	06/08/2021	06/17/2021 11:39	Shengyu Ding	06/18/2021 10:12	Shengyu Ding	2253342
	06/08/2021	06/17/2021 11:39	Shengyu Ding	06/18/2021 10:13	Shengyu Ding	2253343
	06/08/2021	06/17/2021 11:39	Shengyu Ding	06/18/2021 10:14	Shengyu Ding	2253347
EPA 365.1 Rev. 2.0 dissolved	06/08/2021			06/09/2021 14:53	Blanca Fach	2253344
	06/08/2021			06/09/2021 14:56	Blanca Fach	2253345
	06/08/2021			06/09/2021 14:57	Blanca Fach	2253348
SM 2120 B-2011	06/08/2021			06/09/2021 15:30	Sarah A Nixon	2253340, 2253341
	06/08/2021			06/09/2021 15:31	Sarah A Nixon	2253346
SM 2320 B-2011	06/08/2021			06/17/2021 18:46	Dale L. Simmons	2253340
	06/08/2021			06/17/2021 18:56	Dale L. Simmons	2253341
	06/08/2021			06/17/2021 19:06	Dale L. Simmons	2253346
SM 2340B	06/08/2021			06/14/2021 20:16	Josef B Mick	2253352
SM 2540 C-2011	06/08/2021			06/11/2021 15:27	Yijie Li	2253340, 2253341, 2253346
SM 2540 D-2011	06/08/2021			06/11/2021 15:27	Yijie Li	2253340, 2253341, 2253346
SM 4500 F-C-2011	06/08/2021			06/17/2021 18:46	Dale L. Simmons	2253340
	06/08/2021			06/17/2021 18:56	Dale L. Simmons	2253341
	06/08/2021			06/17/2021 19:06	Dale L. Simmons	2253346
SM 5310 B-2011	06/08/2021			06/15/2021 20:45	Touraj Touran	2253343
	06/08/2021			06/15/2021 21:29	Touraj Touran	2253347
	06/08/2021			06/16/2021 00:50	Touraj Touran	2253342