Chemical Analysis Report

TLH-ROC-2021-07-15-01

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

Event Description: **Run 13**
Request ID: **RQ-2021-01-25-43**
Customer: **TLH-ROC**
Project ID: **SMP**

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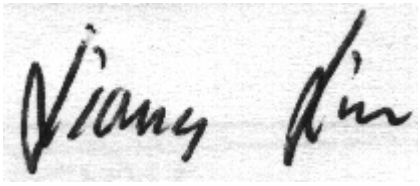
Certified by: Liang Lin, Environmental Administrator

Date Certified: 11-AUG-2021 14:04



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: Fort Gadsden Creek near SR65 **Collection Date/Time: 07/15/2021 10:35**

Field ID: G2TLHR0012 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2262509	EPA 180.1 Rev. 2.0	Turbidity	3.2	A	NTU	P401044	
	EPA 300.0 Rev. 2.1	Chloride	3.4		mg Cl/L	P401362	
		Sulfate	0.21	I	mg SO4/L	P401365	
	SM 2120 B-2011	Color (true)	280		PCU	P401041	
	SM 2320 B-2011	Total Alkalinity	1.6	I	mg CaCO3/L	P401144	
	SM 2540 C-2011	TDS	79		mg/L	P401570	RPD
	SM 2540 D-2011	TSS	6	I	mg/L	P401564	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P401147	
2262510	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P401594	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.91		mg N/L	P401999	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P401151	
	EPA 365.1 Rev. 2.0	Total-P	0.029		mg P/L	P401398	
	SM 5310 B-2011	Organic Carbon	26		mg C/L	P401489	
2262511	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P401032	
2262514	EPA 200.7 Rev. 4.4	Barium	5.6		ug/L	P401304	
		Calcium	9.57		mg/L	P401304	
		Iron	1.88E+03		ug/L	P401304	
		Magnesium	2.87		mg/L	P401304	
		Manganese	10.4		ug/L	P401304	
		Potassium	0.30	U	mg/L	P401304	
		Sodium	2.0		mg/L	P401304	
		Zinc	5.0	U	ug/L	P401304	
	EPA 200.8 Rev. 5.4	Aluminum	607		ug/L	P401304	
		Antimony	0.051	I	ug/L	P401304	
		Arsenic	0.49		ug/L	P401304	
		Beryllium	0.033	I	ug/L	P401304	
		Boron**	11.7		ug/L	P401304	
		Cadmium	0.020	U	ug/L	P401304	
		Chromium	1.2	I	ug/L	P401304	
		Copper	0.40	U	ug/L	P401304	
		Lead	0.62		ug/L	P401304	
		Nickel	0.50	I	ug/L	P401304	
		Selenium	0.20	U	ug/L	P401304	
		Silver	0.010	U	ug/L	P401304	
		Thallium	0.10	U	ug/L	P401304	
	SM 2340B	Hardness	35.7		mg/L	P401304	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
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: P401044

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P401304

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: P401304

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: P401362

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401365

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401594

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: P401999

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401151

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401398

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401032

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

Reference Method: SM 2120 B-2011
Batch ID: P401041

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P401144

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

Reference Method: SM 2540 C-2011
Batch ID: P401570

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P401564

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

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: P401489

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: P401304

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	92.0		P	85 - 115
Calcium	97.1		P	85 - 115
Iron	96.2		P	85 - 115
Magnesium	98.5		P	85 - 115
Manganese	91.4		P	85 - 115
Potassium	95.2		P	85 - 115
Sodium	99.0		P	85 - 115
Zinc	87.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401304

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.0		P	85 - 115
Antimony	94.3		P	85 - 115
Arsenic	96.0		P	85 - 115
Beryllium	102		P	85 - 115
Boron	97.9		P	85 - 115
Cadmium	91.5		P	85 - 115
Chromium	90.7		P	85 - 115
Copper	93.8		P	85 - 115
Lead	93.5		P	85 - 115
Nickel	94.3		P	85 - 115
Selenium	93.7		P	85 - 115
Silver	113		P	85 - 115
Thallium	97.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401362

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401365

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401594

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: P401999

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	109		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401151

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: P401398

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: P401032

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

Reference Method: SM 2120 B-2011
Batch ID: P401041

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P401144

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

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.5		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P401489

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P401304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262527	Barium	96.7	96.3	P/P	80 - 120
2262527	Calcium	100	102	P/P	80 - 120
2262527	Iron	101	103	P/P	80 - 120
2262527	Magnesium	103	105	P/P	80 - 120
2262527	Manganese	95.8	95.2	P/P	80 - 120
2262527	Potassium	99.0	102	P/P	80 - 120
2262527	Sodium	102	105	P/P	80 - 120
2262527	Zinc	91.3	92.2	P/P	80 - 120
2263350	Barium	108		P	80 - 120
2263350	Calcium	114		P	80 - 120
2263350	Iron	112		P	80 - 120
2263350	Magnesium	116		P	80 - 120
2263350	Manganese	106		P	80 - 120
2263350	Potassium	107		P	80 - 120
2263350	Sodium	113		P	80 - 120
2263350	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262527	Aluminum	91.1	93.4	P/P	80 - 120
2262527	Antimony	91.2	92.0	P/P	80 - 120
2262527	Arsenic	89.3	89.5	P/P	80 - 120
2262527	Beryllium	102	102	P/P	80 - 120
2262527	Boron	92.3	93.8	P/P	80 - 120
2262527	Cadmium	88.7	89.6	P/P	80 - 120
2262527	Chromium	85.1	86.1	P/P	80 - 120
2262527	Copper	88.7	89.9	P/P	80 - 120
2262527	Lead	91.3	91.3	P/P	80 - 120
2262527	Nickel	87.6	88.6	P/P	80 - 120
2262527	Selenium	87.0	86.9	P/P	80 - 120
2262527	Silver	111	110	P/P	80 - 120
2262527	Thallium	94.1	95.4	P/P	80 - 120
2263350	Aluminum	92.1		P	80 - 120
2263350	Antimony	92.4		P	80 - 120
2263350	Arsenic	90.3		P	80 - 120
2263350	Beryllium	101		P	80 - 120
2263350	Boron	90.3		P	80 - 120
2263350	Cadmium	87.9		P	80 - 120
2263350	Chromium	88.6		P	80 - 120
2263350	Copper	90.1		P	80 - 120
2263350	Lead	90.3		P	80 - 120
2263350	Nickel	92.0		P	80 - 120
2263350	Selenium	89.6		P	80 - 120
2263350	Silver	111		P	80 - 120
2263350	Thallium	94.6		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401362

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: P401362

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262509	Chloride	100		P	90 - 110
2262657	Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401365

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262509	Sulfate	99.4		P	90 - 110
2262657	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262354	Ammonia-N	99.0	96.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401999

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262520	Kjeldahl Nitrogen	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401151

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262417	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401398

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262482	Total-P	105	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401032

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262430	O-Phosphate-P	96.1	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262394	Fluoride	101	100	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P401489

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2262587	Organic Carbon	95.4	97.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P401044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262509	Turbidity	2.19	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P401304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262527	Barium	0.482	Spike	P	0 - 20
2262527	Calcium	1.38	Spike	P	0 - 20
2262527	Iron	1.79	Spike	P	0 - 20
2262527	Magnesium	1.75	Spike	P	0 - 20
2262527	Manganese	0.578	Spike	P	0 - 20
2262527	Potassium	2.59	Spike	P	0 - 20
2262527	Sodium	2.04	Spike	P	0 - 20
2262527	Zinc	1.01	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P401304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262527	Aluminum	2.47	Spike	P	0 - 20
2262527	Antimony	0.859	Spike	P	0 - 20
2262527	Arsenic	0.317	Spike	P	0 - 20
2262527	Beryllium	0.421	Spike	P	0 - 20
2262527	Boron	1.34	Spike	P	0 - 20
2262527	Cadmium	1.02	Spike	P	0 - 20
2262527	Chromium	1.08	Spike	P	0 - 20
2262527	Copper	1.32	Spike	P	0 - 20
2262527	Lead	0.0351	Spike	P	0 - 20
2262527	Nickel	1.10	Spike	P	0 - 20
2262527	Selenium	0.178	Spike	P	0 - 20
2262527	Silver	0.431	Spike	P	0 - 20
2262527	Thallium	1.38	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P401362

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262657	Chloride	0.393	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P401594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262354	Ammonia-N	2.20	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P401999

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262520	Kjeldahl Nitrogen	0.308	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401151

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262417	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P401398

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262482	Total-P	2.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262430	O-Phosphate-P	1.86	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P401041

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262519	Color (true)	7.46	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P401144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262394	Total Alkalinity	0.291	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P401570

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262470	TDS	10.0	Sample	F	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P401147

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262394	Fluoride	0.457	Spike	P	0 - 2.1

Quality Assurance Report
Precision

Reference Method: SM 5310 B-2011
Batch ID: P401489

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2262587	Organic Carbon	1.42	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A106644
Included Lab Sample IDs: 2262511

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.7	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A106646
Included Lab Sample IDs: 2262509

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A106647
Included Lab Sample IDs: 2262509

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

Reference Method: SM 2320 B-2011
Run ID: A106679
Included Lab Sample IDs: 2262509

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

Reference Method: SM 4500 F-C-2011
Run ID: A106679
Included Lab Sample IDs: 2262509

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A106682
Included Lab Sample IDs: 2262510

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A106762
Included Lab Sample IDs: 2262509

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A106790
Included Lab Sample IDs: 2262510

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2011
Run ID: A106803
Included Lab Sample IDs: 2262510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.8	98.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A106833
Included Lab Sample IDs: 2262514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.6	93.2	P/P	90 - 110
Antimony	97.7	96.1	P/P	90 - 110
Arsenic	98.4	94.3	P/P	90 - 110
Boron	97.6	95.9	P/P	90 - 110
Cadmium	95.1	93.2	P/P	90 - 110
Chromium	94.0	90.5	P/P	90 - 110
Copper	96.8	92.3	P/P	90 - 110
Lead	95.9	93.1	P/P	90 - 110
Nickel	97.7	92.6	P/P	90 - 110
Selenium	95.2	92.2	P/P	90 - 110
Thallium	95.3	91.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A106850
Included Lab Sample IDs: 2262510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A106941
Included Lab Sample IDs: 2262514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	101	101	P/P	90 - 110
Silver	99.4	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A106958
Included Lab Sample IDs: 2262514

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A107072
Included Lab Sample IDs: 2262510

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	101	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						2.19	
EPA 200.7 Rev. 4.4	Barium	92.0	96.7	96.3	108			0.482
	Calcium	97.1	100	102	114			1.38
	Iron	96.2	101	103	112			1.79
	Magnesium	98.5	103	105	116			1.75
	Manganese	91.4	95.8	95.2	106			0.578
	Potassium	95.2	99.0	102	107			2.59
	Sodium	99.0	102	105	113			2.04
	Zinc	87.2	91.3	92.2	102			1.01
EPA 200.8 Rev. 5.4	Aluminum	97.0	91.1	93.4	92.1			2.47
	Antimony	94.3	91.2	92.0	92.4			0.859
	Arsenic	96.0	89.3	89.5	90.3			0.317
	Beryllium	102	102	102	101			0.421
	Boron	97.9	92.3	93.8	90.3			1.34
	Cadmium	91.5	88.7	89.6	87.9			1.02
	Chromium	90.7	88.6	85.1	86.1			1.08
	Copper	93.8	88.7	89.9	90.1			1.32
	Lead	93.5	91.3	91.3	90.3			0.0351
	Nickel	94.3	87.6	88.6	92.0			1.10
	Selenium	93.7	87.0	86.9	89.6			0.178
	Silver	113	111	110	111			0.431
	Thallium	97.3	94.1	95.4	94.6			1.38
EPA 300.0 Rev. 2.1	Chloride	101	99.4	100			0.393	
	Sulfate	101	101	99.4				
EPA 350.1 Rev. 2.0	Ammonia-N	101	99.0	96.0				2.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	109	101	102				0.308
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	101				0.0
EPA 365.1 Rev. 2.0	Total-P	103	105	107				2.01
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	96.1	98.0				1.86
SM 2120 B-2011	Color (true)	101					7.46	
SM 2320 B-2011	Total Alkalinity	101					0.291	
SM 2540 C-2011	TDS						10.0	
SM 4500 F-C-2011	Fluoride	99.5	101	100				0.457
SM 5310 B-2011	Organic Carbon	95.8	95.4	97.4				1.42

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2262509
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2262514
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2262514
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2262509
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2262509
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2262510
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2262510
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2262510
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2262510
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2262511
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2262509
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2262509

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2262514
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2262509
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2262509
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2262509
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2262510

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	07/15/2021			07/15/2021 15:38	Sarah A Nixon	2262509
EPA 200.7 Rev. 4.4	07/15/2021	07/21/2021 14:50	Elliott D. Healy	07/30/2021 19:48	Betina Topolski	2262514
EPA 200.8 Rev. 5.4	07/15/2021	07/21/2021 14:50	Elliott D. Healy	07/26/2021 19:22	Alexander Thompson	2262514
	07/15/2021	07/21/2021 14:50	Elliott D. Healy	07/29/2021 14:34	McKinley C Carter	2262514
EPA 300.0 Rev. 2.1	07/15/2021			07/21/2021 07:19	Lipi Saha	2262509
EPA 350.1 Rev. 2.0	07/15/2021			07/27/2021 12:26	Roberta Tatti	2262510
EPA 351.2 Rev. 2.0	07/15/2021	08/04/2021 14:07	Benjamin T. Nordmann	08/05/2021 14:51	Virginia P. Brown	2262510
EPA 353.2 Rev. 2.0	07/15/2021			07/19/2021 11:16	Beverly Y. Sanders	2262510
EPA 365.1 Rev. 2.0	07/15/2021	07/22/2021 12:02	Shengyu Ding	07/23/2021 10:32	Shengyu Ding	2262510
EPA 365.1 Rev. 2.0 dissolved	07/15/2021			07/15/2021 15:45	Ping Hua	2262511
SM 2120 B-2011	07/15/2021			07/15/2021 16:43	Sarah A Nixon	2262509
SM 2320 B-2011	07/15/2021			07/17/2021 06:41	Dale L. Simmons	2262509
SM 2340B	07/15/2021			07/30/2021 19:48	Betina Topolski	2262514
SM 2540 C-2011	07/15/2021			07/20/2021 14:56	Yijie Li	2262509
SM 2540 D-2011	07/15/2021			07/20/2021 14:56	Yijie Li	2262509
SM 4500 F-C-2011	07/15/2021			07/17/2021 06:41	Dale L. Simmons	2262509
SM 5310 B-2011	07/15/2021			07/22/2021 15:49	Madeline Gruver	2262510