

Chemical Analysis Report

TLH-ROC-2021-01-14-01

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

Event Description: **Run 4a**
Request ID: **RQ-2021-01-04-26**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
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2600 Blair Stone Rd
Tallahassee, FL 32399
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Date Certified: 04-FEB-2021 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: Middle of Cherry Lake

Collection Date/Time: 01/14/2021 10:55

Field ID: G1TLHR0048

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2219267	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P392434	
	EPA 300.0 Rev. 2.1	Chloride	7.1		mg Cl/L	P392675	
		Sulfate	0.64		mg SO4/L	P392676	
	SM 2120 B-2011	Color (true)	6.4		PCU	P392430	
	SM 2320 B-2011	Total Alkalinity	8.8		mg CaCO3/L	P392584	
	SM 2540 C-2011	TDS	30		mg/L	P392810	
	SM 2540 D-2011	TSS	2	U	mg/L	P392969	
	SM 4500 F-C-2011	Fluoride	0.053	I	mg F/L	P392586	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P393175	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P393021	
2219268	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P392667	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P392648	
	SM 5310 B-2011	Organic Carbon	5.4		mg C/L	P392644	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P392427	
	dissolved						

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: ALAPAHA RIVER CR751

Collection Date/Time: 01/14/2021 10:00

Field ID: G1TLHR0146

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2219272	EPA 200.7 Rev. 4.4	Barium	22.3		ug/L	P392428	
		Calcium	3.56		mg/L	P392428	
		Iron	930		ug/L	P392428	
		Magnesium	1.96		mg/L	P392428	
		Manganese	29.5		ug/L	P392428	
		Potassium	3.1		mg/L	P392428	
		Sodium	3.8		mg/L	P392428	
	EPA 200.8 Rev. 5.4	Zinc	6.5	I	ug/L	P392428	
		Aluminum	628		ug/L	P392428	
		Antimony	0.066	I	ug/L	P392428	
		Arsenic	0.56		ug/L	P392428	
		Beryllium	0.044		ug/L	P392428	
		Boron**	19.9		ug/L	P392428	
		Cadmium	0.020	U	ug/L	P392428	
		Chromium	0.85	I	ug/L	P392428	
		Copper	0.90		ug/L	P392428	
		Lead	0.61		ug/L	P392428	
		Nickel	0.62	I	ug/L	P392428	
		Selenium	0.20	U	ug/L	P392428	
		Silver	0.010	U	ug/L	P392428	
		Thallium	0.10	U	ug/L	P392428	
	SM 2340B	Hardness	17.0		mg/L	P392428	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 01/26/2021.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392434

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P392428

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: P392428

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: P392675

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392676

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393175

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: P393021

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392667

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392648

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392427

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

Reference Method: SM 2120 B-2011
Batch ID: P392430

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P392584

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

Reference Method: SM 2540 C-2011
Batch ID: P392810

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P392969

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P392586

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: P392644

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: P392428

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.0		P	85 - 115
Calcium	104		P	85 - 115
Iron	102		P	85 - 115
Magnesium	103		P	85 - 115
Manganese	100		P	85 - 115
Potassium	100		P	85 - 115
Sodium	105		P	85 - 115
Zinc	99.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392428

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.7		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	101		P	85 - 115
Beryllium	93.5		P	85 - 115
Boron	98.7		P	85 - 115
Cadmium	99.9		P	85 - 115
Chromium	107		P	85 - 115
Copper	96.6		P	85 - 115
Lead	103		P	85 - 115
Nickel	98.0		P	85 - 115
Selenium	100		P	85 - 115
Silver	109		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392675

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392676

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393175

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393021

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392667

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392648

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: P392427

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

Reference Method: SM 2120 B-2011
Batch ID: P392430

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

Reference Method: SM 2320 B-2011
Batch ID: P392584

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.2		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P392586

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P392644

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P392428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218962	Barium	101		P	80 - 120
2218962	Calcium	102		P	80 - 120
2218962	Iron	108		P	80 - 120
2218962	Magnesium	108		P	80 - 120
2218962	Manganese	102		P	80 - 120
2218962	Potassium	103		P	80 - 120
2218962	Sodium	104		P	80 - 120
2218962	Zinc	102		P	80 - 120
2219222	Barium	101	103	P/P	80 - 120
2219222	Calcium	107	108	P/P	80 - 120
2219222	Iron	106	106	P/P	80 - 120
2219222	Magnesium	105	106	P/P	80 - 120
2219222	Manganese	101	103	P/P	80 - 120
2219222	Potassium	102	106	P/P	80 - 120
2219222	Sodium	103		P	80 - 120
2219222	Zinc	99.5	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P392428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218962	Aluminum	96.0		P	80 - 120
2218962	Antimony	100		P	80 - 120
2218962	Arsenic	97.0		P	80 - 120
2218962	Beryllium	88.0		P	80 - 120
2218962	Boron	89.8		P	80 - 120
2218962	Cadmium	93.4		P	80 - 120
2218962	Chromium	103		P	80 - 120
2218962	Copper	93.9		P	80 - 120
2218962	Lead	102		P	80 - 120
2218962	Nickel	95.4		P	80 - 120
2218962	Selenium	96.0		P	80 - 120
2218962	Silver	106		P	80 - 120
2218962	Thallium	103		P	80 - 120
2219222	Aluminum	96.4	96.9	P/P	80 - 120
2219222	Antimony	104	103	P/P	80 - 120
2219222	Arsenic	99.6	98.7	P/P	80 - 120
2219222	Beryllium	91.7	90.7	P/P	80 - 120
2219222	Boron	96.1	99.9	P/P	80 - 120
2219222	Cadmium	96.2	92.1	P/P	80 - 120
2219222	Chromium	103	103	P/P	80 - 120
2219222	Copper	96.5	96.1	P/P	80 - 120
2219222	Lead	103	103	P/P	80 - 120
2219222	Nickel	97.9	96.9	P/P	80 - 120
2219222	Selenium	96.6	96.8	P/P	80 - 120
2219222	Silver	110	109	P/P	80 - 120
2219222	Thallium	102	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P392675

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392675

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219267	Chloride	102		P	90 - 110
2219469	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P392676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219267	Sulfate	104		P	90 - 110
2219469	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393175

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219268	Ammonia-N	97.2	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219236	Kjeldahl Nitrogen	106	97.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392667

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219235	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392648

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219101	Total-P	105	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392427

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219103	O-Phosphate-P	99.3	98.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P392586

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219232	Fluoride	101	102	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P392644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219337	Organic Carbon	101	100	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P392434

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219230	Turbidity	5.65	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P392428

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219222	Barium	1.87	Spike	P	0 - 20
2219222	Calcium	0.448	Spike	P	0 - 20
2219222	Iron	0.572	Spike	P	0 - 20
2219222	Magnesium	0.427	Spike	P	0 - 20
2219222	Manganese	1.60	Spike	P	0 - 20
2219222	Potassium	3.36	Spike	P	0 - 20
2219222	Sodium	1.89	Spike	P	0 - 20
2219222	Zinc	1.62	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P392428

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219222	Aluminum	0.488	Spike	P	0 - 20
2219222	Antimony	0.378	Spike	P	0 - 20
2219222	Arsenic	0.847	Spike	P	0 - 20
2219222	Beryllium	1.06	Spike	P	0 - 20
2219222	Boron	3.17	Spike	P	0 - 20
2219222	Cadmium	4.37	Spike	P	0 - 20
2219222	Chromium	0.143	Spike	P	0 - 20
2219222	Copper	0.477	Spike	P	0 - 20
2219222	Lead	0.0331	Spike	P	0 - 20
2219222	Nickel	1.02	Spike	P	0 - 20
2219222	Selenium	0.212	Spike	P	0 - 20
2219222	Silver	1.24	Spike	P	0 - 20
2219222	Thallium	0.313	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P392675

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219469	Chloride	0.489	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P392676

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219469	Sulfate	4.00	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393175

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219268	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219236	Kjeldahl Nitrogen	5.45	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392667

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219235	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392648

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219101	Total-P	1.40	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392427

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219103	O-Phosphate-P	0.470	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P392430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219212	Color (true)	4.56	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P392584

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219232	Total Alkalinity	6.97	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P392810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219065	TDS	5.32	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P392586

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219232	Fluoride	0.934	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P392644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219337	Organic Carbon	0.447	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: A103069

Included Lab Sample IDs: 2219269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	99.0	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A103071

Included Lab Sample IDs: 2219267

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A103072

Included Lab Sample IDs: 2219267

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A103099

Included Lab Sample IDs: 2219272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	103	103	P/P	90 - 110
Calcium	98.9	100	P/P	90 - 110
Iron	98.9	99.5	P/P	90 - 110
Magnesium	98.1	99.3	P/P	90 - 110
Manganese	105	103	P/P	90 - 110
Potassium	99.8	103	P/P	90 - 110
Sodium	102	105	P/P	90 - 110
Zinc	102	101	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A103129

Included Lab Sample IDs: 2219267

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	92.6	97.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A103129

Included Lab Sample IDs: 2219267

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	105	103	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A103143

Included Lab Sample IDs: 2219268

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A103152

Included Lab Sample IDs: 2219268

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: A103154

Included Lab Sample IDs: 2219267

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A103211

Included Lab Sample IDs: 2219268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	97.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A103222

Included Lab Sample IDs: 2219272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.7	97.9	P/P	90 - 110
Antimony	98.3	99.4	P/P	90 - 110
Arsenic	96.6	97.2	P/P	90 - 110
Beryllium	93.0	92.3	P/P	90 - 110
Boron	110	106	P/P	90 - 110
Chromium	104	105	P/P	90 - 110
Copper	93.8	95.0	P/P	90 - 110
Lead	99.4	100	P/P	90 - 110
Nickel	95.3	96.3	P/P	90 - 110
Selenium	98.3	97.3	P/P	90 - 110
Silver	104	104	P/P	90 - 110
Thallium	99.8	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A103250

Included Lab Sample IDs: 2219272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	95.9	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A103298

Included Lab Sample IDs: 2219268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.1	97.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A103329

Included Lab Sample IDs: 2219268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.0	97.0	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					5.65	
EPA 200.7 Rev. 4.4	Barium	99.0	101	101	103		1.87
	Calcium	104	102	107	108		0.448
	Iron	102	108	106	106		0.572
	Magnesium	103	108	105	106		0.427
	Manganese	100	102	101	103		1.60
	Potassium	100	103	102	106		3.36
	Sodium	105	104	103			1.89
	Zinc	99.6	102	99.5	101		1.62
EPA 200.8 Rev. 5.4	Aluminum	98.7	96.4	96.9	96.0		0.488
	Antimony	105	104	103	100		0.378
	Arsenic	101	99.6	98.7	97.0		0.847
	Beryllium	93.5	91.7	90.7	88.0		1.06
	Boron	98.7	96.1	99.9	89.8		3.17
	Cadmium	99.9	96.2	92.1	93.4		4.37
	Chromium	107	103	103	103		0.143
	Copper	96.6	96.5	96.1	93.9		0.477
	Lead	103	103	103	102		0.0331
	Nickel	98.0	97.9	96.9	95.4		1.02
	Selenium	100	96.6	96.8	96.0		0.212
	Silver	109	110	109	106		1.24
	Thallium	102	102	102	103		0.313
EPA 300.0 Rev. 2.1	Chloride	101	103	102		0.489	
	Sulfate	103	104	104		4.00	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	97.2	97.2			0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	106	97.4			5.45
EPA 353.2 Rev. 2.0	NO2NO3-N	103	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	105	105	107			1.40
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	99.3	98.6			0.470
SM 2120 B-2011	Color (true)	101				4.56	
SM 2320 B-2011	Total Alkalinity	95.2				6.97	
SM 2540 C-2011	TDS					5.32	
SM 4500 F-C-2011	Fluoride	101	101	102			0.934
SM 5310 B-2011	Organic Carbon	101	101	100			0.447

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2219267
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2219272
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2219272
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2219267
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2219267
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2219268
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2219268
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2219268
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2219268
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2219269
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2219267
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2219267

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2219272
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2219267
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2219267
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2219267
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2219268

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	01/14/2021			01/14/2021 14:53	Yen Ta	2219267
EPA 200.7 Rev. 4.4	01/14/2021	01/14/2021 17:00	Elliott D. Healy	01/15/2021 18:41	Betina Topolski	2219272
EPA 200.8 Rev. 5.4	01/14/2021	01/14/2021 17:00	Elliott D. Healy	01/25/2021 18:37	Alexander Thompson	2219272
	01/14/2021	01/14/2021 17:00	Elliott D. Healy	01/26/2021 12:58	Alexander Thompson	2219272
EPA 300.0 Rev. 2.1	01/14/2021			01/20/2021 18:19	Lipi Saha	2219267
EPA 350.1 Rev. 2.0	01/14/2021			01/31/2021 15:28	Ping Hua	2219268
EPA 351.2 Rev. 2.0	01/14/2021	01/27/2021 13:10	Yen Ta	01/28/2021 18:24	Julia Storbeck	2219268
EPA 353.2 Rev. 2.0	01/14/2021			01/21/2021 10:05	Beverly Y. Sanders	2219268
EPA 365.1 Rev. 2.0	01/14/2021	01/20/2021 18:21	Madeline Gruver	01/25/2021 12:47	Shengyu Wang	2219268
EPA 365.1 Rev. 2.0 dissolved	01/14/2021			01/14/2021 14:58	Blanca Fach	2219269
SM 2120 B-2011	01/14/2021			01/14/2021 16:36	Benjamin T. Nordmann	2219267
SM 2320 B-2011	01/14/2021			01/16/2021 01:17	Dale L. Simmons	2219267
SM 2340B	01/14/2021			01/15/2021 18:41	Betina Topolski	2219272
SM 2540 C-2011	01/14/2021			01/19/2021 14:52	Yijie Li	2219267
SM 2540 D-2011	01/14/2021			01/19/2021 14:52	Yijie Li	2219267
SM 4500 F-C-2011	01/14/2021			01/16/2021 01:17	Dale L. Simmons	2219267
SM 5310 B-2011	01/14/2021			01/20/2021 04:48	Touraj Touran	2219268