

Chemical Analysis Report

TLH-ROC-2021-01-26-02

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

Event Description: **Run 8a**
Request ID: **RQ-2021-01-11-41**
Customer: **TLH-ROC**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399
Attn: Michael Eckles

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 16-FEB-2021 11:27

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: East Bay (Apalachicola)

Collection Date/Time: 01/26/2021 10:05

Field ID: G2TLHR0027

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2221561	EPA 180.1 Rev. 2.0	Turbidity	5.4	A	NTU	P393077	
	SM 2320 B-2011	Total Alkalinity	58		mg CaCO3/L	P393216	
	SM 2540 D-2011	TSS	7	I	mg/L	P393362	
	SM 4500 F-C-2011	Fluoride	0.39		mg F/L	P393219	
2221563	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P393459	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.52		mg N/L	P393543	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.18		mg N/L	P392962	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P393316	
	SM 5310 B-2011	Organic Carbon	6.2		mg C/L	P393265	
2221565	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P392945	
2221579	EPA 200.7 Rev. 4.4	Calcium	134		mg/L	P393322	
		Chromium	6.5	I	ug/L	P393322	
		Iron	320	I	ug/L	P393322	
		Magnesium	420		mg/L	P393322	
		Manganese	44		ug/L	P393322	
		Zinc	15	U	ug/L	P393322	
	EPA 200.8 Rev. 5.4	Aluminum	230	I	ug/L	P393322	
		Antimony	0.20	U	ug/L	P393322	
		Arsenic	0.85	I	ug/L	P393322	
		Beryllium	0.10	U	ug/L	P393322	
		Cadmium	0.080	U	ug/L	P393322	
		Copper	1.6	U	ug/L	P393322	
		Lead	0.80	U	ug/L	P393322	
		Nickel	2.0	U	ug/L	P393322	
		Selenium	2.0	U	ug/L	P393322	
		Silver	0.040	U	ug/L	P393322	
		Thallium	0.40	U	ug/L	P393322	

Ref. Method and Comment:

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

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and magnesium are unavailable because of high analyte concentration in the QC sample.

Sample Location: Apalachicola Bay Center

Collection Date/Time: 01/26/2021 10:40

Field ID: G2TLHR0026

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2221562	EPA 180.1 Rev. 2.0	Turbidity	13		NTU	P393077	
	SM 2320 B-2011	Total Alkalinity	43		mg CaCO3/L	P393215	
	SM 2540 D-2011	TSS	8	I	mg/L	P393361	
	SM 4500 F-C-2011	Fluoride	0.049	I	mg F/L	P393218	
2221564	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P393463	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26		mg N/L	P393259	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.64		mg N/L	P393109	
	EPA 365.1 Rev. 2.0	Total-P	0.030		mg P/L	P393248	
	SM 5310 B-2011	Organic Carbon	3.2		mg C/L	P393187	
2221566	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	I	mg P/L	P392947	
2221580	EPA 200.7 Rev. 4.4	Calcium	16.1		mg/L	P393014	
		Iron	960		ug/L	P393014	
		Magnesium	2.57		mg/L	P393014	
		Manganese	25.0		ug/L	P393014	
		Zinc	5.0	U	ug/L	P393014	
	EPA 200.8 Rev. 5.4	Aluminum	428		ug/L	P393014	
		Antimony	0.050	U	ug/L	P393014	
		Arsenic	0.33		ug/L	P393014	
		Beryllium	0.028	I	ug/L	P393014	
		Cadmium	0.020	U	ug/L	P393014	
		Chromium	0.87	I	ug/L	P393014	
		Copper	0.69	I	ug/L	P393014	
		Lead	0.41		ug/L	P393014	
		Nickel	0.50	U	ug/L	P393014	
		Selenium	0.20	U	ug/L	P393014	
		Silver	0.010	U	ug/L	P393014	
		Thallium	0.10	U	ug/L	P393014	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Inter-coastal 450m D-stream Pine Log Boat Ramp

Collection Date/Time: 01/26/2021 11:25

Field ID: G2TLHR0034

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2221567	EPA 180.1 Rev. 2.0	Turbidity	12		NTU	P393074	
	EPA 300.0 Rev. 2.1	Chloride	5.9		mg Cl/L	P393370	
		Sulfate	5.2		mg SO4/L	P393373	
	SM 2120 B-2011	Color (true)	33		PCU	P393059	
	SM 2320 B-2011	Total Alkalinity	43		mg CaCO3/L	P393215	
	SM 2540 D-2011	TSS	7	I	mg/L	P393361	
	SM 4500 F-C-2011	Fluoride	0.049	I	mg F/L	P393218	
2221568	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P393463	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.26		mg N/L	P393259	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.62		mg N/L	P393109	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P393248	
	SM 5310 B-2011	Organic Carbon	3.2		mg C/L	P393187	
2221569	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P392947	
2221581	EPA 200.7 Rev. 4.4	Barium	20.6		ug/L	P393014	
		Calcium	16.4		mg/L	P393014	
		Iron	940		ug/L	P393014	
		Magnesium	2.14		mg/L	P393014	
		Manganese	25.3		ug/L	P393014	
		Potassium	1.8		mg/L	P393014	
		Sodium	5.7		mg/L	P393014	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P393014	
		Aluminum	403		ug/L	P393014	
		Antimony	0.051	I	ug/L	P393014	
		Arsenic	0.30		ug/L	P393014	
		Beryllium	0.023	I	ug/L	P393014	
		Boron**	13.9		ug/L	P393014	
		Cadmium	0.020	U	ug/L	P393014	
		Chromium	0.74	I	ug/L	P393014	
		Copper	1.15		ug/L	P393014	
		Lead	0.39	I	ug/L	P393014	
		Nickel	0.50	U	ug/L	P393014	
		Selenium	0.20	U	ug/L	P393014	
		Silver	0.010	U	ug/L	P393014	
		Thallium	0.10	U	ug/L	P393014	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P393074

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P393077

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P393014

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 200.7 Rev. 4.4
Batch ID: P393322

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393014

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393322

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
Cadmium	0.020	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: P393370

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P393373

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393459

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393463

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393259

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393543

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392962

Component	Result	Code	Units
-----------	--------	------	-------

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392962

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393109

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393248

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393316

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392945

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392947

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

Reference Method: SM 2120 B-2011
Batch ID: P393059

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P393215

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

Reference Method: SM 2320 B-2011
Batch ID: P393216

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P393361

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P393362

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P393218

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-2011
Batch ID: P393219

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P393187

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-2011
Batch ID: P393265

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: P393014

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	98.6		P	85 - 115
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Manganese	98.4		P	85 - 115
Potassium	100		P	85 - 115
Sodium	102		P	85 - 115
Zinc	98.1		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P393322

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	98.9		P	85 - 115
Chromium	92.2		P	85 - 115
Iron	101		P	85 - 115
Magnesium	98.7		P	85 - 115
Manganese	97.0		P	85 - 115
Zinc	94.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393014

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.6		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	97.6		P	85 - 115
Beryllium	91.5		P	85 - 115
Boron	96.3		P	85 - 115
Cadmium	94.0		P	85 - 115
Chromium	96.1		P	85 - 115
Copper	96.4		P	85 - 115
Lead	100		P	85 - 115
Nickel	96.8		P	85 - 115
Selenium	98.2		P	85 - 115
Silver	104		P	80 - 120
Thallium	99.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393322

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.4		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	97.7		P	85 - 115
Beryllium	86.9		P	85 - 115
Cadmium	94.4		P	85 - 115
Copper	94.7		P	85 - 115
Lead	98.7		P	85 - 115
Nickel	93.1		P	85 - 115
Selenium	96.3		P	85 - 115
Silver	105		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393322

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Thallium	98.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P393370

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P393373

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393459

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393463

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393259

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393543

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393109

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393248

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393316

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: P392945

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392947

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

Reference Method: SM 2120 B-2011
Batch ID: P393059

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P393215

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.6		P	93 - 104

Reference Method: SM 2320 B-2011
Batch ID: P393216

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.8		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P393218

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.6		P	90 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P393219

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.7		P	90 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P393187

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

Reference Method: SM 5310 B-2011
Batch ID: P393265

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: P393014

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221379	Barium	100		P	80 - 120
2221379	Calcium	107		P	80 - 120
2221379	Iron	109		P	80 - 120
2221379	Magnesium	114		P	80 - 120
2221379	Manganese	101		P	80 - 120
2221379	Potassium	104		P	80 - 120
2221379	Sodium	102		P	80 - 120
2221379	Zinc	108		P	80 - 120
2221555	Barium	104	103	P/P	80 - 120
2221555	Calcium	111	110	P/P	80 - 120
2221555	Iron	108	108	P/P	80 - 120
2221555	Magnesium	109	110	P/P	80 - 120
2221555	Manganese	103	102	P/P	80 - 120
2221555	Potassium	108	107	P/P	80 - 120
2221555	Sodium	106	105	P/P	80 - 120
2221555	Zinc	106	105	P/P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P393322

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221579	Chromium	93.5	91.2	P/P	70 - 130
2221579	Iron	106	101	P/P	70 - 130
2221579	Manganese	96.9	94.4	P/P	70 - 130
2221579	Zinc	98.2	95.1	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P393014

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221379	Aluminum	94.8		P	80 - 120
2221379	Antimony	98.8		P	80 - 120
2221379	Arsenic	95.1		P	80 - 120
2221379	Beryllium	88.7		P	80 - 120
2221379	Boron	97.5		P	80 - 120
2221379	Cadmium	93.3		P	80 - 120
2221379	Chromium	93.2		P	80 - 120
2221379	Copper	91.2		P	80 - 120
2221379	Lead	98.3		P	80 - 120
2221379	Nickel	91.7		P	80 - 120
2221379	Selenium	94.4		P	80 - 120
2221379	Silver	105		P	80 - 120
2221379	Thallium	102		P	80 - 120
2221555	Aluminum	97.2	96.9	P/P	80 - 120
2221555	Antimony	99.9	99.2	P/P	80 - 120
2221555	Arsenic	98.0	97.4	P/P	80 - 120
2221555	Beryllium	88.9	87.8	P/P	80 - 120
2221555	Boron	97.3	98.2	P/P	80 - 120
2221555	Cadmium	94.1	93.9	P/P	80 - 120
2221555	Chromium	97.3	95.3	P/P	80 - 120
2221555	Copper	97.1	95.8	P/P	80 - 120
2221555	Lead	100	99.7	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393014

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221555	Nickel	96.5	95.6	P/P	80 - 120
2221555	Selenium	98.7	98.1	P/P	80 - 120
2221555	Silver	89.0	101	P/P	80 - 120
2221555	Thallium	101	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393322

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221579	Aluminum	93.2	92.8	P/P	70 - 130
2221579	Antimony	103	103	P/P	70 - 130
2221579	Arsenic	102	104	P/P	70 - 130
2221579	Beryllium	98.6	93.9	P/P	70 - 130
2221579	Cadmium	87.1	86.2	P/P	70 - 130
2221579	Copper	105	104	P/P	70 - 130
2221579	Lead	103	102	P/P	70 - 130
2221579	Nickel	95.8	96.3	P/P	70 - 130
2221579	Selenium	99.1	97.5	P/P	70 - 130
2221579	Silver	95.4	95.6	P/P	70 - 130
2221579	Thallium	101	102	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P393370

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221286	Chloride	101		P	90 - 110
2221527	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P393373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221286	Sulfate	101		P	90 - 110
2221527	Sulfate	99.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393459

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2220828	Ammonia-N	98.9	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393463

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221538	Ammonia-N	97.8	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393543

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221391	Kjeldahl Nitrogen	104	102	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221389	NO2NO3-N	102	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221824	NO2NO3-N	97.2	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393248

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221528	Total-P	105	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221563	Total-P	101	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392945

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221133	O-Phosphate-P	97.7	97.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392947

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221541	O-Phosphate-P	107	108	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P393218

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221631	Fluoride	102	102	P/P	94 - 107

Reference Method: SM 4500 F-C-2011
Batch ID: P393219

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2220715	Fluoride	104	102	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P393187

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2221589	Organic Carbon	98.6	101	P/P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P393265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2222201	Organic Carbon	99.4	99.2	P/P	85 - 115

Quality Assurance Report

Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P393074

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221586	Turbidity	13.5	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P393077

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221561	Turbidity	4.07	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P393014

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221555	Barium	0.543	Spike	P	0 - 20
2221555	Calcium	0.975	Spike	P	0 - 20
2221555	Iron	0.0581	Spike	P	0 - 20
2221555	Magnesium	0.567	Spike	P	0 - 20
2221555	Manganese	0.685	Spike	P	0 - 20
2221555	Potassium	0.760	Spike	P	0 - 20
2221555	Sodium	0.658	Spike	P	0 - 20
2221555	Zinc	1.00	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P393322

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221579	Calcium	1.35	Spike	P	0 - 20
2221579	Chromium	2.41	Spike	P	0 - 20
2221579	Iron	4.54	Spike	P	0 - 20
2221579	Magnesium	2.34	Spike	P	0 - 20
2221579	Manganese	2.12	Spike	P	0 - 20
2221579	Zinc	3.22	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P393014

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221555	Aluminum	0.266	Spike	P	0 - 20
2221555	Antimony	0.669	Spike	P	0 - 20
2221555	Arsenic	0.585	Spike	P	0 - 20
2221555	Beryllium	1.28	Spike	P	0 - 20
2221555	Boron	0.853	Spike	P	0 - 20
2221555	Cadmium	0.276	Spike	P	0 - 20
2221555	Chromium	2.04	Spike	P	0 - 20
2221555	Copper	1.34	Spike	P	0 - 20
2221555	Lead	0.287	Spike	P	0 - 20
2221555	Nickel	0.939	Spike	P	0 - 20
2221555	Selenium	0.554	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393014

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221555	Silver	12.3	Spike	P	0 - 20
2221555	Thallium	0.224	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P393322

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221579	Aluminum	0.377	Spike	P	0 - 20
2221579	Antimony	0.372	Spike	P	0 - 20
2221579	Arsenic	1.78	Spike	P	0 - 20
2221579	Beryllium	4.84	Spike	P	0 - 20
2221579	Cadmium	1.08	Spike	P	0 - 20
2221579	Copper	1.46	Spike	P	0 - 20
2221579	Lead	0.423	Spike	P	0 - 20
2221579	Nickel	0.542	Spike	P	0 - 20
2221579	Selenium	1.71	Spike	P	0 - 20
2221579	Silver	0.192	Spike	P	0 - 20
2221579	Thallium	0.937	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P393370

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221527	Chloride	0.397	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P393373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221527	Sulfate	0.201	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220828	Ammonia-N	3.34	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393463

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221538	Ammonia-N	0.458	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221605	Kjeldahl Nitrogen	2.47	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393543

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221391	Kjeldahl Nitrogen	1.25	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221389	NO2NO3-N	0.990	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221824	NO2NO3-N	0.471	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393248

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221528	Total-P	1.69	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221563	Total-P	2.65	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392945

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221133	O-Phosphate-P	0.383	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392947

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221541	O-Phosphate-P	1.21	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B-2011
 Batch ID: P393059

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221633	Color (true)	2.18	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
 Batch ID: P393215

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221631	Total Alkalinity	0.608	Sample	P	0 - 8.1

Reference Method: SM 2320 B-2011
 Batch ID: P393216

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221768	Total Alkalinity	1.09	Sample	P	0 - 8.1

Reference Method: SM 4500 F-C-2011
 Batch ID: P393218

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221631	Fluoride	0.495	Spike	P	0 - 2.8

Reference Method: SM 4500 F-C-2011
 Batch ID: P393219

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220715	Fluoride	0.915	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
 Batch ID: P393187

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2221589	Organic Carbon	1.67	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
 Batch ID: P393265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2222201	Organic Carbon	0.134	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: A103257

Included Lab Sample IDs: 2221565, 2221566, 2221569

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A103259

Included Lab Sample IDs: 2221563

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

Reference Method: SM 2120 B-2011

Run ID: A103286

Included Lab Sample IDs: 2221567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	102	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A103288

Included Lab Sample IDs: 2221561, 2221562, 2221567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	102	P/P	95 - 105
Turbidity	101	100	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A103300

Included Lab Sample IDs: 2221564, 2221568

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A103332

Included Lab Sample IDs: 2221580, 2221581

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.7	100	P/P	90 - 110
Calcium	104	102	P/P	90 - 110
Iron	103	102	P/P	90 - 110
Magnesium	105	101	P/P	90 - 110
Manganese	101	101	P/P	90 - 110
Potassium	101	97.0	P/P	90 - 110
Sodium	100	99.3	P/P	90 - 110
Zinc	104	103	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A103337

Included Lab Sample IDs: 2221564, 2221568

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A103337

Included Lab Sample IDs: 2221564, 2221568

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

Reference Method: SM 2320 B-2011

Run ID: A103352

Included Lab Sample IDs: 2221561, 2221562, 2221567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	93.9	94.9	P/P	90 - 110
Total Alkalinity	93.9	96.2	P/P	90 - 110
Total Alkalinity	96.2	93.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A103352

Included Lab Sample IDs: 2221561, 2221562, 2221567

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

Reference Method: SM 5310 B-2011

Run ID: A103374

Included Lab Sample IDs: 2221563

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	102	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A103395

Included Lab Sample IDs: 2221564, 2221568

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	94.2	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A103412

Included Lab Sample IDs: 2221567

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A103417

Included Lab Sample IDs: 2221564, 2221568

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	98.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A103435

Included Lab Sample IDs: 2221579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.3	95.2	P/P	90 - 110
Chromium	98.8	96.7	P/P	90 - 110
Iron	98.7	96.6	P/P	90 - 110
Magnesium	97.2	97.9	P/P	90 - 110
Manganese	100	97.0	P/P	90 - 110
Zinc	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A103445

Included Lab Sample IDs: 2221563

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A103455

Included Lab Sample IDs: 2221563, 2221564, 2221568

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.2	P/P	90 - 110
Ammonia-N	97.7	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A103527

Included Lab Sample IDs: 2221563

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A103531

Included Lab Sample IDs: 2221580, 2221581

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.1	98.4	P/P	90 - 110
Antimony	98.6	98.9	P/P	90 - 110
Arsenic	96.2	95.3	P/P	90 - 110
Beryllium	93.1	91.4	P/P	90 - 110
Boron	104	100	P/P	90 - 110
Cadmium	95.1	96.5	P/P	90 - 110
Chromium	94.0	94.9	P/P	90 - 110
Copper	93.6	93.3	P/P	90 - 110
Lead	99.1	99.4	P/P	90 - 110
Nickel	93.9	94.3	P/P	90 - 110
Selenium	97.8	97.3	P/P	90 - 110
Thallium	101	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A103547

Included Lab Sample IDs: 2221580, 2221581

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	90.0	92.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A103548

Included Lab Sample IDs: 2221579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	100	103	P/P	90 - 110
Arsenic	101	99.1	P/P	90 - 110
Beryllium	98.0	98.3	P/P	90 - 110
Cadmium	95.7	99.1	P/P	90 - 110
Copper	100	103	P/P	90 - 110
Lead	99.6	101	P/P	90 - 110
Nickel	98.3	101	P/P	90 - 110
Selenium	97.8	95.6	P/P	90 - 110
Silver	102	106	P/P	90 - 110
Thallium	102	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A103570

Included Lab Sample IDs: 2221579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	90.9	93.8	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			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						13.5	
	Turbidity						4.07	
EPA 200.7 Rev. 4.4	Barium	98.6	100	104	103			0.543
	Calcium	106	107	111	110			0.975
	Calcium	98.9						1.35
	Chromium	92.2	93.5	91.2				2.41
	Iron	105	109	108	108			0.0581
	Iron	101	106	101				4.54
	Magnesium	105	114	109	110			0.567
	Magnesium	98.7						2.34
	Manganese	98.4	101	103	102			0.685
	Manganese	97.0	96.9	94.4				2.12
	Potassium	100	104	108	107			0.760
	Sodium	102	102	106	105			0.658
	Zinc	98.1	108	106	105			1.00
	Zinc	94.5	98.2	95.1				3.22
EPA 200.8 Rev. 5.4	Aluminum	96.6	97.2	96.9	94.8			0.266
	Aluminum	98.4	93.2	92.8				0.377
	Antimony	101	99.9	99.2	98.8			0.669
	Antimony	104	103	103				0.372
	Arsenic	97.6	98.0	97.4	95.1			0.585
	Arsenic	97.7	102	104				1.78
	Beryllium	91.5	88.9	87.8	88.7			1.28
	Beryllium	86.9	98.6	93.9				4.84
	Boron	96.3	97.3	98.2	97.5			0.853
	Cadmium	94.0	94.1	93.9	93.3			0.276
	Cadmium	94.4	87.1	86.2				1.08
	Chromium	96.1	97.3	95.3	93.2			2.04
	Copper	96.4	97.1	95.8	91.2			1.34
	Copper	94.7	105	104				1.46
	Lead	100	100	99.7	98.3			0.287
	Lead	98.7	103	102				0.423
	Nickel	96.8	96.5	95.6	91.7			0.939
	Nickel	93.1	95.8	96.3				0.542
	Selenium	98.2	98.7	98.1	94.4			0.554
	Selenium	96.3	99.1	97.5				1.71
	Silver	104	89.0	101	105			12.3
	Silver	105	95.4	95.6				0.192
	Thallium	99.5	101	101	102			0.224
	Thallium	98.3	101	102				0.937
EPA 300.0 Rev. 2.1	Chloride	100	100	101			0.397	
	Sulfate	100	99.4	101			0.201	
EPA 350.1 Rev. 2.0	Ammonia-N	100	98.9	103				3.34
	Ammonia-N	99.7	97.8	98.4				0.458
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106						2.47
	Kjeldahl Nitrogen	105	104	102				1.25
EPA 353.2 Rev. 2.0	NO2NO3-N	97.5	102	100				0.990
	NO2NO3-N	99.5	97.2	97.6				0.471
EPA 365.1 Rev. 2.0	Total-P	106	105	107				1.69
	Total-P	104	101	104				2.65
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	97.7	97.3				0.383
	O-Phosphate-P	105	107	108				1.21
SM 2120 B-2011	Color (true)	102					2.18	
SM 2320 B-2011	Total Alkalinity	95.6					0.608	

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
SM 2320 B-2011	Total Alkalinity	96.8				1.09	
SM 4500 F-C-2011	Fluoride	97.6	102	102			0.495
	Fluoride	98.7	104	102			0.915
SM 5310 B-2011	Organic Carbon	101	98.6	101			1.67
	Organic Carbon	100	99.4	99.2			0.134

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2221561, 2221562, 2221567
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2221579, 2221580, 2221581
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2221579, 2221580, 2221581
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2221567
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2221567
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2221563, 2221564, 2221568
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2221563, 2221564, 2221568
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2221563, 2221564, 2221568
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2221563, 2221564, 2221568
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2221565, 2221566, 2221569
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2221567
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2221561, 2221562, 2221567
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2221561, 2221562, 2221567
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2221561, 2221562, 2221567
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2221563, 2221564, 2221568

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	01/26/2021			01/27/2021 16:06	Yen Ta	2221561, 2221562, 2221567
EPA 200.7 Rev. 4.4	01/26/2021	01/27/2021 16:10	Elliott D. Healy	01/29/2021 15:26	Betina Topolski	2221580
	01/26/2021	01/27/2021 16:10	Elliott D. Healy	01/29/2021 15:34	Betina Topolski	2221581
	01/26/2021	02/03/2021 16:10	Elliott D. Healy	02/04/2021 19:49	Betina Topolski	2221579
	01/26/2021	02/03/2021 16:10	Elliott D. Healy	02/04/2021 20:53	Betina Topolski	2221579
EPA 200.8 Rev. 5.4	01/26/2021	01/27/2021 16:10	Elliott D. Healy	02/10/2021 16:40	Alexander Thompson	2221580
	01/26/2021	01/27/2021 16:10	Elliott D. Healy	02/10/2021 16:48	Alexander Thompson	2221581
	01/26/2021	01/27/2021 16:10	Elliott D. Healy	02/11/2021 15:23	Alexander Thompson	2221580
	01/26/2021	01/27/2021 16:10	Elliott D. Healy	02/11/2021 15:27	Alexander Thompson	2221581
	01/26/2021	02/03/2021 16:10	Elliott D. Healy	02/11/2021 21:18	Alexander Thompson	2221579
	01/26/2021	02/03/2021 16:10	Elliott D. Healy	02/11/2021 22:25	Alexander Thompson	2221579
	01/26/2021	02/03/2021 16:10	Elliott D. Healy	02/12/2021 13:44	Alexander Thompson	2221579
EPA 300.0 Rev. 2.1	01/26/2021			02/03/2021 19:17	Lipi Saha	2221567
EPA 350.1 Rev. 2.0	01/26/2021			02/07/2021 10:11	Ping Hua	2221563
	01/26/2021			02/07/2021 12:29	Ping Hua	2221564
	01/26/2021			02/07/2021 12:30	Ping Hua	2221568
EPA 351.2 Rev. 2.0	01/26/2021	02/02/2021 11:48	Yen Ta	02/03/2021 15:41	Julia Storbeck	2221564
	01/26/2021	02/02/2021 11:48	Yen Ta	02/03/2021 15:43	Julia Storbeck	2221568
	01/26/2021	02/09/2021 11:41	Yen Ta	02/10/2021 16:43	Julia Storbeck	2221563
EPA 353.2 Rev. 2.0	01/26/2021			01/27/2021 10:47	Beverly Y. Sanders	2221563
	01/26/2021			01/28/2021 11:37	Beverly Y. Sanders	2221564
	01/26/2021			01/28/2021 11:51	Beverly Y. Sanders	2221568
EPA 365.1 Rev. 2.0	01/26/2021	02/02/2021 13:00	Lipi Saha	02/04/2021 12:30	Shengyu Wang	2221564, 2221568
	01/26/2021	02/03/2021 16:16	Madeline Gruver	02/05/2021 14:46	Shengyu Wang	2221563
EPA 365.1 Rev. 2.0 dissolved	01/26/2021			01/26/2021 16:04	Blanca Fach	2221565
	01/26/2021			01/26/2021 16:14	Blanca Fach	2221566
	01/26/2021			01/26/2021 16:15	Blanca Fach	2221569
SM 2120 B-2011	01/26/2021			01/27/2021 16:00	Blanca Fach	2221567
SM 2320 B-2011	01/26/2021			01/30/2021 00:01	Dale L. Simmons	2221562
	01/26/2021			01/30/2021 00:45	Dale L. Simmons	2221567
	01/26/2021			01/30/2021 05:43	Dale L. Simmons	2221561
SM 2540 D-2011	01/26/2021			01/29/2021 15:32	Yijie Li	2221561, 2221562, 2221567
SM 4500 F-C-2011	01/26/2021			01/30/2021 00:01	Dale L. Simmons	2221562
	01/26/2021			01/30/2021 00:45	Dale L. Simmons	2221567
	01/26/2021			01/30/2021 04:34	Dale L. Simmons	2221561
SM 5310 B-2011	01/26/2021			01/30/2021 02:47	Madeline Gruver	2221564
	01/26/2021			01/30/2021 02:59	Madeline Gruver	2221568
	01/26/2021			02/02/2021 10:14	Madeline Gruver	2221563