

Chemical Analysis Report

TLH-ROC-2022-06-28-03

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

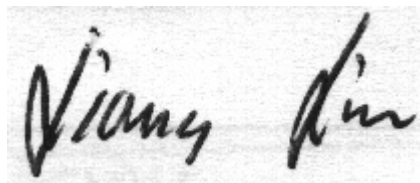
Event Description: **Run 16**
Request ID: **RQ-2022-04-25-46**
Customer: **TLH-ROC**
Project ID: **SMP**

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 19-JUL-2022 10:31

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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: Apalachicola River .8 miles upstream Owl Creek

Collection Date/Time: 06/28/2022 10:55

Field ID: G2TLHR0042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2337729	DEP SOP: NU-094-1	Color (true)	18		PCU	P415985	
	EPA 180.1 Rev. 2.0	Turbidity	10	A	NTU	P415989	
	EPA 300.0 Rev. 2.1	Chloride	5.2	A	mg Cl/L	P416149	
		Sulfate	5.0	A	mg SO4/L	P416152	
	SM 2320 B-2011	Total Alkalinity	59		mg CaCO3/L	P416321	
	SM 2540 C-2011	TDS	89	A	mg/L	P416197	
	SM 2540 D-2011	TSS	12	A	mg/L	P416166	
	SM 4500-F- C-2011	Fluoride	0.058	I	mg F/L	P416325	
2337731	EPA 350.1 Rev. 2.0	Ammonia-N	0.038		mg N/L	P416263	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31		mg N/L	P416181	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.55		mg N/L	P416428	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P416137	
	SM 5310 B-2011	Organic Carbon	2.8		mg C/L	P416106	
2337743	EPA 200.7 Rev. 4.4	Calcium	21.1		mg/L	P415918	
		Iron	440		ug/L	P415918	
		Magnesium	2.40		mg/L	P415918	
		Potassium	1.4		mg/L	P415918	
		Sodium	5.4		mg/L	P415918	
		Strontium	42.7		ug/L	P415918	
		Tin	3.0	U	ug/L	P415918	
		Titanium	12.1		ug/L	P415918	
		Vanadium	2.0	U	ug/L	P415918	
		Zinc	5.0	U	ug/L	P415918	
	EPA 200.8 Rev. 5.4	Aluminum	234		ug/L	P415918	
		Antimony	0.057	I	ug/L	P415918	
		Arsenic	0.46		ug/L	P415918	
		Barium	23.1		ug/L	P415918	
		Beryllium	0.031	I	ug/L	P415918	
		Boron	14.4		ug/L	P415918	
		Cadmium	0.020	U	ug/L	P415918	
		Chromium	0.47	I	ug/L	P415918	
		Cobalt	0.205		ug/L	P415918	
		Copper	0.42	I	ug/L	P415918	
		Lead	0.26	I	ug/L	P415918	
		Manganese	69.1		ug/L	P415918	
		Molybdenum	0.32	I	ug/L	P415918	
		Nickel	0.50	U	ug/L	P415918	
		Selenium	0.20	U	ug/L	P415918	
		Silver	0.010	U	ug/L	P415918	
		Thallium	0.10	U	ug/L	P415918	
	SM 2340 B-2011	Hardness	62.7		mg/L	P415918	

Sample Location: Fort Gadsen Creek near SR65

Collection Date/Time: 06/28/2022 11:30

Field ID: G2TLHR0012

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2337730	DEP SOP: NU-094-1	Color (true)	290		PCU	P415985	
	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P415989	
	EPA 300.0 Rev. 2.1	Chloride	4.0		mg Cl/L	P416149	
		Sulfate	0.35	I	mg SO4/L	P416152	
	SM 2320 B-2011	Total Alkalinity	9.3		mg CaCO3/L	P416321	
	SM 2540 C-2011	TDS	69		mg/L	P416197	
	SM 2540 D-2011	TSS	12		mg/L	P416166	
2337732	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P416325	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.068		mg N/L	P416263	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.79		mg N/L	P416181	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P416428	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P416137	
2337744	SM 5310 B-2011	Organic Carbon	23		mg C/L	P416106	
	EPA 200.7 Rev. 4.4	Calcium	1.94		mg/L	P415918	
		Iron	1.64E+03		ug/L	P415918	
		Magnesium	0.35		mg/L	P415918	
		Potassium	0.30	U	mg/L	P415918	
		Sodium	2.0		mg/L	P415918	
		Strontium	10.8		ug/L	P415918	
		Tin	3.0	U	ug/L	P415918	
		Titanium	1.8	I	ug/L	P415918	
		Vanadium	2.0	U	ug/L	P415918	
		Zinc	5.0	U	ug/L	P415918	
	EPA 200.8 Rev. 5.4	Aluminum	498		ug/L	P415918	
		Antimony	0.050	U	ug/L	P415918	
		Arsenic	0.44		ug/L	P415918	
		Barium	5.30		ug/L	P415918	
		Beryllium	0.015	I	ug/L	P415918	
		Boron	11.7		ug/L	P415918	
		Cadmium	0.020	U	ug/L	P415918	
		Chromium	0.48	I	ug/L	P415918	
		Cobalt	0.120		ug/L	P415918	
		Copper	0.40	U	ug/L	P415918	
		Lead	0.47		ug/L	P415918	
		Manganese	4.53		ug/L	P415918	
		Molybdenum	0.15	U	ug/L	P415918	
		Nickel	0.50	U	ug/L	P415918	
		Selenium	0.20	U	ug/L	P415918	
		Silver	0.010	U	ug/L	P415918	
		Thallium	0.10	U	ug/L	P415918	
	SM 2340 B-2011	Hardness	6.3		mg/L	P415918	

Sample Location: Brothers River @ Mouth

Collection Date/Time: 06/28/2022 12:10

Field ID: G2TLHR0013

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2337733	DEP SOP: NU-094-1	Color (true)	19		PCU	P415985	
	EPA 180.1 Rev. 2.0	Turbidity	5.9		NTU	P415989	
	EPA 300.0 Rev. 2.1	Chloride	5.2		mg Cl/L	P416149	
		Sulfate	4.7		mg SO4/L	P416152	
	SM 2320 B-2011	Total Alkalinity	54		mg CaCO3/L	P416321	
	SM 2540 C-2011	TDS	82		mg/L	P416197	
	SM 2540 D-2011	TSS	4	I	mg/L	P416166	
	SM 4500-F- C-2011	Fluoride	0.058	I	mg F/L	P416325	
2337734	EPA 350.1 Rev. 2.0	Ammonia-N	0.045		mg N/L	P416263	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31		mg N/L	P416181	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.42		mg N/L	P416428	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P416137	
	SM 5310 B-2011	Organic Carbon	3.2		mg C/L	P416106	
2337745	EPA 200.7 Rev. 4.4	Calcium	19.3		mg/L	P415918	
		Iron	370		ug/L	P415918	
		Magnesium	2.23		mg/L	P415918	
		Potassium	1.4		mg/L	P415918	
		Sodium	5.2		mg/L	P415918	
		Strontium	40.0		ug/L	P415918	
		Tin	3.0	U	ug/L	P415918	
		Titanium	9.1		ug/L	P415918	
		Vanadium	2.0	U	ug/L	P415918	
		Zinc	5.0	U	ug/L	P415918	
	EPA 200.8 Rev. 5.4	Aluminum	180		ug/L	P415918	
		Antimony	0.056	I	ug/L	P415918	
		Arsenic	0.44		ug/L	P415918	
		Barium	21.7		ug/L	P415918	
		Beryllium	0.018	I	ug/L	P415918	
		Boron	14.1		ug/L	P415918	
		Cadmium	0.020	U	ug/L	P415918	
		Chromium	0.40	U	ug/L	P415918	
		Cobalt	0.124		ug/L	P415918	
		Copper	0.43	I	ug/L	P415918	
		Lead	0.20	U	ug/L	P415918	
		Manganese	71.5		ug/L	P415918	
		Molybdenum	0.35	I	ug/L	P415918	
		Nickel	0.50	U	ug/L	P415918	
		Selenium	0.20	U	ug/L	P415918	
		Silver	0.010	U	ug/L	P415918	
		Thallium	0.10	U	ug/L	P415918	
		Hardness	57.4		mg/L	P415918	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P415985

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P415989

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P415918

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P415918

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	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
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	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: P416149

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P416152

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416263

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416181

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416428

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416137

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

Reference Method: SM 2320 B-2011
Batch ID: P416321

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

Reference Method: SM 2540 C-2011
Batch ID: P416197

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P416166

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P416325

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: P416106

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P415985

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.1		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P415989

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	95.8		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P415918

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	95.4		P	85 - 115
Magnesium	97.9		P	85 - 115
Potassium	103		P	85 - 115
Sodium	95.3		P	85 - 115
Strontium	104		P	85 - 115
Tin	105		P	85 - 115
Titanium	106		P	85 - 115
Vanadium	98.5		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P415918

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	101		P	85 - 115
Barium	105		P	85 - 115
Beryllium	96.1		P	85 - 115
Boron	104		P	85 - 115
Cadmium	98.7		P	85 - 115
Chromium	99.2		P	85 - 115
Cobalt	98.5		P	85 - 115
Copper	96.9		P	85 - 115
Lead	99.4		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	101		P	85 - 115
Nickel	99.0		P	85 - 115
Selenium	98.8		P	85 - 115
Silver	99.8		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P416149

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P416152

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416263

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416181

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	107		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416428

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: P416137

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

Reference Method: SM 2320 B-2011
Batch ID: P416321

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.2		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P416325

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.4		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P416106

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P415918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2337508	Calcium	100		P	80 - 120
2337508	Iron	104	99.4	P/P	80 - 120
2337508	Magnesium	106	99.9	P/P	80 - 120
2337508	Potassium	106	101	P/P	80 - 120
2337508	Sodium	103	97.0	P/P	80 - 120
2337508	Strontium	109	105	P/P	80 - 120
2337508	Tin	107	104	P/P	80 - 120
2337508	Titanium	108	105	P/P	80 - 120
2337508	Vanadium	104	101	P/P	80 - 120
2337508	Zinc	109	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P415918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2337508	Aluminum	99.0	101	P/P	80 - 120
2337508	Antimony	104	104	P/P	80 - 120
2337508	Arsenic	102	101	P/P	80 - 120
2337508	Barium	104	106	P/P	80 - 120
2337508	Beryllium	101	101	P/P	80 - 120
2337508	Boron	99.0	103	P/P	80 - 120
2337508	Cadmium	101	102	P/P	80 - 120
2337508	Chromium	101	102	P/P	80 - 120
2337508	Cobalt	98.8	99.9	P/P	80 - 120
2337508	Copper	97.6	97.6	P/P	80 - 120
2337508	Lead	99.2	101	P/P	80 - 120
2337508	Manganese	99.9	101	P/P	80 - 120
2337508	Molybdenum	102	103	P/P	80 - 120
2337508	Nickel	101	100	P/P	80 - 120
2337508	Selenium	98.7	98.3	P/P	80 - 120
2337508	Silver	98.7	98.3	P/P	80 - 120
2337508	Thallium	99.8	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P416149

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2337729	Chloride	98.4		P	90 - 110
2337733	Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P416152

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2337729	Sulfate	98.8		P	90 - 110
2337733	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P416263

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2337715	Ammonia-N	98.0	95.4	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416181

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2337734	Kjeldahl Nitrogen	97.0	96.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2337646	NO2NO3-N	98.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416137

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2337731	Total-P	102	105	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P416325

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2338014	Fluoride	99.2	99.2	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P416106

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2337911	Organic Carbon	100	100	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P415985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337846	Color (true)	1.23	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P415989

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337729	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P415918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337508	Calcium	3.39	Spike	P	0 - 20
2337508	Iron	4.71	Spike	P	0 - 20
2337508	Magnesium	4.56	Spike	P	0 - 20
2337508	Potassium	4.06	Spike	P	0 - 20
2337508	Sodium	3.72	Spike	P	0 - 20
2337508	Strontium	3.33	Spike	P	0 - 20
2337508	Tin	2.52	Spike	P	0 - 20
2337508	Titanium	3.27	Spike	P	0 - 20
2337508	Vanadium	3.43	Spike	P	0 - 20
2337508	Zinc	3.14	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P415918

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337508	Aluminum	1.71	Spike	P	0 - 20
2337508	Antimony	0.650	Spike	P	0 - 20
2337508	Arsenic	0.359	Spike	P	0 - 20
2337508	Barium	1.51	Spike	P	0 - 20
2337508	Beryllium	0.0869	Spike	P	0 - 20
2337508	Boron	3.31	Spike	P	0 - 20
2337508	Cadmium	0.940	Spike	P	0 - 20
2337508	Chromium	1.05	Spike	P	0 - 20
2337508	Cobalt	1.13	Spike	P	0 - 20
2337508	Copper	0.0117	Spike	P	0 - 20
2337508	Lead	2.02	Spike	P	0 - 20
2337508	Manganese	0.513	Spike	P	0 - 20
2337508	Molybdenum	0.472	Spike	P	0 - 20
2337508	Nickel	0.979	Spike	P	0 - 20
2337508	Selenium	0.384	Spike	P	0 - 20
2337508	Silver	0.380	Spike	P	0 - 20
2337508	Thallium	3.31	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P416149

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337729	Chloride	0.118	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P416152

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337729	Sulfate	0.0320	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337715	Ammonia-N	2.32	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416181

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337734	Kjeldahl Nitrogen	0.443	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337646	NO2NO3-N	0.966	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337731	Total-P	2.29	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P416321

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338014	Total Alkalinity	0.255	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2011
Batch ID: P416197

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337729	TDS	0.0	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 D-2011
Batch ID: P416166

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337729	TSS	6.67	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P416325

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2338014	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P416106

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2337911	Organic Carbon	0.0628	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A113156

Included Lab Sample IDs: 2337729, 2337730, 2337733

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	99.7	P/P	90 - 110
Sulfate	101	99.7	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A113169

Included Lab Sample IDs: 2337729, 2337730, 2337733

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.7	98.7	P/P	85 - 115
Color (true)	98.0	97.2	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A113170

Included Lab Sample IDs: 2337729, 2337730, 2337733

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A113218

Included Lab Sample IDs: 2337743, 2337744, 2337745

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	98.9	P/P	90 - 110
Antimony	95.7	96.3	P/P	90 - 110
Arsenic	98.1	97.9	P/P	90 - 110
Barium	97.4	97.7	P/P	90 - 110
Beryllium	95.7	96.2	P/P	90 - 110
Boron	102	99.1	P/P	90 - 110
Cadmium	95.6	96.6	P/P	90 - 110
Chromium	96.4	96.5	P/P	90 - 110
Cobalt	97.8	98.0	P/P	90 - 110
Copper	98.5	99.4	P/P	90 - 110
Lead	95.5	94.6	P/P	90 - 110
Manganese	96.9	97.0	P/P	90 - 110
Molybdenum	96.4	95.6	P/P	90 - 110
Nickel	99.1	99.2	P/P	90 - 110
Selenium	97.2	96.4	P/P	90 - 110
Silver	97.4	97.4	P/P	90 - 110
Thallium	95.5	93.9	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A113244

Included Lab Sample IDs: 2337731, 2337732, 2337734

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A113317

Included Lab Sample IDs: 2337743, 2337744, 2337745

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.8	98.2	P/P	90 - 110
Iron	98.2	97.1	P/P	90 - 110
Magnesium	97.9	97.3	P/P	90 - 110
Potassium	98.9	99.2	P/P	90 - 110
Sodium	98.3	98.4	P/P	90 - 110
Strontium	101	103	P/P	90 - 110
Tin	101	101	P/P	90 - 110
Titanium	101	100	P/P	90 - 110
Vanadium	101	102	P/P	90 - 110
Zinc	102	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A113332

Included Lab Sample IDs: 2337731, 2337732, 2337734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.6	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A113361

Included Lab Sample IDs: 2337731, 2337732, 2337734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.2	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A113365

Included Lab Sample IDs: 2337729, 2337730, 2337733

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	98.0	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A113365

Included Lab Sample IDs: 2337729, 2337730, 2337733

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A113420

Included Lab Sample IDs: 2337731, 2337732, 2337734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A113474

Included Lab Sample IDs: 2337731, 2337732, 2337734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A113474

Included Lab Sample IDs: 2337731, 2337732, 2337734

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	105	P/P	90 - 110
Kjeldahl Nitrogen	105	97.4	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
DEP SOP: NU-094-1	Color (true)	96.1				1.23
EPA 180.1 Rev. 2.0	Turbidity	95.8				0.0
EPA 200.7 Rev. 4.4	Calcium	102	100			
	Iron	95.4	104	99.4		3.39
	Magnesium	97.9	106	99.9		4.71
	Potassium	103	106	101		4.56
	Sodium	95.3	103	97.0		4.06
	Strontium	104	109	105		3.72
	Tin	105	107	104		3.33
	Titanium	106	108	105		2.52
	Vanadium	98.5	104	101		3.27
	Zinc	104	109	106		3.43
EPA 200.8 Rev. 5.4	Aluminum	102	99.0	101		3.14
	Antimony	102	104	104		1.71
	Arsenic	101	102	101		0.650
	Barium	105	104	106		0.359
	Beryllium	96.1	101	101		1.51
	Boron	104	99.0	103		0.0869
	Cadmium	98.7	101	102		3.31
	Chromium	99.2	101	102		0.940
	Cobalt	98.5	98.8	99.9		1.05
	Copper	96.9	97.6	97.6		1.13
	Lead	99.4	99.2	101		0.0117
	Manganese	101	99.9	101		2.02
	Molybdenum	101	102	103		0.513
	Nickel	99.0	101	100		0.472
	Selenium	98.8	98.7	98.3		0.979
	Silver	99.8	98.7	98.3		0.384
	Thallium	100	99.8	103		0.380
EPA 300.0 Rev. 2.1	Chloride	101	98.4	99.4		3.31
	Sulfate	101	98.8	100		0.118
EPA 350.1 Rev. 2.0	Ammonia-N	95.2	98.0	95.4		0.0320
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	97.0	96.5		2.32
EPA 353.2 Rev. 2.0	NO2NO3-N	102	98.5	100		0.443
EPA 365.1 Rev. 2.0	Total-P	102	102	105		0.966
SM 2320 B-2011	Total Alkalinity	99.2				2.29
SM 2540 C-2011	TDS					0.255
SM 2540 D-2011	TSS					0.0
SM 4500-F- C-2011	Fluoride	98.4	99.2	99.2		6.67
SM 5310 B-2011	Organic Carbon	97.4	100	100		0.0
						0.0628

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2337729, 2337730, 2337733
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2337729, 2337730, 2337733
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2337743, 2337744, 2337745
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2337743, 2337744, 2337745
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2337729, 2337730, 2337733
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2337729, 2337730, 2337733
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2337731, 2337732, 2337734

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2337731, 2337732, 2337734
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2337731, 2337732, 2337734
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2337731, 2337732, 2337734
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2337729, 2337730, 2337733
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2337743, 2337744, 2337745
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2337729, 2337730, 2337733
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2337729, 2337730, 2337733
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2337729, 2337730, 2337733
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2337731, 2337732, 2337734

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	06/28/2022			06/29/2022 15:31	Anna M. Plaviak	2337729
	06/28/2022			06/29/2022 15:33	Anna M. Plaviak	2337733
	06/28/2022			06/29/2022 15:56	Anna M. Plaviak	2337730
EPA 180.1 Rev. 2.0	06/28/2022			06/29/2022 14:02	Khloe J Berg	2337729
	06/28/2022			06/29/2022 14:07	Khloe J Berg	2337730, 2337733
EPA 200.7 Rev. 4.4	06/28/2022	06/29/2022 09:13	Mackenzie Hunt	07/06/2022 17:19	McKinley C Carter	2337743
	06/28/2022	06/29/2022 09:13	Mackenzie Hunt	07/06/2022 17:27	McKinley C Carter	2337744
	06/28/2022	06/29/2022 09:13	Mackenzie Hunt	07/06/2022 17:33	McKinley C Carter	2337745
EPA 200.8 Rev. 5.4	06/28/2022	06/29/2022 09:13	Mackenzie Hunt	06/30/2022 18:50	Alexander Thompson	2337743
	06/28/2022	06/29/2022 09:13	Mackenzie Hunt	06/30/2022 18:59	Alexander Thompson	2337744
	06/28/2022	06/29/2022 09:13	Mackenzie Hunt	06/30/2022 19:08	Alexander Thompson	2337745
EPA 300.0 Rev. 2.1	06/28/2022			07/02/2022 01:16	Anna M. Plaviak	2337729
	06/28/2022			07/02/2022 01:41	Anna M. Plaviak	2337733
	06/28/2022			07/02/2022 03:30	Anna M. Plaviak	2337730
EPA 350.1 Rev. 2.0	06/28/2022			07/07/2022 11:05	Ping Hua	2337731
	06/28/2022			07/07/2022 11:06	Ping Hua	2337732
	06/28/2022			07/07/2022 11:08	Ping Hua	2337734
EPA 351.2 Rev. 2.0	06/28/2022	07/12/2022 12:13	Simonne.V. Calhoun	07/13/2022 11:37	Alexandra J Mattheus	2337731
	06/28/2022	07/12/2022 12:13	Simonne.V. Calhoun	07/13/2022 11:38	Alexandra J Mattheus	2337732
	06/28/2022	07/12/2022 12:13	Simonne.V. Calhoun	07/13/2022 11:43	Alexandra J Mattheus	2337734
EPA 353.2 Rev. 2.0	06/28/2022			07/11/2022 12:48	Judith K. Clark	2337731
	06/28/2022			07/11/2022 12:49	Judith K. Clark	2337732
	06/28/2022			07/11/2022 12:50	Judith K. Clark	2337734
EPA 365.1 Rev. 2.0	06/28/2022	07/06/2022 16:30	Adam P Silver	07/07/2022 16:52	James L Waggeberby	2337731
	06/28/2022	07/06/2022 16:30	Adam P Silver	07/07/2022 16:54	James L Waggeberby	2337732
	06/28/2022	07/06/2022 16:30	Adam P Silver	07/07/2022 16:55	James L Waggeberby	2337734
SM 2320 B-2011	06/28/2022			07/06/2022 20:13	Dale L. Simmons	2337729
	06/28/2022			07/06/2022 20:25	Dale L. Simmons	2337730
	06/28/2022			07/06/2022 20:39	Dale L. Simmons	2337733
SM 2340 B-2011	06/28/2022			07/06/2022 17:19	McKinley C Carter	2337743
	06/28/2022			07/06/2022 17:27	McKinley C Carter	2337744
	06/28/2022			07/06/2022 17:33	McKinley C Carter	2337745
SM 2540 C-2011	06/28/2022			07/01/2022 14:10	Ping Hua	2337729, 2337730, 2337733
SM 2540 D-2011	06/28/2022			07/01/2022 14:10	Ping Hua	2337729, 2337730, 2337733
SM 4500-F- C-2011	06/28/2022			07/06/2022 20:13	Dale L. Simmons	2337729
	06/28/2022			07/06/2022 20:25	Dale L. Simmons	2337730
	06/28/2022			07/06/2022 20:39	Dale L. Simmons	2337733
SM 5310 B-2011	06/28/2022			06/30/2022 15:11	Khloe J Berg	2337734
	06/28/2022			06/30/2022 18:47	Khloe J Berg	2337731
	06/28/2022			06/30/2022 19:03	Khloe J Berg	2337732