

Chemical Analysis Report

TLH-ROC-2022-06-07-02

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

Event Description: **Run 9**
Request ID: **RQ-2022-05-02-73**
Customer: **TLH-ROC**
Project ID: **SMP**

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

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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 27-JUN-2022 10:42



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: Inter-Coastal 450m d-stream Pine Log Boat Ramp

Collection Date/Time: 06/07/2022 11:15

Field ID: G2TLHR0034

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2332729	DEP SOP: NU-094-1	Color (true)**	42	A	PCU	P414910	
	EPA 180.1 Rev. 2.0	Turbidity	7.2	A	NTU	P414915	
	EPA 300.0 Rev. 2.1	Chloride	4.9		mg Cl/L	P415410	
		Sulfate	4.5		mg SO4/L	P415415	
	SM 2320 B-2011	Total Alkalinity	46		mg CaCO3/L	P415388	
	SM 2540 C-2011	TDS	83		mg/L	P415243	
	SM 2540 D-2011	TSS	4	I	mg/L	P415246	
2332730	SM 4500-F- C-2011	Fluoride	0.058	I	mg F/L	P415393	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P415487	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.35		mg N/L	P415099	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.39		mg N/L	P415492	
	EPA 365.1 Rev. 2.0	Total-P	0.029		mg P/L	P415014	
2332732	SM 5310 B-2011	Organic Carbon	4.6		mg C/L	P415135	
	EPA 200.7 Rev. 4.4	Calcium	15.6		mg/L	P415009	
		Iron	390		ug/L	P415009	
		Magnesium	1.88		mg/L	P415009	
		Potassium	1.4		mg/L	P415009	
		Sodium	5.0		mg/L	P415009	
		Strontium	32.7		ug/L	P415009	
		Tin	3.0	U	ug/L	P415009	
		Titanium	3.8		ug/L	P415009	
		Vanadium	2.0	U	ug/L	P415009	
		Zinc	5.0	U	ug/L	P415009	
	EPA 200.8 Rev. 5.4	Aluminum	167		ug/L	P415208	
		Antimony	0.053	I	ug/L	P415009	
		Arsenic	0.35		ug/L	P415009	
		Barium	19.4		ug/L	P415009	
		Beryllium	0.017	I	ug/L	P415009	
		Boron**	13.3		ug/L	P415009	
		Cadmium	0.020	U	ug/L	P415009	
		Chromium	0.40	U	ug/L	P415009	
		Cobalt	0.088		ug/L	P415009	
		Copper	0.57	I	ug/L	P415009	
		Lead	0.20	U	ug/L	P415009	
		Manganese	27.4		ug/L	P415009	
		Molybdenum	0.24	I	ug/L	P415009	
		Nickel	0.50	U	ug/L	P415009	
		Selenium	0.20	U	ug/L	P415009	
		Silver	0.010	U	ug/L	P415009	
		Thallium	0.10	U	ug/L	P415009	
	SM 2340 B-2011	Hardness	46.7		mg/L	P415009	

Field ID: G2TLHR0034

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P414910

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P414915

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P415009

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: P415009

Component	Result	Code	Units
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 200.8 Rev. 5.4
Batch ID: P415208

Component	Result	Code	Units
Aluminum	5.0	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415410

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415415

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415487

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415099

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415492

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P415014

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

Reference Method: SM 2320 B-2011
Batch ID: P415388

Component	Result	Code	Units
Total Alkalinity	1.0	U	mg CaCO3/L

Reference Method: SM 2540 C-2011
Batch ID: P415243

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P415246

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P415393

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P415135

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: P414910

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.8		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P414915

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	97.1		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P415009

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	103		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	106		P	85 - 115
Sodium	102		P	85 - 115
Strontium	103		P	85 - 115
Tin	100		P	85 - 115
Titanium	100		P	85 - 115
Vanadium	94.3		P	85 - 115
Zinc	99.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P415009

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Antimony	99.7		P	85 - 115
Arsenic	101		P	85 - 115
Barium	103		P	85 - 115
Beryllium	96.5		P	85 - 115
Boron	106		P	85 - 115
Cadmium	97.8		P	85 - 115
Chromium	95.9		P	85 - 115
Cobalt	99.1		P	85 - 115
Copper	99.1		P	85 - 115
Lead	101		P	85 - 115
Manganese	96.6		P	85 - 115
Molybdenum	99.2		P	85 - 115
Nickel	100		P	85 - 115
Selenium	98.6		P	85 - 115
Silver	99.4		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P415208

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415410

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415415

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415487

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415099

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415492

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P415014

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

Reference Method: SM 2320 B-2011
Batch ID: P415388

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P415393

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P415135

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	89.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P415009

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332350	Calcium	101		P	80 - 120
2332350	Iron	102	105	P/P	80 - 120
2332350	Magnesium	101	102	P/P	80 - 120
2332350	Potassium	103	104	P/P	80 - 120
2332350	Sodium	101		P	80 - 120
2332350	Strontium	104	104	P/P	80 - 120
2332350	Tin	97.9	99.3	P/P	80 - 120
2332350	Titanium	104	113	P/P	80 - 120
2332350	Vanadium	96.1	96.5	P/P	80 - 120
2332350	Zinc	98.1	98.9	P/P	80 - 120
2332352	Calcium	98.8		P	80 - 120
2332352	Iron	103		P	80 - 120
2332352	Magnesium	104		P	80 - 120
2332352	Potassium	111		P	80 - 120
2332352	Sodium	102		P	80 - 120
2332352	Strontium	105		P	80 - 120
2332352	Tin	103		P	80 - 120
2332352	Titanium	101		P	80 - 120
2332352	Vanadium	97.5		P	80 - 120
2332352	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P415009

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332350	Antimony	97.7	100	P/P	80 - 120
2332350	Arsenic	98.9	101	P/P	80 - 120
2332350	Barium	101	104	P/P	80 - 120
2332350	Beryllium	96.6	98.6	P/P	80 - 120
2332350	Boron	107	108	P/P	80 - 120
2332350	Cadmium	98.1	101	P/P	80 - 120
2332350	Chromium	99.2	100	P/P	80 - 120
2332350	Cobalt	98.1	99.3	P/P	80 - 120
2332350	Copper	97.7	99.0	P/P	80 - 120
2332350	Lead	100	102	P/P	80 - 120
2332350	Molybdenum	99.7	101	P/P	80 - 120
2332350	Nickel	100	102	P/P	80 - 120
2332350	Selenium	96.7	97.7	P/P	80 - 120
2332350	Silver	98.5	99.2	P/P	80 - 120
2332350	Thallium	102	105	P/P	80 - 120
2332352	Antimony	101		P	80 - 120
2332352	Arsenic	100		P	80 - 120
2332352	Barium	104		P	80 - 120
2332352	Beryllium	95.3		P	80 - 120
2332352	Boron	105		P	80 - 120
2332352	Cadmium	101		P	80 - 120
2332352	Chromium	97.4		P	80 - 120
2332352	Cobalt	99.4		P	80 - 120
2332352	Copper	100		P	80 - 120
2332352	Lead	102		P	80 - 120
2332352	Manganese	99.7		P	80 - 120
2332352	Molybdenum	101		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P415009

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332352	Nickel	102		P	80 - 120
2332352	Selenium	98.4		P	80 - 120
2332352	Silver	100		P	80 - 120
2332352	Thallium	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P415208

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332374	Aluminum	102	99.5	P/P	80 - 120
2333022	Aluminum	109		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P415410

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332669	Chloride	100		P	90 - 110
2332812	Chloride	99.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P415415

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332669	Sulfate	99.2		P	90 - 110
2332812	Sulfate	99.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P415487

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332814	Ammonia-N	109	109	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P415099

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332730	Kjeldahl Nitrogen	104	95.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P415492

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332654	NO2NO3-N	96.5	96.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P415014

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332730	Total-P	109	108	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P415393

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2333178	Fluoride	103	103	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P415135

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2332876	Organic Carbon	90.0	93.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P414910

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332729	Color (true)	5.36	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P414915

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332729	Turbidity	3.76	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P415009

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332350	Calcium	2.31	Spike	P	0 - 20
2332350	Iron	2.61	Spike	P	0 - 20
2332350	Magnesium	1.02	Spike	P	0 - 20
2332350	Potassium	0.864	Spike	P	0 - 20
2332350	Sodium	1.16	Spike	P	0 - 20
2332350	Strontium	0.0407	Spike	P	0 - 20
2332350	Tin	1.39	Spike	P	0 - 20
2332350	Titanium	7.49	Spike	P	0 - 20
2332350	Vanadium	0.405	Spike	P	0 - 20
2332350	Zinc	0.759	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P415009

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332350	Antimony	2.59	Spike	P	0 - 20
2332350	Arsenic	2.27	Spike	P	0 - 20
2332350	Barium	2.05	Spike	P	0 - 20
2332350	Beryllium	1.81	Spike	P	0 - 20
2332350	Boron	1.45	Spike	P	0 - 20
2332350	Cadmium	3.11	Spike	P	0 - 20
2332350	Chromium	1.31	Spike	P	0 - 20
2332350	Cobalt	1.23	Spike	P	0 - 20
2332350	Copper	1.23	Spike	P	0 - 20
2332350	Lead	1.43	Spike	P	0 - 20
2332350	Manganese	1.35	Spike	P	0 - 20
2332350	Molybdenum	0.894	Spike	P	0 - 20
2332350	Nickel	1.17	Spike	P	0 - 20
2332350	Selenium	1.05	Spike	P	0 - 20
2332350	Silver	0.742	Spike	P	0 - 20
2332350	Thallium	2.48	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P415208

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332374	Aluminum	2.15	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415410

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332669	Chloride	2.74	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P415415

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332669	Sulfate	1.25	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P415487

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332814	Ammonia-N	0.323	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P415099

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332730	Kjeldahl Nitrogen	6.34	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P415492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332654	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P415014

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332730	Total-P	1.03	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P415388

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2333178	Total Alkalinity	0.100	Sample	P	0 - 3.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P415243

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332513	TDS	7.00	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P415393

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2333178	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P415135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2332876	Organic Carbon	1.91	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A112681

Included Lab Sample IDs: 2332729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.6	104	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A112682

Included Lab Sample IDs: 2332729

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A112753

Included Lab Sample IDs: 2332732

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.9	99.7	P/P	90 - 110
Iron	101	102	P/P	90 - 110
Magnesium	101	102	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	99.2	98.6	P/P	90 - 110
Strontium	103	103	P/P	90 - 110
Tin	100	100	P/P	90 - 110
Titanium	98.6	100	P/P	90 - 110
Vanadium	100	100	P/P	90 - 110
Zinc	101	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A112755

Included Lab Sample IDs: 2332732

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	98.0	98.2	P/P	90 - 110
Arsenic	100	99.1	P/P	90 - 110
Barium	98.7	98.3	P/P	90 - 110
Beryllium	94.9	94.2	P/P	90 - 110
Boron	100	98.5	P/P	90 - 110
Cadmium	98.3	97.2	P/P	90 - 110
Chromium	97.1	95.5	P/P	90 - 110
Cobalt	98.3	97.2	P/P	90 - 110
Copper	100	98.7	P/P	90 - 110
Lead	98.6	98.7	P/P	90 - 110
Manganese	97.0	96.8	P/P	90 - 110
Molybdenum	98.7	98.1	P/P	90 - 110
Nickel	99.7	98.0	P/P	90 - 110
Selenium	97.7	96.8	P/P	90 - 110
Silver	100	99.2	P/P	90 - 110
Thallium	98.5	98.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A112797

Included Lab Sample IDs: 2332730

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.4	98.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A112847

Included Lab Sample IDs: 2332730

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A112854

Included Lab Sample IDs: 2332732

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	105	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112887

Included Lab Sample IDs: 2332730

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.8	99.0	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A112906

Included Lab Sample IDs: 2332729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	102	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A112906

Included Lab Sample IDs: 2332729

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	103	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A112925

Included Lab Sample IDs: 2332729

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A112954

Included Lab Sample IDs: 2332730

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	96.8	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A112961

Included Lab Sample IDs: 2332730

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

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
DEP SOP: NU-094-1	Color (true)	98.8				5.36	
EPA 180.1 Rev. 2.0	Turbidity	97.1				3.76	
EPA 200.7 Rev. 4.4	Calcium	103	98.8	101			2.31
	Iron	103	102	105	103		2.61
	Magnesium	104	101	102	104		1.02
	Potassium	106	103	104	111		0.864
	Sodium	102	101	102			1.16
	Strontium	103	104	104	105		0.0407
	Tin	100	97.9	99.3	103		1.39
	Titanium	100	104	113	101		7.49
	Vanadium	94.3	96.1	96.5	97.5		0.405
	Zinc	99.2	98.1	98.9	102		0.759
EPA 200.8 Rev. 5.4	Aluminum	102	102	99.5	109		2.15
	Antimony	99.7	97.7	100	101		2.59
	Arsenic	101	98.9	101	100		2.27
	Barium	103	104	101	104		2.05
	Beryllium	96.5	96.6	98.6	95.3		1.81
	Boron	106	107	108	105		1.45
	Cadmium	97.8	98.1	101	101		3.11
	Chromium	95.9	99.2	100	97.4		1.31
	Cobalt	99.1	98.1	99.3	99.4		1.23
	Copper	99.1	97.7	99.0	100		1.23
	Lead	101	100	102	102		1.43
	Manganese	96.6	99.7				1.35
	Molybdenum	99.2	99.7	101	101		0.894
	Nickel	100	100	102	102		1.17
	Selenium	98.6	96.7	97.7	98.4		1.05
	Silver	99.4	98.5	99.2	100		0.742
	Thallium	102	102	105	104		2.48
EPA 300.0 Rev. 2.1	Chloride	99.6	100	99.7		2.74	
	Sulfate	98.9	99.2	99.2		1.25	
EPA 350.1 Rev. 2.0	Ammonia-N	102	109	109			0.323
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.2	104	95.6			6.34
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	96.5	96.5			0.0
EPA 365.1 Rev. 2.0	Total-P	103	109	108			1.03
SM 2320 B-2011	Total Alkalinity	103				0.100	
SM 2540 C-2011	TDS					7.00	
SM 4500-F- C-2011	Fluoride	102	103	103			0.0
SM 5310 B-2011	Organic Carbon	89.1	90.0	93.2			1.91

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2332729
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2332729
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2332732
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2332732
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2332729
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2332729
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2332730
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2332730

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2332730
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2332730
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2332729
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2332732
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2332729
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2332729
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2332729
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2332730

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	06/07/2022			06/08/2022 16:00	Samantha L Bates	2332729
EPA 180.1 Rev. 2.0	06/07/2022			06/08/2022 11:14	Khloe J Berg	2332729
EPA 200.7 Rev. 4.4	06/07/2022	06/10/2022 10:12	Megan Whitefoot	06/11/2022 15:12	Betina Topolski	2332732
EPA 200.8 Rev. 5.4	06/07/2022	06/10/2022 10:12	Megan Whitefoot	06/10/2022 19:52	Alexander Thompson	2332732
	06/07/2022	06/15/2022 09:35	Megan Whitefoot	06/15/2022 15:59	Alexander Thompson	2332732
EPA 300.0 Rev. 2.1	06/07/2022			06/15/2022 21:37	Anna M. Plaviak	2332729
EPA 350.1 Rev. 2.0	06/07/2022			06/21/2022 11:23	Ping Hua	2332730
EPA 351.2 Rev. 2.0	06/07/2022	06/14/2022 16:18	Samantha L Bates	06/16/2022 11:13	Alexandra J Mattheus	2332730
EPA 353.2 Rev. 2.0	06/07/2022			06/20/2022 12:33	Beverly Y. Sanders	2332730
EPA 365.1 Rev. 2.0	06/07/2022	06/10/2022 14:40	Simonne.V. Calhoun	06/13/2022 16:32	James L Waggeberby	2332730
SM 2320 B-2011	06/07/2022			06/16/2022 21:47	Dale L. Simmons	2332729
SM 2340 B-2011	06/07/2022			06/11/2022 15:12	Betina Topolski	2332732
SM 2540 C-2011	06/07/2022			06/10/2022 14:26	Yijie Li	2332729
SM 2540 D-2011	06/07/2022			06/10/2022 14:26	Yijie Li	2332729
SM 4500-F- C-2011	06/07/2022			06/16/2022 21:47	Dale L. Simmons	2332729
SM 5310 B-2011	06/07/2022			06/13/2022 19:04	Judith K. Clark	2332730