Chemical Analysis Report

CEN-DIST-2022-11-30-03

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Florence Lake and Faulk Canal**
Request ID: **RQ-2022-10-03-27**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
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FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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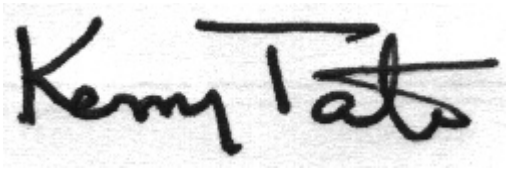
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 21-DEC-2022 10:44



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: Florence Lake @ Center **Collection Date/Time: 11/29/2022 13:00**

Field ID: G3CE0012 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2371886	DEP SOP: NU-094-1	Color (true)	210		PCU	P422939	
	EPA 180.1 Rev. 2.0	Turbidity	4.0		NTU	P422942	
	EPA 300.0 Rev. 2.1	Chloride	210		mg Cl/L	P423297	
		Sulfate	42		mg SO4/L	P423301	
	SM 2320 B-2011	Total Alkalinity	86		mg CaCO3/L	P423194	
	SM 2540 C-2015	TDS	590		mg/L	P423544	
	SM 2540 D-2015	TSS	3	I A	mg/L	P423370	
	SM 4500-F- C-2011	Fluoride	0.13		mg F/L	P423196	
2371887	EPA 350.1 Rev. 2.0	Ammonia-N	0.076		mg N/L	P423316	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P423022	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P423079	
	EPA 365.1 Rev. 2.0	Total-P	0.071		mg P/L	P423029	
	SM 5310 B-2011	Organic Carbon	23		mg C/L	P423077	
2371888	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.023		mg P/L	P422946	
2371890	EPA 200.7 Rev. 4.4	Calcium	53.3		mg/L	P422962	
		Iron	1.28E+03		ug/L	P422962	
		Magnesium	15.6		mg/L	P422962	
		Potassium	4.7		mg/L	P422962	
		Sodium	101		mg/L	P422962	
		Strontium	1.76E+03		ug/L	P422962	
		Tin	3.0	U	ug/L	P422962	
		Titanium	0.76	I	ug/L	P422962	
		Vanadium	2.0	U	ug/L	P422962	
		Zinc	5.0	U	ug/L	P422962	
	EPA 200.8 Rev. 5.4	Aluminum	15	I	ug/L	P422962	
		Antimony	0.15	I	ug/L	P422962	
		Arsenic	1.11		ug/L	P422962	
		Barium	35.1		ug/L	P422962	
		Beryllium	0.010	U	ug/L	P422962	
		Boron	33.5		ug/L	P422962	
		Cadmium	0.020	U	ug/L	P422962	
		Chromium	0.49	I	ug/L	P422962	
		Cobalt	0.241		ug/L	P422962	
		Copper	1.19		ug/L	P422962	
		Lead	1.83		ug/L	P422962	
		Manganese	27.8		ug/L	P422962	
		Molybdenum	0.71		ug/L	P422962	
		Nickel	0.76	I	ug/L	P422962	
		Selenium	0.20	U	ug/L	P422962	
		Silver	0.010	U	ug/L	P422962	
		Thallium	0.10	U	ug/L	P422962	
	SM 2340 B-2011	Hardness	197		mg/L	P422962	

Field ID: G3CE0012 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

Ref. Method and Comment:
SM 2540 C-2015: Batch relative percent difference is unavailable because of analytical difficulties.
SM 2540 D-2015: 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 are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for copper 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: P422939

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P422942

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422962

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: P422962

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: P423297

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: P423301

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423316

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423022

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423079

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423029

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422946

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

Reference Method: SM 2320 B-2011
Batch ID: P423194

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

Reference Method: SM 2540 C-2015
Batch ID: P423544

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P423370

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P423196

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P423077

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: P422939

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.9		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P422942

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	109		P	85 - 115
Iron	112		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	108		P	85 - 115
Sodium	111		P	85 - 115
Strontium	107		P	85 - 115
Tin	107		P	85 - 115
Titanium	107		P	85 - 115
Vanadium	105		P	85 - 115
Zinc	104		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.3		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	96.6		P	85 - 115
Barium	99.0		P	85 - 115
Beryllium	95.8		P	85 - 115
Boron	100		P	85 - 115
Cadmium	103		P	85 - 115
Chromium	95.9		P	85 - 115
Cobalt	94.3		P	85 - 115
Copper	97.3		P	85 - 115
Lead	91.8		P	85 - 115
Manganese	95.6		P	85 - 115
Molybdenum	95.6		P	85 - 115
Nickel	97.1		P	85 - 115
Selenium	96.4		P	85 - 115
Silver	98.1		P	85 - 115
Thallium	94.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423297

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423301

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423316

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423022

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423079

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423029

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422946

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

Reference Method: SM 2320 B-2011
Batch ID: P423194

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.9		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P423544

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	92.4		P	90 - 110

Reference Method: SM 2540 D-2015
Batch ID: P423370

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	91.5		P	85 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P423196

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P423077

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.5		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371117	Calcium	103		P	80 - 120
2371117	Iron	109	105	P/P	80 - 120
2371117	Magnesium	104		P	80 - 120
2371117	Potassium	106	100	P/P	80 - 120
2371117	Sodium	109	101	P/P	80 - 120
2371117	Strontium	104	99.9	P/P	80 - 120
2371117	Tin	107	103	P/P	80 - 120
2371117	Titanium	103	101	P/P	80 - 120
2371117	Vanadium	103	101	P/P	80 - 120
2371117	Zinc	97.3	95.5	P/P	80 - 120
2371789	Iron	108		P	80 - 120
2371789	Magnesium	110		P	80 - 120
2371789	Potassium	103		P	80 - 120
2371789	Sodium	111		P	80 - 120
2371789	Strontium	103		P	80 - 120
2371789	Tin	106		P	80 - 120
2371789	Titanium	106		P	80 - 120
2371789	Vanadium	103		P	80 - 120
2371789	Zinc	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371117	Aluminum	95.7	92.4	P/P	80 - 120
2371117	Antimony	106	103	P/P	80 - 120
2371117	Arsenic	100	96.7	P/P	80 - 120
2371117	Barium	101	99.1	P/P	80 - 120
2371117	Beryllium	92.6	94.4	P/P	80 - 120
2371117	Boron	100	98.1	P/P	80 - 120
2371117	Cadmium	106	103	P/P	80 - 120
2371117	Chromium	101	99.9	P/P	80 - 120
2371117	Cobalt	94.7	92.7	P/P	80 - 120
2371117	Lead	91.6	91.1	P/P	80 - 120
2371117	Manganese	98.1	98.2	P/P	80 - 120
2371117	Molybdenum	101	97.8	P/P	80 - 120
2371117	Nickel	97.8	96.1	P/P	80 - 120
2371117	Selenium	99.1	96.5	P/P	80 - 120
2371117	Silver	98.4	96.4	P/P	80 - 120
2371117	Thallium	100	98.4	P/P	80 - 120
2371789	Aluminum	93.6		P	80 - 120
2371789	Antimony	103		P	80 - 120
2371789	Arsenic	100		P	80 - 120
2371789	Barium	98.2		P	80 - 120
2371789	Beryllium	93.7		P	80 - 120
2371789	Boron	102		P	80 - 120
2371789	Cadmium	103		P	80 - 120
2371789	Chromium	98.3		P	80 - 120
2371789	Cobalt	100		P	80 - 120
2371789	Copper	89.6		P	80 - 120
2371789	Lead	97.1		P	80 - 120
2371789	Manganese	96.4		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371789	Molybdenum	100		P	80 - 120
2371789	Nickel	90.7		P	80 - 120
2371789	Selenium	98.3		P	80 - 120
2371789	Silver	95.7		P	80 - 120
2371789	Thallium	99.2		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423297

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2372052	Chloride	101		P	90 - 110
2372062	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423301

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2372052	Sulfate	98.9		P	90 - 110
2372062	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371797	Ammonia-N	104	110	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423022

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371734	Kjeldahl Nitrogen	94.1	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2372453	NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423029

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371787	Total-P	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422946

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371888	O-Phosphate-P	98.6	97.2	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P423196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371786	Fluoride	101	99.5	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P423077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371948	Organic Carbon	98.6	98.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P422939

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371795	Color (true)	2.61	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P422942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371692	Turbidity	1.61	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P422962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371117	Calcium	5.48	Spike	P	0 - 20
2371117	Iron	3.22	Spike	P	0 - 20
2371117	Magnesium	3.75	Spike	P	0 - 20
2371117	Potassium	4.13	Spike	P	0 - 20
2371117	Sodium	4.14	Spike	P	0 - 20
2371117	Strontium	4.14	Spike	P	0 - 20
2371117	Tin	4.23	Spike	P	0 - 20
2371117	Titanium	1.38	Spike	P	0 - 20
2371117	Vanadium	1.41	Spike	P	0 - 20
2371117	Zinc	1.39	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P422962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371117	Aluminum	3.46	Spike	P	0 - 20
2371117	Antimony	2.14	Spike	P	0 - 20
2371117	Arsenic	3.77	Spike	P	0 - 20
2371117	Barium	1.42	Spike	P	0 - 20
2371117	Beryllium	1.91	Spike	P	0 - 20
2371117	Boron	1.83	Spike	P	0 - 20
2371117	Cadmium	2.43	Spike	P	0 - 20
2371117	Chromium	1.15	Spike	P	0 - 20
2371117	Cobalt	2.17	Spike	P	0 - 20
2371117	Copper	0.947	Spike	P	0 - 20
2371117	Lead	0.496	Spike	P	0 - 20
2371117	Manganese	0.0534	Spike	P	0 - 20
2371117	Molybdenum	2.52	Spike	P	0 - 20
2371117	Nickel	1.80	Spike	P	0 - 20
2371117	Selenium	2.60	Spike	P	0 - 20
2371117	Silver	2.05	Spike	P	0 - 20
2371117	Thallium	2.04	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423297

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2372052	Chloride	0.277	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423301

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2372052	Sulfate	0.501	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371797	Ammonia-N	2.93	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423022

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371734	Kjeldahl Nitrogen	9.44	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2372453	NO2NO3-N	0.426	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371787	Total-P	0.459	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422946

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371888	O-Phosphate-P	1.16	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P423194

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371786	Total Alkalinity	0.111	Sample	P	0 - 3.8

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P423196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371786	Fluoride	0.953	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P423077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371948	Organic Carbon	0.101	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: A116195
Included Lab Sample IDs: 2371886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.7	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A116196
Included Lab Sample IDs: 2371886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.0	98.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A116197
Included Lab Sample IDs: 2371888

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A116245
Included Lab Sample IDs: 2371890

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	105	101	P/P	90 - 110
Iron	107	101	P/P	90 - 110
Magnesium	106	101	P/P	90 - 110
Potassium	105	98.8	P/P	90 - 110
Sodium	104	98.9	P/P	90 - 110
Strontium	103	104	P/P	90 - 110
Tin	104	104	P/P	90 - 110
Titanium	102	102	P/P	90 - 110
Vanadium	99.7	99.6	P/P	90 - 110
Zinc	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116255
Included Lab Sample IDs: 2371887

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

Reference Method: SM 5310 B-2011
Run ID: A116256
Included Lab Sample IDs: 2371887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.0	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A116257
Included Lab Sample IDs: 2371887

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A116257
Included Lab Sample IDs: 2371887

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A116269
Included Lab Sample IDs: 2371890

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	95.9	96.7	P/P	90 - 110
Antimony	101	102	P/P	90 - 110
Arsenic	97.9	98.6	P/P	90 - 110
Barium	96.6	96.4	P/P	90 - 110
Beryllium	97.3	98.4	P/P	90 - 110
Boron	96.1	94.7	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	95.2	94.7	P/P	90 - 110
Manganese	96.2	96.8	P/P	90 - 110
Molybdenum	95.2	95.9	P/P	90 - 110
Selenium	101	103	P/P	90 - 110
Silver	95.4	94.4	P/P	90 - 110
Thallium	97.9	96.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A116272
Included Lab Sample IDs: 2371886

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A116281
Included Lab Sample IDs: 2371887

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

Reference Method: SM 2320 B-2011
Run ID: A116298
Included Lab Sample IDs: 2371886

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.7	95.0	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A116298
Included Lab Sample IDs: 2371886

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A116317
Included Lab Sample IDs: 2371890

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	92.8	92.6	P/P	90 - 110
Nickel	90.6	91.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A116336
Included Lab Sample IDs: 2371887

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	99.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A116345
Included Lab Sample IDs: 2371890

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cobalt	96.4	96.4	P/P	90 - 110
Lead	94.0	94.3	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
DEP SOP: NU-094-1	Color (true)	97.9					2.61	
EPA 180.1 Rev. 2.0	Turbidity	99.4					1.61	
EPA 200.7 Rev. 4.4	Calcium	109	103					5.48
	Iron	112	109	105	108			3.22
	Magnesium	110	104	110				3.75
	Potassium	108	106	100	103			4.13
	Sodium	111	109	101	111			4.14
	Strontium	107	104	99.9	103			4.14
	Tin	107	107	103	106			4.23
	Titanium	107	103	101	106			1.38
	Vanadium	105	103	101	103			1.41
	Zinc	104	97.3	95.5	100			1.39
EPA 200.8 Rev. 5.4	Aluminum	96.3	95.7	92.4	93.6			3.46
	Antimony	102	106	103	103			2.14
	Arsenic	96.6	100	96.7	100			3.77
	Barium	99.0	101	99.1	98.2			1.42
	Beryllium	95.8	92.6	94.4	93.7			1.91
	Boron	100	100	98.1	102			1.83
	Cadmium	103	106	103	103			2.43
	Chromium	95.9	101	99.9	98.3			1.15
	Cobalt	94.3	100	94.7	92.7			2.17
	Copper	97.3	89.6					0.947
	Lead	91.8	97.1	91.6	91.1			0.496
	Manganese	95.6	96.4	98.1	98.2			0.0534
	Molybdenum	95.6	101	97.8	100			2.52
	Nickel	97.1	97.8	96.1	90.7			1.80
	Selenium	96.4	99.1	96.5	98.3			2.60
	Silver	98.1	98.4	96.4	95.7			2.05
	Thallium	94.4	100	98.4	99.2			2.04
EPA 300.0 Rev. 2.1	Chloride	102	101	101			0.277	
	Sulfate	102	98.9	102			0.501	
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	104	110				2.93
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	94.1	108				9.44
EPA 353.2 Rev. 2.0	NO2NO3-N	103	104	103				0.426
EPA 365.1 Rev. 2.0	Total-P	107	106	106				0.459
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	98.6	97.2				1.16
SM 2320 B-2011	Total Alkalinity	95.9					0.111	
SM 2540 C-2015	TDS	92.4						
SM 2540 D-2015	TSS	91.5						
SM 4500-F- C-2011	Fluoride	100	101	99.5				0.953
SM 5310 B-2011	Organic Carbon	96.5	98.6	98.6				0.101

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2371886
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2371886
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2371890
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2371890
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2371886
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2371886

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2371887
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2371887
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2371887
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2371887
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2371888
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2371886
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2371890
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2371886
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2371886
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2371886
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2371887

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	11/30/2022			11/30/2022 14:49	Chandler E Cox	2371886
EPA 180.1 Rev. 2.0	11/30/2022			11/30/2022 14:14	Anna M. Plaviak	2371886
EPA 200.7 Rev. 4.4	11/30/2022	12/01/2022 11:10	Megan Whitefoot	12/02/2022 23:01	McKinley C Carter	2371890
EPA 200.8 Rev. 5.4	11/30/2022	12/01/2022 11:10	Megan Whitefoot	12/05/2022 20:37	Emily M Philpot	2371890
	11/30/2022	12/01/2022 11:10	Megan Whitefoot	12/07/2022 21:01	Megan Whitefoot	2371890
	11/30/2022	12/01/2022 11:10	Megan Whitefoot	12/08/2022 21:52	Emily M Philpot	2371890
EPA 300.0 Rev. 2.1	11/30/2022			12/08/2022 04:05	Anna M. Plaviak	2371886
EPA 350.1 Rev. 2.0	11/30/2022			12/08/2022 14:31	Ping Hua	2371887
EPA 351.2 Rev. 2.0	11/30/2022	12/02/2022 13:20	Simonne.V. Calhoun	12/06/2022 11:35	Samantha L Bates	2371887
EPA 353.2 Rev. 2.0	11/30/2022			12/05/2022 09:42	Beverly Y. Sanders	2371887
EPA 365.1 Rev. 2.0	11/30/2022	12/02/2022 09:51	Adam P Silver	12/05/2022 10:34	James L Waggerby	2371887
EPA 365.1 Rev. 2.0 dissolved	11/30/2022			11/30/2022 15:31	Elise M. Gillis	2371888
SM 2320 B-2011	11/30/2022			12/06/2022 00:18	Dale L. Simmons	2371886
SM 2340 B-2011	11/30/2022			12/02/2022 23:01	McKinley C Carter	2371890
SM 2540 C-2015	11/30/2022			12/05/2022 16:21	Yijie Li	2371886
SM 2540 D-2015	11/30/2022			12/05/2022 16:21	Yijie Li	2371886
SM 4500-F- C-2011	11/30/2022			12/06/2022 00:18	Dale L. Simmons	2371886
SM 5310 B-2011	11/30/2022			12/02/2022 21:30	Elise M. Gillis	2371887