Chemical Analysis Report

SO-DIST-2023-03-15-03

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

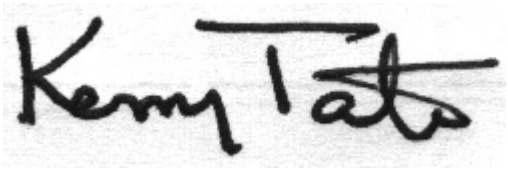
Event Description: **2023 SMP: Bobcat Resample**
Request ID: **RQ-2023-03-20-41**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 314
Fort Myers, FL 33901-3381
Attn: William Mullen

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

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

Date Certified: 30-MAR-2023 14:38



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: BOBCAT CREEK IN PRESERVE EAST **Collection Date/Time: 03/14/2023 09:55**

Field ID: G3SD0131 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2394010	DEP SOP: NU-094-1	Color (true)	62		PCU	P427217	
	EPA 180.1 Rev. 2.0	Turbidity	12		NTU	P427201	
	EPA 300.0 Rev. 2.1	Chloride	36		mg Cl/L	P427727	
		Sulfate	11		mg SO4/L	P427730	
	SM 2320 B-2011	Total Alkalinity	106	AJ	mg CaCO3/L	P427349	RPD
	SM 2540 C-2015	TDS	204		mg/L	P427644	
	SM 2540 D-2015	TSS	18		mg/L	P427537	
	SM 4500-F- C-2011	Fluoride	0.63		mg F/L	P427356	
2394011	EPA 350.1 Rev. 2.0	Ammonia-N	0.029		mg N/L	P427417	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P427434	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P427342	
	EPA 365.1 Rev. 2.0	Total-P	0.89		mg P/L	P427333	
	SM 5310 B-2011	Organic Carbon	15		mg C/L	P427625	
2394022	EPA 200.7 Rev. 4.4	Calcium	38.9		mg/L	P427227	
		Iron	2.95E+03		ug/L	P427227	
		Magnesium	10.2		mg/L	P427227	
		Potassium	1.5		mg/L	P427227	
		Sodium	24.7		mg/L	P427227	
		Strontium	391		ug/L	P427227	
		Tin	3.0	U	ug/L	P427227	
		Titanium	1.1	I	ug/L	P427227	
		Vanadium	3.6	I	ug/L	P427227	
		Zinc	6.2	I	ug/L	P427227	
	EPA 200.8 Rev. 5.4	Aluminum	240		ug/L	P427227	
		Antimony	0.061	I	ug/L	P427227	
		Arsenic	1.85		ug/L	P427227	
		Barium	5.16		ug/L	P427227	
		Beryllium	0.022	I	ug/L	P427227	
		Boron	44.9		ug/L	P427227	
		Cadmium	0.020	U	ug/L	P427227	
		Chromium	3.4		ug/L	P427227	
		Cobalt	0.169		ug/L	P427227	
		Copper	0.43	I	ug/L	P427227	
		Lead	0.27	I	ug/L	P427227	
		Manganese	20.5		ug/L	P427227	
		Molybdenum	0.59	I	ug/L	P427227	
		Nickel	0.54	I	ug/L	P427227	
		Selenium	0.20	U	ug/L	P427227	
		Silver	0.010	U	ug/L	P427227	
		Thallium	0.10	U	ug/L	P427227	
	SM 2340 B-2011	Hardness	139		mg/L	P427227	

Field ID: G3SD0131 Matrix: W-SURF-FRH

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

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 2320 B-2011: Refer to the Lab Analysis Report for an explanation of QC Codes.
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500-F- C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P427217

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P427201

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P427227

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: P427227

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: P427727

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: P427730

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427417

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427434

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427342

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427333

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

Reference Method: SM 2320 B-2011
Batch ID: P427349

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

Reference Method: SM 2540 C-2015
Batch ID: P427644

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P427537

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P427356

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P427625

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: P427217

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P427201

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P427227

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	107		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	102		P	85 - 115
Sodium	106		P	85 - 115
Strontium	102		P	85 - 115
Tin	103		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427227

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.9		P	85 - 115
Antimony	97.2		P	85 - 115
Arsenic	98.3		P	85 - 115
Barium	101		P	85 - 115
Beryllium	96.0		P	85 - 115
Boron	96.4		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	99.3		P	85 - 115
Cobalt	97.5		P	85 - 115
Copper	97.5		P	85 - 115
Lead	94.4		P	85 - 115
Manganese	100		P	85 - 115
Molybdenum	97.5		P	85 - 115
Nickel	99.6		P	85 - 115
Selenium	97.9		P	85 - 115
Silver	96.0		P	85 - 115
Thallium	98.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427727

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.7		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427730

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427417

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427434

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427342

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427333

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

Reference Method: SM 2320 B-2011
Batch ID: P427349

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.8		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P427644

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

Reference Method: SM 2540 D-2015
Batch ID: P427537

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	99.0		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P427356

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	103		P	96 - 104

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P427625

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P427227

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393877	Calcium	102		P	80 - 120
2393877	Iron	105	103	P/P	80 - 120
2393877	Magnesium	105	103	P/P	80 - 120
2393877	Potassium	100	102	P/P	80 - 120
2393877	Sodium	103	102	P/P	80 - 120
2393877	Strontium	101	101	P/P	80 - 120
2393877	Tin	102	102	P/P	80 - 120
2393877	Titanium	101	102	P/P	80 - 120
2393877	Vanadium	101	101	P/P	80 - 120
2393877	Zinc	99.5	97.9	P/P	80 - 120
2393881	Calcium	107		P	80 - 120
2393881	Iron	107		P	80 - 120
2393881	Magnesium	108		P	80 - 120
2393881	Potassium	103		P	80 - 120
2393881	Sodium	102		P	80 - 120
2393881	Strontium	104		P	80 - 120
2393881	Tin	106		P	80 - 120
2393881	Titanium	103		P	80 - 120
2393881	Vanadium	103		P	80 - 120
2393881	Zinc	103		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427227

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393877	Aluminum	101	95.4	P/P	80 - 120
2393877	Antimony	94.4	94.7	P/P	80 - 120
2393877	Arsenic	94.9	96.9	P/P	80 - 120
2393877	Barium	99.7	97.9	P/P	80 - 120
2393877	Beryllium	88.9	93.4	P/P	80 - 120
2393877	Boron	96.8	94.7	P/P	80 - 120
2393877	Cadmium	95.9	98.3	P/P	80 - 120
2393877	Chromium	99.9	99.0	P/P	80 - 120
2393877	Cobalt	96.3	96.0	P/P	80 - 120
2393877	Copper	96.9	97.1	P/P	80 - 120
2393877	Lead	95.7	94.3	P/P	80 - 120
2393877	Manganese	99.8	99.5	P/P	80 - 120
2393877	Molybdenum	98.2	97.6	P/P	80 - 120
2393877	Nickel	98.0	97.5	P/P	80 - 120
2393877	Selenium	92.1	96.4	P/P	80 - 120
2393877	Silver	95.4	94.5	P/P	80 - 120
2393877	Thallium	101	99.1	P/P	80 - 120
2393881	Aluminum	97.3		P	80 - 120
2393881	Antimony	96.5		P	80 - 120
2393881	Arsenic	96.6		P	80 - 120
2393881	Barium	100		P	80 - 120
2393881	Beryllium	95.7		P	80 - 120
2393881	Boron	99.5		P	80 - 120
2393881	Cadmium	99.5		P	80 - 120
2393881	Chromium	97.9		P	80 - 120
2393881	Cobalt	94.9		P	80 - 120
2393881	Copper	95.5		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427227

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393881	Lead	95.6		P	80 - 120
2393881	Manganese	101		P	80 - 120
2393881	Molybdenum	97.3		P	80 - 120
2393881	Nickel	96.7		P	80 - 120
2393881	Selenium	95.3		P	80 - 120
2393881	Silver	96.2		P	80 - 120
2393881	Thallium	99.8		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427727

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394077	Chloride	97.0		P	90 - 110
2394243	Chloride	97.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427730

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394077	Sulfate	95.4		P	90 - 110
2394243	Sulfate	96.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427417

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393943	Ammonia-N	105	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394011	Kjeldahl Nitrogen	97.4	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427342

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393901	NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427333

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394042	Total-P	103	104	P/P	90 - 110

Reference Method: SM 5310 B-2011
Batch ID: P427625

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393846	Organic Carbon	94.0	94.3	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P427217

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394027	Color (true)	0.571	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P427201

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393841	Turbidity	15.8	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P427227

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393877	Calcium	0.283	Spike	P	0 - 20
2393877	Iron	1.15	Spike	P	0 - 20
2393877	Magnesium	1.39	Spike	P	0 - 20
2393877	Potassium	1.24	Spike	P	0 - 20
2393877	Sodium	0.848	Spike	P	0 - 20
2393877	Strontium	0.0692	Spike	P	0 - 20
2393877	Tin	0.646	Spike	P	0 - 20
2393877	Titanium	0.826	Spike	P	0 - 20
2393877	Vanadium	0.119	Spike	P	0 - 20
2393877	Zinc	1.70	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427227

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393877	Aluminum	4.57	Spike	P	0 - 20
2393877	Antimony	0.318	Spike	P	0 - 20
2393877	Arsenic	2.10	Spike	P	0 - 20
2393877	Barium	1.51	Spike	P	0 - 20
2393877	Beryllium	4.65	Spike	P	0 - 20
2393877	Boron	2.02	Spike	P	0 - 20
2393877	Cadmium	2.47	Spike	P	0 - 20
2393877	Chromium	0.828	Spike	P	0 - 20
2393877	Cobalt	0.265	Spike	P	0 - 20
2393877	Copper	0.196	Spike	P	0 - 20
2393877	Lead	1.49	Spike	P	0 - 20
2393877	Manganese	0.216	Spike	P	0 - 20
2393877	Molybdenum	0.552	Spike	P	0 - 20
2393877	Nickel	0.488	Spike	P	0 - 20
2393877	Selenium	4.60	Spike	P	0 - 20
2393877	Silver	0.964	Spike	P	0 - 20
2393877	Thallium	1.64	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427727

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394077	Chloride	1.78	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427417

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393943	Ammonia-N	5.53	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394011	Kjeldahl Nitrogen	3.06	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427342

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393901	NO2NO3-N	0.264	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427333

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394042	Total-P	1.36	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P427349

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394010	Total Alkalinity	3.92	Sample	F	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P427644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393812	TDS	5.30	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P427356

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394010	Fluoride	0.989	Spike	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 5310 B-2011
Batch ID: P427625

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393846	Organic Carbon	0.266	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A118016
Included Lab Sample IDs: 2394010

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

Reference Method: DEP SOP: NU-094-1
Run ID: A118035
Included Lab Sample IDs: 2394010

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A118071
Included Lab Sample IDs: 2394022

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.5	96.7	P/P	90 - 110
Antimony	95.9	96.1	P/P	90 - 110
Arsenic	97.2	96.8	P/P	90 - 110
Barium	97.5	98.0	P/P	90 - 110
Beryllium	96.1	97.1	P/P	90 - 110
Boron	94.0	93.2	P/P	90 - 110
Cadmium	98.2	97.0	P/P	90 - 110
Chromium	96.5	97.7	P/P	90 - 110
Cobalt	94.6	94.9	P/P	90 - 110
Copper	94.6	95.4	P/P	90 - 110
Lead	94.3	94.2	P/P	90 - 110
Manganese	99.7	100	P/P	90 - 110
Molybdenum	96.5	97.0	P/P	90 - 110
Nickel	95.9	96.5	P/P	90 - 110
Selenium	99.4	98.9	P/P	90 - 110
Silver	94.6	94.7	P/P	90 - 110
Thallium	98.7	98.9	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A118077
Included Lab Sample IDs: 2394010

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	93.5	96.1	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A118077
Included Lab Sample IDs: 2394010

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A118078
Included Lab Sample IDs: 2394011

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A118078
Included Lab Sample IDs: 2394011

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A118094
Included Lab Sample IDs: 2394011

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A118109
Included Lab Sample IDs: 2394011

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.4	96.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A118124
Included Lab Sample IDs: 2394010

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	96.4	97.1	P/P	90 - 110
Sulfate	96.8	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A118158
Included Lab Sample IDs: 2394011

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.8	98.8	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A118179
Included Lab Sample IDs: 2394011

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.4	96.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A118244
Included Lab Sample IDs: 2394022

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	103	P/P	90 - 110
Iron	104	104	P/P	90 - 110
Magnesium	103	104	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	104	99.7	P/P	90 - 110
Strontium	103	101	P/P	90 - 110
Tin	102	102	P/P	90 - 110
Titanium	102	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A118244
Included Lab Sample IDs: 2394022

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Vanadium	102	102	P/P	90 - 110
Zinc	103	102	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)	100					0.571	
EPA 180.1 Rev. 2.0	Turbidity	100					15.8	
EPA 200.7 Rev. 4.4	Calcium	104	102	107				0.283
	Iron	107	105	103	107			1.15
	Magnesium	107	105	103	108			1.39
	Potassium	102	100	102	103			1.24
	Sodium	106	103	102	102			0.848
	Strontium	102	101	101	104			0.0692
	Tin	103	102	102	106			0.646
	Titanium	102	101	102	103			0.826
	Vanadium	101	101	101	103			0.119
	Zinc	102	99.5	97.9	103			1.70
EPA 200.8 Rev. 5.4	Aluminum	96.9	101	95.4	97.3			4.57
	Antimony	97.2	94.4	94.7	96.5			0.318
	Arsenic	98.3	94.9	96.9	96.6			2.10
	Barium	101	99.7	97.9	100			1.51
	Beryllium	96.0	88.9	93.4	95.7			4.65
	Boron	96.4	96.8	94.7	99.5			2.02
	Cadmium	98.9	95.9	98.3	99.5			2.47
	Chromium	99.3	99.9	99.0	97.9			0.828
	Cobalt	97.5	96.3	96.0	94.9			0.265
	Copper	97.5	96.9	97.1	95.5			0.196
	Lead	94.4	95.7	94.3	95.6			1.49
	Manganese	100	99.8	99.5	101			0.216
	Molybdenum	97.5	98.2	97.6	97.3			0.552
	Nickel	99.6	98.0	97.5	96.7			0.488
	Selenium	97.9	92.1	96.4	95.3			4.60
	Silver	96.0	95.4	94.5	96.2			0.964
	Thallium	98.7	101	99.1	99.8			1.64
EPA 300.0 Rev. 2.1	Chloride	98.7	97.0	97.3			1.78	
	Sulfate	98.7	95.4	96.4				
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	105	99.0				5.53
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	97.4	101				3.06
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.0	99.5				0.264
EPA 365.1 Rev. 2.0	Total-P	101	103	104				1.36
SM 2320 B-2011	Total Alkalinity	95.8					3.92	
SM 2540 C-2015	TDS	105					5.30	
SM 2540 D-2015	TSS	99.0						
SM 4500-F- C-2011	Fluoride	103						0.989
SM 5310 B-2011	Organic Carbon	94.8	94.0	94.3				0.266

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2394010
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2394010
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2394022
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2394022
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2394010
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2394010
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2394011

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2394011
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2394011
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2394011
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2394010
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2394022
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2394010
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2394010
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2394010
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2394011

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	03/15/2023			03/15/2023 17:40	Alexis Price	2394010
EPA 180.1 Rev. 2.0	03/15/2023			03/15/2023 16:01	Anna M. Plaviak	2394010
EPA 200.7 Rev. 4.4	03/15/2023	03/16/2023 11:05	George D Taylor	03/28/2023 18:04	McKinley C Carter	2394022
EPA 200.8 Rev. 5.4	03/15/2023	03/16/2023 11:05	George D Taylor	03/17/2023 18:25	Conrad Hartmann	2394022
EPA 300.0 Rev. 2.1	03/15/2023			03/23/2023 14:29	Judith K. Clark	2394010
EPA 350.1 Rev. 2.0	03/15/2023			03/21/2023 13:01	Judith K. Clark	2394011
EPA 351.2 Rev. 2.0	03/15/2023	03/22/2023 10:42	Simonne.V. Calhoun	03/23/2023 11:50	Judith K. Clark	2394011
EPA 353.2 Rev. 2.0	03/15/2023			03/20/2023 11:00	Beverly Y. Sanders	2394011
EPA 365.1 Rev. 2.0	03/15/2023	03/20/2023 14:58	Adam P Silver	03/21/2023 09:51	James L Waggerby	2394011
SM 2320 B-2011	03/15/2023			03/18/2023 09:42	Dale L. Simmons	2394010
SM 2340 B-2011	03/15/2023			03/28/2023 18:04	McKinley C Carter	2394022
SM 2540 C-2015	03/15/2023			03/17/2023 15:51	Yijie Li	2394010
SM 2540 D-2015	03/15/2023			03/17/2023 15:51	Yijie Li	2394010
SM 4500-F- C-2011	03/15/2023			03/18/2023 09:30	Dale L. Simmons	2394010
SM 5310 B-2011	03/15/2023			03/23/2023 21:00	Elise M. Gillis	2394011