Chemical Analysis Report

SE-DIST-2023-03-03-01

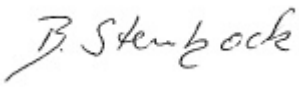
Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **SMP - Okeechobee**
Request ID: **RQ-2023-02-27-37**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Andrew Luering

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: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 23-MAR-2023 18:25



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: Gomez Creek North @ 441 **Collection Date/Time: 03/02/2023 10:00**

Field ID: G3SE0046 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391577	DEP SOP: NU-094-1	Color (true)	66	A	PCU	P426686	
	EPA 180.1 Rev. 2.0	Turbidity	20		NTU	P426689	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P427040	
		Sulfate	9.4		mg SO4/L	P427044	
	SM 2320 B-2011	Total Alkalinity	12		mg CaCO3/L	P427035	
	SM 2540 C-2015	TDS	89		mg/L	P427304	
	SM 2540 D-2015	TSS	32		mg/L	P427280	
	SM 4500-F- C-2011	Fluoride	0.16		mg F/L	P427162	
2391579	EPA 350.1 Rev. 2.0	Ammonia-N	0.048		mg N/L	P426795	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.1		mg N/L	P426910	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.015		mg N/L	P426928	
	EPA 365.1 Rev. 2.0	Total-P	0.73		mg P/L	P426916	
	SM 5310 B-2011	Organic Carbon	18		mg C/L	P426936	

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Fort Drum Creek @ 304th Street **Collection Date/Time: 03/02/2023 10:15**

Field ID: G3SE0012 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391587	EPA 200.7 Rev. 4.4	Calcium	21.3		mg/L	P426715	
		Iron	640		ug/L	P426715	
		Magnesium	3.09		mg/L	P426715	
		Potassium	2.0		mg/L	P426715	
		Sodium	10.3		mg/L	P426715	
		Strontium	280		ug/L	P426715	
		Tin	3.0	U	ug/L	P426715	
		Titanium	1.0	I	ug/L	P426715	
		Vanadium	2.0	U	ug/L	P426715	
		Zinc	5.0	U	ug/L	P426715	
	EPA 200.8 Rev. 5.4	Aluminum	101		ug/L	P426715	
		Antimony	0.050	U	ug/L	P426715	
		Arsenic	0.37		ug/L	P426715	
		Barium	13.5		ug/L	P426715	
		Beryllium	0.013	I	ug/L	P426715	
		Boron	21.5		ug/L	P426715	
		Cadmium	0.020	U	ug/L	P426715	
		Chromium	0.62	I	ug/L	P426715	
		Cobalt	0.117		ug/L	P426715	
		Copper	0.40	U	ug/L	P426715	
		Lead	0.20	U	ug/L	P426715	
		Manganese	35.7		ug/L	P426715	
		Molybdenum	0.15	U	ug/L	P426715	
		Nickel	0.50	U	ug/L	P426715	
		Selenium	0.20	U	ug/L	P426715	
		Silver	0.010	U	ug/L	P426715	
		Thallium	0.10	U	ug/L	P426715	
	SM 2340 B-2011	Hardness	66.0		mg/L	P426715	

Sample Location: Lettuce Creek @ 710 **Collection Date/Time: 03/02/2023 11:15**

Field ID: G1SE0015 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2391578	DEP SOP: NU-094-1	Color (true)	160		PCU	P426684	
	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P426689	
	EPA 300.0 Rev. 2.1	Chloride	82		mg Cl/L	P427040	
		Sulfate	27		mg SO4/L	P427044	
	SM 2320 B-2011	Total Alkalinity	128		mg CaCO3/L	P427035	
	SM 2540 C-2015	TDS	352	A	mg/L	P427304	
	SM 2540 D-2015	TSS	3	I A	mg/L	P427280	
	SM 4500-F- C-2011	Fluoride	0.15		mg F/L	P427162	
2391580	EPA 350.1 Rev. 2.0	Ammonia-N	0.068		mg N/L	P426795	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P426910	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.057		mg N/L	P426928	
	EPA 365.1 Rev. 2.0	Total-P	0.26		mg P/L	P426916	
	SM 5310 B-2011	Organic Carbon	29		mg C/L	P426936	

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P426684

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: DEP SOP: NU-094-1
Batch ID: P426686

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P426689

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426715

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: P426715

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427040

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427044

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426795

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426910

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426928

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426916

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

Reference Method: SM 2320 B-2011
Batch ID: P427035

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

Reference Method: SM 2540 C-2015
Batch ID: P427304

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P427280

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P427162

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P426936

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: P426684

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.9		P	90 - 110

Reference Method: DEP SOP: NU-094-1
Batch ID: P426686

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.0		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P426689

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426715

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	104		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	102		P	85 - 115
Sodium	103		P	85 - 115
Strontium	103		P	85 - 115
Tin	96.9		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	99.8		P	85 - 115
Zinc	98.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426715

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	104		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	106		P	85 - 115
Barium	105		P	85 - 115
Beryllium	97.8		P	85 - 115
Boron	101		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	99.0		P	85 - 115
Cobalt	104		P	85 - 115
Copper	102		P	85 - 115
Lead	96.7		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	102		P	85 - 115
Nickel	105		P	85 - 115
Selenium	102		P	85 - 115
Silver	101		P	85 - 115
Thallium	103		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427040

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427044

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426795

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426910

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.7		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426928

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426916

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.5		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P427035

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.1		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P427304

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

Reference Method: SM 2540 D-2015
Batch ID: P427280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	97.4		P	85 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P427162

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.8		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P426936

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.1		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426715

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391352	Calcium	103		P	80 - 120
2391352	Iron	103	104	P/P	80 - 120
2391352	Magnesium	102		P	80 - 120
2391352	Potassium	102	101	P/P	80 - 120
2391352	Sodium	104	103	P/P	80 - 120
2391352	Strontium	103	102	P/P	80 - 120
2391352	Tin	97.5	98.1	P/P	80 - 120
2391352	Titanium	101	99.6	P/P	80 - 120
2391352	Vanadium	100	98.9	P/P	80 - 120
2391352	Zinc	97.7	97.1	P/P	80 - 120
2391468	Calcium	102		P	80 - 120
2391468	Iron	103		P	80 - 120
2391468	Magnesium	103		P	80 - 120
2391468	Potassium	100		P	80 - 120
2391468	Sodium	99.4		P	80 - 120
2391468	Strontium	102		P	80 - 120
2391468	Tin	99.1		P	80 - 120
2391468	Titanium	99.7		P	80 - 120
2391468	Vanadium	98.8		P	80 - 120
2391468	Zinc	97.3		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426715

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391352	Aluminum	104	103	P/P	80 - 120
2391352	Antimony	106	106	P/P	80 - 120
2391352	Arsenic	107	104	P/P	80 - 120
2391352	Barium	104	104	P/P	80 - 120
2391352	Beryllium	98.8	96.5	P/P	80 - 120
2391352	Boron	99.8	101	P/P	80 - 120
2391352	Cadmium	104	103	P/P	80 - 120
2391352	Chromium	98.1	98.2	P/P	80 - 120
2391352	Cobalt	101	101	P/P	80 - 120
2391352	Copper	101	100	P/P	80 - 120
2391352	Lead	97.0	96.9	P/P	80 - 120
2391352	Manganese	103	104	P/P	80 - 120
2391352	Molybdenum	103	104	P/P	80 - 120
2391352	Nickel	101	101	P/P	80 - 120
2391352	Selenium	104	102	P/P	80 - 120
2391352	Silver	102	101	P/P	80 - 120
2391352	Thallium	104	105	P/P	80 - 120
2391468	Aluminum	102		P	80 - 120
2391468	Antimony	107		P	80 - 120
2391468	Arsenic	104		P	80 - 120
2391468	Barium	107		P	80 - 120
2391468	Beryllium	102		P	80 - 120
2391468	Boron	101		P	80 - 120
2391468	Cadmium	104		P	80 - 120
2391468	Chromium	99.0		P	80 - 120
2391468	Cobalt	102		P	80 - 120
2391468	Copper	101		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426715

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391468	Lead	98.4		P	80 - 120
2391468	Manganese	104		P	80 - 120
2391468	Molybdenum	106		P	80 - 120
2391468	Nickel	103		P	80 - 120
2391468	Selenium	101		P	80 - 120
2391468	Silver	103		P	80 - 120
2391468	Thallium	107		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427040

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391601	Chloride	99.6		P	90 - 110
2391854	Chloride	96.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391601	Sulfate	102		P	90 - 110
2391854	Sulfate	99.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426795

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391559	Ammonia-N	98.2	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391580	Kjeldahl Nitrogen	105	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426928

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391557	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426916

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391528	Total-P	98.4	97.2	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P427162

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2392889	Fluoride	100	101	P/P	94 - 104

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P426936

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2391558	Organic Carbon	97.5	96.5	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P426684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391555	Color (true)	0.322	Sample	P	0 - 20

Reference Method: DEP SOP: NU-094-1
Batch ID: P426686

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391577	Color (true)	0.162	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P426689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391441	Turbidity	1.90	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426715

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391352	Calcium	0.146	Spike	P	0 - 20
2391352	Iron	0.809	Spike	P	0 - 20
2391352	Magnesium	1.24	Spike	P	0 - 20
2391352	Potassium	0.982	Spike	P	0 - 20
2391352	Sodium	0.776	Spike	P	0 - 20
2391352	Strontium	0.551	Spike	P	0 - 20
2391352	Tin	0.576	Spike	P	0 - 20
2391352	Titanium	1.54	Spike	P	0 - 20
2391352	Vanadium	1.36	Spike	P	0 - 20
2391352	Zinc	0.643	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426715

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391352	Aluminum	0.825	Spike	P	0 - 20
2391352	Antimony	0.278	Spike	P	0 - 20
2391352	Arsenic	2.19	Spike	P	0 - 20
2391352	Barium	0.438	Spike	P	0 - 20
2391352	Beryllium	2.33	Spike	P	0 - 20
2391352	Boron	1.26	Spike	P	0 - 20
2391352	Cadmium	0.904	Spike	P	0 - 20
2391352	Chromium	0.161	Spike	P	0 - 20
2391352	Cobalt	0.0671	Spike	P	0 - 20
2391352	Copper	0.599	Spike	P	0 - 20
2391352	Lead	0.0281	Spike	P	0 - 20
2391352	Manganese	0.931	Spike	P	0 - 20
2391352	Molybdenum	0.321	Spike	P	0 - 20
2391352	Nickel	0.197	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426715

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391352	Selenium	2.81	Spike	P	0 - 20
2391352	Silver	0.507	Spike	P	0 - 20
2391352	Thallium	0.951	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427040

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391601	Chloride	0.853	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391601	Sulfate	0.704	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426795

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391559	Ammonia-N	0.107	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391580	Kjeldahl Nitrogen	3.27	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426928

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391557	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426916

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391528	Total-P	0.719	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P427035

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P427035

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2392889	Total Alkalinity	0.840	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P427304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391578	TDS	5.68	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P427162

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2392889	Fluoride	0.467	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P426936

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2391558	Organic Carbon	0.633	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: A117794
Included Lab Sample IDs: 2391577, 2391578

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.9	98.4	P/P	90 - 110
Color (true)	98.4	98.4	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A117797
Included Lab Sample IDs: 2391577, 2391578

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A117833
Included Lab Sample IDs: 2391577, 2391578

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.6	99.3	P/P	90 - 110
Sulfate	102	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A117845
Included Lab Sample IDs: 2391579, 2391580

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.1	98.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117862
Included Lab Sample IDs: 2391587

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	104	103	P/P	90 - 110
Antimony	105	105	P/P	90 - 110
Arsenic	103	105	P/P	90 - 110
Barium	104	104	P/P	90 - 110
Beryllium	103	104	P/P	90 - 110
Boron	101	96.8	P/P	90 - 110
Cadmium	104	104	P/P	90 - 110
Cobalt	101	102	P/P	90 - 110
Copper	100	101	P/P	90 - 110
Lead	96.2	96.5	P/P	90 - 110
Manganese	104	104	P/P	90 - 110
Molybdenum	103	102	P/P	90 - 110
Nickel	101	102	P/P	90 - 110
Selenium	104	105	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Thallium	104	104	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117884
Included Lab Sample IDs: 2391587

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	98.4	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A117895
Included Lab Sample IDs: 2391579, 2391580

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	102	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A117898
Included Lab Sample IDs: 2391579, 2391580

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A117927
Included Lab Sample IDs: 2391579, 2391580

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.0	97.3	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A117948
Included Lab Sample IDs: 2391577, 2391578

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	94.0	96.8	P/P	90 - 110
Total Alkalinity	96.8	94.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A117978
Included Lab Sample IDs: 2391579, 2391580

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	96.5	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A117988
Included Lab Sample IDs: 2391577, 2391578

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	100	P/P	90 - 110
Fluoride	102	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A118115
Included Lab Sample IDs: 2391587

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A118115
Included Lab Sample IDs: 2391587

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	100	102	P/P	90 - 110
Magnesium	99.5	102	P/P	90 - 110
Potassium	98.6	100	P/P	90 - 110
Sodium	100	98.7	P/P	90 - 110
Strontium	105	102	P/P	90 - 110
Tin	100	99.2	P/P	90 - 110
Titanium	99.7	98.5	P/P	90 - 110
Vanadium	99.8	101	P/P	90 - 110
Zinc	102	101	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)	98.9					0.322	
	Color (true)	99.0					0.162	
EPA 180.1 Rev. 2.0	Turbidity	101					1.90	
EPA 200.7 Rev. 4.4	Calcium	102	103	102				0.146
	Iron	104	103	104	103			0.809
	Magnesium	102	102	103				1.24
	Potassium	102	102	101	100			0.982
	Sodium	103	104	103	99.4			0.776
	Strontium	103	103	102	102			0.551
	Tin	96.9	97.5	98.1	99.1			0.576
	Titanium	101	101	99.6	99.7			1.54
	Vanadium	99.8	100	98.9	98.8			1.36
	Zinc	98.6	97.7	97.1	97.3			0.643
EPA 200.8 Rev. 5.4	Aluminum	104	104	103	102			0.825
	Antimony	104	106	106	107			0.278
	Arsenic	106	107	104	104			2.19
	Barium	105	104	104	107			0.438
	Beryllium	97.8	98.8	96.5	102			2.33
	Boron	101	99.8	101	101			1.26
	Cadmium	104	104	103	104			0.904
	Chromium	99.0	98.1	98.2	99.0			0.161
	Cobalt	104	101	101	102			0.0671
	Copper	102	101	100	101			0.599
	Lead	96.7	97.0	96.9	98.4			0.0281
	Manganese	101	103	104	104			0.931
	Molybdenum	102	103	104	106			0.321
	Nickel	105	101	101	103			0.197
	Selenium	102	104	102	101			2.81
	Silver	101	102	101	103			0.507
	Thallium	103	104	105	107			0.951
EPA 300.0 Rev. 2.1	Chloride	100	99.6	96.1			0.853	
	Sulfate	99.8	102	99.7			0.704	
EPA 350.1 Rev. 2.0	Ammonia-N	96.4	98.2	98.4				0.107
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.7	105	98.9				3.27
EPA 353.2 Rev. 2.0	NO2NO3-N	97.0	101	101				0.0
EPA 365.1 Rev. 2.0	Total-P	96.5	98.4	97.2				0.719
SM 2320 B-2011	Total Alkalinity	95.1					0.840	
SM 2540 C-2015	TDS	106					5.68	
SM 2540 D-2015	TSS	97.4						
SM 4500-F- C-2011	Fluoride	99.8	100	101				0.467
SM 5310 B-2011	Organic Carbon	96.1	97.5	96.5				0.633

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2391577, 2391578
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2391577, 2391578
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2391587
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2391587
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2391577, 2391578
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2391577, 2391578

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2391579, 2391580
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2391579, 2391580
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2391579, 2391580
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2391579, 2391580
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2391577, 2391578
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2391587
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2391577, 2391578
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2391577, 2391578
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2391577, 2391578
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2391579, 2391580

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	03/03/2023			03/03/2023 14:49	Anna M. Plaviak	2391578
	03/03/2023			03/03/2023 14:52	Anna M. Plaviak	2391577
EPA 180.1 Rev. 2.0	03/03/2023			03/03/2023 14:30	Khloe J Berg	2391577
	03/03/2023			03/03/2023 14:32	Khloe J Berg	2391578
EPA 200.7 Rev. 4.4	03/03/2023	03/06/2023 12:10	George D Taylor	03/21/2023 18:18	McKinley C Carter	2391587
EPA 200.8 Rev. 5.4	03/03/2023	03/06/2023 12:10	George D Taylor	03/07/2023 20:15	Emily M Philpot	2391587
	03/03/2023	03/06/2023 12:10	George D Taylor	03/08/2023 17:19	Conrad Hartmann	2391587
EPA 300.0 Rev. 2.1	03/03/2023			03/11/2023 04:26	Judith K. Clark	2391577
	03/03/2023			03/11/2023 05:03	Judith K. Clark	2391578
EPA 350.1 Rev. 2.0	03/03/2023			03/07/2023 11:22	Khloe J Berg	2391579
	03/03/2023			03/07/2023 11:23	Khloe J Berg	2391580
EPA 351.2 Rev. 2.0	03/03/2023	03/09/2023 14:00	Simonne.V. Calhoun	03/14/2023 13:12	Samantha L Bates	2391579
	03/03/2023	03/09/2023 14:00	Simonne.V. Calhoun	03/14/2023 13:13	Samantha L Bates	2391580
EPA 353.2 Rev. 2.0	03/03/2023			03/09/2023 10:34	Beverly Y. Sanders	2391579
	03/03/2023			03/09/2023 10:35	Beverly Y. Sanders	2391580
EPA 365.1 Rev. 2.0	03/03/2023	03/09/2023 13:42	Adam P Silver	03/10/2023 09:36	James L Waggerby	2391579
	03/03/2023	03/09/2023 13:42	Adam P Silver	03/10/2023 09:37	James L Waggerby	2391580
SM 2320 B-2011	03/03/2023			03/11/2023 07:55	Dale L. Simmons	2391577
	03/03/2023			03/11/2023 08:47	Dale L. Simmons	2391578
SM 2340 B-2011	03/03/2023			03/21/2023 18:18	McKinley C Carter	2391587
SM 2540 C-2015	03/03/2023			03/08/2023 14:08	Yijie Li	2391577, 2391578
SM 2540 D-2015	03/03/2023			03/08/2023 14:08	Yijie Li	2391577, 2391578
SM 4500-F- C-2011	03/03/2023			03/14/2023 22:15	Dale L. Simmons	2391577
	03/03/2023			03/14/2023 22:56	Dale L. Simmons	2391578
SM 5310 B-2011	03/03/2023			03/09/2023 05:30	Khloe J Berg	2391579
	03/03/2023			03/09/2023 05:45	Khloe J Berg	2391580