Chemical Analysis Report

SE-DIST-2023-02-24-03

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

Event Description: **SMP - Highlands Canoe**
Request ID: **RQ-2023-02-13-14**
Customer: **SE-DIST**
Project ID: **SMP**

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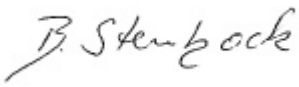
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 21-MAR-2023 12:49



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: Buck Lake Near Center **Collection Date/Time: 02/23/2023 10:45**

Field ID: G4SE0167 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2389982	DEP SOP: NU-094-1	Color (true)	4.8	I	PCU	P426369	
	EPA 180.1 Rev. 2.0	Turbidity	0.35	I	NTU	P426373	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P426869	
		Sulfate	59		mg SO4/L	P426873	
	SM 2320 B-2011	Total Alkalinity	17	A	mg CaCO3/L	P426755	
	SM 2540 C-2015	TDS	176		mg/L	P426961	
	SM 2540 D-2015	TSS	2	I	mg/L	P426805	
	SM 4500-F- C-2011	Fluoride	0.077	I	mg F/L	P426757	
2389984	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P426546	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39		mg N/L	P426844	
	EPA 353.2 Rev. 2.0	NO2NO3-N	10		mg N/L	P426787	
	EPA 365.1 Rev. 2.0	Total-P	0.003	I	mg P/L	P426514	
	SM 5310 B-2011	Organic Carbon	3.8		mg C/L	P426789	

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: Lake Crews Northern Section **Collection Date/Time: 02/23/2023 11:45**

Field ID: G4SE0168 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2389986	DEP SOP: NU-094-1	Color (true)	70		PCU	P426369	
	EPA 180.1 Rev. 2.0	Turbidity	4.2		NTU	P426373	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P426869	
		Sulfate	2.8		mg SO4/L	P426873	
	SM 2320 B-2011	Total Alkalinity	2.2	I	mg CaCO3/L	P426755	
	SM 2540 C-2015	TDS	57		mg/L	P426961	
	SM 2540 D-2015	TSS	4	I	mg/L	P426805	
	SM 4500-F- C-2011	Fluoride	0.037	I	mg F/L	P426757	
2389987	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P426600	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P476770	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P426584	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P426514	
	SM 5310 B-2011	Organic Carbon	14		mg C/L	P426789	
2389991	EPA 200.7 Rev. 4.4	Calcium	2.75		mg/L	P426398	
		Iron	64	I	ug/L	P426398	
		Magnesium	1.27		mg/L	P426398	
		Potassium	1.1	I	mg/L	P426398	
		Sodium	9.0		mg/L	P426398	
		Strontium	16.3		ug/L	P426398	
		Tin	3.0	U	ug/L	P426398	
		Titanium	1.1	I	ug/L	P426398	
		Vanadium	2.0	U	ug/L	P426398	
		Zinc	5.0	U	ug/L	P426398	
	EPA 200.8 Rev. 5.4	Aluminum	165		ug/L	P426398	
		Antimony	0.050	U	ug/L	P426398	
		Arsenic	1.44		ug/L	P426398	
		Barium	2.37		ug/L	P426398	
		Beryllium	0.010	U	ug/L	P426398	
		Boron	31.7		ug/L	P426398	
		Cadmium	0.020	U	ug/L	P426398	
		Chromium	0.40	U	ug/L	P426398	
		Cobalt	0.022	I	ug/L	P426398	
		Copper	0.60	I	ug/L	P426398	
		Lead	0.28	I	ug/L	P426398	
		Manganese	7.12		ug/L	P426398	
		Molybdenum	0.15	U	ug/L	P426398	
		Nickel	0.50	U	ug/L	P426398	
		Selenium	0.20	U	ug/L	P426398	
		Silver	0.010	U	ug/L	P426398	
		Thallium	0.10	U	ug/L	P426398	
	SM 2340 B-2011	Hardness	12.1		mg/L	P426398	

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: Little Lake Jackson Near Center **Collection Date/Time: 02/23/2023 13:15**

Field ID: G4SE0166 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2389983	DEP SOP: NU-094-1	Color (true)	26	A	PCU	P426369	
	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P426373	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P426869	
		Sulfate	14		mg SO4/L	P426873	
	SM 2320 B-2011	Total Alkalinity	14		mg CaCO3/L	P426755	
	SM 2540 C-2015	TDS	72		mg/L	P426961	
	SM 2540 D-2015	TSS	2	I	mg/L	P426805	
	SM 4500-F- C-2011	Fluoride	0.077	I	mg F/L	P426757	
2389985	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P426600	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.72		mg N/L	P476770	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P426584	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P426514	
	SM 5310 B-2011	Organic Carbon	7.2		mg C/L	P426789	

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: P426369

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P426373

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426398

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: P426398

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: P426869

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: P426873

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426546

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426600

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426844

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P476770

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426584

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426787

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426514

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

Reference Method: SM 2320 B-2011
Batch ID: P426755

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 C-2015
Batch ID: P426961

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P426805

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P426757

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P426789

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: P426369

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P426373

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426398

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	107		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	101		P	85 - 115
Sodium	101		P	85 - 115
Strontium	102		P	85 - 115
Tin	99.5		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426398

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.5		P	85 - 115
Antimony	96.8		P	85 - 115
Arsenic	96.3		P	85 - 115
Barium	98.8		P	85 - 115
Beryllium	95.7		P	85 - 115
Boron	100		P	85 - 115
Cadmium	98.0		P	85 - 115
Chromium	97.2		P	85 - 115
Cobalt	97.1		P	85 - 115
Copper	94.5		P	85 - 115
Lead	91.9		P	85 - 115
Manganese	95.6		P	85 - 115
Molybdenum	96.4		P	85 - 115
Nickel	97.6		P	85 - 115
Selenium	96.0		P	85 - 115
Silver	97.8		P	85 - 115
Thallium	96.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426869

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426873

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426546

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426600

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426844

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P476770

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: P426584

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	105		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426787

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426514

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.6		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P426755

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.0		P	94 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2540 C-2015
Batch ID: P426961

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	91.4		P	90 - 110

Reference Method: SM 2540 D-2015
Batch ID: P426805

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	102		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P426757

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

Reference Method: SM 5310 B-2011
Batch ID: P426789

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426398

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389778	Calcium	101		P	80 - 120
2389778	Iron	104	103	P/P	80 - 120
2389778	Magnesium	106	104	P/P	80 - 120
2389778	Potassium	98.0	96.9	P/P	80 - 120
2389778	Sodium	99.1	95.7	P/P	80 - 120
2389778	Strontium	99.5	98.0	P/P	80 - 120
2389778	Tin	99.0	97.7	P/P	80 - 120
2389778	Titanium	105	104	P/P	80 - 120
2389778	Vanadium	105	104	P/P	80 - 120
2389778	Zinc	102	99.9	P/P	80 - 120
2389975	Calcium	102		P	80 - 120
2389975	Iron	107		P	80 - 120
2389975	Magnesium	99.8		P	80 - 120
2389975	Potassium	100		P	80 - 120
2389975	Sodium	98.3		P	80 - 120
2389975	Strontium	103		P	80 - 120
2389975	Tin	103		P	80 - 120
2389975	Titanium	107		P	80 - 120
2389975	Vanadium	105		P	80 - 120
2389975	Zinc	107		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426398

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389778	Aluminum	92.8	95.4	P/P	80 - 120
2389778	Antimony	96.9	99.3	P/P	80 - 120
2389778	Arsenic	95.5	96.4	P/P	80 - 120
2389778	Barium	97.7	99.0	P/P	80 - 120
2389778	Beryllium	93.9	93.4	P/P	80 - 120
2389778	Boron	96.3	99.7	P/P	80 - 120
2389778	Cadmium	97.5	99.4	P/P	80 - 120
2389778	Chromium	99.4	100	P/P	80 - 120
2389778	Cobalt	94.0	95.1	P/P	80 - 120
2389778	Copper	94.4	94.8	P/P	80 - 120
2389778	Lead	90.3	92.0	P/P	80 - 120
2389778	Manganese	94.4	97.2	P/P	80 - 120
2389778	Molybdenum	97.8	101	P/P	80 - 120
2389778	Nickel	96.0	97.7	P/P	80 - 120
2389778	Selenium	93.8	96.2	P/P	80 - 120
2389778	Silver	96.3	98.1	P/P	80 - 120
2389778	Thallium	96.3	99.0	P/P	80 - 120
2389975	Aluminum	97.9		P	80 - 120
2389975	Antimony	99.9		P	80 - 120
2389975	Arsenic	97.1		P	80 - 120
2389975	Barium	99.3		P	80 - 120
2389975	Beryllium	94.4		P	80 - 120
2389975	Boron	103		P	80 - 120
2389975	Cadmium	99.8		P	80 - 120
2389975	Chromium	98.2		P	80 - 120
2389975	Cobalt	95.1		P	80 - 120
2389975	Copper	94.4		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426398

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389975	Lead	92.7		P	80 - 120
2389975	Manganese	98.4		P	80 - 120
2389975	Molybdenum	99.0		P	80 - 120
2389975	Nickel	96.0		P	80 - 120
2389975	Selenium	94.8		P	80 - 120
2389975	Silver	100		P	80 - 120
2389975	Thallium	97.8		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389942	Chloride	98.6		P	90 - 110
2389971	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389942	Sulfate	103		P	90 - 110
2389971	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426546

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389923	Ammonia-N	101	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426600

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389985	Ammonia-N	98.8	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426844

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2390090	Kjeldahl Nitrogen	100	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P476770

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389978	Kjeldahl Nitrogen	100		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426584

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389987	NO2NO3-N	106	106	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426787

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2390424	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389966	Total-P	98.2	100	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P426757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389982	Fluoride	100	99.0	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P426789

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2389879	Organic Carbon	97.2	98.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P426369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389983	Color (true)	0.754	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P426373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389913	Turbidity	12.6	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P426398

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389778	Calcium	1.86	Spike	P	0 - 20
2389778	Iron	0.698	Spike	P	0 - 20
2389778	Magnesium	1.38	Spike	P	0 - 20
2389778	Potassium	1.02	Spike	P	0 - 20
2389778	Sodium	1.83	Spike	P	0 - 20
2389778	Strontium	1.50	Spike	P	0 - 20
2389778	Tin	1.35	Spike	P	0 - 20
2389778	Titanium	1.02	Spike	P	0 - 20
2389778	Vanadium	1.17	Spike	P	0 - 20
2389778	Zinc	1.66	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P426398

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389778	Aluminum	2.76	Spike	P	0 - 20
2389778	Antimony	2.48	Spike	P	0 - 20
2389778	Arsenic	0.946	Spike	P	0 - 20
2389778	Barium	1.32	Spike	P	0 - 20
2389778	Beryllium	0.528	Spike	P	0 - 20
2389778	Boron	3.02	Spike	P	0 - 20
2389778	Cadmium	1.90	Spike	P	0 - 20
2389778	Chromium	0.781	Spike	P	0 - 20
2389778	Cobalt	1.16	Spike	P	0 - 20
2389778	Copper	0.442	Spike	P	0 - 20
2389778	Lead	1.92	Spike	P	0 - 20
2389778	Manganese	2.25	Spike	P	0 - 20
2389778	Molybdenum	2.87	Spike	P	0 - 20
2389778	Nickel	1.70	Spike	P	0 - 20
2389778	Selenium	2.44	Spike	P	0 - 20
2389778	Silver	1.91	Spike	P	0 - 20
2389778	Thallium	2.69	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389942	Chloride	0.267	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P426873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389942	Sulfate	0.966	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426546

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389923	Ammonia-N	1.22	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P426600

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389985	Ammonia-N	1.32	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P426844

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2390090	Kjeldahl Nitrogen	2.37	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P476770

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389978	Kjeldahl Nitrogen	2.00	Sample	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426584

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389987	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P426787

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2390424	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P426514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389966	Total-P	1.84	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P426755

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389982	Total Alkalinity	2.71	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P426961

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389918	TDS	2.65	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P426757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389982	Fluoride	1.02	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P426789

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2389879	Organic Carbon	0.973	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: A117658
Included Lab Sample IDs: 2389982, 2389983, 2389986

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.5	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A117659
Included Lab Sample IDs: 2389982, 2389983, 2389986

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A117738
Included Lab Sample IDs: 2389984

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A117742
Included Lab Sample IDs: 2389991

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	100	P/P	90 - 110
Iron	103	101	P/P	90 - 110
Magnesium	103	101	P/P	90 - 110
Potassium	101	100	P/P	90 - 110
Sodium	99.2	97.5	P/P	90 - 110
Strontium	99.4	99.9	P/P	90 - 110
Tin	99.5	99.0	P/P	90 - 110
Titanium	99.8	99.6	P/P	90 - 110
Vanadium	99.1	98.7	P/P	90 - 110
Zinc	101	97.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A117755
Included Lab Sample IDs: 2389985, 2389987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	105	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117757
Included Lab Sample IDs: 2389991

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.3	96.5	P/P	90 - 110
Antimony	96.3	96.6	P/P	90 - 110
Arsenic	94.8	95.4	P/P	90 - 110
Barium	95.6	95.5	P/P	90 - 110
Beryllium	93.0	93.1	P/P	90 - 110
Boron	98.5	97.0	P/P	90 - 110
Cadmium	96.6	95.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A117757
Included Lab Sample IDs: 2389991

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	95.0	95.9	P/P	90 - 110
Cobalt	92.8	92.4	P/P	90 - 110
Copper	92.7	92.7	P/P	90 - 110
Lead	90.0	90.3	P/P	90 - 110
Manganese	95.6	95.7	P/P	90 - 110
Molybdenum	94.1	95.2	P/P	90 - 110
Nickel	93.7	93.1	P/P	90 - 110
Selenium	95.7	95.8	P/P	90 - 110
Silver	96.6	95.8	P/P	90 - 110
Thallium	96.6	96.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A117760
Included Lab Sample IDs: 2389985, 2389987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A117820
Included Lab Sample IDs: 2389984

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: A117829
Included Lab Sample IDs: 2389984, 2389985, 2389987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.5	P/P	90 - 110
Total-P	99.5	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A117833
Included Lab Sample IDs: 2389982, 2389983, 2389986

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.5	98.6	P/P	90 - 110
Sulfate	101	101	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A117836
Included Lab Sample IDs: 2389982, 2389983, 2389986

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.5	99.0	P/P	90 - 110
Total Alkalinity	99.0	96.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500-F- C-2011
Run ID: A117836
Included Lab Sample IDs: 2389982, 2389983, 2389986

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

Reference Method: SM 5310 B-2011
Run ID: A117844
Included Lab Sample IDs: 2389984, 2389985, 2389987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.8	94.6	P/P	90 - 110
Organic Carbon	96.0	95.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A117939
Included Lab Sample IDs: 2389984, 2389985, 2389987

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.9	97.0	P/P	90 - 110
Kjeldahl Nitrogen	98.9	98.0	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)	101					0.754	
EPA 180.1 Rev. 2.0	Turbidity	101					12.6	
EPA 200.7 Rev. 4.4	Calcium	103	101	102				1.86
	Iron	107	104	103	107			0.698
	Magnesium	109	106	104	99.8			1.38
	Potassium	101	98.0	96.9	100			1.02
	Sodium	101	99.1	95.7	98.3			1.83
	Strontium	102	99.5	98.0	103			1.50
	Tin	99.5	99.0	97.7	103			1.35
	Titanium	103	105	104	107			1.02
	Vanadium	101	105	104	105			1.17
	Zinc	103	102	99.9	107			1.66
EPA 200.8 Rev. 5.4	Aluminum	97.5	92.8	95.4	97.9			2.76
	Antimony	96.8	96.9	99.3	99.9			2.48
	Arsenic	96.3	95.5	96.4	97.1			0.946
	Barium	98.8	97.7	99.0	99.3			1.32
	Beryllium	95.7	93.9	93.4	94.4			0.528
	Boron	100	96.3	99.7	103			3.02
	Cadmium	98.0	97.5	99.4	99.8			1.90
	Chromium	97.2	99.4	100	98.2			0.781
	Cobalt	97.1	94.0	95.1	95.1			1.16
	Copper	94.5	94.4	94.8	94.4			0.442
	Lead	91.9	90.3	92.0	92.7			1.92
	Manganese	95.6	98.4	94.4	97.2			2.25
	Molybdenum	96.4	97.8	101	99.0			2.87
	Nickel	97.6	96.0	97.7	96.0			1.70
	Selenium	96.0	93.8	96.2	94.8			2.44
	Silver	97.8	96.3	98.1	100			1.91
	Thallium	96.3	96.3	99.0	97.8			2.69
EPA 300.0 Rev. 2.1	Chloride	100	98.6	102			0.267	
	Sulfate	104	103	103			0.966	
EPA 350.1 Rev. 2.0	Ammonia-N	101	101	103				1.22
	Ammonia-N	97.4	98.8	100				1.32
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.1	100	103				2.37
	Kjeldahl Nitrogen	101	100				2.00	
EPA 353.2 Rev. 2.0	NO2NO3-N	105	106	106				0.0
	NO2NO3-N	102	102	102				0.0
EPA 365.1 Rev. 2.0	Total-P	98.6	98.2	100				1.84
SM 2320 B-2011	Total Alkalinity	98.0					2.71	
SM 2540 C-2015	TDS	91.4					2.65	
SM 2540 D-2015	TSS	102						
SM 4500-F- C-2011	Fluoride	100	100	99.0				1.02
SM 5310 B-2011	Organic Carbon	98.2	97.2	98.2				0.973

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2389982, 2389983, 2389986
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2389982, 2389983, 2389986
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2389991
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2389991

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2389982, 2389983, 2389986
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2389982, 2389983, 2389986
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2389984, 2389985, 2389987
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2389984, 2389985, 2389987
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2389984, 2389985, 2389987
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2389984, 2389985, 2389987
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2389982, 2389983, 2389986
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2389991
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2389982, 2389983, 2389986
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2389982, 2389983, 2389986
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2389982, 2389983, 2389986
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2389984, 2389985, 2389987

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	02/24/2023			02/24/2023 15:25	Chandler E Cox	2389983
	02/24/2023			02/24/2023 15:29	Chandler E Cox	2389982, 2389986
EPA 180.1 Rev. 2.0	02/24/2023			02/24/2023 14:27	Khloe J Berg	2389982, 2389983
	02/24/2023			02/24/2023 14:28	Khloe J Berg	2389986
EPA 200.7 Rev. 4.4	02/24/2023	02/27/2023 10:40	Vijayalakshmi Reddy	03/01/2023 19:21	McKinley C Carter	2389991
EPA 200.8 Rev. 5.4	02/24/2023	02/27/2023 10:40	Vijayalakshmi Reddy	03/01/2023 20:15	Conrad Hartmann	2389991
EPA 300.0 Rev. 2.1	02/24/2023			03/07/2023 21:31	Judith K. Clark	2389982
	02/24/2023			03/07/2023 21:46	Judith K. Clark	2389983
	02/24/2023			03/07/2023 22:01	Judith K. Clark	2389986
EPA 350.1 Rev. 2.0	02/24/2023			03/01/2023 12:44	Khloe J Berg	2389984
	02/24/2023			03/02/2023 10:48	Khloe J Berg	2389985
	02/24/2023			03/02/2023 10:54	Khloe J Berg	2389987
EPA 351.2 Rev. 2.0	02/24/2023	03/07/2023 13:40	Simonne.V. Calhoun	03/10/2023 16:04	Samantha L Bates	2389985
	02/24/2023	03/07/2023 13:40	Simonne.V. Calhoun	03/10/2023 16:06	Samantha L Bates	2389987
	02/24/2023	03/08/2023 14:00	Simonne.V. Calhoun	03/10/2023 17:04	Samantha L Bates	2389984
EPA 353.2 Rev. 2.0	02/24/2023			03/01/2023 10:57	Beverly Y. Sanders	2389985
	02/24/2023			03/01/2023 10:58	Beverly Y. Sanders	2389987
	02/24/2023			03/06/2023 10:12	Beverly Y. Sanders	2389984
EPA 365.1 Rev. 2.0	02/24/2023	03/01/2023 14:02	Adam P Silver	03/06/2023 14:37	James L Waggerby	2389984
	02/24/2023	03/01/2023 14:02	Adam P Silver	03/06/2023 14:45	James L Waggerby	2389985
	02/24/2023	03/01/2023 14:02	Adam P Silver	03/06/2023 14:46	James L Waggerby	2389987
SM 2320 B-2011	02/24/2023			03/07/2023 01:25	Chandler E Cox	2389982
	02/24/2023			03/07/2023 03:45	Chandler E Cox	2389983
	02/24/2023			03/07/2023 03:55	Chandler E Cox	2389986
SM 2340 B-2011	02/24/2023			03/01/2023 19:21	McKinley C Carter	2389991
SM 2540 C-2015	02/24/2023			03/01/2023 16:46	Yijie Li	2389982, 2389983, 2389986
SM 2540 D-2015	02/24/2023			03/01/2023 16:46	Yijie Li	2389982, 2389983, 2389986
SM 4500-F- C-2011	02/24/2023			03/07/2023 01:15	Chandler E Cox	2389982
	02/24/2023			03/07/2023 03:45	Chandler E Cox	2389983
	02/24/2023			03/07/2023 03:55	Chandler E Cox	2389986
SM 5310 B-2011	02/24/2023			03/07/2023 02:49	Elise M. Gillis	2389984
	02/24/2023			03/07/2023 03:32	Elise M. Gillis	2389985
	02/24/2023			03/07/2023 03:46	Elise M. Gillis	2389987