Chemical Analysis Report

NE-DIST-2022-04-15-04

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

Event Description: **Butcher Pen SMP**
Request ID: **RQ-2022-04-18-46**
Customer: **NE-DIST**
Project ID: **SMP**

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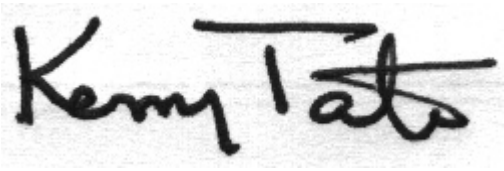
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 06-MAY-2022 10:45



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: BUTCHER PEN CR. AT BLANDING BLVD **Collection Date/Time: 04/14/2022 12:50**

Field ID: 20030580 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2319799	EPA 200.7 Rev. 4.4	Calcium	50.5		mg/L	P412514	
		Iron	1.53E+03		ug/L	P412514	
		Magnesium	6.30		mg/L	P412514	
		Potassium	1.6		mg/L	P412514	
		Sodium	20.0		mg/L	P412514	
		Strontium	375		ug/L	P412514	
		Tin	3.0	U	ug/L	P412514	
		Titanium	0.88	I	ug/L	P412514	
		Vanadium	2.0	U	ug/L	P412514	
		Zinc	6.9	I	ug/L	P412514	
	EPA 200.8 Rev. 5.4	Aluminum	43		ug/L	P412514	
		Antimony	0.13	I	ug/L	P412514	
		Arsenic	1.22		ug/L	P412514	
		Barium	38.4		ug/L	P412514	
		Beryllium	0.015	I	ug/L	P412514	
		Boron**	39.7		ug/L	P412514	
		Cadmium	0.020	U	ug/L	P412514	
		Chromium	0.84	I	ug/L	P412514	
		Cobalt	0.150		ug/L	P412514	
		Copper	1.19		ug/L	P412514	
		Lead	0.30	I	ug/L	P412514	
		Manganese	27.3		ug/L	P412514	
		Molybdenum	0.41	I	ug/L	P412514	
		Nickel	0.90	I	ug/L	P412514	
		Selenium	0.20	U	ug/L	P412514	
		Silver	0.010	U	ug/L	P412514	
		Thallium	0.10	U	ug/L	P412514	
	SM 2340 B-2011	Hardness	152		mg/L	P412514	

Sample Location: BUTCHER PEN CR @ CONFEDERATE PT ROAD **Collection Date/Time: 04/14/2022 12:35**

Field ID: 20030082 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2319795	DEP SOP: NU-094-1	Color (true)**	52		PCU	P412437	
	EPA 180.1 Rev. 2.0	Turbidity	8.0		NTU	P412439	
	EPA 300.0 Rev. 2.1	Chloride	48		mg Cl/L	P412952	
		Sulfate	30		mg SO4/L	P412955	
	SM 2320 B-2011	Total Alkalinity	104		mg CaCO3/L	P412807	
	SM 2540 C-2011	TDS	233		mg/L	P413061	
	SM 2540 D-2011	TSS	11		mg/L	P412988	
	SM 4500-F- C-2011	Fluoride	0.14		mg F/L	P412810	
2319796	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P412627	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.76		mg N/L	P413006	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P412608	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P412796	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P412783	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 2540 D-2011: 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: P412437

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412439

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412514

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: P412514

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: P412952

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: P412955

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P412627

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413006

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412608

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P412796

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

Reference Method: SM 2320 B-2011
Batch ID: P412807

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

Reference Method: SM 2540 C-2011
Batch ID: P413061

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P412988

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P412810

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P412783

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: P412437

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412439

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	96.3		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412514

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	80 - 120
Iron	105		P	80 - 120
Magnesium	108		P	80 - 120
Potassium	101		P	80 - 120
Sodium	103		P	80 - 120
Strontium	101		P	80 - 120
Tin	97.6		P	80 - 120
Titanium	96.4		P	80 - 120
Vanadium	92.4		P	80 - 120
Zinc	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412514

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.4		P	85 - 115
Antimony	98.9		P	85 - 115
Arsenic	99.8		P	85 - 115
Barium	103		P	85 - 115
Beryllium	96.3		P	85 - 115
Boron	101		P	85 - 115
Cadmium	96.5		P	85 - 115
Chromium	96.8		P	85 - 115
Cobalt	99.5		P	85 - 115
Copper	96.2		P	85 - 115
Lead	99.3		P	85 - 115
Manganese	97.8		P	85 - 115
Molybdenum	98.7		P	85 - 115
Nickel	98.3		P	85 - 115
Selenium	98.9		P	85 - 115
Silver	101		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P412952

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P412955

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P412627

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413006

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412608

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P412796

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

Reference Method: SM 2320 B-2011
Batch ID: P412807

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.6		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P412810

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.6		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P412783

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2318527	Calcium	103		P	80 - 120
2318527	Iron	113	113	P/P	80 - 120
2318527	Magnesium	115	115	P/P	80 - 120
2318527	Potassium	105	106	P/P	80 - 120
2318527	Sodium	100		P	80 - 120
2318527	Strontium	103	103	P/P	80 - 120
2318527	Tin	99.1	100	P/P	80 - 120
2318527	Titanium	100	103	P/P	80 - 120
2318527	Vanadium	96.6	98.4	P/P	80 - 120
2318527	Zinc	102	102	P/P	80 - 120
2318529	Calcium	104		P	80 - 120
2318529	Iron	118		P	80 - 120
2318529	Magnesium	113		P	80 - 120
2318529	Potassium	111		P	80 - 120
2318529	Sodium	101		P	80 - 120
2318529	Strontium	104		P	80 - 120
2318529	Tin	104		P	80 - 120
2318529	Titanium	105		P	80 - 120
2318529	Vanadium	101		P	80 - 120
2318529	Zinc	103		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2318527	Aluminum	108	104	P/P	80 - 120
2318527	Antimony	99.2	99.1	P/P	80 - 120
2318527	Arsenic	97.9	98.0	P/P	80 - 120
2318527	Barium	103	103	P/P	80 - 120
2318527	Beryllium	92.9	95.9	P/P	80 - 120
2318527	Boron	101	102	P/P	80 - 120
2318527	Cadmium	99.1	99.6	P/P	80 - 120
2318527	Chromium	98.2	96.8	P/P	80 - 120
2318527	Cobalt	99.5	97.7	P/P	80 - 120
2318527	Copper	94.5	94.1	P/P	80 - 120
2318527	Lead	99.4	99.4	P/P	80 - 120
2318527	Manganese	98.8	99.6	P/P	80 - 120
2318527	Molybdenum	99.3	101	P/P	80 - 120
2318527	Nickel	94.0	94.9	P/P	80 - 120
2318527	Selenium	94.4	96.8	P/P	80 - 120
2318527	Silver	101	100	P/P	80 - 120
2318527	Thallium	101	102	P/P	80 - 120
2318529	Aluminum	114		P	80 - 120
2318529	Antimony	100		P	80 - 120
2318529	Arsenic	101		P	80 - 120
2318529	Barium	105		P	80 - 120
2318529	Beryllium	95.6		P	80 - 120
2318529	Boron	101		P	80 - 120
2318529	Cadmium	102		P	80 - 120
2318529	Chromium	100		P	80 - 120
2318529	Cobalt	101		P	80 - 120
2318529	Copper	97.7		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2318529	Lead	103		P	80 - 120
2318529	Manganese	101		P	80 - 120
2318529	Molybdenum	102		P	80 - 120
2318529	Nickel	102		P	80 - 120
2318529	Selenium	99.0		P	80 - 120
2318529	Silver	104		P	80 - 120
2318529	Thallium	105		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P412952

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2319726	Chloride	96.9		P	90 - 110
2319765	Chloride	96.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P412955

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2319726	Sulfate	96.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P412627

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2319739	Ammonia-N	97.4	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413006

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320505	Kjeldahl Nitrogen	90.7	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412608

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2319796	NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P412796

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2319805	Total-P	102	104	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P412810

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2319704	Fluoride	100	99.4	P/P	92 - 107

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P412783

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2319870	Organic Carbon	97.1	97.9	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P412437

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319738	Color (true)	0.972	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412439

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319572	Turbidity	12.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2318527	Calcium	0.433	Spike	P	0 - 20
2318527	Iron	0.441	Spike	P	0 - 20
2318527	Magnesium	0.112	Spike	P	0 - 20
2318527	Potassium	0.723	Spike	P	0 - 20
2318527	Sodium	0.235	Spike	P	0 - 20
2318527	Strontium	0.301	Spike	P	0 - 20
2318527	Tin	1.39	Spike	P	0 - 20
2318527	Titanium	2.20	Spike	P	0 - 20
2318527	Vanadium	1.79	Spike	P	0 - 20
2318527	Zinc	0.921	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2318527	Aluminum	2.15	Spike	P	0 - 20
2318527	Antimony	0.144	Spike	P	0 - 20
2318527	Arsenic	0.0191	Spike	P	0 - 20
2318527	Barium	0.0189	Spike	P	0 - 20
2318527	Beryllium	2.88	Spike	P	0 - 20
2318527	Boron	1.02	Spike	P	0 - 20
2318527	Cadmium	0.483	Spike	P	0 - 20
2318527	Chromium	1.44	Spike	P	0 - 20
2318527	Cobalt	1.85	Spike	P	0 - 20
2318527	Copper	0.384	Spike	P	0 - 20
2318527	Lead	0.0203	Spike	P	0 - 20
2318527	Manganese	0.527	Spike	P	0 - 20
2318527	Molybdenum	1.33	Spike	P	0 - 20
2318527	Nickel	0.956	Spike	P	0 - 20
2318527	Selenium	2.47	Spike	P	0 - 20
2318527	Silver	0.232	Spike	P	0 - 20
2318527	Thallium	1.12	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P412952

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319726	Chloride	0.748	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P412955

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319726	Sulfate	1.37	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P412627

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319739	Ammonia-N	0.148	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413006

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320505	Kjeldahl Nitrogen	6.53	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319796	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P412796

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319805	Total-P	1.77	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P412807

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319704	Total Alkalinity	0.146	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P413061

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319726	TDS	4.49	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P412810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319704	Fluoride	0.476	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P412783

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319870	Organic Carbon	0.556	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: A111505
Included Lab Sample IDs: 2319795

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A111506
Included Lab Sample IDs: 2319795

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	100	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A111570
Included Lab Sample IDs: 2319796

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111574
Included Lab Sample IDs: 2319796

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.6	97.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111585
Included Lab Sample IDs: 2319799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.6	97.0	P/P	90 - 110
Antimony	101	102	P/P	90 - 110
Arsenic	100	98.7	P/P	90 - 110
Barium	99.6	99.4	P/P	90 - 110
Beryllium	96.5	96.5	P/P	90 - 110
Boron	96.7	95.3	P/P	90 - 110
Cadmium	99.9	101	P/P	90 - 110
Chromium	98.4	99.3	P/P	90 - 110
Cobalt	98.7	97.6	P/P	90 - 110
Copper	96.8	95.8	P/P	90 - 110
Lead	98.1	97.7	P/P	90 - 110
Manganese	99.0	99.1	P/P	90 - 110
Molybdenum	99.6	98.8	P/P	90 - 110
Nickel	96.8	95.9	P/P	90 - 110
Selenium	101	97.7	P/P	90 - 110
Silver	104	104	P/P	90 - 110
Thallium	97.3	95.8	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A111644
Included Lab Sample IDs: 2319796

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2011
Run ID: A111644
Included Lab Sample IDs: 2319796

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.8	99.3	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A111656
Included Lab Sample IDs: 2319795

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.9	97.6	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A111656
Included Lab Sample IDs: 2319795

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A111715
Included Lab Sample IDs: 2319795

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.6	100	P/P	90 - 110
Sulfate	99.9	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A111747
Included Lab Sample IDs: 2319799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	102	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	103	104	P/P	90 - 110
Potassium	104	104	P/P	90 - 110
Sodium	100	102	P/P	90 - 110
Strontium	99.0	104	P/P	90 - 110
Tin	97.1	102	P/P	90 - 110
Titanium	96.8	100	P/P	90 - 110
Vanadium	96.8	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A111780
Included Lab Sample IDs: 2319796

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A111857
Included Lab Sample IDs: 2319799

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A111857
Included Lab Sample IDs: 2319799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	102	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A111882
Included Lab Sample IDs: 2319796

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.8	91.0	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					0.972	
EPA 180.1 Rev. 2.0	Turbidity	96.3					12.0	
EPA 200.7 Rev. 4.4	Calcium	102	103	104				0.433
	Iron	105	113	113	118			0.441
	Magnesium	108	113	115	115			0.112
	Potassium	101	105	106	111			0.723
	Sodium	103	100	101				0.235
	Strontium	101	103	103	104			0.301
	Tin	97.6	99.1	100	104			1.39
	Titanium	96.4	100	103	105			2.20
	Vanadium	92.4	96.6	98.4	101			1.79
	Zinc	100	102	102	103			0.921
EPA 200.8 Rev. 5.4	Aluminum	99.4	114	108	104			2.15
	Antimony	98.9	100	99.2	99.1			0.144
	Arsenic	99.8	101	97.9	98.0			0.0191
	Barium	103	105	103	103			0.0189
	Beryllium	96.3	92.9	95.9	95.6			2.88
	Boron	101	101	101	102			1.02
	Cadmium	96.5	102	99.1	99.6			0.483
	Chromium	96.8	100	98.2	96.8			1.44
	Cobalt	99.5	101	99.5	97.7			1.85
	Copper	96.2	97.7	94.5	94.1			0.384
	Lead	99.3	103	99.4	99.4			0.0203
	Manganese	97.8	101	98.8	99.6			0.527
	Molybdenum	98.7	102	99.3	101			1.33
	Nickel	98.3	102	94.0	94.9			0.956
	Selenium	98.9	99.0	94.4	96.8			2.47
	Silver	101	104	101	100			0.232
	Thallium	100	105	101	102			1.12
EPA 300.0 Rev. 2.1	Chloride	98.4	96.9	96.6			0.748	
	Sulfate	97.0	96.8				1.37	
EPA 350.1 Rev. 2.0	Ammonia-N	95.8	97.4	97.6				0.148
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.5	90.7	101				6.53
EPA 353.2 Rev. 2.0	NO2NO3-N	101	102	101				0.494
EPA 365.1 Rev. 2.0	Total-P	104	102	104				1.77
SM 2320 B-2011	Total Alkalinity	96.6					0.146	
SM 2540 C-2011	TDS						4.49	
SM 4500-F- C-2011	Fluoride	99.6	100	99.4				0.476
SM 5310 B-2011	Organic Carbon	96.0	97.1	97.9				0.556

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2319795
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2319795
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2319799
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2319799
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2319795
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2319795
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2319796
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2319796

Reference Method Descriptions

Method	Description	Associated Samples
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2319796
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2319796
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2319795
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2319799
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2319795
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2319795
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2319795
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2319796

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	04/15/2022			04/15/2022 16:26	Anna M. Plaviak	2319795
EPA 180.1 Rev. 2.0	04/15/2022			04/15/2022 14:11	Khloe J Berg	2319795
EPA 200.7 Rev. 4.4	04/15/2022	04/19/2022 10:25	Megan Whitefoot	04/27/2022 21:26	McKinley C Carter	2319799
	04/15/2022	04/19/2022 10:25	Megan Whitefoot	05/02/2022 20:05	Josef B Mick	2319799
EPA 200.8 Rev. 5.4	04/15/2022	04/19/2022 10:25	Megan Whitefoot	04/21/2022 02:52	Alexander Thompson	2319799
EPA 300.0 Rev. 2.1	04/15/2022			04/26/2022 16:47	Anna M. Plaviak	2319795
EPA 350.1 Rev. 2.0	04/15/2022			04/20/2022 11:24	Ping Hua	2319796
EPA 351.2 Rev. 2.0	04/15/2022	04/29/2022 11:06	Alexandra J Mattheus	05/03/2022 13:24	Alexandra J Mattheus	2319796
EPA 353.2 Rev. 2.0	04/15/2022			04/20/2022 10:12	Beverly Y. Sanders	2319796
EPA 365.1 Rev. 2.0	04/15/2022	04/26/2022 14:30	Simonne.V. Calhoun	04/27/2022 16:44	Sarah A Nixon	2319796
SM 2320 B-2011	04/15/2022			04/22/2022 05:42	Sarah A Nixon	2319795
SM 2340 B-2011	04/15/2022			04/27/2022 21:26	McKinley C Carter	2319799
SM 2540 C-2011	04/15/2022			04/20/2022 15:36	Yijie Li	2319795
SM 2540 D-2011	04/15/2022			04/20/2022 15:36	Yijie Li	2319795
SM 4500-F- C-2011	04/15/2022			04/22/2022 05:42	Sarah A Nixon	2319795
SM 5310 B-2011	04/15/2022			04/21/2022 05:59	Judith K. Clark	2319796