Chemical Analysis Report

NE-DIST-2022-09-01-02

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

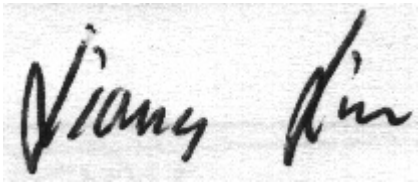
Event Description: **Butcherpen makeup**
Request ID: **RQ-2022-08-22-25**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256
Attn: Jeremy Parrish

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

Certified by: Liang Lin, Environmental Administrator

Date Certified: 22-SEP-2022 10:30



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: 08/31/2022 09:10**

Field ID: 20030580 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2353663	EPA 200.7 Rev. 4.4	Calcium	47.9		mg/L	P419103	
		Iron	1.54E+03		ug/L	P419103	
		Magnesium	5.14		mg/L	P419103	
		Potassium	2.0		mg/L	P419103	
		Sodium	17.5		mg/L	P419103	
		Strontium	319		ug/L	P419103	
		Tin	6.6	I	ug/L	P419103	
		Titanium	1.1	I	ug/L	P419103	
		Vanadium	2.0	U	ug/L	P419103	
		Zinc	7.9	I	ug/L	P419103	
	EPA 200.8 Rev. 5.4	Aluminum	60		ug/L	P419103	
		Antimony	0.23		ug/L	P419103	
		Arsenic	1.92		ug/L	P419103	
		Barium	44.0		ug/L	P419103	
		Beryllium	0.021	I	ug/L	P419103	
		Boron	42.7		ug/L	P419103	
		Cadmium	0.020	U	ug/L	P419103	
		Chromium	0.96	I	ug/L	P419103	
		Cobalt	0.173		ug/L	P419103	
		Copper	1.01		ug/L	P419103	
		Lead	0.53		ug/L	P419103	
		Manganese	22.7		ug/L	P419103	
		Molybdenum	0.46	I	ug/L	P419103	
		Nickel	0.98	I	ug/L	P419103	
		Selenium	0.20	U	ug/L	P419103	
		Silver	0.010	U	ug/L	P419103	
		Thallium	0.10	U	ug/L	P419103	
	SM 2340 B-2011	Hardness	141		mg/L	P419103	

Sample Location: BUTCHER PEN CR AT WESCONNETT **Collection Date/Time: 08/31/2022 09:20**

Field ID: 20030760 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2353664	EPA 200.7 Rev. 4.4	Calcium	44.1		mg/L	P419103	
		Iron	1.19E+03		ug/L	P419103	
		Magnesium	4.72		mg/L	P419103	
		Potassium	2.2		mg/L	P419103	
		Sodium	13.5		mg/L	P419103	
		Strontium	388		ug/L	P419103	
		Tin	7.6	I	ug/L	P419103	
		Titanium	1.1	I	ug/L	P419103	
		Vanadium	2.0	U	ug/L	P419103	
		Zinc	8.0	I	ug/L	P419103	
	EPA 200.8 Rev. 5.4	Aluminum	63		ug/L	P419103	
		Antimony	0.17	I	ug/L	P419103	
		Arsenic	1.33		ug/L	P419103	
		Barium	36.1		ug/L	P419103	
		Beryllium	0.015	I	ug/L	P419103	
		Boron	39.0		ug/L	P419103	
		Cadmium	0.020	U	ug/L	P419103	
		Chromium	0.64	I	ug/L	P419103	
		Cobalt	0.129		ug/L	P419103	
		Copper	1.09		ug/L	P419103	
		Lead	0.47		ug/L	P419103	
		Manganese	19.8		ug/L	P419103	
		Molybdenum	0.53	I	ug/L	P419103	
		Nickel	0.76	I	ug/L	P419103	
		Selenium	0.22	I	ug/L	P419103	
		Silver	0.010	U	ug/L	P419103	
		Thallium	0.10	U	ug/L	P419103	
	SM 2340 B-2011	Hardness	129		mg/L	P419103	

Sample Location: BUTCHER PEN CR @ CONFEDERATE PT ROAD **Collection Date/Time: 08/31/2022 09:35**

Field ID: 20030082 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2353657	DEP SOP: NU-094-1	Color (true)	91		PCU	P419023	
	EPA 180.1 Rev. 2.0	Turbidity	4.3		NTU	P419015	
	EPA 300.0 Rev. 2.1	Chloride	100		mg Cl/L	P419470	
		Sulfate	24		mg SO4/L	P419473	
	SM 2320 B-2011	Total Alkalinity	92		mg CaCO3/L	P419411	
	SM 2540 C-2011	TDS	328		mg/L	P419429	
	SM 2540 D-2011	TSS	4	I	mg/L	P419319	
	SM 4500-F- C-2011	Fluoride	0.12		mg F/L	P419389	
2353658	EPA 350.1 Rev. 2.0	Ammonia-N	0.18		mg N/L	P419309	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P419098	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.059		mg N/L	P419295	
	EPA 365.1 Rev. 2.0	Total-P	0.24		mg P/L	P419248	
	SM 5310 B-2011	Organic Carbon	13		mg C/L	P419188	

Ref. Method and Comment:
SM 2540 C-2011: The reported result is consistent with the conductivity measured in the laboratory, 564 µmhos/cm.
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: P419023

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P419015

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P419103

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: P419103

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: P419470

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: P419473

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419309

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419098

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419295

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419248

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

Reference Method: SM 2320 B-2011
Batch ID: P419411

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

Reference Method: SM 2540 C-2011
Batch ID: P419429

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P419319

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P419389

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: P419188

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: P419023

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	95.8		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P419015

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P419103

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	108		P	85 - 115
Iron	110		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	104		P	85 - 115
Sodium	104		P	85 - 115
Strontium	104		P	85 - 115
Tin	110		P	85 - 115
Titanium	107		P	85 - 115
Vanadium	106		P	85 - 115
Zinc	109		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P419103

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	104		P	85 - 115
Arsenic	103		P	85 - 115
Barium	105		P	85 - 115
Beryllium	99.9		P	85 - 115
Boron	101		P	85 - 115
Cadmium	99.4		P	85 - 115
Chromium	102		P	85 - 115
Cobalt	98.9		P	85 - 115
Copper	101		P	85 - 115
Lead	92.8		P	85 - 115
Manganese	102		P	85 - 115
Molybdenum	98.8		P	85 - 115
Nickel	102		P	85 - 115
Selenium	101		P	85 - 115
Silver	88.8		P	85 - 115
Thallium	97.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419470

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419473

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419309

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419098

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419295

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: P419248

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

Reference Method: SM 2320 B-2011
Batch ID: P419411

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.4		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P419389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P419188

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P419103

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353636	Calcium	105		P	80 - 120
2353636	Iron	110	106	P/P	80 - 120
2353636	Magnesium	105		P	80 - 120
2353636	Potassium	101		P	80 - 120
2353636	Sodium	103		P	80 - 120
2353636	Strontium	104	103	P/P	80 - 120
2353636	Tin	110	109	P/P	80 - 120
2353636	Titanium	109	109	P/P	80 - 120
2353636	Vanadium	107	107	P/P	80 - 120
2353636	Zinc	106	107	P/P	80 - 120
2353686	Calcium	111		P	80 - 120
2353686	Iron	111		P	80 - 120
2353686	Magnesium	110		P	80 - 120
2353686	Potassium	114		P	80 - 120
2353686	Sodium	108		P	80 - 120
2353686	Strontium	105		P	80 - 120
2353686	Tin	111		P	80 - 120
2353686	Titanium	110		P	80 - 120
2353686	Vanadium	108		P	80 - 120
2353686	Zinc	109		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P419103

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353636	Aluminum	99.6	99.7	P/P	80 - 120
2353636	Antimony	106	106	P/P	80 - 120
2353636	Arsenic	104	103	P/P	80 - 120
2353636	Barium	104	105	P/P	80 - 120
2353636	Beryllium	103	99.0	P/P	80 - 120
2353636	Boron	97.9	97.4	P/P	80 - 120
2353636	Cadmium	101	102	P/P	80 - 120
2353636	Chromium	100	100	P/P	80 - 120
2353636	Cobalt	97.8	97.3	P/P	80 - 120
2353636	Copper	96.5	97.2	P/P	80 - 120
2353636	Lead	93.6	93.7	P/P	80 - 120
2353636	Manganese	100	93.5	P/P	80 - 120
2353636	Molybdenum	102	102	P/P	80 - 120
2353636	Nickel	101	99.4	P/P	80 - 120
2353636	Selenium	102	101	P/P	80 - 120
2353636	Silver	86.9	87.8	P/P	80 - 120
2353636	Thallium	99.4	100	P/P	80 - 120
2353686	Aluminum	101		P	80 - 120
2353686	Antimony	105		P	80 - 120
2353686	Arsenic	105		P	80 - 120
2353686	Barium	105		P	80 - 120
2353686	Beryllium	99.9		P	80 - 120
2353686	Boron	99.4		P	80 - 120
2353686	Cadmium	99.0		P	80 - 120
2353686	Chromium	104		P	80 - 120
2353686	Cobalt	98.2		P	80 - 120
2353686	Copper	104		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P419103

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353686	Lead	93.5		P	80 - 120
2353686	Manganese	102		P	80 - 120
2353686	Molybdenum	100		P	80 - 120
2353686	Nickel	102		P	80 - 120
2353686	Selenium	101		P	80 - 120
2353686	Silver	87.6		P	80 - 120
2353686	Thallium	97.7		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419470

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353590	Chloride	100		P	90 - 110
2353615	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419473

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353590	Sulfate	99.8		P	90 - 110
2353615	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419309

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353499	Ammonia-N	98.0	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353658	Kjeldahl Nitrogen	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419295

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353616	NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419248

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353651	Total-P	104	106	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P419389

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353650	Fluoride	99.9	98.0	P/P	94 - 104

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P419188

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353844	Organic Carbon	99.8	101	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P419023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353672	Color (true)	0.366	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P419015

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353547	Turbidity	14.7	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P419103

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353636	Calcium	2.26	Spike	P	0 - 20
2353636	Iron	3.28	Spike	P	0 - 20
2353636	Magnesium	3.69	Spike	P	0 - 20
2353636	Potassium	2.49	Spike	P	0 - 20
2353636	Sodium	1.54	Spike	P	0 - 20
2353636	Strontium	0.885	Spike	P	0 - 20
2353636	Tin	1.01	Spike	P	0 - 20
2353636	Titanium	0.407	Spike	P	0 - 20
2353636	Vanadium	0.0197	Spike	P	0 - 20
2353636	Zinc	0.246	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P419103

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353636	Aluminum	0.0665	Spike	P	0 - 20
2353636	Antimony	0.276	Spike	P	0 - 20
2353636	Arsenic	1.06	Spike	P	0 - 20
2353636	Barium	1.12	Spike	P	0 - 20
2353636	Beryllium	3.66	Spike	P	0 - 20
2353636	Boron	0.254	Spike	P	0 - 20
2353636	Cadmium	0.672	Spike	P	0 - 20
2353636	Chromium	0.279	Spike	P	0 - 20
2353636	Cobalt	0.515	Spike	P	0 - 20
2353636	Copper	0.734	Spike	P	0 - 20
2353636	Lead	0.104	Spike	P	0 - 20
2353636	Manganese	1.13	Spike	P	0 - 20
2353636	Molybdenum	0.0878	Spike	P	0 - 20
2353636	Nickel	1.67	Spike	P	0 - 20
2353636	Selenium	0.515	Spike	P	0 - 20
2353636	Silver	0.959	Spike	P	0 - 20
2353636	Thallium	0.972	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419470

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353590	Chloride	0.461	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419473

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353590	Sulfate	0.382	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419309

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353499	Ammonia-N	0.465	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353658	Kjeldahl Nitrogen	0.516	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419295

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353616	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419248

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353651	Total-P	1.70	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P419411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353959	Total Alkalinity	0.145	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2011
Batch ID: P419429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353393	TDS	2.89	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P419389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353650	Fluoride	1.45	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P419188

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353844	Organic Carbon	1.08	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A114489
Included Lab Sample IDs: 2353657

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

Reference Method: DEP SOP: NU-094-1
Run ID: A114494
Included Lab Sample IDs: 2353657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.6	91.1	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A114572
Included Lab Sample IDs: 2353658

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A114576
Included Lab Sample IDs: 2353658

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A114600
Included Lab Sample IDs: 2353657

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A114607
Included Lab Sample IDs: 2353658

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: A114613
Included Lab Sample IDs: 2353658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.7	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A114641
Included Lab Sample IDs: 2353658

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.3	98.9	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A114659
Included Lab Sample IDs: 2353663, 2353664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.1	96.0	P/P	90 - 110
Antimony	101	98.8	P/P	90 - 110
Arsenic	103	100	P/P	90 - 110
Barium	99.8	96.7	P/P	90 - 110
Beryllium	99.5	96.6	P/P	90 - 110
Boron	94.6	91.1	P/P	90 - 110
Cadmium	103	101	P/P	90 - 110
Chromium	103	100	P/P	90 - 110
Cobalt	98.9	95.6	P/P	90 - 110
Copper	103	99.7	P/P	90 - 110
Manganese	103	100	P/P	90 - 110
Molybdenum	98.5	96.4	P/P	90 - 110
Nickel	102	98.6	P/P	90 - 110
Selenium	102	98.5	P/P	90 - 110
Silver	96.6	94.7	P/P	90 - 110
Thallium	99.5	96.7	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A114660
Included Lab Sample IDs: 2353657

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

Reference Method: SM 2320 B-2011
Run ID: A114670
Included Lab Sample IDs: 2353657

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.8	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A114684
Included Lab Sample IDs: 2353663, 2353664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	91.3	91.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A114713
Included Lab Sample IDs: 2353663, 2353664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	106	102	P/P	90 - 110
Iron	108	106	P/P	90 - 110
Magnesium	107	105	P/P	90 - 110
Potassium	104	103	P/P	90 - 110
Sodium	103	100	P/P	90 - 110
Strontium	99.7	97.9	P/P	90 - 110
Tin	105	105	P/P	90 - 110
Titanium	103	99.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A114713
Included Lab Sample IDs: 2353663, 2353664

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A114728
Included Lab Sample IDs: 2353663, 2353664

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	98.0	99.1	P/P	95 - 105

* 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)	95.8					0.366	
EPA 180.1 Rev. 2.0	Turbidity	96.4					14.7	
EPA 200.7 Rev. 4.4	Calcium	108	105	111				2.26
	Iron	110	110	106	111			3.28
	Magnesium	106	105	110				3.69
	Potassium	104	101	114				2.49
	Sodium	104	103	108				1.54
	Strontium	104	104	103	105			0.885
	Tin	110	110	109	111			1.01
	Titanium	107	109	109	110			0.407
	Vanadium	106	107	107	108			0.0197
	Zinc	109	106	107	109			0.246
EPA 200.8 Rev. 5.4	Aluminum	102	99.6	99.7	101			0.0665
	Antimony	104	106	106	105			0.276
	Arsenic	103	104	103	105			1.06
	Barium	105	104	105	105			1.12
	Beryllium	99.9	103	99.0	99.9			3.66
	Boron	101	97.9	97.4	99.4			0.254
	Cadmium	99.4	101	102	99.0			0.672
	Chromium	102	100	100	104			0.279
	Cobalt	98.9	97.8	97.3	98.2			0.515
	Copper	101	96.5	97.2	104			0.734
	Lead	92.8	93.6	93.7	93.5			0.104
	Manganese	102	100	93.5	102			1.13
	Molybdenum	98.8	102	102	100			0.0878
	Nickel	102	101	99.4	102			1.67
	Selenium	101	102	101	101			0.515
	Silver	88.8	86.9	87.8	87.6			0.959
	Thallium	97.4	99.4	100	97.7			0.972
EPA 300.0 Rev. 2.1	Chloride	102	100	102			0.461	
	Sulfate	101	99.8	101			0.382	
EPA 350.1 Rev. 2.0	Ammonia-N	99.6	98.0	98.6				0.465
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.6	101	102				0.516
EPA 353.2 Rev. 2.0	NO2NO3-N	101	98.0					0.0
EPA 365.1 Rev. 2.0	Total-P	107	104	106				1.70
SM 2320 B-2011	Total Alkalinity	98.4					0.145	
SM 2540 C-2011	TDS						2.89	
SM 4500-F- C-2011	Fluoride	102	99.9	98.0				1.45
SM 5310 B-2011	Organic Carbon	95.0	99.8	101				1.08

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2353657
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2353657
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2353663, 2353664
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2353663, 2353664
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2353657
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2353657
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2353658
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2353658

Reference Method Descriptions

Method	Description	Associated Samples
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2353658
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2353658
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2353657
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2353663, 2353664
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2353657
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2353657
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2353657
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2353658

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	09/01/2022			09/01/2022 15:51	Anna M. Plaviak	2353657
EPA 180.1 Rev. 2.0	09/01/2022			09/01/2022 13:42	Chandler E Cox	2353657
EPA 200.7 Rev. 4.4	09/01/2022	09/06/2022 10:20	Megan Whitefoot	09/14/2022 08:46	McKinley C Carter	2353663
	09/01/2022	09/06/2022 10:20	Megan Whitefoot	09/14/2022 08:54	McKinley C Carter	2353664
	09/01/2022	09/06/2022 10:20	Megan Whitefoot	09/14/2022 18:52	McKinley C Carter	2353663
	09/01/2022	09/06/2022 10:20	Megan Whitefoot	09/14/2022 19:00	McKinley C Carter	2353664
EPA 200.8 Rev. 5.4	09/01/2022	09/06/2022 10:20	Megan Whitefoot	09/09/2022 18:21	Emily M Philpot	2353663
	09/01/2022	09/06/2022 10:20	Megan Whitefoot	09/09/2022 18:30	Emily M Philpot	2353664
	09/01/2022	09/06/2022 10:20	Megan Whitefoot	09/12/2022 16:31	Emily M Philpot	2353663
	09/01/2022	09/06/2022 10:20	Megan Whitefoot	09/12/2022 16:37	Emily M Philpot	2353664
EPA 300.0 Rev. 2.1	09/01/2022			09/10/2022 12:45	Anna M. Plaviak	2353657
EPA 350.1 Rev. 2.0	09/01/2022			09/08/2022 13:06	Ping Hua	2353658
EPA 351.2 Rev. 2.0	09/01/2022	09/06/2022 14:30	Alexandra J Mattheus	09/07/2022 12:06	Alexandra J Mattheus	2353658
EPA 353.2 Rev. 2.0	09/01/2022			09/08/2022 10:47	Beverly Y. Sanders	2353658
EPA 365.1 Rev. 2.0	09/01/2022	09/08/2022 16:33	Adam P Silver	09/09/2022 12:08	James L Waggerby	2353658
SM 2320 B-2011	09/01/2022			09/12/2022 00:10	Dale L. Simmons	2353657
SM 2340 B-2011	09/01/2022			09/14/2022 08:46	McKinley C Carter	2353663
	09/01/2022			09/14/2022 08:54	McKinley C Carter	2353664
SM 2540 C-2011	09/01/2022			09/02/2022 16:08	Yijie Li	2353657
SM 2540 D-2011	09/01/2022			09/02/2022 16:08	Yijie Li	2353657
SM 4500-F- C-2011	09/01/2022			09/09/2022 13:35	Dale L. Simmons	2353657
SM 5310 B-2011	09/01/2022			09/06/2022 22:13	Khloe J Berg	2353658