Chemical Analysis Report

CEN-DIST-2023-03-24-01

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

Event Description: **Run 10**
Request ID: **RQ-2023-03-20-25**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Matthew Bearden

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

Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 13-APR-2023 14:35

B. Steinbock

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: Lake Fairhope @ Center **Collection Date/Time: 03/23/2023 10:57**

Field ID: G2CE0016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2396270	DEP SOP: NU-094-1	Color (true)	36		PCU	P427640	
	EPA 180.1 Rev. 2.0	Turbidity	14		NTU	P427643	
	EPA 300.0 Rev. 2.1	Chloride	29		mg Cl/L	P427892	
		Sulfate	0.61		mg SO4/L	P427894	
	SM 2320 B-2011	Total Alkalinity	100		mg CaCO3/L	P427850	
	SM 2540 C-2015	TDS	169		mg/L	P428327	
	SM 2540 D-2015	TSS	22		mg/L	P428169	
	SM 4500-F- C-2011	Fluoride	0.061	I	mg F/L	P427852	MS
2396271	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P427761	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.36		mg N/L	P427792	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P427973	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P427690	
	SM 5310 B-2011	Organic Carbon	19		mg C/L	P427906	
2396276	EPA 200.7 Rev. 4.4	Calcium	42.3		mg/L	P427791	
		Iron	190		ug/L	P427791	
		Magnesium	3.13		mg/L	P427791	
		Potassium	3.0		mg/L	P427791	
		Sodium	17.7		mg/L	P427791	
		Strontium	94.6		ug/L	P427791	
		Tin	3.8	I	ug/L	P427791	
		Titanium	0.94	I	ug/L	P427791	
		Vanadium	2.0	U	ug/L	P427791	
		Zinc	6.7	I	ug/L	P427791	
	EPA 200.8 Rev. 5.4	Aluminum	107		ug/L	P427791	
		Antimony	1.53		ug/L	P427791	
		Arsenic	1.83		ug/L	P427791	
		Barium	15.9		ug/L	P427791	
		Beryllium	0.010	U	ug/L	P427791	
		Boron	32.6		ug/L	P427791	
		Cadmium	0.020	U	ug/L	P427791	
		Chromium	0.40	U	ug/L	P427791	
		Cobalt	0.063	I	ug/L	P427791	
		Copper	1.04		ug/L	P427791	
		Lead	1.84		ug/L	P427791	
		Manganese	38.7		ug/L	P427791	
		Molybdenum	0.39	I	ug/L	P427791	
		Nickel	0.54	I	ug/L	P427791	
		Selenium	0.20	U	ug/L	P427791	
		Silver	0.010	U	ug/L	P427791	
		Thallium	0.10	U	ug/L	P427791	
	SM 2340 B-2011	Hardness	118		mg/L	P427791	

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 Ingram East **Collection Date/Time: 03/23/2023 12:57**

Field ID: G4CE0155 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2396272	DEP SOP: NU-094-1	Color (true)	51		PCU	P427640	
	EPA 180.1 Rev. 2.0	Turbidity	0.75	I	NTU	P427643	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P427892	
		Sulfate	4.0		mg SO4/L	P427894	
	SM 2320 B-2011	Total Alkalinity	23		mg CaCO3/L	P427850	
	SM 2540 C-2015	TDS	70		mg/L	P428327	
	SM 2540 D-2015	TSS	2	I	mg/L	P428169	
	SM 4500-F- C-2011	Fluoride	0.043	I	mg F/L	P427852	MS
2396273	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P427761	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P427792	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P427973	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P427690	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P427906	

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 Reams @ Center **Collection Date/Time: 03/23/2023 14:15**

Field ID: G4CE0242 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2396277	EPA 200.7 Rev. 4.4	Calcium	7.06		mg/L	P427791	
		Iron	170		ug/L	P427791	
		Magnesium	3.45		mg/L	P427791	
		Potassium	6.5		mg/L	P427791	
		Sodium	23.1		mg/L	P427791	
		Strontium	22.8		ug/L	P427791	
		Tin	3.0	U	ug/L	P427791	
		Titanium	0.75	U	ug/L	P427791	
		Vanadium	2.0	U	ug/L	P427791	
		Zinc	5.0	U	ug/L	P427791	
	EPA 200.8 Rev. 5.4	Aluminum	67		ug/L	P427791	
		Antimony	0.26		ug/L	P427791	
		Arsenic	0.31		ug/L	P427791	
		Barium	9.43		ug/L	P427791	
		Beryllium	0.016	I	ug/L	P427791	
		Boron	45.1		ug/L	P427791	
		Cadmium	0.020	U	ug/L	P427791	
		Chromium	0.40	U	ug/L	P427791	
		Cobalt	0.038	I	ug/L	P427791	
		Copper	0.78	I	ug/L	P427791	
		Lead	0.23	I	ug/L	P427791	
		Manganese	4.80		ug/L	P427791	
		Molybdenum	0.15	U	ug/L	P427791	
		Nickel	0.50	U	ug/L	P427791	
		Selenium	0.20	U	ug/L	P427791	
		Silver	0.010	U	ug/L	P427791	
		Thallium	0.10	U	ug/L	P427791	
	SM 2340 B-2011	Hardness	31.8		mg/L	P427791	

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P427640

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P427643

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P427791

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: P427791

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: P427892

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: P427894

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427761

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427792

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427973

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427690

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

Reference Method: SM 2320 B-2011
Batch ID: P427850

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

Reference Method: SM 2540 C-2015
Batch ID: P428327

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P428169

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P427852

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P427906

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: P427640

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P427643

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P427791

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	108		P	80 - 120
Iron	107		P	80 - 120
Magnesium	104		P	80 - 120
Potassium	102		P	80 - 120
Sodium	102		P	80 - 120
Strontium	100		P	80 - 120
Tin	104		P	80 - 120
Titanium	103		P	80 - 120
Vanadium	101		P	80 - 120
Zinc	99.2		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427791

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	107		P	85 - 115
Arsenic	102		P	85 - 115
Barium	104		P	85 - 115
Beryllium	93.3		P	85 - 115
Boron	102		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	101		P	85 - 115
Cobalt	104		P	85 - 115
Copper	103		P	85 - 115
Lead	103		P	85 - 115
Manganese	100		P	85 - 115
Molybdenum	100		P	85 - 115
Nickel	103		P	85 - 115
Selenium	100		P	85 - 115
Silver	106		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427892

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427894

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427761

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427792

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: P427973

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: P427690

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.7		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P427850

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.9		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P428327

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

Reference Method: SM 2540 D-2015
Batch ID: P428169

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	92.7		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P427852

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P427906

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P427791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396455	Calcium	101		P	80 - 120
2396455	Iron	106	105	P/P	80 - 120
2396455	Magnesium	99.7		P	80 - 120
2396455	Potassium	101	99.4	P/P	80 - 120
2396455	Sodium	98.0		P	80 - 120
2396455	Strontium	99.8	98.7	P/P	80 - 120
2396455	Tin	103	102	P/P	80 - 120
2396455	Titanium	103	101	P/P	80 - 120
2396455	Vanadium	100	99.1	P/P	80 - 120
2396455	Zinc	95.5	92.9	P/P	80 - 120
2396470	Calcium	102		P	80 - 120
2396470	Iron	105		P	80 - 120
2396470	Magnesium	103		P	80 - 120
2396470	Potassium	100		P	80 - 120
2396470	Sodium	98.5		P	80 - 120
2396470	Strontium	98.8		P	80 - 120
2396470	Tin	104		P	80 - 120
2396470	Titanium	101		P	80 - 120
2396470	Vanadium	98.9		P	80 - 120
2396470	Zinc	94.0		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396455	Aluminum	101	99.4	P/P	80 - 120
2396455	Antimony	107	105	P/P	80 - 120
2396455	Arsenic	101	100	P/P	80 - 120
2396455	Barium	103	101	P/P	80 - 120
2396455	Beryllium	94.5	94.3	P/P	80 - 120
2396455	Boron	106	105	P/P	80 - 120
2396455	Cadmium	105	104	P/P	80 - 120
2396455	Chromium	99.9	97.8	P/P	80 - 120
2396455	Cobalt	100	98.3	P/P	80 - 120
2396455	Copper	96.9	95.6	P/P	80 - 120
2396455	Lead	102	102	P/P	80 - 120
2396455	Manganese	101	99.4	P/P	80 - 120
2396455	Molybdenum	102	102	P/P	80 - 120
2396455	Nickel	98.9	96.3	P/P	80 - 120
2396455	Selenium	98.2	97.8	P/P	80 - 120
2396455	Silver	104	103	P/P	80 - 120
2396455	Thallium	102	102	P/P	80 - 120
2396470	Aluminum	101		P	80 - 120
2396470	Antimony	105		P	80 - 120
2396470	Arsenic	99.8		P	80 - 120
2396470	Barium	102		P	80 - 120
2396470	Beryllium	91.6		P	80 - 120
2396470	Boron	109		P	80 - 120
2396470	Cadmium	103		P	80 - 120
2396470	Chromium	97.6		P	80 - 120
2396470	Cobalt	97.8		P	80 - 120
2396470	Copper	94.8		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396470	Lead	102		P	80 - 120
2396470	Manganese	100		P	80 - 120
2396470	Molybdenum	101		P	80 - 120
2396470	Nickel	95.7		P	80 - 120
2396470	Selenium	96.4		P	80 - 120
2396470	Silver	104		P	80 - 120
2396470	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427892

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395895	Chloride	101		P	90 - 110
2396077	Chloride	94.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395895	Sulfate	99.0		P	90 - 110
2396077	Sulfate	96.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427761

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396199	Ammonia-N	99.8	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427792

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396282	Kjeldahl Nitrogen	106	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427973

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396199	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396243	Total-P	102	102	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P427852

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396122	Fluoride	108	106	F/F	94 - 104

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P427906

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2395708	Organic Carbon	97.4	96.6	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P427640

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396188	Color (true)	1.64	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P427643

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396188	Turbidity	4.58	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P427791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396455	Calcium	1.14	Spike	P	0 - 20
2396455	Iron	0.888	Spike	P	0 - 20
2396455	Magnesium	0.804	Spike	P	0 - 20
2396455	Potassium	1.31	Spike	P	0 - 20
2396455	Sodium	1.17	Spike	P	0 - 20
2396455	Strontium	1.05	Spike	P	0 - 20
2396455	Tin	1.10	Spike	P	0 - 20
2396455	Titanium	1.65	Spike	P	0 - 20
2396455	Vanadium	1.26	Spike	P	0 - 20
2396455	Zinc	2.76	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P427791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396455	Aluminum	1.48	Spike	P	0 - 20
2396455	Antimony	1.21	Spike	P	0 - 20
2396455	Arsenic	0.995	Spike	P	0 - 20
2396455	Barium	1.01	Spike	P	0 - 20
2396455	Beryllium	0.219	Spike	P	0 - 20
2396455	Boron	0.907	Spike	P	0 - 20
2396455	Cadmium	1.24	Spike	P	0 - 20
2396455	Chromium	2.06	Spike	P	0 - 20
2396455	Cobalt	2.02	Spike	P	0 - 20
2396455	Copper	1.30	Spike	P	0 - 20
2396455	Lead	0.134	Spike	P	0 - 20
2396455	Manganese	1.41	Spike	P	0 - 20
2396455	Molybdenum	0.191	Spike	P	0 - 20
2396455	Nickel	2.67	Spike	P	0 - 20
2396455	Selenium	0.421	Spike	P	0 - 20
2396455	Silver	1.58	Spike	P	0 - 20
2396455	Thallium	0.0645	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427892

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395895	Chloride	0.546	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P427894

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395895	Sulfate	1.52	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427761

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396199	Ammonia-N	2.14	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396282	Kjeldahl Nitrogen	4.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396199	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396243	Total-P	0.138	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P427850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396122	Total Alkalinity	0.125	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P428327

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396188	TDS	1.50	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P427852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396122	Fluoride	1.01	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P427906

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2395708	Organic Carbon	0.722	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: A118185
Included Lab Sample IDs: 2396270, 2396272

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A118188
Included Lab Sample IDs: 2396270, 2396272

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A118228
Included Lab Sample IDs: 2396271

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A118235
Included Lab Sample IDs: 2396273

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A118236
Included Lab Sample IDs: 2396271, 2396273

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	99.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A118247
Included Lab Sample IDs: 2396270, 2396272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.7	98.1	P/P	90 - 110
Sulfate	97.7	96.8	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A118280
Included Lab Sample IDs: 2396270, 2396272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.7	94.0	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A118280
Included Lab Sample IDs: 2396270, 2396272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	107	108	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A118307
Included Lab Sample IDs: 2396276, 2396277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	102	P/P	90 - 110
Antimony	105	105	P/P	90 - 110
Arsenic	99.9	99.3	P/P	90 - 110
Barium	101	100	P/P	90 - 110
Beryllium	95.9	95.8	P/P	90 - 110
Boron	106	106	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	97.4	96.5	P/P	90 - 110
Cobalt	99.2	98.8	P/P	90 - 110
Copper	97.1	96.2	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Manganese	99.6	99.2	P/P	90 - 110
Molybdenum	99.2	99.0	P/P	90 - 110
Nickel	96.7	96.1	P/P	90 - 110
Selenium	101	100	P/P	90 - 110
Silver	103	103	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A118311
Included Lab Sample IDs: 2396271, 2396273

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.0	99.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A118335
Included Lab Sample IDs: 2396276, 2396277

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A118342
Included Lab Sample IDs: 2396271, 2396273

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A118347
Included Lab Sample IDs: 2396271, 2396273

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	106	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A118359
Included Lab Sample IDs: 2396276, 2396277

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A118359
Included Lab Sample IDs: 2396276, 2396277

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	104	104	P/P	90 - 110
Magnesium	101	102	P/P	90 - 110
Potassium	99.6	100	P/P	90 - 110
Sodium	98.7	98.8	P/P	90 - 110
Strontium	99.9	99.6	P/P	90 - 110
Tin	101	101	P/P	90 - 110
Titanium	101	101	P/P	90 - 110
Vanadium	99.6	100	P/P	90 - 110
Zinc	97.7	97.7	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)	96.9					1.64	
EPA 180.1 Rev. 2.0	Turbidity	99.6					4.58	
EPA 200.7 Rev. 4.4	Calcium	108	101	102				1.14
	Iron	107	106	105	105			0.888
	Magnesium	104	99.7	103				0.804
	Potassium	102	101	99.4	100			1.31
	Sodium	102	98.0	98.5				1.17
	Strontium	100	99.8	98.7	98.8			1.05
	Tin	104	103	102	104			1.10
	Titanium	103	103	101	101			1.65
	Vanadium	101	100	99.1	98.9			1.26
	Zinc	99.2	95.5	92.9	94.0			2.76
EPA 200.8 Rev. 5.4	Aluminum	102	101	99.4	101			1.48
	Antimony	107	107	105	105			1.21
	Arsenic	102	101	100	99.8			0.995
	Barium	104	103	101	102			1.01
	Beryllium	93.3	94.5	94.3	91.6			0.219
	Boron	102	106	105	109			0.907
	Cadmium	104	105	104	103			1.24
	Chromium	101	99.9	97.8	97.6			2.06
	Cobalt	104	100	98.3	97.8			2.02
	Copper	103	96.9	95.6	94.8			1.30
	Lead	103	102	102	102			0.134
	Manganese	100	101	99.4	100			1.41
	Molybdenum	100	102	102	101			0.191
	Nickel	103	98.9	96.3	95.7			2.67
	Selenium	100	98.2	97.8	96.4			0.421
	Silver	106	104	103	104			1.58
	Thallium	101	103	102	102			0.0645
EPA 300.0 Rev. 2.1	Chloride	98.7	101	94.8			0.546	
	Sulfate	96.7	99.0	96.4			1.52	
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	99.8	103				2.14
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.6	106	98.2				4.94
EPA 353.2 Rev. 2.0	NO2NO3-N	102	103	102				0.487
EPA 365.1 Rev. 2.0	Total-P	99.7	102	102				0.138
SM 2320 B-2011	Total Alkalinity	96.9					0.125	
SM 2540 C-2015	TDS	105					1.50	
SM 2540 D-2015	TSS	92.7						
SM 4500-F- C-2011	Fluoride	104	108	106				1.01
SM 5310 B-2011	Organic Carbon	95.8	97.4	96.6				0.722

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2396270, 2396272
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2396270, 2396272
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2396276, 2396277
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2396276, 2396277
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2396270, 2396272
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2396270, 2396272
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2396271, 2396273

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2396271, 2396273
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2396271, 2396273
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2396271, 2396273
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2396270, 2396272
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2396276, 2396277
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2396270, 2396272
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2396270, 2396272
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2396270, 2396272
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2396271, 2396273

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	03/24/2023			03/24/2023 13:59	Anna M. Plaviak	2396270, 2396272
EPA 180.1 Rev. 2.0	03/24/2023			03/24/2023 14:12	Khloe J Berg	2396270
	03/24/2023			03/24/2023 14:14	Khloe J Berg	2396272
EPA 200.7 Rev. 4.4	03/24/2023	03/29/2023 10:50	Vijayalakshmi Reddy	04/03/2023 20:21	McKinley C Carter	2396276
	03/24/2023	03/29/2023 10:50	Vijayalakshmi Reddy	04/03/2023 20:29	McKinley C Carter	2396277
EPA 200.8 Rev. 5.4	03/24/2023	03/29/2023 10:50	Vijayalakshmi Reddy	03/30/2023 18:11	Conrad Hartmann	2396276
	03/24/2023	03/29/2023 10:50	Vijayalakshmi Reddy	03/30/2023 18:20	Conrad Hartmann	2396277
	03/24/2023	03/29/2023 10:50	Vijayalakshmi Reddy	03/31/2023 20:28	Conrad Hartmann	2396276
	03/24/2023	03/29/2023 10:50	Vijayalakshmi Reddy	03/31/2023 20:38	Conrad Hartmann	2396277
EPA 300.0 Rev. 2.1	03/24/2023			03/30/2023 16:18	James L Waggerby	2396270
	03/24/2023			03/30/2023 16:33	James L Waggerby	2396272
EPA 350.1 Rev. 2.0	03/24/2023			03/28/2023 13:10	Khloe J Berg	2396271
	03/24/2023			03/28/2023 13:11	Khloe J Berg	2396273
EPA 351.2 Rev. 2.0	03/24/2023	03/30/2023 12:39	Simonne.V. Calhoun	04/03/2023 13:33	Samantha L Bates	2396271
	03/24/2023	03/30/2023 12:39	Simonne.V. Calhoun	04/03/2023 13:35	Samantha L Bates	2396273
EPA 353.2 Rev. 2.0	03/24/2023			04/03/2023 10:18	Beverly Y. Sanders	2396271
	03/24/2023			04/03/2023 10:19	Beverly Y. Sanders	2396273
EPA 365.1 Rev. 2.0	03/24/2023	03/27/2023 13:30	Alexis Price	03/28/2023 10:35	James L Waggerby	2396271
	03/24/2023	03/27/2023 13:30	Alexis Price	03/28/2023 14:10	James L Waggerby	2396273
SM 2320 B-2011	03/24/2023			03/30/2023 02:19	Dale L. Simmons	2396270
	03/24/2023			03/30/2023 02:32	Dale L. Simmons	2396272
SM 2340 B-2011	03/24/2023			04/03/2023 20:21	McKinley C Carter	2396276
	03/24/2023			04/03/2023 20:29	McKinley C Carter	2396277
SM 2540 C-2015	03/24/2023			03/29/2023 16:02	Yijie Li	2396270, 2396272
SM 2540 D-2015	03/24/2023			03/29/2023 16:02	Yijie Li	2396270, 2396272
SM 4500-F- C-2011	03/24/2023			03/30/2023 02:19	Dale L. Simmons	2396270
	03/24/2023			03/30/2023 02:32	Dale L. Simmons	2396272
SM 5310 B-2011	03/24/2023			03/30/2023 21:56	Elise M. Gillis	2396271
	03/24/2023			03/30/2023 22:11	Elise M. Gillis	2396273