

Chemical Analysis Report

CEN-DIST-2022-12-14-01

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

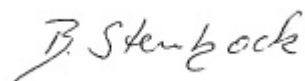
Event Description: **Lakes: Florida, Ellen, Asher, Alma**
Request ID: **RQ-2022-11-21-38**
Customer: **CEN-DIST**
Project ID: **SMP**

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.
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: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 09-JAN-2023 12:55



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 Terrace SW of Center

Collection Date/Time: 12/13/2022 12:56

Field ID: G4CE0153

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2375057	DEP SOP: NU-094-1	Color (true)	24		PCU	P423541	
	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P423536	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P423714	
		Sulfate	16		mg SO4/L	P423717	
	SM 2320 B-2011	Total Alkalinity	33		mg CaCO3/L	P423927	
	SM 2540 C-2015	TDS	82		mg/L	P423893	
	SM 2540 D-2015	TSS	5	I	mg/L	P423786	
2375058	SM 4500-F- C-2011	Fluoride	0.050	I	mg F/L	P423931	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P424100	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.72		mg N/L	P423703	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P423591	
	EPA 365.1 Rev. 2.0	Total-P	0.093		mg P/L	P423568	
2375059	SM 5310 B-2011	Organic Carbon	5.7		mg C/L	P423698	
2375059	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.034		mg P/L	P423551	
2375069	EPA 200.7 Rev. 4.4	Calcium	15.3		mg/L	P423598	
		Iron	33	I	ug/L	P423598	
		Magnesium	2.03		mg/L	P423598	
		Potassium	2.6		mg/L	P423598	
		Sodium	8.6		mg/L	P423598	
		Strontium	37.6		ug/L	P423598	
		Tin	3.0	U	ug/L	P423598	
	EPA 200.8 Rev. 5.4	Titanium	0.75	U	ug/L	P423598	
		Vanadium	2.0	U	ug/L	P423598	
		Zinc	5.0	U	ug/L	P423598	
		Aluminum	36		ug/L	P423598	
		Antimony	0.19	I	ug/L	P423598	
		Arsenic	0.62		ug/L	P423598	
		Barium	12.2		ug/L	P423598	
		Beryllium	0.010	U	ug/L	P423598	
		Boron	23.6		ug/L	P423598	
		Cadmium	0.020	U	ug/L	P423598	
		Chromium	0.40	U	ug/L	P423598	
		Cobalt	0.029	I	ug/L	P423598	
		Copper	3.35		ug/L	P423598	
		Lead	0.20	U	ug/L	P423598	
		Manganese	9.76		ug/L	P423598	
		Molybdenum	0.45	I	ug/L	P423598	
		Nickel	0.50	U	ug/L	P423598	
		Selenium	0.20	U	ug/L	P423598	
		Silver	0.010	U	ug/L	P423598	
		Thallium	0.10	U	ug/L	P423598	
	SM 2340 B-2011	Hardness	46.5		mg/L	P423598	

Ref. Method and Comment:

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

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P423541

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P423536

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P423598

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: P423598

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: P423714

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: P423717

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424100

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423703

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423591

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423568

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423551

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2320 B-2011
Batch ID: P423927

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

Reference Method: SM 2540 C-2015
Batch ID: P423893

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P423786

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P423931

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P423698

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: P423541

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P423536

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P423598

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	102		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	94.3		P	85 - 115
Sodium	98.5		P	85 - 115
Strontium	95.5		P	85 - 115
Tin	98.2		P	85 - 115
Titanium	101		P	85 - 115
Vanadium	98.3		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P423598

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	102		P	85 - 115
Barium	103		P	85 - 115
Beryllium	92.3		P	85 - 115
Boron	105		P	85 - 115
Cadmium	105		P	85 - 115
Chromium	93.5		P	85 - 115
Cobalt	94.0		P	85 - 115
Copper	97.2		P	85 - 115
Lead	94.0		P	85 - 115
Manganese	97.2		P	85 - 115
Molybdenum	101		P	85 - 115
Nickel	99.4		P	85 - 115
Selenium	102		P	85 - 115
Silver	101		P	85 - 115
Thallium	98.6		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423714

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423717

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424100

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423703

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423591

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423568

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423551

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

Reference Method: SM 2320 B-2011
Batch ID: P423927

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.6		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P423893

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	92.2		P	90 - 110

Reference Method: SM 2540 D-2015
Batch ID: P423786

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	95.2		P	85 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P423931

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P423698

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P423598

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2375565	Calcium	99.6		P	80 - 120
2375565	Iron	102	103	P/P	80 - 120
2375565	Magnesium	97.9		P	80 - 120
2375565	Potassium	96.8	97.3	P/P	80 - 120
2375565	Sodium	98.1	97.7	P/P	80 - 120
2375565	Strontium	97.9	98.5	P/P	80 - 120
2375565	Tin	98.7	100	P/P	80 - 120
2375565	Titanium	102	104	P/P	80 - 120
2375565	Vanadium	99.8	102	P/P	80 - 120
2375565	Zinc	99.8	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P423598

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2375565	Aluminum	98.5	100	P/P	80 - 120
2375565	Antimony	102	104	P/P	80 - 120
2375565	Arsenic	102	104	P/P	80 - 120
2375565	Barium	101	104	P/P	80 - 120
2375565	Beryllium	92.4	94.3	P/P	80 - 120
2375565	Boron	100	103	P/P	80 - 120
2375565	Cadmium	103	107	P/P	80 - 120
2375565	Chromium	94.1	95.8	P/P	80 - 120
2375565	Cobalt	93.0	95.6	P/P	80 - 120
2375565	Copper	95.6	97.2	P/P	80 - 120
2375565	Lead	91.1	93.9	P/P	80 - 120
2375565	Manganese	96.7	98.8	P/P	80 - 120
2375565	Molybdenum	102	103	P/P	80 - 120
2375565	Nickel	97.4	101	P/P	80 - 120
2375565	Selenium	101	102	P/P	80 - 120
2375565	Silver	101	102	P/P	80 - 120
2375565	Thallium	98.9	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P423714

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2374882	Chloride	95.2		P	90 - 110
2375057	Chloride	98.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P423717

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2374882	Sulfate	96.6		P	90 - 110
2375057	Sulfate	95.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P424100

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2374775	Ammonia-N	99.8	100	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423703

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2375418	Kjeldahl Nitrogen	93.8	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423591

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2374954	NO2NO3-N	98.0	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423568

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2375138	Total-P	104	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423551

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2375059	O-Phosphate-P	99.5	99.7	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P423931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2374629	Fluoride	98.1	97.5	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P423698

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2375418	Organic Carbon	94.5	95.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P423541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2375175	Color (true)	4.28	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P423536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2374898	Turbidity	0.531	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P423598

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2375565	Calcium	0.0263	Spike	P	0 - 20
2375565	Iron	0.379	Spike	P	0 - 20
2375565	Magnesium	0.336	Spike	P	0 - 20
2375565	Potassium	0.461	Spike	P	0 - 20
2375565	Sodium	0.208	Spike	P	0 - 20
2375565	Strontium	0.571	Spike	P	0 - 20
2375565	Tin	1.48	Spike	P	0 - 20
2375565	Titanium	1.88	Spike	P	0 - 20
2375565	Vanadium	2.12	Spike	P	0 - 20
2375565	Zinc	1.87	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P423598

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2375565	Aluminum	1.62	Spike	P	0 - 20
2375565	Antimony	2.63	Spike	P	0 - 20
2375565	Arsenic	2.00	Spike	P	0 - 20
2375565	Barium	2.63	Spike	P	0 - 20
2375565	Beryllium	2.10	Spike	P	0 - 20
2375565	Boron	2.15	Spike	P	0 - 20
2375565	Cadmium	3.04	Spike	P	0 - 20
2375565	Chromium	1.80	Spike	P	0 - 20
2375565	Cobalt	2.69	Spike	P	0 - 20
2375565	Copper	1.72	Spike	P	0 - 20
2375565	Lead	2.94	Spike	P	0 - 20
2375565	Manganese	1.91	Spike	P	0 - 20
2375565	Molybdenum	0.492	Spike	P	0 - 20
2375565	Nickel	3.81	Spike	P	0 - 20
2375565	Selenium	1.10	Spike	P	0 - 20
2375565	Silver	0.666	Spike	P	0 - 20
2375565	Thallium	2.52	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2374882	Chloride	3.46	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P423717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2374882	Sulfate	4.46	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2374775	Ammonia-N	0.141	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2375418	Kjeldahl Nitrogen	5.82	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423591

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2374954	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423568

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2375138	Total-P	2.56	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2375059	O-Phosphate-P	0.150	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P423927

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2374629	Total Alkalinity	1.30	Sample	P	0 - 3.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-2015
Batch ID: P423893

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2374869	TDS	5.86	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P423931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2374629	Fluoride	0.472	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P423698

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2375418	Organic Carbon	0.881	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A116398

Included Lab Sample IDs: 2375057

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	104	104	P/P	90 - 110
Sulfate	104	105	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A116438

Included Lab Sample IDs: 2375057

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: A116439

Included Lab Sample IDs: 2375057

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.0	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A116443

Included Lab Sample IDs: 2375059

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A116461

Included Lab Sample IDs: 2375058

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	94.5	94.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A116491

Included Lab Sample IDs: 2375058

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A116526

Included Lab Sample IDs: 2375069

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	102	P/P	90 - 110
Antimony	101	99.7	P/P	90 - 110
Arsenic	103	101	P/P	90 - 110
Barium	100	100	P/P	90 - 110
Boron	101	101	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Cobalt	93.8	92.4	P/P	90 - 110
Copper	98.7	98.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A116526

Included Lab Sample IDs: 2375069

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	97.6	96.0	P/P	90 - 110
Manganese	97.7	96.8	P/P	90 - 110
Molybdenum	100	100	P/P	90 - 110
Nickel	98.0	96.6	P/P	90 - 110
Selenium	106	103	P/P	90 - 110
Silver	97.6	98.1	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A116527

Included Lab Sample IDs: 2375058

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	97.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A116537

Included Lab Sample IDs: 2375069

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	96.1	95.9	P/P	90 - 110
Chromium	90.0	91.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A116567

Included Lab Sample IDs: 2375058

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.8	94.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A116621

Included Lab Sample IDs: 2375069

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	105	99.9	P/P	90 - 110
Iron	105	100	P/P	90 - 110
Magnesium	104	98.2	P/P	90 - 110
Potassium	101	96.9	P/P	90 - 110
Sodium	103	98.5	P/P	90 - 110
Strontium	95.8	108	P/P	90 - 110
Tin	96.7	109	P/P	90 - 110
Titanium	96.2	108	P/P	90 - 110
Vanadium	95.5	107	P/P	90 - 110
Zinc	98.3	110	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A116645

Included Lab Sample IDs: 2375057

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	94.6	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500-F- C-2011

Run ID: A116645

Included Lab Sample IDs: 2375057

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A116666

Included Lab Sample IDs: 2375069

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Thallium	99.6	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A116722

Included Lab Sample IDs: 2375058

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	98.9	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)	100			4.28	
EPA 180.1 Rev. 2.0	Turbidity	102			0.531	
EPA 200.7 Rev. 4.4	Calcium	106	99.6			0.0263
	Iron	102	102 103			0.379
	Magnesium	101	97.9			0.336
	Potassium	94.3	96.8 97.3			0.461
	Sodium	98.5	98.1 97.7			0.208
	Strontium	95.5	97.9 98.5			0.571
	Tin	98.2	98.7 100			1.48
	Titanium	101	102 104			1.88
	Vanadium	98.3	99.8 102			2.12
	Zinc	101	99.8 102			1.87
EPA 200.8 Rev. 5.4	Aluminum	103	98.5 100			1.62
	Antimony	103	102 104			2.63
	Arsenic	102	102 104			2.00
	Barium	103	101 104			2.63
	Beryllium	92.3	92.4 94.3			2.10
	Boron	105	100 103			2.15
	Cadmium	105	103 107			3.04
	Chromium	93.5	94.1 95.8			1.80
	Cobalt	94.0	93.0 95.6			2.69
	Copper	97.2	95.6 97.2			1.72
	Lead	94.0	91.1 93.9			2.94
	Manganese	97.2	96.7 98.8			1.91
	Molybdenum	101	102 103			0.492
	Nickel	99.4	97.4 101			3.81
	Selenium	102	101 102			1.10
	Silver	101	101 102			0.666
	Thallium	98.6	98.9 101			2.52
EPA 300.0 Rev. 2.1	Chloride	100	95.2 98.7		3.46	
	Sulfate	101	96.6 95.1		4.46	
EPA 350.1 Rev. 2.0	Ammonia-N	98.0	99.8 100			0.141
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	93.8 100			5.82
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	98.0 98.0			0.0
EPA 365.1 Rev. 2.0	Total-P	105	104 107			2.56
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	99.7 99.5			0.150
SM 2320 B-2011	Total Alkalinity	97.6			1.30	
SM 2540 C-2015	TDS	92.2			5.86	
SM 2540 D-2015	TSS	95.2				
SM 4500-F- C-2011	Fluoride	101	98.1 97.5			0.472
SM 5310 B-2011	Organic Carbon	94.4	94.5 95.6			0.881

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2375057
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2375057
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2375069
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2375069
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2375057
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2375057

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2375058
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2375058
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2375058
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2375058
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2375059
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2375057
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2375069
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2375057
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2375057
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2375057
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2375058

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	12/14/2022			12/14/2022 14:45	Alexis Price	2375057
EPA 180.1 Rev. 2.0	12/14/2022			12/14/2022 13:37	Chandler E Cox	2375057
EPA 200.7 Rev. 4.4	12/14/2022	12/15/2022 13:35	George D Taylor	12/21/2022 11:52	McKinley C Carter	2375069
EPA 200.8 Rev. 5.4	12/14/2022	12/15/2022 13:35	George D Taylor	12/17/2022 03:22	Emily M Philpot	2375069
	12/14/2022	12/15/2022 13:35	George D Taylor	12/18/2022 22:18	Emily M Philpot	2375069
	12/14/2022	12/15/2022 13:35	George D Taylor	12/22/2022 17:26	Emily M Philpot	2375069
EPA 300.0 Rev. 2.1	12/14/2022			12/17/2022 05:31	Anna M. Plaviak	2375057
EPA 350.1 Rev. 2.0	12/14/2022			01/04/2023 12:23	Ping Hua	2375058
EPA 351.2 Rev. 2.0	12/14/2022	12/19/2022 12:30	Simonne.V. Calhoun	12/20/2022 11:03	Samantha L Bates	2375058
EPA 353.2 Rev. 2.0	12/14/2022			12/15/2022 10:56	Beverly Y. Sanders	2375058
EPA 365.1 Rev. 2.0	12/14/2022	12/15/2022 15:15	Simonne.V. Calhoun	12/16/2022 09:49	James L Waggeberby	2375058
EPA 365.1 Rev. 2.0 dissolved	12/14/2022			12/14/2022 17:08	Elise M. Gillis	2375059
SM 2320 B-2011	12/14/2022			12/22/2022 11:48	Dale L. Simmons	2375057
SM 2340 B-2011	12/14/2022			12/21/2022 11:52	McKinley C Carter	2375069
SM 2540 C-2015	12/14/2022			12/15/2022 16:01	Yijie Li	2375057
SM 2540 D-2015	12/14/2022			12/15/2022 16:01	Yijie Li	2375057
SM 4500-F- C-2011	12/14/2022			12/22/2022 11:48	Dale L. Simmons	2375057
SM 5310 B-2011	12/14/2022			12/16/2022 16:08	Khloe J Berg	2375058