Chemical Analysis Report

CEN-DIST-2022-10-05-01

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

Event Description: **Lakes: Effie, Isabell, Leonore**
Request ID: **RQ-2022-09-19-21**
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
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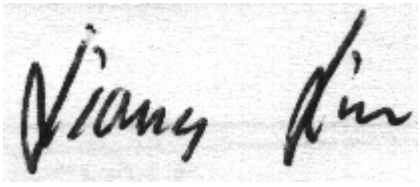
Certified by: Liang Lin, Environmental Administrator

Date Certified: 25-OCT-2022 14:57



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 Isabell @ Center **Collection Date/Time: 10/04/2022 12:25**

Field ID: G4CE0214 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2360330	DEP SOP: NU-094-1	Color (true)	130		PCU	P420529	
	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P420531	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P421101	
		Sulfate	17		mg SO4/L	P421104	
	SM 2320 B-2011	Total Alkalinity	13		mg CaCO3/L	P420701	
	SM 2540 C-2015	TDS	101		mg/L	P421071	
	SM 2540 D-2015	TSS	2	U	mg/L	P421137	
	SM 4500-F- C-2011	Fluoride	0.052	I	mg F/L	P420703	
2360331	EPA 350.1 Rev. 2.0	Ammonia-N	0.035		mg N/L	P420791	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.99		mg N/L	P420545	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.054		mg N/L	P420564	
	EPA 365.1 Rev. 2.0	Total-P	0.029		mg P/L	P420523	
	SM 5310 B-2011	Organic Carbon	16		mg C/L	P420780	
2360333	EPA 200.7 Rev. 4.4	Calcium	7.99		mg/L	P420603	
		Iron	94	I	ug/L	P420603	
		Magnesium	4.75		mg/L	P420603	
		Potassium	6.1		mg/L	P420603	
		Sodium	3.5		mg/L	P420603	
		Strontium	90.4		ug/L	P420603	
		Tin	3.0	U	ug/L	P420603	
		Titanium	0.95	I	ug/L	P420603	
		Vanadium	2.0	U	ug/L	P420603	
		Zinc	5.0	U	ug/L	P420603	
	EPA 200.8 Rev. 5.4	Aluminum	82		ug/L	P420603	
		Antimony	0.056	I	ug/L	P420603	
		Arsenic	0.75		ug/L	P420603	
		Barium	11.6		ug/L	P420603	
		Beryllium	0.011	I	ug/L	P420603	
		Boron	29.3		ug/L	P420603	
		Cadmium	0.020	U	ug/L	P420603	
		Chromium	0.40	U	ug/L	P420603	
		Cobalt	0.112		ug/L	P420603	
		Copper	0.59	I	ug/L	P420603	
		Lead	0.20	U	ug/L	P420603	
		Manganese	71.7		ug/L	P420603	
		Molybdenum	0.28	I	ug/L	P420603	
		Nickel	0.50	U	ug/L	P420603	
		Selenium	0.20	U	ug/L	P420603	
		Silver	0.010	U	ug/L	P420603	
		Thallium	0.10	U	ug/L	P420603	
	SM 2340 B-2011	Hardness	39.5		mg/L	P420603	

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: P420529

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P420531

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P420603

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: P420603

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: P421101

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: P421104

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420791

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420545

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420564

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420523

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

Reference Method: SM 2320 B-2011
Batch ID: P420701

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

Reference Method: SM 2540 C-2015
Batch ID: P421071

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P421137

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P420703

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: P420780

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: P420529

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P420531

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P420603

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	99.3		P	80 - 120
Iron	102		P	80 - 120
Magnesium	103		P	80 - 120
Potassium	102		P	80 - 120
Sodium	103		P	80 - 120
Strontium	103		P	80 - 120
Tin	101		P	80 - 120
Titanium	100		P	80 - 120
Vanadium	101		P	80 - 120
Zinc	98.3		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P420603

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.3		P	85 - 115
Antimony	98.5		P	85 - 115
Arsenic	99.5		P	85 - 115
Barium	99.9		P	85 - 115
Beryllium	92.2		P	85 - 115
Boron	99.6		P	85 - 115
Cadmium	95.3		P	85 - 115
Chromium	99.2		P	85 - 115
Cobalt	99.2		P	85 - 115
Copper	98.3		P	85 - 115
Lead	91.6		P	85 - 115
Manganese	99.3		P	85 - 115
Molybdenum	95.1		P	85 - 115
Nickel	98.7		P	85 - 115
Selenium	97.9		P	85 - 115
Silver	113		P	85 - 115
Thallium	92.5		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421101

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421104

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420791

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420545

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420564

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: P420523

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

Reference Method: SM 2320 B-2011
Batch ID: P420701

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.5		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P421071

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

Reference Method: SM 2540 D-2015
Batch ID: P421137

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	90.2		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P420703

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	96 - 104

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P420780

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P420603

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360194	Calcium	99.3		P	80 - 120
2360194	Iron	105	108	P/P	80 - 120
2360194	Magnesium	103	108	P/P	80 - 120
2360194	Potassium	105	109	P/P	80 - 120
2360194	Sodium	102	109	P/P	80 - 120
2360194	Strontium	105	109	P/P	80 - 120
2360194	Tin	100	110	P/P	80 - 120
2360194	Titanium	101	110	P/P	80 - 120
2360194	Vanadium	103	112	P/P	80 - 120
2360194	Zinc	98.8	107	P/P	80 - 120
2360284	Calcium	106		P	80 - 120
2360284	Iron	105		P	80 - 120
2360284	Magnesium	107		P	80 - 120
2360284	Potassium	103		P	80 - 120
2360284	Sodium	102		P	80 - 120
2360284	Strontium	105		P	80 - 120
2360284	Tin	104		P	80 - 120
2360284	Titanium	102		P	80 - 120
2360284	Vanadium	102		P	80 - 120
2360284	Zinc	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P420603

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360194	Aluminum	99.3	98.6	P/P	80 - 120
2360194	Antimony	102	101	P/P	80 - 120
2360194	Arsenic	102	102	P/P	80 - 120
2360194	Barium	102	103	P/P	80 - 120
2360194	Beryllium	91.6	93.3	P/P	80 - 120
2360194	Boron	107	107	P/P	80 - 120
2360194	Cadmium	102	99.7	P/P	80 - 120
2360194	Chromium	106	102	P/P	80 - 120
2360194	Cobalt	102	100	P/P	80 - 120
2360194	Copper	100	98.0	P/P	80 - 120
2360194	Lead	95.4	95.6	P/P	80 - 120
2360194	Manganese	104	102	P/P	80 - 120
2360194	Molybdenum	101	99.7	P/P	80 - 120
2360194	Nickel	100	98.7	P/P	80 - 120
2360194	Selenium	98.1	97.4	P/P	80 - 120
2360194	Silver	117	115	P/P	80 - 120
2360194	Thallium	97.7	98.4	P/P	80 - 120
2360284	Aluminum	99.0		P	80 - 120
2360284	Antimony	99.9		P	80 - 120
2360284	Arsenic	102		P	80 - 120
2360284	Barium	103		P	80 - 120
2360284	Beryllium	95.1		P	80 - 120
2360284	Boron	105		P	80 - 120
2360284	Cadmium	98.1		P	80 - 120
2360284	Chromium	102		P	80 - 120
2360284	Cobalt	102		P	80 - 120
2360284	Copper	102		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P420603

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360284	Lead	95.9		P	80 - 120
2360284	Manganese	102		P	80 - 120
2360284	Molybdenum	97.2		P	80 - 120
2360284	Nickel	100		P	80 - 120
2360284	Selenium	99.1		P	80 - 120
2360284	Silver	113		P	80 - 120
2360284	Thallium	97.6		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421101

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360307	Chloride	95.9		P	90 - 110
2360786	Chloride	96.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421104

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360307	Sulfate	96.8		P	90 - 110
2360786	Sulfate	96.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360278	Ammonia-N	97.4	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420545

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360100	Kjeldahl Nitrogen	95.2	97.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420564

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360308	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420523

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360188	Total-P	109	108	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P420703

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360185	Fluoride	98.9	97.4	P/P	94 - 104

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P420780

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2360686	Organic Carbon	99.2	97.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P420529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360281	Color (true)	0.0686	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P420531

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360097	Turbidity	17.6	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P420603

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360194	Calcium	3.65	Spike	P	0 - 20
2360194	Iron	2.93	Spike	P	0 - 20
2360194	Magnesium	3.59	Spike	P	0 - 20
2360194	Potassium	3.42	Spike	P	0 - 20
2360194	Sodium	4.16	Spike	P	0 - 20
2360194	Strontium	2.96	Spike	P	0 - 20
2360194	Tin	9.37	Spike	P	0 - 20
2360194	Titanium	7.61	Spike	P	0 - 20
2360194	Vanadium	7.96	Spike	P	0 - 20
2360194	Zinc	7.86	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P420603

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360194	Aluminum	0.601	Spike	P	0 - 20
2360194	Antimony	1.23	Spike	P	0 - 20
2360194	Arsenic	0.324	Spike	P	0 - 20
2360194	Barium	0.583	Spike	P	0 - 20
2360194	Beryllium	1.56	Spike	P	0 - 20
2360194	Boron	0.104	Spike	P	0 - 20
2360194	Cadmium	1.96	Spike	P	0 - 20
2360194	Chromium	2.44	Spike	P	0 - 20
2360194	Cobalt	1.81	Spike	P	0 - 20
2360194	Copper	2.11	Spike	P	0 - 20
2360194	Lead	0.225	Spike	P	0 - 20
2360194	Manganese	1.47	Spike	P	0 - 20
2360194	Molybdenum	1.17	Spike	P	0 - 20
2360194	Nickel	1.34	Spike	P	0 - 20
2360194	Selenium	0.767	Spike	P	0 - 20
2360194	Silver	2.19	Spike	P	0 - 20
2360194	Thallium	0.727	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421101

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360307	Chloride	0.505	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421104

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360307	Sulfate	1.17	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360278	Ammonia-N	1.55	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420545

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360100	Kjeldahl Nitrogen	1.57	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360308	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P420523

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360188	Total-P	0.673	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P420701

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360185	Total Alkalinity	0.339	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P421071

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2359953	TDS	5.41	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P420703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360185	Fluoride	0.960	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P420780

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2360686	Organic Carbon	1.09	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: A115142
Included Lab Sample IDs: 2360330

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

Reference Method: DEP SOP: NU-094-1
Run ID: A115143
Included Lab Sample IDs: 2360330

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.6	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115154
Included Lab Sample IDs: 2360331

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A115180
Included Lab Sample IDs: 2360331

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.6	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A115182
Included Lab Sample IDs: 2360331

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A115204
Included Lab Sample IDs: 2360333

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	99.5	P/P	90 - 110
Iron	100	99.1	P/P	90 - 110
Magnesium	99.2	97.9	P/P	90 - 110
Potassium	99.9	97.9	P/P	90 - 110
Sodium	100	98.0	P/P	90 - 110
Strontium	99.6	99.2	P/P	90 - 110
Tin	97.5	97.7	P/P	90 - 110
Titanium	99.1	98.9	P/P	90 - 110
Vanadium	100	99.6	P/P	90 - 110
Zinc	98.0	97.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115215
Included Lab Sample IDs: 2360333

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115215
Included Lab Sample IDs: 2360333

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	101	P/P	90 - 110
Antimony	98.2	98.1	P/P	90 - 110
Arsenic	101	100	P/P	90 - 110
Barium	97.9	98.0	P/P	90 - 110
Beryllium	96.4	96.3	P/P	90 - 110
Boron	103	102	P/P	90 - 110
Cadmium	99.1	99.8	P/P	90 - 110
Chromium	100	99.6	P/P	90 - 110
Cobalt	99.0	98.5	P/P	90 - 110
Copper	97.9	96.4	P/P	90 - 110
Lead	93.8	94.4	P/P	90 - 110
Manganese	99.7	99.5	P/P	90 - 110
Molybdenum	99.4	99.5	P/P	90 - 110
Nickel	98.7	97.9	P/P	90 - 110
Selenium	102	102	P/P	90 - 110
Silver	99.1	99.8	P/P	90 - 110
Thallium	97.2	96.8	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A115216
Included Lab Sample IDs: 2360330

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.8	98.1	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A115216
Included Lab Sample IDs: 2360330

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

Reference Method: SM 5310 B-2011
Run ID: A115247
Included Lab Sample IDs: 2360331

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115253
Included Lab Sample IDs: 2360331

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A115395
Included Lab Sample IDs: 2360330

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A115395
Included Lab Sample IDs: 2360330

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	96.7	97.6	P/P	90 - 110
Sulfate	97.8	98.8	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)	98.0					0.0686	
EPA 180.1 Rev. 2.0	Turbidity	100					17.6	
EPA 200.7 Rev. 4.4	Calcium	99.3	99.3	106				3.65
	Iron	102	105	108	105			2.93
	Magnesium	103	103	108	107			3.59
	Potassium	102	105	109	103			3.42
	Sodium	103	102	109	102			4.16
	Strontium	103	105	109	105			2.96
	Tin	101	100	110	104			9.37
	Titanium	100	101	110	102			7.61
	Vanadium	101	103	112	102			7.96
	Zinc	98.3	98.8	107	100			7.86
EPA 200.8 Rev. 5.4	Aluminum	96.3	99.0	99.3	98.6			0.601
	Antimony	98.5	99.9	102	101			1.23
	Arsenic	99.5	102	102	102			0.324
	Barium	99.9	102	103	103			0.583
	Beryllium	92.2	95.1	91.6	93.3			1.56
	Boron	99.6	105	107	107			0.104
	Cadmium	95.3	98.1	102	99.7			1.96
	Chromium	99.2	102	106	102			2.44
	Cobalt	99.2	102	102	100			1.81
	Copper	98.3	102	100	98.0			2.11
	Lead	91.6	95.9	95.4	95.6			0.225
	Manganese	99.3	102	104	102			1.47
	Molybdenum	95.1	97.2	101	99.7			1.17
	Nickel	98.7	100	100	98.7			1.34
	Selenium	97.9	99.1	98.1	97.4			0.767
	Silver	113	113	117	115			2.19
	Thallium	92.5	97.6	97.7	98.4			0.727
EPA 300.0 Rev. 2.1	Chloride	97.0	95.9	96.5			0.505	
	Sulfate	98.4	96.8	96.0			1.17	
EPA 350.1 Rev. 2.0	Ammonia-N	98.2	97.4	99.0				1.55
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.7	95.2	97.9				1.57
EPA 353.2 Rev. 2.0	NO2NO3-N	101	102	102				0.0
EPA 365.1 Rev. 2.0	Total-P	108	109	108				0.673
SM 2320 B-2011	Total Alkalinity	98.5					0.339	
SM 2540 C-2015	TDS	102					5.41	
SM 2540 D-2015	TSS	90.2						
SM 4500-F- C-2011	Fluoride	99.4	98.9	97.4				0.960
SM 5310 B-2011	Organic Carbon	98.6	99.2	97.4				1.09

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2360330
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2360330
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2360333
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2360333
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2360330
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2360330
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2360331

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2360331
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2360331
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2360331
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2360330
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2360333
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2360330
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2360330
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2360330
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2360331

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	10/05/2022			10/05/2022 14:46	Blanca Fach	2360330
EPA 180.1 Rev. 2.0	10/05/2022			10/05/2022 13:31	Chandler E Cox	2360330
EPA 200.7 Rev. 4.4	10/05/2022	10/07/2022 10:50	Megan Whitefoot	10/07/2022 20:32	McKinley C Carter	2360333
EPA 200.8 Rev. 5.4	10/05/2022	10/07/2022 10:50	Megan Whitefoot	10/10/2022 19:47	Emily M Philpot	2360333
EPA 300.0 Rev. 2.1	10/05/2022			10/18/2022 15:36	Anna M. Plaviak	2360330
EPA 350.1 Rev. 2.0	10/05/2022			10/12/2022 11:10	Ping Hua	2360331
EPA 351.2 Rev. 2.0	10/05/2022	10/06/2022 10:45	Alexandra J Mattheus	10/07/2022 10:28	Alexandra J Mattheus	2360331
EPA 353.2 Rev. 2.0	10/05/2022			10/06/2022 10:50	Beverly Y. Sanders	2360331
EPA 365.1 Rev. 2.0	10/05/2022	10/05/2022 13:12	Adam P Silver	10/07/2022 12:28	James L Waggerby	2360331
SM 2320 B-2011	10/05/2022			10/07/2022 22:17	Dale L. Simmons	2360330
SM 2340 B-2011	10/05/2022			10/07/2022 20:32	McKinley C Carter	2360333
SM 2540 C-2015	10/05/2022			10/07/2022 16:28	Yijie Li	2360330
SM 2540 D-2015	10/05/2022			10/07/2022 16:28	Yijie Li	2360330
SM 4500-F- C-2011	10/05/2022			10/07/2022 22:17	Dale L. Simmons	2360330
SM 5310 B-2011	10/05/2022			10/11/2022 14:19	Khloe J Berg	2360331