Chemical Analysis Report

CEN-DIST-2022-09-13-01

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

Event Description: **Lakes: Florida, Ellen, Asher**
Request ID: **RQ-2022-09-12-21**
Customer: **CEN-DIST**
Project ID: **SMP**

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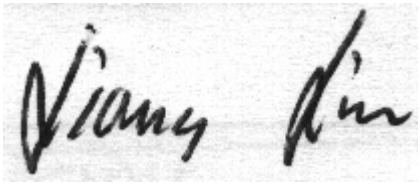
Date Certified: 28-SEP-2022 15:49



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 Ellen @ Center **Collection Date/Time: 09/12/2022 13:17**

Field ID: G2CE0060 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2355982	DEP SOP: NU-094-1	Color (true)	17	A	PCU	P419508	
	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P419499	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P419940	
		Sulfate	12		mg SO4/L	P419942	
	SM 2320 B-2011	Total Alkalinity	4.1		mg CaCO3/L	P419768	
	SM 2540 C-2011	TDS	54		mg/L	P419799	
	SM 2540 D-2011	TSS	5	I	mg/L	P419817	
	SM 4500-F- C-2011	Fluoride	0.054	I	mg F/L	P419772	
2355983	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P419731	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P419681	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.047		mg N/L	P420052	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P419599	
	SM 5310 B-2011	Organic Carbon	7.1		mg C/L	P419713	
2355994	EPA 200.7 Rev. 4.4	Calcium	3.21		mg/L	P419590	
		Iron	30	U	ug/L	P419590	
		Magnesium	2.10		mg/L	P419590	
		Potassium	2.7		mg/L	P419590	
		Sodium	8.7		mg/L	P419590	
		Strontium	17.1		ug/L	P419590	
		Tin	3.0	U	ug/L	P419590	
		Titanium	0.75	U	ug/L	P419590	
		Vanadium	2.0	U	ug/L	P419590	
		Zinc	5.0	U	ug/L	P419590	
	EPA 200.8 Rev. 5.4	Aluminum	23		ug/L	P419590	
		Antimony	0.099	I	ug/L	P419590	
		Arsenic	1.84		ug/L	P419590	
		Barium	4.30		ug/L	P419590	
		Beryllium	0.010	U	ug/L	P419590	
		Boron	42.0		ug/L	P419590	
		Cadmium	0.020	U	ug/L	P419590	
		Chromium	0.40	U	ug/L	P419590	
		Cobalt	0.027	I	ug/L	P419590	
		Copper	0.60	I	ug/L	P419590	
		Lead	0.20	U	ug/L	P419590	
		Manganese	4.45		ug/L	P419590	
		Molybdenum	0.15	U	ug/L	P419590	
		Nickel	0.50	U	ug/L	P419590	
		Selenium	0.20	U	ug/L	P419590	
		Silver	0.010	U	ug/L	P419590	
		Thallium	0.10	U	ug/L	P419590	
	SM 2340 B-2011	Hardness	16.7		mg/L	P419590	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Florida @ Center of Lake **Collection Date/Time: 09/12/2022 13:50**

Field ID: G2CE0150 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2355979	DEP SOP: NU-094-1	Color (true)	56		PCU	P419508	
	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P419499	
	EPA 300.0 Rev. 2.1	Chloride	13	A	mg Cl/L	P419940	
		Sulfate	2.4	A	mg SO4/L	P419942	
	SM 2320 B-2011	Total Alkalinity	44		mg CaCO3/L	P419768	
	SM 2540 C-2011	TDS	83		mg/L	P419799	
	SM 2540 D-2011	TSS	3	I	mg/L	P419817	
	SM 4500-F- C-2011	Fluoride	0.075	I	mg F/L	P419772	
2355980	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P419731	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77		mg N/L	P419678	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P420052	
	EPA 365.1 Rev. 2.0	Total-P	0.039		mg P/L	P419599	
	SM 5310 B-2011	Organic Carbon	11	A	mg C/L	P419713	
2355981	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P419502	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Asher @ Center of Lake **Collection Date/Time: 09/12/2022 12:34**

Field ID: G2CE0130 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2355984	DEP SOP: NU-094-1	Color (true)	38		PCU	P419508	
	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P419499	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P419940	
		Sulfate	5.4		mg SO4/L	P419942	
	SM 2320 B-2011	Total Alkalinity	44		mg CaCO3/L	P419768	
	SM 2540 C-2011	TDS	95		mg/L	P419799	
	SM 2540 D-2011	TSS	4	I	mg/L	P419817	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P419772	
2355985	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P419724	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P419589	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P420052	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P419599	
	SM 5310 B-2011	Organic Carbon	8.8		mg C/L	P419713	

Ref. Method and Comment:
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: P419508

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P419499

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P419590

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: P419590

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: P419940

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: P419942

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419724

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419731

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419589

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419678

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419681

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420052

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419599

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419502

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P419768

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

Reference Method: SM 2540 C-2011
Batch ID: P419799

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P419817

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P419772

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P419713

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: P419508

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.8		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P419499

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P419590

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Iron	105		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	104		P	85 - 115
Sodium	104		P	85 - 115
Strontium	102		P	85 - 115
Tin	104		P	85 - 115
Titanium	99.3		P	85 - 115
Vanadium	98.5		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P419590

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	105		P	85 - 115
Barium	104		P	85 - 115
Beryllium	97.1		P	85 - 115
Boron	105		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	101		P	85 - 115
Cobalt	100		P	85 - 115
Copper	104		P	85 - 115
Lead	93.4		P	85 - 115
Manganese	100		P	85 - 115
Molybdenum	100		P	85 - 115
Nickel	104		P	85 - 115
Selenium	102		P	85 - 115
Silver	88.1		P	85 - 115
Thallium	99.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419940

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.5		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419942

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	97.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419724

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419731

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419589

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419678

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419681

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420052

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: P419599

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419502

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-2011
Batch ID: P419768

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P419772

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P419713

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P419590

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2356076	Calcium	104	106	P/P	80 - 120
2356076	Iron	104	106	P/P	80 - 120
2356076	Magnesium	104	105	P/P	80 - 120
2356076	Potassium	104	106	P/P	80 - 120
2356076	Sodium	99.8	101	P/P	80 - 120
2356076	Strontium	101	102	P/P	80 - 120
2356076	Tin	104	106	P/P	80 - 120
2356076	Titanium	101	102	P/P	80 - 120
2356076	Vanadium	99.8	101	P/P	80 - 120
2356076	Zinc	103	104	P/P	80 - 120
2356077	Calcium	106		P	80 - 120
2356077	Iron	107		P	80 - 120
2356077	Magnesium	105		P	80 - 120
2356077	Potassium	106		P	80 - 120
2356077	Sodium	102		P	80 - 120
2356077	Strontium	102		P	80 - 120
2356077	Tin	102		P	80 - 120
2356077	Titanium	101		P	80 - 120
2356077	Vanadium	99.1		P	80 - 120
2356077	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P419590

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2356076	Aluminum	99.4	102	P/P	80 - 120
2356076	Antimony	102	105	P/P	80 - 120
2356076	Arsenic	103	107	P/P	80 - 120
2356076	Barium	103	105	P/P	80 - 120
2356076	Beryllium	96.6	98.6	P/P	80 - 120
2356076	Boron	104	106	P/P	80 - 120
2356076	Cadmium	98.6	103	P/P	80 - 120
2356076	Chromium	99.7	103	P/P	80 - 120
2356076	Cobalt	97.8	102	P/P	80 - 120
2356076	Copper	104	107	P/P	80 - 120
2356076	Lead	93.4	96.9	P/P	80 - 120
2356076	Manganese	98.6	104	P/P	80 - 120
2356076	Molybdenum	98.6	103	P/P	80 - 120
2356076	Nickel	102	106	P/P	80 - 120
2356076	Selenium	98.8	103	P/P	80 - 120
2356076	Silver	85.4	88.3	P/P	80 - 120
2356076	Thallium	99.7	104	P/P	80 - 120
2356077	Aluminum	101		P	80 - 120
2356077	Antimony	102		P	80 - 120
2356077	Arsenic	103		P	80 - 120
2356077	Barium	103		P	80 - 120
2356077	Beryllium	98.1		P	80 - 120
2356077	Boron	107		P	80 - 120
2356077	Cadmium	98.2		P	80 - 120
2356077	Chromium	101		P	80 - 120
2356077	Cobalt	97.7		P	80 - 120
2356077	Copper	103		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P419590

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2356077	Lead	94.1		P	80 - 120
2356077	Manganese	101		P	80 - 120
2356077	Molybdenum	100		P	80 - 120
2356077	Nickel	100		P	80 - 120
2356077	Selenium	100		P	80 - 120
2356077	Silver	85.5		P	80 - 120
2356077	Thallium	99.6		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419940

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355979	Chloride	96.3		P	90 - 110
2356095	Chloride	97.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419942

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355979	Sulfate	97.1		P	90 - 110
2356095	Sulfate	96.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419724

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355974	Ammonia-N	97.8	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419731

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355983	Ammonia-N	100	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419589

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355860	Kjeldahl Nitrogen	100	96.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420052

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355983	NO2NO3-N	95.5	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419599

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355980	Total-P	108	105	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419502

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355981	O-Phosphate-P	98.8	95.8	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P419772

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355843	Fluoride	98.2	98.2	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P419713

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2355980	Organic Carbon	102		P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P419508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355982	Color (true)	1.53	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P419499

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355855	Turbidity	1.82	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P419590

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2356076	Calcium	1.11	Spike	P	0 - 20
2356076	Iron	1.06	Spike	P	0 - 20
2356076	Magnesium	0.862	Spike	P	0 - 20
2356076	Potassium	1.50	Spike	P	0 - 20
2356076	Sodium	0.949	Spike	P	0 - 20
2356076	Strontium	1.35	Spike	P	0 - 20
2356076	Tin	1.50	Spike	P	0 - 20
2356076	Titanium	0.396	Spike	P	0 - 20
2356076	Vanadium	1.25	Spike	P	0 - 20
2356076	Zinc	0.926	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P419590

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2356076	Aluminum	2.85	Spike	P	0 - 20
2356076	Antimony	2.76	Spike	P	0 - 20
2356076	Arsenic	3.80	Spike	P	0 - 20
2356076	Barium	2.34	Spike	P	0 - 20
2356076	Beryllium	2.01	Spike	P	0 - 20
2356076	Boron	2.16	Spike	P	0 - 20
2356076	Cadmium	4.50	Spike	P	0 - 20
2356076	Chromium	3.58	Spike	P	0 - 20
2356076	Cobalt	4.31	Spike	P	0 - 20
2356076	Copper	3.21	Spike	P	0 - 20
2356076	Lead	3.61	Spike	P	0 - 20
2356076	Manganese	3.89	Spike	P	0 - 20
2356076	Molybdenum	4.08	Spike	P	0 - 20
2356076	Nickel	3.68	Spike	P	0 - 20
2356076	Selenium	4.24	Spike	P	0 - 20
2356076	Silver	3.44	Spike	P	0 - 20
2356076	Thallium	4.02	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355979	Chloride	0.489	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P419942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355979	Sulfate	1.73	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355974	Ammonia-N	4.70	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419731

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355983	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419589

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355860	Kjeldahl Nitrogen	2.76	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419678

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355808	Kjeldahl Nitrogen	1.57	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P419681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2356130	Kjeldahl Nitrogen	0.693	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355983	NO2NO3-N	1.67	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419599

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355980	Total-P	2.12	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419502

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355981	O-Phosphate-P	3.08	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P419768

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355843	Total Alkalinity	0.566	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2011
Batch ID: P419799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355474	TDS	2.74	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P419772

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355843	Fluoride	0.0	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P419713

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2355980	Organic Carbon	1.48	Sample	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: A114694
Included Lab Sample IDs: 2355979, 2355982, 2355984

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A114695
Included Lab Sample IDs: 2355981

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	99.6	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1
Run ID: A114696
Included Lab Sample IDs: 2355979, 2355982, 2355984

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A114764
Included Lab Sample IDs: 2355994

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.3	99.2	P/P	90 - 110
Antimony	98.8	97.8	P/P	90 - 110
Arsenic	105	103	P/P	90 - 110
Barium	98.9	97.0	P/P	90 - 110
Beryllium	98.9	96.8	P/P	90 - 110
Boron	99.2	99.6	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	103	102	P/P	90 - 110
Cobalt	100	99.1	P/P	90 - 110
Copper	106	103	P/P	90 - 110
Lead	90.9	90.3	P/P	90 - 110
Manganese	101	102	P/P	90 - 110
Molybdenum	99.1	98.1	P/P	90 - 110
Nickel	104	102	P/P	90 - 110
Selenium	103	101	P/P	90 - 110
Silver	98.1	97.1	P/P	90 - 110
Thallium	103	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A114771
Included Lab Sample IDs: 2355994

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	103	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	101	100	P/P	90 - 110
Potassium	99.9	99.5	P/P	90 - 110
Sodium	99.9	100	P/P	90 - 110
Strontium	98.7	98.9	P/P	90 - 110
Tin	102	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A114771
Included Lab Sample IDs: 2355994

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Titanium	98.4	96.9	P/P	90 - 110
Vanadium	97.7	97.7	P/P	90 - 110
Zinc	101	98.7	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A114782
Included Lab Sample IDs: 2355980, 2355983, 2355985

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.7	97.9	P/P	90 - 110
Organic Carbon	97.9	97.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A114783
Included Lab Sample IDs: 2355985

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A114785
Included Lab Sample IDs: 2355980, 2355983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.5	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A114800
Included Lab Sample IDs: 2355985

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.4	98.5	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A114801
Included Lab Sample IDs: 2355979, 2355982, 2355984

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.7	101	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A114801
Included Lab Sample IDs: 2355979, 2355982, 2355984

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A114809
Included Lab Sample IDs: 2355980, 2355983, 2355985

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A114823
Included Lab Sample IDs: 2355980, 2355983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	98.6	P/P	90 - 110
Kjeldahl Nitrogen	98.4	102	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A114857
Included Lab Sample IDs: 2355979, 2355982, 2355984

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.4	98.8	P/P	90 - 110
Sulfate	98.6	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A114919
Included Lab Sample IDs: 2355980, 2355983, 2355985

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	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)	99.8					1.53	
EPA 180.1 Rev. 2.0	Turbidity	101					1.82	
EPA 200.7 Rev. 4.4	Calcium	105	104	106	106			1.11
	Iron	105	104	106	107			1.06
	Magnesium	104	104	105	105			0.862
	Potassium	104	104	106	106			1.50
	Sodium	104	99.8	101	102			0.949
	Strontium	102	101	102	102			1.35
	Tin	104	104	106	102			1.50
	Titanium	99.3	101	102	101			0.396
	Vanadium	98.5	99.8	101	99.1			1.25
	Zinc	100	103	104	102			0.926
EPA 200.8 Rev. 5.4	Aluminum	101	99.4	102	101			2.85
	Antimony	102	102	105	102			2.76
	Arsenic	105	103	107	103			3.80
	Barium	104	103	105	103			2.34
	Beryllium	97.1	96.6	98.6	98.1			2.01
	Boron	105	104	106	107			2.16
	Cadmium	98.9	98.6	103	98.2			4.50
	Chromium	101	99.7	103	101			3.58
	Cobalt	100	97.8	102	97.7			4.31
	Copper	104	104	107	103			3.21
	Lead	93.4	93.4	96.9	94.1			3.61
	Manganese	100	98.6	104	101			3.89
	Molybdenum	100	98.6	103	100			4.08
	Nickel	104	102	106	100			3.68
	Selenium	102	98.8	103	100			4.24
	Silver	88.1	85.4	88.3	85.5			3.44
	Thallium	99.7	99.7	104	99.6			4.02
EPA 300.0 Rev. 2.1	Chloride	98.5	96.3	97.2			0.489	
	Sulfate	97.1	97.1	96.7			1.73	
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	97.8	104				4.70
	Ammonia-N	94.0	100	100				0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	100	96.1				2.76
	Kjeldahl Nitrogen	108						1.57
	Kjeldahl Nitrogen	106						0.693
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	95.5	97.5				1.67
EPA 365.1 Rev. 2.0	Total-P	106	108	105				2.12
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	95.8	98.8	95.8				3.08
SM 2320 B-2011	Total Alkalinity	101					0.566	
SM 2540 C-2011	TDS						2.74	
SM 4500-F- C-2011	Fluoride	100	98.2	98.2				0.0
SM 5310 B-2011	Organic Carbon	97.2	102				1.48	

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2355979, 2355982, 2355984
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2355979, 2355982, 2355984
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2355994
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2355994

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2355979, 2355982, 2355984
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2355979, 2355982, 2355984
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2355980, 2355983, 2355985
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2355980, 2355983, 2355985
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2355980, 2355983, 2355985
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2355980, 2355983, 2355985
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2355981
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2355979, 2355982, 2355984
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2355994
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2355979, 2355982, 2355984
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2355979, 2355982, 2355984
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2355979, 2355982, 2355984
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2355980, 2355983, 2355985

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	09/13/2022			09/13/2022 16:25	Anna M. Plaviak	2355979
	09/13/2022			09/13/2022 16:26	Anna M. Plaviak	2355982
	09/13/2022			09/13/2022 16:27	Anna M. Plaviak	2355984
EPA 180.1 Rev. 2.0	09/13/2022			09/13/2022 14:29	Chandler E Cox	2355979
	09/13/2022			09/13/2022 14:31	Chandler E Cox	2355982
	09/13/2022			09/13/2022 14:32	Chandler E Cox	2355984
EPA 200.7 Rev. 4.4	09/13/2022	09/15/2022 10:20	Megan Whitefoot	09/16/2022 02:22	McKinley C Carter	2355994
EPA 200.8 Rev. 5.4	09/13/2022	09/15/2022 10:20	Megan Whitefoot	09/15/2022 18:41	Emily M Philpot	2355994
EPA 300.0 Rev. 2.1	09/13/2022			09/20/2022 12:16	James L Waggerby	2355979
	09/13/2022			09/20/2022 14:46	James L Waggerby	2355982
	09/13/2022			09/20/2022 15:02	James L Waggerby	2355984
EPA 350.1 Rev. 2.0	09/13/2022			09/16/2022 11:55	Judith K. Clark	2355985
	09/13/2022			09/16/2022 12:13	Ping Hua	2355983
	09/13/2022			09/16/2022 12:21	Ping Hua	2355980
EPA 351.2 Rev. 2.0	09/13/2022	09/15/2022 13:58	Alexandra J Mattheus	09/16/2022 15:34	Alexandra J Mattheus	2355985
	09/13/2022	09/16/2022 09:29	Simonne.V. Calhoun	09/20/2022 12:05	Samantha L Bates	2355980
	09/13/2022	09/16/2022 09:29	Simonne.V. Calhoun	09/20/2022 12:40	Samantha L Bates	2355983
EPA 353.2 Rev. 2.0	09/13/2022			09/23/2022 12:47	Judith K. Clark	2355983
	09/13/2022			09/23/2022 12:56	Judith K. Clark	2355980
	09/13/2022			09/23/2022 12:57	Judith K. Clark	2355985
EPA 365.1 Rev. 2.0	09/13/2022	09/15/2022 15:47	Adam P Silver	09/19/2022 13:56	Simonne.V. Calhoun	2355980
	09/13/2022	09/15/2022 15:47	Adam P Silver	09/19/2022 13:57	Simonne.V. Calhoun	2355983
	09/13/2022	09/15/2022 15:47	Adam P Silver	09/19/2022 13:58	Simonne.V. Calhoun	2355985
EPA 365.1 Rev. 2.0 dissolved	09/13/2022			09/13/2022 15:57	Elise M. Gillis	2355981
SM 2320 B-2011	09/13/2022			09/17/2022 10:28	Dale L. Simmons	2355979
	09/13/2022			09/17/2022 10:39	Dale L. Simmons	2355982
	09/13/2022			09/17/2022 10:50	Dale L. Simmons	2355984
SM 2340 B-2011	09/13/2022			09/16/2022 02:22	McKinley C Carter	2355994
SM 2540 C-2011	09/13/2022			09/14/2022 15:45	Yijie Li	2355979, 2355982, 2355984
SM 2540 D-2011	09/13/2022			09/14/2022 15:45	Yijie Li	2355979, 2355982, 2355984
SM 4500-F- C-2011	09/13/2022			09/17/2022 10:28	Dale L. Simmons	2355979
	09/13/2022			09/17/2022 10:39	Dale L. Simmons	2355982
	09/13/2022			09/17/2022 10:50	Dale L. Simmons	2355984
SM 5310 B-2011	09/13/2022			09/15/2022 17:59	Khloe J Berg	2355980
	09/13/2022			09/15/2022 21:34	Khloe J Berg	2355983
	09/13/2022			09/15/2022 21:57	Khloe J Berg	2355985