Chemical Analysis Report

CEN-DIST-2022-02-15-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Run 14**
Request ID: **RQ-2022-02-14-14**
Customer: **CEN-DIST**
Project ID: **SMP**

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3319 Maguire Blvd., Suite 232
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 09-MAR-2022 18:23

B. Steinbock

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

A - Value reported is the mean of two or more determinations.
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value and/or the analysis did not meet established quality control criteria.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Ingram East **Collection Date/Time: 02/14/2022 10:58**

Field ID: G4CE0155 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2305562	DEP SOP: NU-094-1	Color (true)**	25	A	PCU	P409869	
	EPA 180.1 Rev. 2.0	Turbidity	0.80	I	NTU	P409872	
	EPA 300.0 Rev. 2.1	Chloride	10		mg Cl/L	P410028	
		Sulfate	3.3		mg SO4/L	P410031	
	SM 2320 B-2011	Total Alkalinity	7.7		mg CaCO3/L	P409941	
	SM 2540 C-2011	TDS	37		mg/L	P410161	
	SM 2540 D-2011	TSS	3	I	mg/L	P410192	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P409942	
2305563	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P410526	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.73		mg N/L	P409824	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P410232	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P409835	
	SM 5310 B-2011	Organic Carbon	9.1		mg C/L	P410385	
2305564	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P409865	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Lake Lotta at Center of Southern Lobe **Collection Date/Time: 02/14/2022 12:07**

Field ID: G2CE0093 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2305559	DEP SOP: NU-094-1	Color (true)**	57		PCU	P409869	
	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P409872	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P410028	
		Sulfate	11		mg SO4/L	P410031	
	SM 2320 B-2011	Total Alkalinity	53		mg CaCO3/L	P409941	
	SM 2540 C-2011	TDS	118		mg/L	P410161	
	SM 2540 D-2011	TSS	4	I	mg/L	P410192	
	SM 4500 F-C-2011	Fluoride	0.12		mg F/L	P409942	
2305560	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P410526	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.92		mg N/L	P409824	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P410232	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P409835	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P410385	
2305561	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P409864	
2305567	EPA 200.7 Rev. 4.4	Calcium	23.2		mg/L	P409946	
		Iron	30	U	ug/L	P409946	
		Magnesium	3.55		mg/L	P409946	
		Potassium	3.2		mg/L	P409946	
		Sodium	7.6		mg/L	P409946	
		Strontium	48.5		ug/L	P409946	
		Tin	3.0	U	ug/L	P409946	
		Titanium	1.1	I	ug/L	P409946	
		Vanadium	2.0	U	ug/L	P409946	
		Zinc	5.0	U	ug/L	P409946	
	EPA 200.8 Rev. 5.4	Aluminum	20	I	ug/L	P409946	
		Antimony	0.21		ug/L	P409946	
		Arsenic	0.71		ug/L	P409946	
		Barium	29.4		ug/L	P409946	
		Beryllium	0.010	U	ug/L	P409946	
		Boron**	30.3		ug/L	P409946	
		Cadmium	0.020	U	ug/L	P409946	
		Chromium	1.6		ug/L	P409946	
		Cobalt	0.061	I	ug/L	P409946	
		Copper	0.40	U	ug/L	P409946	
		Lead	0.20	U	ug/L	P409946	
		Manganese	13.7		ug/L	P409946	
		Molybdenum	1.18		ug/L	P409946	
		Nickel	0.86	I	ug/L	P409946	
		Selenium	0.20	U	ug/L	P409946	MS
		Silver	0.010	U	ug/L	P409946	
		Thallium	0.10	U	ug/L	P409946	
	SM 2340B	Hardness	72.5		mg/L	P409946	

Field ID: G2CE0093 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for sodium and strontium are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P409869

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P409872

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409946

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: P409946

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: P410028

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: P410031

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410526

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409824

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410232

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409835

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409864

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409865

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

Reference Method: SM 2320 B-2011
Batch ID: P409941

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

Reference Method: SM 2540 C-2011
Batch ID: P410161

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P410192

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P409942

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P410385

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: P409869

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P409872

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	97.4		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409946

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	105		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	100		P	85 - 115
Sodium	101		P	85 - 115
Strontium	101		P	85 - 115
Tin	103		P	85 - 115
Titanium	103		P	85 - 115
Vanadium	96.7		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P409946

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	100		P	85 - 115
Barium	103		P	85 - 115
Beryllium	99.0		P	85 - 115
Boron	108		P	85 - 115
Cadmium	98.0		P	85 - 115
Chromium	99.2		P	85 - 115
Cobalt	99.8		P	85 - 115
Copper	98.8		P	85 - 115
Lead	95.8		P	85 - 115
Manganese	99.5		P	85 - 115
Molybdenum	99.0		P	85 - 115
Nickel	100		P	85 - 115
Selenium	99.3		P	85 - 115
Silver	102		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410028

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410031

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410526

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409824

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410232

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	100		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409835

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409864

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409865

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

Reference Method: SM 2320 B-2011
Batch ID: P409941

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.3		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P409942

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	93 - 104

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P410385

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409946

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305378	Calcium	103		P	80 - 120
2305378	Iron	103	103	P/P	80 - 120
2305378	Magnesium	101		P	80 - 120
2305378	Potassium	99.9		P	80 - 120
2305378	Tin	101	99.7	P/P	80 - 120
2305378	Titanium	102	102	P/P	80 - 120
2305378	Vanadium	98.0	97.2	P/P	80 - 120
2305378	Zinc	98.4	97.3	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P409946

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305378	Aluminum	101	101	P/P	80 - 120
2305378	Antimony	106	106	P/P	80 - 120
2305378	Arsenic	109	109	P/P	80 - 120
2305378	Barium	105	105	P/P	80 - 120
2305378	Beryllium	93.0	92.8	P/P	80 - 120
2305378	Boron	98.1	102	P/P	80 - 120
2305378	Cadmium	103	102	P/P	80 - 120
2305378	Chromium	95.2	95.3	P/P	80 - 120
2305378	Cobalt	108	108	P/P	80 - 120
2305378	Copper	102	102	P/P	80 - 120
2305378	Lead	100	100	P/P	80 - 120
2305378	Manganese	103	103	P/P	80 - 120
2305378	Molybdenum	108	107	P/P	80 - 120
2305378	Nickel	104	104	P/P	80 - 120
2305378	Selenium	59.1	64.0	F/F	80 - 120
2305378	Silver	100	99.6	P/P	80 - 120
2305378	Thallium	105	107	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410028

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305323	Chloride	103		P	90 - 110
2305515	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410031

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305323	Sulfate	101		P	90 - 110
2305515	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410526

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305881	Ammonia-N	95.6	95.6	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409824

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305555	Kjeldahl Nitrogen	93.3	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410232

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305563	NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409835

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305520	Total-P	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305507	O-Phosphate-P	97.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409865

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305604	O-Phosphate-P	93.0	95.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P409942

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305588	Fluoride	98.8	98.1	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P410385

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2305518	Organic Carbon	95.7	97.5	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P409869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305562	Color (true)	0.399	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P409872

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305516	Turbidity	6.64	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P409946

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305378	Calcium	2.29	Spike	P	0 - 20
2305378	Iron	0.877	Spike	P	0 - 20
2305378	Magnesium	2.97	Spike	P	0 - 20
2305378	Potassium	1.25	Spike	P	0 - 20
2305378	Sodium	1.85	Spike	P	0 - 20
2305378	Strontium	0.772	Spike	P	0 - 20
2305378	Tin	1.14	Spike	P	0 - 20
2305378	Titanium	0.293	Spike	P	0 - 20
2305378	Vanadium	0.854	Spike	P	0 - 20
2305378	Zinc	1.06	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P409946

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305378	Aluminum	0.440	Spike	P	0 - 20
2305378	Antimony	0.121	Spike	P	0 - 20
2305378	Arsenic	0.0253	Spike	P	0 - 20
2305378	Barium	0.219	Spike	P	0 - 20
2305378	Beryllium	0.162	Spike	P	0 - 20
2305378	Boron	1.68	Spike	P	0 - 20
2305378	Cadmium	1.18	Spike	P	0 - 20
2305378	Chromium	0.0531	Spike	P	0 - 20
2305378	Cobalt	0.530	Spike	P	0 - 20
2305378	Copper	0.561	Spike	P	0 - 20
2305378	Lead	0.132	Spike	P	0 - 20
2305378	Manganese	0.374	Spike	P	0 - 20
2305378	Molybdenum	0.644	Spike	P	0 - 20
2305378	Nickel	0.0643	Spike	P	0 - 20
2305378	Selenium	7.99	Spike	P	0 - 20
2305378	Silver	0.591	Spike	P	0 - 20
2305378	Thallium	1.41	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410028

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305323	Chloride	0.231	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P410031

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305323	Sulfate	0.128	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P410526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305881	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409824

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305555	Kjeldahl Nitrogen	4.38	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P410232

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305563	NO2NO3-N	0.494	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409835

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305520	Total-P	0.507	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305507	O-Phosphate-P	0.997	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409865

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305604	O-Phosphate-P	2.10	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P409941

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305588	Total Alkalinity	0.139	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P410161

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305329	TDS	4.41	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P409942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305588	Fluoride	0.477	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P410385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2305518	Organic Carbon	1.34	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A110421
Included Lab Sample IDs: 2305561, 2305564

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	99.6	P/P	90 - 110
O-Phosphate-P	99.6	99.2	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1
Run ID: A110422
Included Lab Sample IDs: 2305559, 2305562

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	101	P/P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A110423
Included Lab Sample IDs: 2305559, 2305562

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	103	103	P/P	90 - 110
Sulfate	102	102	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A110424
Included Lab Sample IDs: 2305559, 2305562

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

Reference Method: SM 2320 B-2011
Run ID: A110447
Included Lab Sample IDs: 2305559, 2305562

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.0	90.3	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A110447
Included Lab Sample IDs: 2305559, 2305562

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A110467
Included Lab Sample IDs: 2305560, 2305563

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.4	96.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110503
Included Lab Sample IDs: 2305567

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A110503
Included Lab Sample IDs: 2305567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	105	105	P/P	90 - 110
Antimony	97.7	98.2	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Barium	101	101	P/P	90 - 110
Beryllium	98.8	97.8	P/P	90 - 110
Boron	106	108	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Chromium	99.3	99.5	P/P	90 - 110
Cobalt	103	101	P/P	90 - 110
Copper	105	102	P/P	90 - 110
Lead	95.9	96.2	P/P	90 - 110
Manganese	102	102	P/P	90 - 110
Molybdenum	101	101	P/P	90 - 110
Nickel	105	103	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Silver	93.5	93.6	P/P	90 - 110
Thallium	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A110521
Included Lab Sample IDs: 2305563

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A110529
Included Lab Sample IDs: 2305560

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.1	99.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A110565
Included Lab Sample IDs: 2305560, 2305563

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A110578
Included Lab Sample IDs: 2305567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	99.3	P/P	90 - 110
Iron	101	99.8	P/P	90 - 110
Magnesium	101	100	P/P	90 - 110
Potassium	97.7	96.8	P/P	90 - 110
Sodium	99.7	98.2	P/P	90 - 110
Strontium	96.6	100	P/P	90 - 110
Tin	96.6	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A110578
Included Lab Sample IDs: 2305567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Titanium	96.9	102	P/P	90 - 110
Vanadium	97.4	102	P/P	90 - 110
Zinc	97.7	102	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A110636
Included Lab Sample IDs: 2305560, 2305563

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	96.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110696
Included Lab Sample IDs: 2305560, 2305563

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.8	97.1	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				0.399	
EPA 180.1 Rev. 2.0	Turbidity	97.4				6.64	
EPA 200.7 Rev. 4.4	Calcium	103	103				2.29
	Iron	105	103	103			0.877
	Magnesium	102	101				2.97
	Potassium	100	99.9				1.25
	Sodium	101					1.85
	Strontium	101					0.772
	Tin	103	101	99.7			1.14
	Titanium	103	102	102			0.293
	Vanadium	96.7	98.0	97.2			0.854
	Zinc	101	98.4	97.3			1.06
EPA 200.8 Rev. 5.4	Aluminum	102	101	101			0.440
	Antimony	100	106	106			0.121
	Arsenic	100	109	109			0.0253
	Barium	103	105	105			0.219
	Beryllium	99.0	93.0	92.8			0.162
	Boron	108	98.1	102			1.68
	Cadmium	98.0	103	102			1.18
	Chromium	99.2	95.2	95.3			0.0531
	Cobalt	99.8	108	108			0.530
	Copper	98.8	102	102			0.561
	Lead	95.8	100	100			0.132
	Manganese	99.5	103	103			0.374
	Molybdenum	99.0	108	107			0.644
	Nickel	100	104	104			0.0643
	Selenium	99.3	59.1	64.0			7.99
	Silver	102	100	99.6			0.591
	Thallium	100	105	107			1.41
EPA 300.0 Rev. 2.1	Chloride	103	103	102		0.231	
	Sulfate	102	101	101		0.128	
EPA 350.1 Rev. 2.0	Ammonia-N	96.4	95.6	95.6			0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	93.3	99.5			4.38
EPA 353.2 Rev. 2.0	NO2NO3-N	100	102	101			0.494
EPA 365.1 Rev. 2.0	Total-P	102	104	105			0.507
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8	97.5	99.0			0.997
	O-Phosphate-P	100	93.0	95.2			2.10
SM 2320 B-2011	Total Alkalinity	98.3				0.139	
SM 2540 C-2011	TDS					4.41	
SM 4500 F-C-2011	Fluoride	98.8	98.8	98.1			0.477
SM 5310 B-2011	Organic Carbon	96.0	95.7	97.5			1.34

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2305559, 2305562
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2305559, 2305562
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2305567
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2305567
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2305559, 2305562
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2305559, 2305562

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2305560, 2305563
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2305560, 2305563
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2305560, 2305563
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2305560, 2305563
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2305561, 2305564
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2305559, 2305562
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2305567
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2305559, 2305562
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2305559, 2305562
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2305559, 2305562
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2305560, 2305563

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	02/15/2022			02/15/2022 15:50	Samantha L Bates	2305559
	02/15/2022			02/15/2022 15:51	Samantha L Bates	2305562
EPA 180.1 Rev. 2.0	02/15/2022			02/15/2022 15:07	Khloe J Berg	2305559
	02/15/2022			02/15/2022 15:10	Khloe J Berg	2305562
EPA 200.7 Rev. 4.4	02/15/2022	02/17/2022 10:12	Megan Whitefoot	02/23/2022 16:11	Josef B Mick	2305567
EPA 200.8 Rev. 5.4	02/15/2022	02/17/2022 10:12	Megan Whitefoot	02/18/2022 17:37	Alexander Thompson	2305567
EPA 300.0 Rev. 2.1	02/15/2022			02/17/2022 22:45	Roberta Tatti	2305559
	02/15/2022			02/17/2022 22:57	Roberta Tatti	2305562
EPA 350.1 Rev. 2.0	02/15/2022			03/01/2022 11:45	Ping Hua	2305560
	02/15/2022			03/01/2022 11:47	Ping Hua	2305563
EPA 351.2 Rev. 2.0	02/15/2022	02/16/2022 13:48	Samantha L Bates	02/17/2022 12:36	Alexandra J Mattheus	2305560
	02/15/2022	02/16/2022 13:48	Samantha L Bates	02/17/2022 12:37	Alexandra J Mattheus	2305563
EPA 353.2 Rev. 2.0	02/15/2022			02/23/2022 08:55	Beverly Y. Sanders	2305563
	02/15/2022			02/23/2022 09:01	Beverly Y. Sanders	2305560
EPA 365.1 Rev. 2.0	02/15/2022	02/16/2022 14:20	Simonne.V. Calhoun	02/17/2022 15:59	Shengyu Ding	2305560
	02/15/2022	02/16/2022 14:20	Simonne.V. Calhoun	02/21/2022 15:31	Sarah A Nixon	2305563
EPA 365.1 Rev. 2.0 dissolved	02/15/2022			02/15/2022 14:42	James L Waggerby	2305561
	02/15/2022			02/15/2022 14:51	James L Waggerby	2305564
SM 2320 B-2011	02/15/2022			02/16/2022 18:38	Dale L. Simmons	2305559
	02/15/2022			02/16/2022 18:48	Dale L. Simmons	2305562
SM 2340B	02/15/2022			02/23/2022 16:11	Josef B Mick	2305567
SM 2540 C-2011	02/15/2022			02/16/2022 15:36	Yijie Li	2305559, 2305562
SM 2540 D-2011	02/15/2022			02/16/2022 15:36	Yijie Li	2305559, 2305562
SM 4500 F-C-2011	02/15/2022			02/16/2022 18:38	Dale L. Simmons	2305559
	02/15/2022			02/16/2022 18:48	Dale L. Simmons	2305562
SM 5310 B-2011	02/15/2022			02/25/2022 11:57	Touraj Touran	2305560
	02/15/2022			02/25/2022 12:11	Touraj Touran	2305563