

Chemical Analysis Report

SO-DIST-2023-12-19-02

Florida DEP Laboratory
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Tallahassee, FL 32399-2400
DOH Accreditation E31780

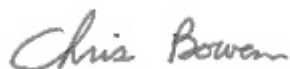
Event Description: **2023 SMP : Land O' Lakes**
Request ID: **RQ-2023-12-18-18**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
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FLDEP South District Office
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Certified by: Chris Bowen, Environmental Administrator

Date Certified: 10-JAN-2024 11:49



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: RED WATER LAKE AT MID

Collection Date/Time: 12/18/2023 10:35

Field ID: G4SD0224

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2457813	DEP SOP: NU-094-1	Color (true)	20		PCU	P439199	
	EPA 180.1 Rev. 2.0	Turbidity	7.6		NTU	P439226	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P439407	
		Sulfate	32		mg SO4/L	P439410	
	SM 2320 B-2011	Total Alkalinity	23		mg CaCO3/L	P439372	
	SM 2540 C-2015	TDS	122		mg/L	P439634	
	SM 2540 D-2015	TSS	7	I	mg/L	P439571	
	SM 4500-F- C-2011	Fluoride	0.051	I	mg F/L	P439374	
2457814	EPA 350.1 Rev. 2.0	Ammonia-N	0.072		mg N/L	P439597	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P439243	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P439300	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P439255	
	SM 5310 B-2014	Organic Carbon	9.7		mg C/L	P439526	

Ref. Method and Comment:

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

Sample Location: LAKE JUNE IN WINTER

Collection Date/Time: 12/18/2023 11:45

Field ID: G4SD0186

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2457811	DEP SOP: NU-094-1	Color (true)	13		PCU	P439199	
	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P439226	
	EPA 300.0 Rev. 2.1	Chloride	20	A	mg Cl/L	P439407	
		Sulfate	28	A	mg SO4/L	P439410	
	SM 2320 B-2011	Total Alkalinity	18		mg CaCO3/L	P439372	
	SM 2540 C-2015	TDS	104	A	mg/L	P439634	
	SM 2540 D-2015	TSS	5	IA	mg/L	P439571	
	SM 4500-F- C-2011	Fluoride	0.063	I	mg F/L	P439374	
2457812	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P439344	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.52		mg N/L	P439243	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.010		mg N/L	P439300	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P439255	
	SM 5310 B-2014	Organic Carbon	6.8		mg C/L	P439526	

Ref. Method and Comment:

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

Sample Location: LAKEPLACIDOUTLETATSR70W

Collection Date/Time: 12/18/2023 12:30

Field ID: G4SD0213

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2457815	DEP SOP: NU-094-1	Color (true)	410		PCU	P439199	
	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P439226	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P439407	
		Sulfate	16		mg SO4/L	P439410	
	SM 2320 B-2011	Total Alkalinity	6.6		mg CaCO3/L	P439372	
	SM 2540 C-2015	TDS	135		mg/L	P439634	
	SM 2540 D-2015	TSS	2	I	mg/L	P439571	
	SM 4500-F- C-2011	Fluoride	0.075	I	mg F/L	P439374	
2457816	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P439597	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P439243	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.16		mg N/L	P439300	
	EPA 365.1 Rev. 2.0	Total-P	1.1		mg P/L	P439255	
	SM 5310 B-2014	Organic Carbon	32		mg C/L	P439527	
2457822	EPA 200.7 Rev. 4.4	Calcium	7.87		mg/L	P439262	
		Iron	110	I	ug/L	P439262	
		Magnesium	4.40		mg/L	P439262	
		Potassium	10.1		mg/L	P439262	
		Sodium	4.7		mg/L	P439262	
		Strontium	335		ug/L	P439262	
		Tin	3.0	U	ug/L	P439262	
		Titanium	5.4		ug/L	P439262	
	EPA 200.8 Rev. 5.4	Vanadium	2.0	U	ug/L	P439262	
		Zinc	5.0	U	ug/L	P439262	
		Aluminum	303		ug/L	P439262	
		Antimony	0.050	U	ug/L	P439262	
		Arsenic	0.56		ug/L	P439262	
		Barium	2.48		ug/L	P439262	
		Beryllium	0.011	I	ug/L	P439262	
		Boron	33.7		ug/L	P439262	
		Cadmium	0.020	U	ug/L	P439262	
		Chromium	1.0	I	ug/L	P439262	
		Cobalt	0.135		ug/L	P439262	
		Copper	0.78	I	ug/L	P439262	
		Lead	0.20	U	ug/L	P439262	
		Manganese	5.61		ug/L	P439262	
		Molybdenum	0.39	I	ug/L	P439262	
		Nickel	0.54	I	ug/L	P439262	
		Selenium	0.33	I	ug/L	P439262	
		Silver	0.010	U	ug/L	P439262	
		Thallium	0.10	U	ug/L	P439262	
	SM 2340 B-2011	Hardness	37.8		mg/L	P439262	

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: P439199

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P439226

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P439262

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: P439262

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: P439407

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: P439410

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439344

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439597

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439243

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439300

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439255

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

Reference Method: SM 2320 B-2011
Batch ID: P439372

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

Reference Method: SM 2540 C-2015
Batch ID: P439634

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P439571

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P439374

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2014
Batch ID: P439526

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-2014
Batch ID: P439527

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: P439199

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.9		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P439226

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P439262

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	111		P	85 - 115
Iron	106		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	99.5		P	85 - 115
Sodium	103		P	85 - 115
Strontium	99.8		P	85 - 115
Tin	102		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	101		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P439262

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.9		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	99.8		P	85 - 115
Barium	100		P	85 - 115
Beryllium	95.1		P	85 - 115
Boron	99.7		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	101		P	85 - 115
Cobalt	98.5		P	85 - 115
Copper	97.7		P	85 - 115
Lead	94.9		P	85 - 115
Manganese	99.9		P	85 - 115
Molybdenum	98.4		P	85 - 115
Nickel	99.2		P	85 - 115
Selenium	99.3		P	85 - 115
Silver	96.1		P	85 - 115
Thallium	98.5		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439407

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439410

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439344

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439597

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439243

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439300

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: P439255

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

Reference Method: SM 2320 B-2011
Batch ID: P439372

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.8		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P439634

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	92.4		P	85 - 115

Reference Method: SM 2540 D-2015
Batch ID: P439571

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	92.0		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P439374

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	103		P	94 - 106

Reference Method: SM 5310 B-2014
Batch ID: P439526

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Reference Method: SM 5310 B-2014
Batch ID: P439527

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P439262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457797	Calcium	107	107	P/P	80 - 120
2457797	Iron	103	104	P/P	80 - 120
2457797	Magnesium	107	107	P/P	80 - 120
2457797	Potassium	103	103	P/P	80 - 120
2457797	Sodium	100	98.0	P/P	80 - 120
2457797	Strontium	99.4	98.4	P/P	80 - 120
2457797	Tin	98.4	98.9	P/P	80 - 120
2457797	Titanium	100	100	P/P	80 - 120
2457797	Vanadium	100	99.8	P/P	80 - 120
2457797	Zinc	99.7	99.9	P/P	80 - 120
2458059	Calcium	105		P	80 - 120
2458059	Iron	104		P	80 - 120
2458059	Magnesium	105		P	80 - 120
2458059	Potassium	100		P	80 - 120
2458059	Sodium	101		P	80 - 120
2458059	Strontium	98.8		P	80 - 120
2458059	Tin	97.2		P	80 - 120
2458059	Titanium	101		P	80 - 120
2458059	Vanadium	101		P	80 - 120
2458059	Zinc	99.0		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P439262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457797	Aluminum	99.0	100	P/P	80 - 120
2457797	Antimony	101	102	P/P	80 - 120
2457797	Arsenic	101	102	P/P	80 - 120
2457797	Barium	102	103	P/P	80 - 120
2457797	Beryllium	94.7	94.8	P/P	80 - 120
2457797	Boron	100	101	P/P	80 - 120
2457797	Cadmium	101	101	P/P	80 - 120
2457797	Chromium	103	103	P/P	80 - 120
2457797	Cobalt	100	101	P/P	80 - 120
2457797	Copper	102	102	P/P	80 - 120
2457797	Lead	96.3	96.6	P/P	80 - 120
2457797	Manganese	99.4	102	P/P	80 - 120
2457797	Molybdenum	99.1	99.5	P/P	80 - 120
2457797	Nickel	101	102	P/P	80 - 120
2457797	Selenium	100	103	P/P	80 - 120
2457797	Silver	95.9	96.4	P/P	80 - 120
2457797	Thallium	102	103	P/P	80 - 120
2458059	Aluminum	99.7		P	80 - 120
2458059	Antimony	104		P	80 - 120
2458059	Arsenic	99.7		P	80 - 120
2458059	Barium	101		P	80 - 120
2458059	Beryllium	94.3		P	80 - 120
2458059	Boron	106		P	80 - 120
2458059	Cadmium	103		P	80 - 120
2458059	Chromium	99.9		P	80 - 120
2458059	Cobalt	99.5		P	80 - 120
2458059	Copper	97.0		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P439262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458059	Lead	96.2		P	80 - 120
2458059	Manganese	102		P	80 - 120
2458059	Molybdenum	101		P	80 - 120
2458059	Nickel	100		P	80 - 120
2458059	Selenium	99.5		P	80 - 120
2458059	Silver	96.7		P	80 - 120
2458059	Thallium	103		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439407

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457811	Chloride	103		P	90 - 110
2457813	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439410

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457811	Sulfate	101		P	90 - 110
2457813	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439344

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457755	Ammonia-N	95.4	99.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439597

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457753	Ammonia-N	97.6	96.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439243

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457871	Kjeldahl Nitrogen	96.8	115	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439300

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457352	NO2NO3-N	98.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439255

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457756	Total-P	108	108	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P439374

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457904	Fluoride	103	103	P/P	94 - 106

Reference Method: SM 5310 B-2014
Batch ID: P439526

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457784	Organic Carbon	100	99.6	P/P	85 - 115

Reference Method: SM 5310 B-2014
Batch ID: P439527

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2457827	Organic Carbon	102	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P439199

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457749	Color (true)	6.48	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P439226

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457748	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P439262

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457797	Calcium	0.676	Spike	P	0 - 20
2457797	Iron	0.705	Spike	P	0 - 20
2457797	Magnesium	0.407	Spike	P	0 - 20
2457797	Potassium	0.590	Spike	P	0 - 20
2457797	Sodium	1.39	Spike	P	0 - 20
2457797	Strontium	1.05	Spike	P	0 - 20
2457797	Tin	0.506	Spike	P	0 - 20
2457797	Titanium	0.00329	Spike	P	0 - 20
2457797	Vanadium	0.316	Spike	P	0 - 20
2457797	Zinc	0.220	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P439262

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457797	Aluminum	1.21	Spike	P	0 - 20
2457797	Antimony	0.946	Spike	P	0 - 20
2457797	Arsenic	0.476	Spike	P	0 - 20
2457797	Barium	1.27	Spike	P	0 - 20
2457797	Beryllium	0.105	Spike	P	0 - 20
2457797	Boron	0.710	Spike	P	0 - 20
2457797	Cadmium	0.0812	Spike	P	0 - 20
2457797	Chromium	0.130	Spike	P	0 - 20
2457797	Cobalt	1.21	Spike	P	0 - 20
2457797	Copper	0.588	Spike	P	0 - 20
2457797	Lead	0.329	Spike	P	0 - 20
2457797	Manganese	1.57	Spike	P	0 - 20
2457797	Molybdenum	0.428	Spike	P	0 - 20
2457797	Nickel	0.635	Spike	P	0 - 20
2457797	Selenium	2.98	Spike	P	0 - 20
2457797	Silver	0.546	Spike	P	0 - 20
2457797	Thallium	0.506	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439407

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457811	Chloride	0.207	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439410

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457811	Sulfate	0.166	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439344

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457755	Ammonia-N	3.99	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439597

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457753	Ammonia-N	0.694	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439243

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457871	Kjeldahl Nitrogen	9.73	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439300

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457352	NO2NO3-N	2.53	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439255

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457756	Total-P	0.279	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P439372

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457904	Total Alkalinity	0.162	Sample	P	0 - 3.9

Quality Assurance Report Precision

Reference Method: SM 2540 C-2015
Batch ID: P439634

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457811	TDS	2.87	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P439374

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457904	Fluoride	0.513	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2014
Batch ID: P439526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457784	Organic Carbon	0.759	Spike	P	0 - 15

Reference Method: SM 5310 B-2014
Batch ID: P439527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2457827	Organic Carbon	0.644	Spike	P	0 - 15

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

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A123320

Included Lab Sample IDs: 2457811, 2457813, 2457815

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.7	102	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A123330

Included Lab Sample IDs: 2457811, 2457813, 2457815

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A123338

Included Lab Sample IDs: 2457811, 2457813, 2457815

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	103	P/P	90 - 110
Chloride	103	105	P/P	90 - 110
Sulfate	102	103	P/P	90 - 110
Sulfate	103	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A123355

Included Lab Sample IDs: 2457812, 2457814, 2457816

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A123358

Included Lab Sample IDs: 2457816

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.4	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A123369

Included Lab Sample IDs: 2457812, 2457814

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.8	98.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A123372

Included Lab Sample IDs: 2457812

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.4	98.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-2011

Run ID: A123386

Included Lab Sample IDs: 2457811, 2457813, 2457815

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	98.9	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A123386

Included Lab Sample IDs: 2457811, 2457813, 2457815

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	103	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A123391

Included Lab Sample IDs: 2457822

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.6	98.7	P/P	90 - 110
Antimony	99.8	98.9	P/P	90 - 110
Arsenic	99.1	98.5	P/P	90 - 110
Barium	98.8	98.2	P/P	90 - 110
Beryllium	98.4	97.1	P/P	90 - 110
Boron	95.9	94.6	P/P	90 - 110
Cadmium	97.0	95.8	P/P	90 - 110
Chromium	95.9	94.8	P/P	90 - 110
Cobalt	95.0	96.1	P/P	90 - 110
Copper	95.6	97.3	P/P	90 - 110
Lead	94.6	93.8	P/P	90 - 110
Manganese	95.3	95.1	P/P	90 - 110
Molybdenum	99.4	98.3	P/P	90 - 110
Nickel	95.2	96.9	P/P	90 - 110
Selenium	99.5	97.3	P/P	90 - 110
Silver	98.1	97.1	P/P	90 - 110
Thallium	99.4	98.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A123399

Included Lab Sample IDs: 2457822

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	105	104	P/P	90 - 110
Iron	103	101	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	98.5	97.9	P/P	90 - 110
Sodium	100	99.3	P/P	90 - 110
Strontium	99.3	99.8	P/P	90 - 110
Tin	98.7	100	P/P	90 - 110
Titanium	99.6	101	P/P	90 - 110
Vanadium	99.0	101	P/P	90 - 110
Zinc	101	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A123416

Included Lab Sample IDs: 2457812, 2457814, 2457816

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.3	98.8	P/P	90 - 110
Kjeldahl Nitrogen	98.8	98.8	P/P	90 - 110

Reference Method: SM 5310 B-2014

Run ID: A123465

Included Lab Sample IDs: 2457812, 2457814, 2457816

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	122	P/P	85 - 115
Organic Carbon	97.2	100	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A123501

Included Lab Sample IDs: 2457814, 2457816

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	98.3	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			LCS	Precision	MS
							SMP	
DEP SOP: NU-094-1	Color (true)	99.9					6.48	
EPA 180.1 Rev. 2.0	Turbidity	103					0.0	
EPA 200.7 Rev. 4.4	Calcium	111	107	107	105			0.676
	Iron	106	103	104	104			0.705
	Magnesium	109	107	107	105			0.407
	Potassium	99.5	103	103	100			0.590
	Sodium	103	100	98.0	101			1.39
	Strontium	99.8	99.4	98.4	98.8			1.05
	Tin	102	98.4	98.9	97.2			0.506
	Titanium	102	100	100	101			0.0032
	Vanadium	101	100	99.8	101			0.316
	Zinc	102	99.7	99.9	99.0			0.220
EPA 200.8 Rev. 5.4	Aluminum	97.9	99.0	100	99.7			1.21
	Antimony	101	101	102	104			0.946
	Arsenic	99.8	101	102	99.7			0.476
	Barium	100	102	103	101			1.27
	Beryllium	95.1	94.7	94.8	94.3			0.105
	Boron	99.7	100	101	106			0.710
	Cadmium	100	103	101	101			0.0812
	Chromium	101	103	103	99.9			0.130
	Cobalt	98.5	100	101	99.5			1.21
	Copper	97.7	102	102	97.0			0.588
	Lead	94.9	96.3	96.6	96.2			0.329
	Manganese	99.9	99.4	102	102			1.57
	Molybdenum	98.4	99.1	99.5	101			0.428
	Nickel	99.2	101	102	100			0.635
	Selenium	99.3	100	103	99.5			2.98
	Silver	96.1	95.9	96.4	96.7			0.546
	Thallium	98.5	102	103	103			0.506
EPA 300.0 Rev. 2.1	Chloride	105	103	102			0.207	
	Sulfate	105	101	101			0.166	
EPA 350.1 Rev. 2.0	Ammonia-N	95.0	95.4	99.8				3.99
	Ammonia-N	101	97.6	96.6				0.694
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	92.8	96.8	115				9.73
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	98.2					2.53
EPA 365.1 Rev. 2.0	Total-P	109	108	108				0.279
SM 2320 B-2011	Total Alkalinity	99.8					0.162	
SM 2540 C-2015	TDS	92.4					2.87	
SM 2540 D-2015	TSS	92.0						
SM 4500-F- C-2011	Fluoride	103	103	103				0.513
SM 5310 B-2014	Organic Carbon	100	100	99.6				0.759
	Organic Carbon	101	102	101				0.644

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2457811, 2457813, 2457815
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2457811, 2457813, 2457815
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2457822
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2457822
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2457811, 2457813, 2457815

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2457811, 2457813, 2457815
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2457812, 2457814, 2457816
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2457812, 2457814, 2457816
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2457812, 2457814, 2457816
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2457812, 2457814, 2457816
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2457811, 2457813, 2457815
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2457822
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2457811, 2457813, 2457815
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2457811, 2457813, 2457815
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2457811, 2457813, 2457815
SM 5310 B-2014	Nonpurgeable Organic Carbon in aqueous matrices	2457812, 2457814, 2457816

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	12/19/2023			12/19/2023 14:19	Chandler E Cox	2457811
	12/19/2023			12/19/2023 14:20	Chandler E Cox	2457813
	12/19/2023			12/19/2023 14:21	Chandler E Cox	2457815
EPA 180.1 Rev. 2.0	12/19/2023			12/19/2023 11:53	Anna M. Plaviak	2457811
	12/19/2023			12/19/2023 11:54	Anna M. Plaviak	2457813
	12/19/2023			12/19/2023 13:20	Anna M. Plaviak	2457815
EPA 200.7 Rev. 4.4	12/19/2023	12/20/2023 13:15	George D Taylor	12/21/2023 16:25	Samatha Luckman	2457822
EPA 200.8 Rev. 5.4	12/19/2023	12/20/2023 13:15	George D Taylor	12/21/2023 16:41	Emily M Philpot	2457822
EPA 300.0 Rev. 2.1	12/19/2023			12/22/2023 02:56	James L Waggeberby	2457811
	12/19/2023			12/22/2023 03:26	James L Waggeberby	2457813
	12/19/2023			12/22/2023 08:43	James L Waggeberby	2457815
EPA 350.1 Rev. 2.0	12/19/2023			01/04/2024 14:25	Ping Hua	2457814
	12/19/2023			01/04/2024 14:26	Ping Hua	2457816
	12/19/2023			12/20/2023 13:06	Khloe J Berg	2457812
EPA 351.2 Rev. 2.0	12/19/2023	12/20/2023 13:42	Simonne.V. Calhoun	12/22/2023 16:34	Samantha L Bates	2457812
	12/19/2023	12/20/2023 13:42	Simonne.V. Calhoun	12/22/2023 16:39	Samantha L Bates	2457814
	12/19/2023	12/20/2023 13:42	Simonne.V. Calhoun	12/22/2023 16:40	Samantha L Bates	2457816
EPA 353.2 Rev. 2.0	12/19/2023			12/20/2023 13:04	Fadila Guebre	2457812
	12/19/2023			12/20/2023 13:05	Fadila Guebre	2457814
	12/19/2023			12/20/2023 13:06	Fadila Guebre	2457816
EPA 365.1 Rev. 2.0	12/19/2023	12/20/2023 12:07	Adam P Silver	12/20/2023 18:03	James L Waggeberby	2457816
	12/19/2023	12/20/2023 12:07	Adam P Silver	12/21/2023 10:23	Chandler E Cox	2457812
	12/19/2023	12/20/2023 12:07	Adam P Silver	12/21/2023 10:24	Chandler E Cox	2457814
SM 2320 B-2011	12/19/2023			12/21/2023 01:43	Dale L. Simmons	2457811
	12/19/2023			12/21/2023 01:56	Dale L. Simmons	2457813
	12/19/2023			12/21/2023 02:08	Dale L. Simmons	2457815
SM 2340 B-2011	12/19/2023			12/21/2023 16:25	Samatha Luckman	2457822
SM 2540 C-2015	12/19/2023			12/21/2023 15:04	Yijie Li	2457811, 2457813, 2457815
SM 2540 D-2015	12/19/2023			12/21/2023 15:04	Yijie Li	2457811, 2457813, 2457815
SM 4500-F- C-2011	12/19/2023			12/21/2023 01:43	Dale L. Simmons	2457811
	12/19/2023			12/21/2023 01:56	Dale L. Simmons	2457813
	12/19/2023			12/21/2023 02:08	Dale L. Simmons	2457815
SM 5310 B-2014	12/19/2023			12/23/2023 04:35	Kenneth H Lee	2457812
	12/19/2023			12/23/2023 04:50	Kenneth H Lee	2457814
	12/19/2023			12/23/2023 06:56	Kenneth H Lee	2457816