Chemical Analysis Report

CEN-DIST-2023-09-15-01

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

Event Description: **Run 10**
Request ID: **RQ-2023-09-11-36**
Customer: **CEN-DIST**
Project ID: **SMP**

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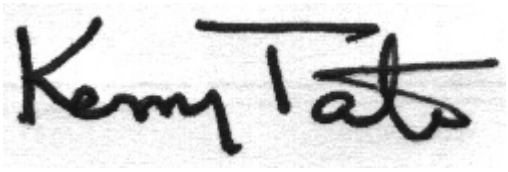
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 04-OCT-2023 10:02



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: 09/14/2023 10:43**

Field ID: G4CE0155 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2437671	DEP SOP: NU-094-1	Color (true)	39		PCU	P435081	
	EPA 180.1 Rev. 2.0	Turbidity	1.2		NTU	P435085	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P435515	
		Sulfate	3.6		mg SO4/L	P435517	
	SM 2320 B-2011	Total Alkalinity	17		mg CaCO3/L	P435325	
	SM 2540 C-2015	TDS	71		mg/L	P435610	
	SM 2540 D-2015	TSS	3	I	mg/L	P435612	
	SM 4500-F- C-2011	Fluoride	0.047	I	mg F/L	P435328	
2437672	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P435191	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.80		mg N/L	P435652	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P435658	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P435308	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P435615	

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 Fairhope at Center **Collection Date/Time: 09/14/2023 13:59**

Field ID: G2CE0016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2437669	DEP SOP: NU-094-1	Color (true)	28		PCU	P435081	
	EPA 180.1 Rev. 2.0	Turbidity	7.5	A	NTU	P435085	
	EPA 300.0 Rev. 2.1	Chloride	7.8		mg Cl/L	P435515	
		Sulfate	1.9		mg SO4/L	P435517	
	SM 2320 B-2011	Total Alkalinity	42		mg CaCO3/L	P435325	
	SM 2540 C-2015	TDS	66		mg/L	P435610	
	SM 2540 D-2015	TSS	11	I	mg/L	P435612	
	SM 4500-F- C-2011	Fluoride	0.037	I	mg F/L	P435328	
2437670	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P435191	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P435652	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P435658	
	EPA 365.1 Rev. 2.0	Total-P	0.067		mg P/L	P435308	
	SM 5310 B-2011	Organic Carbon	7.8		mg C/L	P435615	
2437675	EPA 200.7 Rev. 4.4	Calcium	17.5		mg/L	P435144	
		Iron	81	I	ug/L	P435144	
		Magnesium	1.08		mg/L	P435144	
		Potassium	1.3		mg/L	P435144	
		Sodium	4.9		mg/L	P435144	
		Strontium	40.3		ug/L	P435144	
		Tin	3.0	U	ug/L	P435144	
		Titanium	0.83	I	ug/L	P435144	
		Vanadium	2.0	U	ug/L	P435144	
		Zinc	5.0	U	ug/L	P435144	
	EPA 200.8 Rev. 5.4	Aluminum	79		ug/L	P435144	
		Antimony	0.82		ug/L	P435144	
		Arsenic	1.36		ug/L	P435144	
		Barium	8.21		ug/L	P435144	
		Beryllium	0.010	U	ug/L	P435144	
		Boron	18.5		ug/L	P435144	
		Cadmium	0.020	U	ug/L	P435144	
		Chromium	0.40	U	ug/L	P435144	
		Cobalt	0.038	I	ug/L	P435144	
		Copper	0.98		ug/L	P435144	
		Lead	0.97		ug/L	P435144	
		Manganese	10.6		ug/L	P435144	
		Molybdenum	0.31	I	ug/L	P435144	
		Nickel	0.50	U	ug/L	P435144	
		Selenium	0.20	U	ug/L	P435144	
		Silver	0.010	U	ug/L	P435144	
		Thallium	0.10	U	ug/L	P435144	
	SM 2340 B-2011	Hardness	48.2		mg/L	P435144	

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The PQL was elevated because of sample matrix interference.

Sample Location: Lake Reams at Center **Collection Date/Time: 09/14/2023 12:33**

Field ID: G4CE0242 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2437676	EPA 200.7 Rev. 4.4	Calcium	7.16		mg/L	P435144	
		Iron	120	I	ug/L	P435144	
		Magnesium	3.75		mg/L	P435144	
		Potassium	6.2		mg/L	P435144	
		Sodium	24.4		mg/L	P435144	
		Strontium	24.0		ug/L	P435144	
		Tin	3.0	U	ug/L	P435144	
		Titanium	0.75	U	ug/L	P435144	
		Vanadium	2.0	U	ug/L	P435144	
		Zinc	6.5	I	ug/L	P435144	
	EPA 200.8 Rev. 5.4	Aluminum	40		ug/L	P435144	
		Antimony	0.15	I	ug/L	P435144	
		Arsenic	0.35		ug/L	P435144	
		Barium	9.11		ug/L	P435144	
		Beryllium	0.010	U	ug/L	P435144	
		Boron	49.0		ug/L	P435144	
		Cadmium	0.020	U	ug/L	P435144	
		Chromium	0.40	U	ug/L	P435144	
		Cobalt	0.034	I	ug/L	P435144	
		Copper	0.63	I	ug/L	P435144	
		Lead	0.20	U	ug/L	P435144	
		Manganese	8.27		ug/L	P435144	
		Molybdenum	0.16	I	ug/L	P435144	
		Nickel	0.50	U	ug/L	P435144	
		Selenium	0.20	U	ug/L	P435144	
		Silver	0.010	U	ug/L	P435144	
		Thallium	0.10	U	ug/L	P435144	
	SM 2340 B-2011	Hardness	33.3		mg/L	P435144	

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P435081

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P435085

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P435144

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: P435144

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: P435515

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: P435517

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435191

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435652

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P435658

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435308

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

Reference Method: SM 2320 B-2011
Batch ID: P435325

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

Reference Method: SM 2540 C-2015
Batch ID: P435610

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P435612

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P435328

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P435615

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: P435081

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	103		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P435085

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P435144

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	107		P	85 - 115
Magnesium	108		P	85 - 115
Potassium	102		P	85 - 115
Sodium	102		P	85 - 115
Strontium	100		P	85 - 115
Tin	104		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	103		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P435144

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.5		P	85 - 115
Antimony	95.9		P	85 - 115
Arsenic	98.0		P	85 - 115
Barium	99.9		P	85 - 115
Beryllium	93.0		P	85 - 115
Boron	102		P	85 - 115
Cadmium	98.2		P	85 - 115
Chromium	95.8		P	85 - 115
Cobalt	96.2		P	85 - 115
Copper	96.4		P	85 - 115
Lead	92.4		P	85 - 115
Manganese	97.3		P	85 - 115
Molybdenum	97.1		P	85 - 115
Nickel	95.8		P	85 - 115
Selenium	97.3		P	85 - 115
Silver	111		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435515

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435517

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435191

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435652

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	107		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P435658

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: P435308

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

Reference Method: SM 2320 B-2011
Batch ID: P435325

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.8		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P435610

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	98.1		P	90 - 110

Reference Method: SM 2540 D-2015
Batch ID: P435612

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	96.0		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P435328

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	94 - 106

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P435615

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P435144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437356	Calcium	102		P	80 - 120
2437356	Iron	105	105	P/P	80 - 120
2437356	Magnesium	107	106	P/P	80 - 120
2437356	Potassium	102	103	P/P	80 - 120
2437356	Sodium	102		P	80 - 120
2437356	Strontium	99.4	99.4	P/P	80 - 120
2437356	Tin	99.0	98.4	P/P	80 - 120
2437356	Titanium	97.2	95.4	P/P	80 - 120
2437356	Vanadium	102	101	P/P	80 - 120
2437356	Zinc	100	99.2	P/P	80 - 120
2437492	Calcium	104		P	80 - 120
2437492	Iron	105		P	80 - 120
2437492	Magnesium	103		P	80 - 120
2437492	Potassium	101		P	80 - 120
2437492	Sodium	103		P	80 - 120
2437492	Strontium	99.2		P	80 - 120
2437492	Tin	102		P	80 - 120
2437492	Titanium	103		P	80 - 120
2437492	Vanadium	104		P	80 - 120
2437492	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P435144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437356	Aluminum	107	99.4	P/P	80 - 120
2437356	Antimony	93.5	95.8	P/P	80 - 120
2437356	Arsenic	96.8	99.0	P/P	80 - 120
2437356	Barium	99.4	103	P/P	80 - 120
2437356	Beryllium	94.7	94.8	P/P	80 - 120
2437356	Boron	102	104	P/P	80 - 120
2437356	Cadmium	102	101	P/P	80 - 120
2437356	Chromium	96.6	98.3	P/P	80 - 120
2437356	Cobalt	95.5	96.7	P/P	80 - 120
2437356	Copper	95.8	96.7	P/P	80 - 120
2437356	Lead	93.1	95.0	P/P	80 - 120
2437356	Manganese	95.3	99.2	P/P	80 - 120
2437356	Molybdenum	96.4	98.9	P/P	80 - 120
2437356	Nickel	97.1	97.2	P/P	80 - 120
2437356	Selenium	97.1	99.2	P/P	80 - 120
2437356	Silver	109	110	P/P	80 - 120
2437356	Thallium	103	105	P/P	80 - 120
2437492	Aluminum	97.6		P	80 - 120
2437492	Antimony	98.8		P	80 - 120
2437492	Arsenic	101		P	80 - 120
2437492	Barium	102		P	80 - 120
2437492	Beryllium	95.8		P	80 - 120
2437492	Boron	102		P	80 - 120
2437492	Cadmium	104		P	80 - 120
2437492	Chromium	98.0		P	80 - 120
2437492	Cobalt	96.9		P	80 - 120
2437492	Copper	97.3		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P435144

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437492	Lead	94.5		P	80 - 120
2437492	Manganese	98.6		P	80 - 120
2437492	Molybdenum	100		P	80 - 120
2437492	Nickel	95.5		P	80 - 120
2437492	Selenium	98.6		P	80 - 120
2437492	Silver	109		P	80 - 120
2437492	Thallium	104		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435515

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437620	Chloride	107		P	90 - 110
2437626	Chloride	105		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435517

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437620	Sulfate	106		P	90 - 110
2437626	Sulfate	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435191

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437627	Ammonia-N	99.6	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435652

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437670	Kjeldahl Nitrogen	91.2	96.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P435658

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437627	NO2NO3-N	98.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435308

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437627	Total-P	107	106	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P435328

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437756	Fluoride	99.9	98.9	P/P	94 - 106

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P435615

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2437670	Organic Carbon	95.8	97.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P435081

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437641	Color (true)	0.145	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P435085

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437669	Turbidity	0.266	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P435144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437356	Calcium	0.299	Spike	P	0 - 20
2437356	Iron	0.239	Spike	P	0 - 20
2437356	Magnesium	0.154	Spike	P	0 - 20
2437356	Potassium	0.613	Spike	P	0 - 20
2437356	Sodium	0.107	Spike	P	0 - 20
2437356	Strontium	0.0281	Spike	P	0 - 20
2437356	Tin	0.548	Spike	P	0 - 20
2437356	Titanium	1.60	Spike	P	0 - 20
2437356	Vanadium	0.808	Spike	P	0 - 20
2437356	Zinc	0.948	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P435144

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437356	Aluminum	4.90	Spike	P	0 - 20
2437356	Antimony	2.50	Spike	P	0 - 20
2437356	Arsenic	2.18	Spike	P	0 - 20
2437356	Barium	2.44	Spike	P	0 - 20
2437356	Beryllium	0.0722	Spike	P	0 - 20
2437356	Boron	1.34	Spike	P	0 - 20
2437356	Cadmium	0.990	Spike	P	0 - 20
2437356	Chromium	1.75	Spike	P	0 - 20
2437356	Cobalt	1.24	Spike	P	0 - 20
2437356	Copper	0.934	Spike	P	0 - 20
2437356	Lead	1.91	Spike	P	0 - 20
2437356	Manganese	1.70	Spike	P	0 - 20
2437356	Molybdenum	2.48	Spike	P	0 - 20
2437356	Nickel	0.0528	Spike	P	0 - 20
2437356	Selenium	2.17	Spike	P	0 - 20
2437356	Silver	1.44	Spike	P	0 - 20
2437356	Thallium	2.00	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435515

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437620	Chloride	2.15	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P435517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437620	Sulfate	1.80	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P435191

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437627	Ammonia-N	0.180	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P435652

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437670	Kjeldahl Nitrogen	3.28	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P435658

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437627	NO2NO3-N	0.583	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P435308

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437627	Total-P	0.860	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P435325

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437756	Total Alkalinity	0.944	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015
Batch ID: P435610

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437620	TDS	6.67	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P435328

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437756	Fluoride	0.968	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011
Batch ID: P435615

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2437670	Organic Carbon	1.43	Spike	P	0 - 20

* 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: A121567
Included Lab Sample IDs: 2437669, 2437671

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A121569
Included Lab Sample IDs: 2437669, 2437671

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	97.0	97.0	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A121624
Included Lab Sample IDs: 2437670, 2437672

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.6	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A121636
Included Lab Sample IDs: 2437675, 2437676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	98.9	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	100	100	P/P	90 - 110
Sodium	100	100	P/P	90 - 110
Strontium	98.2	100	P/P	90 - 110
Tin	101	101	P/P	90 - 110
Titanium	101	101	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	101	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A121637
Included Lab Sample IDs: 2437675, 2437676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.5	99.4	P/P	90 - 110
Antimony	95.5	95.3	P/P	90 - 110
Arsenic	98.7	99.3	P/P	90 - 110
Barium	98.1	98.8	P/P	90 - 110
Beryllium	95.3	96.5	P/P	90 - 110
Boron	100	101	P/P	90 - 110
Cadmium	102	101	P/P	90 - 110
Chromium	100	99.4	P/P	90 - 110
Cobalt	97.5	97.7	P/P	90 - 110
Copper	96.2	97.4	P/P	90 - 110
Lead	93.1	93.1	P/P	90 - 110
Manganese	101	99.7	P/P	90 - 110
Molybdenum	98.8	98.4	P/P	90 - 110
Nickel	96.7	97.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A121637
Included Lab Sample IDs: 2437675, 2437676

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Selenium	100	100	P/P	90 - 110
Silver	101	100	P/P	90 - 110
Thallium	99.1	98.9	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A121687
Included Lab Sample IDs: 2437669, 2437671

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.9	94.3	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A121687
Included Lab Sample IDs: 2437669, 2437671

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A121717
Included Lab Sample IDs: 2437670

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A121729
Included Lab Sample IDs: 2437672

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	95.0	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A121771
Included Lab Sample IDs: 2437669, 2437671

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	99.6	P/P	90 - 110
Sulfate	104	101	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A121799
Included Lab Sample IDs: 2437670, 2437672

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	96.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A121819
Included Lab Sample IDs: 2437670, 2437672

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A121856
Included Lab Sample IDs: 2437670, 2437672

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	108	P/P	90 - 110
Kjeldahl Nitrogen	108	108	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)	103					0.145	
EPA 180.1 Rev. 2.0	Turbidity	101					0.266	
EPA 200.7 Rev. 4.4	Calcium	101	102	104				0.299
	Iron	107	105	105	105			0.239
	Magnesium	108	107	106	103			0.154
	Potassium	102	102	103	101			0.613
	Sodium	102	102	103				0.107
	Strontium	100	99.4	99.4	99.2			0.0281
	Tin	104	99.0	98.4	102			0.548
	Titanium	102	97.2	95.4	103			1.60
	Vanadium	103	102	101	104			0.808
	Zinc	101	100	99.2	102			0.948
EPA 200.8 Rev. 5.4	Aluminum	97.5	107	99.4	97.6			4.90
	Antimony	95.9	93.5	95.8	98.8			2.50
	Arsenic	98.0	96.8	99.0	101			2.18
	Barium	99.9	99.4	103	102			2.44
	Beryllium	93.0	94.7	94.8	95.8			0.0722
	Boron	102	102	104	102			1.34
	Cadmium	98.2	102	101	104			0.990
	Chromium	95.8	96.6	98.3	98.0			1.75
	Cobalt	96.2	95.5	96.7	96.9			1.24
	Copper	96.4	95.8	96.7	97.3			0.934
	Lead	92.4	93.1	95.0	94.5			1.91
	Manganese	97.3	95.3	99.2	98.6			1.70
	Molybdenum	97.1	96.4	98.9	100			2.48
	Nickel	95.8	97.1	97.2	95.5			0.0528
	Selenium	97.3	97.1	99.2	98.6			2.17
	Silver	111	109	110	109			1.44
	Thallium	101	103	105	104			2.00
EPA 300.0 Rev. 2.1	Chloride	101	107	105			2.15	
	Sulfate	103	106	102			1.80	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	99.6	99.8				0.180
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	91.2	96.7				3.28
EPA 353.2 Rev. 2.0	NO2NO3-N	100	98.8					0.583
EPA 365.1 Rev. 2.0	Total-P	102	107	106				0.860
SM 2320 B-2011	Total Alkalinity	95.8					0.944	
SM 2540 C-2015	TDS	98.1					6.67	
SM 2540 D-2015	TSS	96.0						
SM 4500-F- C-2011	Fluoride	100	99.9	98.9				0.968
SM 5310 B-2011	Organic Carbon	95.6	95.8	97.8				1.43

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2437669, 2437671
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2437669, 2437671
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2437675, 2437676
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2437675, 2437676
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2437669, 2437671
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2437669, 2437671
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2437670, 2437672

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2437670, 2437672
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2437670, 2437672
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2437670, 2437672
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2437669, 2437671
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2437675, 2437676
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2437669, 2437671
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2437669, 2437671
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2437669, 2437671
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2437670, 2437672

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	09/15/2023			09/15/2023 15:00	Alexis Price	2437669, 2437671
EPA 180.1 Rev. 2.0	09/15/2023			09/15/2023 14:20	Alexis Price	2437669
	09/15/2023			09/15/2023 14:22	Alexis Price	2437671
EPA 200.7 Rev. 4.4	09/15/2023	09/18/2023 13:10	George D Taylor	09/19/2023 20:54	Samatha Luckman	2437675
	09/15/2023	09/18/2023 13:10	George D Taylor	09/19/2023 21:01	Samatha Luckman	2437676
EPA 200.8 Rev. 5.4	09/15/2023	09/18/2023 13:10	George D Taylor	09/19/2023 16:59	Emily M Philpot	2437675
	09/15/2023	09/18/2023 13:10	George D Taylor	09/19/2023 17:08	Emily M Philpot	2437676
EPA 300.0 Rev. 2.1	09/15/2023			09/26/2023 04:29	James L Waggerby	2437669
	09/15/2023			09/26/2023 04:44	James L Waggerby	2437671
EPA 350.1 Rev. 2.0	09/15/2023			09/19/2023 13:51	Ping Hua	2437670
	09/15/2023			09/19/2023 13:52	Ping Hua	2437672
EPA 351.2 Rev. 2.0	09/15/2023	09/28/2023 17:05	Simonne.V. Calhoun	09/29/2023 13:26	Ping Hua	2437670
	09/15/2023	09/28/2023 17:05	Simonne.V. Calhoun	09/29/2023 13:34	Ping Hua	2437672
EPA 353.2 Rev. 2.0	09/15/2023			09/27/2023 14:19	Anna M. Plaviak	2437670
	09/15/2023			09/27/2023 14:20	Anna M. Plaviak	2437672
EPA 365.1 Rev. 2.0	09/15/2023	09/21/2023 14:48	Adam P Silver	09/22/2023 10:15	James L Waggerby	2437670
	09/15/2023	09/21/2023 14:48	Adam P Silver	09/22/2023 13:56	James L Waggerby	2437672
SM 2320 B-2011	09/15/2023			09/21/2023 05:07	Dale L. Simmons	2437669
	09/15/2023			09/21/2023 05:20	Dale L. Simmons	2437671
SM 2340 B-2011	09/15/2023			09/19/2023 20:54	Samatha Luckman	2437675
	09/15/2023			09/19/2023 21:01	Samatha Luckman	2437676
SM 2540 C-2015	09/15/2023			09/19/2023 15:12	Yijie Li	2437669, 2437671
SM 2540 D-2015	09/15/2023			09/19/2023 15:12	Yijie Li	2437669, 2437671
SM 4500-F- C-2011	09/15/2023			09/21/2023 05:07	Dale L. Simmons	2437669
	09/15/2023			09/21/2023 05:20	Dale L. Simmons	2437671
SM 5310 B-2011	09/15/2023			09/26/2023 23:36	Elise M. Gillis	2437670
	09/15/2023			09/27/2023 00:57	Elise M. Gillis	2437672