

Chemical Analysis Report

NW-DIST-2023-04-26-03

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

Event Description: **Rest Area Run**
Request ID: **RQ-2023-04-24-21**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government Street
Suite 208
Pensacola, FL 32502-5794
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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant

Date Certified: 15-MAY-2023 12:36



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: REST AREA RUN BELOW BEAVER POND CREEK

Collection Date/Time: 04/25/2023 10:20

Field ID: G5NW0068

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2403157	DEP SOP: NU-094-1	Color (true)	38		PCU	P429019	
	EPA 180.1 Rev. 2.0	Turbidity	3.3	A	NTU	P429018	
	EPA 300.0 Rev. 2.1	Chloride	7.3		mg Cl/L	P429145	
		Sulfate	2.2		mg SO4/L	P429148	
	SM 2320 B-2011	Total Alkalinity	6.1		mg CaCO3/L	P429391	
	SM 2540 C-2015	TDS	33		mg/L	P429528	
	SM 2540 D-2015	TSS	2	I	mg/L	P429530	
2403159	SM 4500-F- C-2011	Fluoride	0.025	U	mg F/L	P429284	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P429253	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.21		mg N/L	P429369	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.41		mg N/L	P429330	
	EPA 365.1 Rev. 2.0	Total-P	0.007		mg P/L	P429044	
2403167	SM 5310 B-2011	Organic Carbon	3.3		mg C/L	P429239	
	EPA 200.7 Rev. 4.4	Barium	16.3		ug/L	P429078	
		Calcium	2.68		mg/L	P429078	
		Iron	330		ug/L	P429078	
		Magnesium	1.15		mg/L	P429078	
		Potassium	1.1	I	mg/L	P429078	
		Sodium	4.4		mg/L	P429078	
		Strontium	12.2		ug/L	P429078	
		Tin	3.0	U	ug/L	P429078	
		Titanium	3.0	I	ug/L	P429078	
		Vanadium	2.0	U	ug/L	P429078	
		Zinc	5.0	U	ug/L	P429078	
	EPA 200.8 Rev. 5.4	Aluminum	145		ug/L	P429078	
		Antimony	0.050	U	ug/L	P429078	
		Arsenic	0.21		ug/L	P429078	
		Barium	16.7		ug/L	P429078	
		Beryllium	0.012	I	ug/L	P429078	
		Boron	19.5		ug/L	P429078	
		Cadmium	0.020	U	ug/L	P429078	
		Chromium	0.40	U	ug/L	P429078	
		Cobalt	0.097		ug/L	P429078	
		Copper	2.19		ug/L	P429078	
		Lead	0.30	I	ug/L	P429078	
		Manganese	9.31		ug/L	P429078	
		Molybdenum	0.15	U	ug/L	P429078	
		Nickel	0.50	U	ug/L	P429078	
		Selenium	0.20	U	ug/L	P429078	
		Silver	0.010	U	ug/L	P429078	
		Thallium	0.10	U	ug/L	P429078	
	SM 2340 B-2011	Hardness	11.4		mg/L	P429078	

Field ID: G5NW0068

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: BEAVER POND CREEK

Collection Date/Time: 04/25/2023 10:51

Field ID: 33010066

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2403158	DEP SOP: NU-094-1	Color (true)	31		PCU	P429021	
	EPA 180.1 Rev. 2.0	Turbidity	29		NTU	P429018	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P429145	
		Sulfate	3.3		mg SO4/L	P429148	
	SM 2320 B-2011	Total Alkalinity	52		mg CaCO3/L	P429391	
	SM 2540 C-2015	TDS	115		mg/L	P429528	
	SM 2540 D-2015	TSS	6	I	mg/L	P429530	
2403160	SM 4500-F- C-2011	Fluoride	0.050	I	mg F/L	P429284	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.22		mg N/L	P429343	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.72		mg N/L	P429418	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P429330	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P429044	
2403168	SM 5310 B-2011	Organic Carbon	8.2		mg C/L	P429239	
	EPA 200.7 Rev. 4.4	Barium	17.0		ug/L	P429078	
		Calcium	15.2		mg/L	P429078	
		Iron	2.87E+03		ug/L	P429078	
		Magnesium	3.07		mg/L	P429078	
		Potassium	4.6		mg/L	P429078	
		Sodium	14.1		mg/L	P429078	
		Strontium	42.1		ug/L	P429078	
		Tin	3.0	U	ug/L	P429078	
		Titanium	9.8		ug/L	P429078	
		Vanadium	2.0	U	ug/L	P429078	
		Zinc	5.0	U	ug/L	P429078	
	EPA 200.8 Rev. 5.4	Aluminum	448		ug/L	P429078	
		Antimony	0.062	I	ug/L	P429078	
		Arsenic	0.84		ug/L	P429078	
		Barium	17.5		ug/L	P429078	
		Beryllium	0.015	I	ug/L	P429078	
		Boron	83.5		ug/L	P429078	
		Cadmium	0.020	U	ug/L	P429078	
		Chromium	0.79	I	ug/L	P429078	
		Cobalt	0.263		ug/L	P429078	
		Copper	0.47	I	ug/L	P429078	
		Lead	0.32	I	ug/L	P429078	
		Manganese	84.7		ug/L	P429078	
		Molybdenum	0.17	I	ug/L	P429078	
		Nickel	0.70	I	ug/L	P429078	
		Selenium	0.20	U	ug/L	P429078	
		Silver	0.011	I	ug/L	P429078	
		Thallium	0.10	U	ug/L	P429078	
	SM 2340 B-2011	Hardness	50.7		mg/L	P429078	

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: P429019

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: DEP SOP: NU-094-1
Batch ID: P429021

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P429018

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P429078

Component	Result	Code	Units
Barium	1.0	U	ug/L
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: P429078

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P429145

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P429148

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429253

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429343

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429369

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429418

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429330

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429044

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

Reference Method: SM 2320 B-2011
Batch ID: P429391

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2015
Batch ID: P429528

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P429530

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P429284

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P429239

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: P429019

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

Reference Method: DEP SOP: NU-094-1
Batch ID: P429021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.8		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P429018

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P429078

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	80 - 120
Calcium	99.5		P	80 - 120
Iron	99.3		P	80 - 120
Magnesium	101		P	80 - 120
Potassium	99.4		P	80 - 120
Sodium	101		P	80 - 120
Strontium	96.9		P	80 - 120
Tin	95.5		P	80 - 120
Titanium	99.0		P	80 - 120
Vanadium	98.8		P	80 - 120
Zinc	98.4		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P429078

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	107		P	85 - 115
Arsenic	100		P	85 - 115
Barium	105		P	85 - 115
Beryllium	94.7		P	85 - 115
Boron	103		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	100		P	85 - 115
Cobalt	103		P	85 - 115
Copper	97.7		P	85 - 115
Lead	101		P	85 - 115
Manganese	98.8		P	85 - 115
Molybdenum	99.1		P	85 - 115
Nickel	100		P	85 - 115
Selenium	101		P	85 - 115
Silver	105		P	85 - 115
Thallium	97.2		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P429145

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P429148

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429253

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429343

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429369

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429418

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.1		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429330

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429044

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

Reference Method: SM 2320 B-2011
Batch ID: P429391

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2540 C-2015
Batch ID: P429528

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	98.3		P	90 - 110

Reference Method: SM 2540 D-2015
Batch ID: P429530

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	97.9		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P429284

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.8		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P429239

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P429078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403010	Barium	98.9	99.1	P/P	80 - 120
2403010	Calcium	98.5	100	P/P	80 - 120
2403010	Iron	100	102	P/P	80 - 120
2403010	Magnesium	100	103	P/P	80 - 120
2403010	Potassium	99.3	99.3	P/P	80 - 120
2403010	Sodium	100	102	P/P	80 - 120
2403010	Strontium	97.6	97.5	P/P	80 - 120
2403010	Tin	94.3	96.4	P/P	80 - 120
2403010	Titanium	97.8	97.9	P/P	80 - 120
2403010	Vanadium	97.3	97.1	P/P	80 - 120
2403010	Zinc	95.8	96.1	P/P	80 - 120
2403167	Barium	101		P	80 - 120
2403167	Calcium	101		P	80 - 120
2403167	Iron	101		P	80 - 120
2403167	Magnesium	101		P	80 - 120
2403167	Potassium	98.8		P	80 - 120
2403167	Sodium	101		P	80 - 120
2403167	Strontium	98.3		P	80 - 120
2403167	Tin	96.9		P	80 - 120
2403167	Titanium	97.4		P	80 - 120
2403167	Vanadium	98.4		P	80 - 120
2403167	Zinc	98.6		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P429078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403010	Aluminum	98.9	97.4	P/P	80 - 120
2403010	Antimony	105	103	P/P	80 - 120
2403010	Arsenic	99.7	99.2	P/P	80 - 120
2403010	Barium	106	103	P/P	80 - 120
2403010	Beryllium	94.9	93.4	P/P	80 - 120
2403010	Boron	105	100	P/P	80 - 120
2403010	Cadmium	101	99.4	P/P	80 - 120
2403010	Chromium	102	100	P/P	80 - 120
2403010	Cobalt	104	102	P/P	80 - 120
2403010	Copper	100	98.0	P/P	80 - 120
2403010	Lead	104	103	P/P	80 - 120
2403010	Manganese	103	98.6	P/P	80 - 120
2403010	Molybdenum	98.4	98.0	P/P	80 - 120
2403010	Nickel	101	99.3	P/P	80 - 120
2403010	Selenium	99.2	98.6	P/P	80 - 120
2403010	Silver	104	103	P/P	80 - 120
2403010	Thallium	103	101	P/P	80 - 120
2403167	Aluminum	97.8		P	80 - 120
2403167	Antimony	104		P	80 - 120
2403167	Arsenic	97.9		P	80 - 120
2403167	Barium	102		P	80 - 120
2403167	Beryllium	89.1		P	80 - 120
2403167	Boron	103		P	80 - 120
2403167	Cadmium	102		P	80 - 120
2403167	Chromium	101		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P429078

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403167	Cobalt	103		P	80 - 120
2403167	Copper	96.3		P	80 - 120
2403167	Lead	104		P	80 - 120
2403167	Manganese	101		P	80 - 120
2403167	Molybdenum	98.7		P	80 - 120
2403167	Nickel	98.2		P	80 - 120
2403167	Selenium	98.8		P	80 - 120
2403167	Silver	103		P	80 - 120
2403167	Thallium	102		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P429145

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402952	Chloride	101		P	90 - 110
2403100	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P429148

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2402952	Sulfate	102		P	90 - 110
2403100	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403075	Ammonia-N	100	98.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429343

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403356	Ammonia-N	98.6	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403854	Kjeldahl Nitrogen	99.3	97.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429330

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403101	NO2NO3-N	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403159	Total-P	108	109	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P429284

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403073	Fluoride	100	102	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P429239

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403159	Organic Carbon	94.4	95.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P429019

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403071	Color (true)	2.07	Sample	P	0 - 20

Reference Method: DEP SOP: NU-094-1
Batch ID: P429021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402952	Color (true)	4.08	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P429018

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403157	Turbidity	0.913	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P429078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403010	Barium	0.162	Spike	P	0 - 20
2403010	Calcium	1.12	Spike	P	0 - 20
2403010	Iron	1.24	Spike	P	0 - 20
2403010	Magnesium	1.53	Spike	P	0 - 20
2403010	Potassium	0.0240	Spike	P	0 - 20
2403010	Sodium	1.10	Spike	P	0 - 20
2403010	Strontium	0.0836	Spike	P	0 - 20
2403010	Tin	2.24	Spike	P	0 - 20
2403010	Titanium	0.139	Spike	P	0 - 20
2403010	Vanadium	0.275	Spike	P	0 - 20
2403010	Zinc	0.258	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P429078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403010	Aluminum	1.35	Spike	P	0 - 20
2403010	Antimony	1.43	Spike	P	0 - 20
2403010	Arsenic	0.557	Spike	P	0 - 20
2403010	Barium	2.36	Spike	P	0 - 20
2403010	Beryllium	1.56	Spike	P	0 - 20
2403010	Boron	4.32	Spike	P	0 - 20
2403010	Cadmium	1.11	Spike	P	0 - 20
2403010	Chromium	2.00	Spike	P	0 - 20
2403010	Cobalt	1.98	Spike	P	0 - 20
2403010	Copper	2.55	Spike	P	0 - 20
2403010	Lead	1.31	Spike	P	0 - 20
2403010	Manganese	3.20	Spike	P	0 - 20
2403010	Molybdenum	0.468	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P429078

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403010	Nickel	1.53	Spike	P	0 - 20
2403010	Selenium	0.570	Spike	P	0 - 20
2403010	Silver	0.735	Spike	P	0 - 20
2403010	Thallium	2.00	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P429145

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402952	Chloride	0.696	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P429148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402952	Sulfate	1.07	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403075	Ammonia-N	1.10	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429343

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403356	Ammonia-N	0.437	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403118	Kjeldahl Nitrogen	2.33	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403854	Kjeldahl Nitrogen	1.76	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429330

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403101	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403159	Total-P	1.09	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P429391

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402972	Total Alkalinity	0.122	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P429528

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2402949	TDS	5.90	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P429284

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403073	Fluoride	0.973	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P429239

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403159	Organic Carbon	1.16	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A118755

Included Lab Sample IDs: 2403157, 2403158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.7	100	P/P	90 - 110
Sulfate	99.4	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A118794

Included Lab Sample IDs: 2403157, 2403158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.0	98.0	P/P	95 - 105

Reference Method: DEP SOP: NU-094-1

Run ID: A118795

Included Lab Sample IDs: 2403157, 2403158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	97.7	P/P	90 - 110
Color (true)	99.8	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A118857

Included Lab Sample IDs: 2403159, 2403160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	98.5	P/P	90 - 110
Total-P	101	98.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A118865

Included Lab Sample IDs: 2403167, 2403168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	104	103	P/P	90 - 110
Antimony	105	104	P/P	90 - 110
Arsenic	99.2	98.0	P/P	90 - 110
Arsenic	99.5	99.2	P/P	90 - 110
Barium	102	99.6	P/P	90 - 110
Barium	99.6	101	P/P	90 - 110
Beryllium	98.8	98.4	P/P	90 - 110
Beryllium	99.4	98.8	P/P	90 - 110
Boron	98.1	98.9	P/P	90 - 110
Boron	98.9	96.5	P/P	90 - 110
Cadmium	99.7	98.0	P/P	90 - 110
Cadmium	100	99.7	P/P	90 - 110
Chromium	100	99.0	P/P	90 - 110
Chromium	102	100	P/P	90 - 110
Cobalt	103	100	P/P	90 - 110
Cobalt	103	103	P/P	90 - 110
Copper	96.1	95.5	P/P	90 - 110
Copper	97.7	96.1	P/P	90 - 110
Lead	102	100	P/P	90 - 110
Lead	100	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A118865

Included Lab Sample IDs: 2403167, 2403168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Manganese	101	101	P/P	90 - 110
Manganese	101	99.1	P/P	90 - 110
Molybdenum	97.9	96.9	P/P	90 - 110
Molybdenum	98.0	97.9	P/P	90 - 110
Nickel	97.4	97.0	P/P	90 - 110
Nickel	99.4	97.4	P/P	90 - 110
Selenium	101	101	P/P	90 - 110
Selenium	101	99.1	P/P	90 - 110
Silver	103	104	P/P	90 - 110
Silver	104	101	P/P	90 - 110
Thallium	97.8	98.9	P/P	90 - 110
Thallium	98.9	97.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A118874

Included Lab Sample IDs: 2403167, 2403168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	97.3	P/P	90 - 110
Barium	97.3	99.0	P/P	90 - 110
Calcium	101	100	P/P	90 - 110
Calcium	102	101	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	102	102	P/P	90 - 110
Potassium	102	102	P/P	90 - 110
Sodium	102	103	P/P	90 - 110
Sodium	103	102	P/P	90 - 110
Strontium	97.9	98.1	P/P	90 - 110
Strontium	99.3	97.9	P/P	90 - 110
Tin	95.6	96.1	P/P	90 - 110
Tin	97.4	95.6	P/P	90 - 110
Titanium	95.7	97.4	P/P	90 - 110
Titanium	98.8	95.7	P/P	90 - 110
Vanadium	96.5	96.8	P/P	90 - 110
Vanadium	97.9	96.5	P/P	90 - 110
Zinc	93.2	95.1	P/P	90 - 110
Zinc	97.5	93.2	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A118896

Included Lab Sample IDs: 2403159, 2403160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.7	98.0	P/P	90 - 110
Organic Carbon	98.0	97.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A118900

Included Lab Sample IDs: 2403159

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	98.8	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A118916

Included Lab Sample IDs: 2403157, 2403158

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A118933

Included Lab Sample IDs: 2403159, 2403160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	105	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A118935

Included Lab Sample IDs: 2403160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	99.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A118943

Included Lab Sample IDs: 2403167, 2403168

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.4	101	P/P	90 - 110
Aluminum	99.1	98.4	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A118951

Included Lab Sample IDs: 2403157, 2403158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.1	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A118962

Included Lab Sample IDs: 2403159

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	95.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A118983

Included Lab Sample IDs: 2403160

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.3	103	P/P	90 - 110

Quality Assurance Report

Calibration Verification

* 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 SMP	MS
			LCS				
DEP SOP: NU-094-1	Color (true)	99.8				2.07	
	Color (true)	96.8				4.08	
EPA 180.1 Rev. 2.0	Turbidity	97.1				0.913	
EPA 200.7 Rev. 4.4	Barium	101	98.9	99.1	101		0.162
	Calcium	99.5	98.5	100	101		1.12
	Iron	99.3	100	102	101		1.24
	Magnesium	101	100	103	101		1.53
	Potassium	99.4	99.3	99.3	98.8		0.0240
	Sodium	101	100	102	101		1.10
	Strontium	96.9	97.6	97.5	98.3		0.0836
	Tin	95.5	94.3	96.4	96.9		2.24
	Titanium	99.0	97.8	97.9	97.4		0.139
	Vanadium	98.8	97.3	97.1	98.4		0.275
	Zinc	98.4	95.8	96.1	98.6		0.258
EPA 200.8 Rev. 5.4	Aluminum	102	98.9	97.4	97.8		1.35
	Antimony	107	105	103	104		1.43
	Arsenic	100	99.7	99.2	97.9		0.557
	Barium	105	106	103	102		2.36
	Beryllium	94.7	94.9	93.4	89.1		1.56
	Boron	103	105	100	103		4.32
	Cadmium	101	101	99.4	102		1.11
	Chromium	100	102	100	101		2.00
	Cobalt	103	104	102	103		1.98
	Copper	97.7	100	98.0	96.3		2.55
	Lead	101	104	103	104		1.31
	Manganese	98.8	103	98.6	101		3.20
	Molybdenum	99.1	98.4	98.0	98.7		0.468
	Nickel	100	101	99.3	98.2		1.53
	Selenium	101	99.2	98.6	98.8		0.570
	Silver	105	104	103	103		0.735
	Thallium	97.2	103	101	102		2.00
EPA 300.0 Rev. 2.1	Chloride	102	101	103		0.696	
	Sulfate	103	102	103		1.07	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	100	98.0			1.10
	Ammonia-N	100	98.6	99.2			0.437
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.1					2.33
	Kjeldahl Nitrogen	94.1	99.3	97.2			1.76
EPA 353.2 Rev. 2.0	NO2NO3-N	104	103	103			0.0
EPA 365.1 Rev. 2.0	Total-P	106	108	109			1.09
SM 2320 B-2011	Total Alkalinity	100				0.122	
SM 2540 C-2015	TDS	98.3				5.90	
SM 2540 D-2015	TSS	97.9					
SM 4500-F- C-2011	Fluoride	98.8	100	102			0.973
SM 5310 B-2011	Organic Carbon	96.8	94.4	95.7			1.16

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2403157, 2403158
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2403157, 2403158
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2403167, 2403168

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2403167, 2403168
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2403157, 2403158
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2403157, 2403158
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2403159, 2403160
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2403159, 2403160
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2403159, 2403160
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2403159, 2403160
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2403157, 2403158
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2403167, 2403168
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2403157, 2403158
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2403157, 2403158
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2403157, 2403158
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2403159, 2403160

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	04/26/2023			04/26/2023 15:05	Alexis Price	2403157
	04/26/2023			04/26/2023 15:17	Alexis Price	2403158
EPA 180.1 Rev. 2.0	04/26/2023			04/26/2023 14:01	Khloe J Berg	2403157
	04/26/2023			04/26/2023 14:03	Khloe J Berg	2403158
EPA 200.7 Rev. 4.4	04/26/2023	04/27/2023 11:30	George D Taylor	04/28/2023 20:29	McKinley C Carter	2403167
	04/26/2023	04/27/2023 11:30	George D Taylor	04/28/2023 21:19	McKinley C Carter	2403168
EPA 200.8 Rev. 5.4	04/26/2023	04/27/2023 11:30	George D Taylor	04/28/2023 18:58	Conrad Hartmann	2403167
	04/26/2023	04/27/2023 11:30	George D Taylor	04/28/2023 20:19	Conrad Hartmann	2403168
	04/26/2023	04/27/2023 11:30	George D Taylor	05/03/2023 16:25	Conrad Hartmann	2403167
	04/26/2023	04/27/2023 11:30	George D Taylor	05/03/2023 17:19	Conrad Hartmann	2403168
EPA 300.0 Rev. 2.1	04/26/2023			04/28/2023 10:07	James L Waggeberby	2403157
	04/26/2023			04/28/2023 10:22	James L Waggeberby	2403158
EPA 350.1 Rev. 2.0	04/26/2023			05/02/2023 12:00	Ping Hua	2403159
	04/26/2023			05/03/2023 11:33	Ping Hua	2403160
EPA 351.2 Rev. 2.0	04/26/2023	05/03/2023 16:07	Dana G. Hughes	05/04/2023 14:16	Samantha L Bates	2403159
	04/26/2023	05/04/2023 13:29	Dana G. Hughes	05/05/2023 10:40	Ping Hua	2403160
EPA 353.2 Rev. 2.0	04/26/2023			05/03/2023 10:55	Beverly Y. Sanders	2403159
	04/26/2023			05/03/2023 10:56	Beverly Y. Sanders	2403160
EPA 365.1 Rev. 2.0	04/26/2023	04/27/2023 13:00	Alexis Price	04/28/2023 14:11	Chandler E Cox	2403159
	04/26/2023	04/27/2023 13:00	Alexis Price	04/28/2023 14:35	Chandler E Cox	2403160
SM 2320 B-2011	04/26/2023			05/03/2023 23:57	Dale L. Simmons	2403157
	04/26/2023			05/04/2023 00:08	Dale L. Simmons	2403158
SM 2340 B-2011	04/26/2023			04/28/2023 20:29	McKinley C Carter	2403167
	04/26/2023			04/28/2023 21:19	McKinley C Carter	2403168
SM 2540 C-2015	04/26/2023			04/28/2023 15:36	Yijie Li	2403157, 2403158
SM 2540 D-2015	04/26/2023			04/28/2023 15:36	Yijie Li	2403157, 2403158
SM 4500-F- C-2011	04/26/2023			05/02/2023 21:58	Dale L. Simmons	2403157
	04/26/2023			05/02/2023 22:03	Dale L. Simmons	2403158
SM 5310 B-2011	04/26/2023			05/01/2023 15:50	Elise M. Gillis	2403159
	04/26/2023			05/01/2023 19:22	Elise M. Gillis	2403160