

Chemical Analysis Report

NE-DIST-2023-11-21-02

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

Event Description: **Nassau North**
Request ID: **RQ-2023-11-27-32**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 13-DEC-2023 09:22

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light pink rectangular background.

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: PIGEON CREEK AT ANDREWS RD

Collection Date/Time: 11/20/2023 10:40

Field ID: 19010098

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2452634	EPA 200.7 Rev. 4.4	Calcium	2.50		mg/L	P438276	
		Iron	2.19E+03		ug/L	P438276	
		Magnesium	0.86		mg/L	P438276	
		Potassium	1.5		mg/L	P438276	
		Sodium	8.2		mg/L	P438276	
		Strontium	12.0		ug/L	P438276	
		Tin	3.0	U	ug/L	P438276	
		Titanium	0.92	I	ug/L	P438276	
		Vanadium	2.0	U	ug/L	P438276	
		Zinc	5.0	U	ug/L	P438276	
	EPA 200.8 Rev. 5.4	Aluminum	402		ug/L	P438276	
		Antimony	0.050	U	ug/L	P438276	
		Arsenic	0.58		ug/L	P438276	
		Barium	14.5		ug/L	P438276	
		Beryllium	0.017	I	ug/L	P438276	
		Boron	22.3		ug/L	P438276	
		Cadmium	0.020	U	ug/L	P438276	
		Chromium	0.56	I	ug/L	P438453	
		Cobalt	0.190		ug/L	P438276	
		Copper	0.40	U	ug/L	P438276	
	SM 2340 B-2011	Lead	0.76		ug/L	P438276	
		Manganese	17.2		ug/L	P438276	
		Molybdenum	0.15	U	ug/L	P438276	
		Nickel	0.50	U	ug/L	P438276	
		Selenium	0.20	U	ug/L	P438276	
		Silver	0.010	U	ug/L	P438276	
		Thallium	0.10	U	ug/L	P438276	
		Hardness	9.8		mg/L	P438276	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for aluminum are unavailable for one of two spiked samples because of high analyte concentration in the QC sample. The lead result was confirmed in the undigested sample on 12/01/2023.

Sample Location: ALLIGATOR CR AT SR200

Collection Date/Time: 11/20/2023 11:15

Field ID: 19021007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2452622	DEP SOP: NU-094-1	Color (true)	240		PCU	P438139	
	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P438142	
	EPA 300.0 Rev. 2.1	Chloride	34		mg Cl/L	P438359	
		Sulfate	40		mg SO4/L	P438362	
	SM 2320 B-2011	Total Alkalinity	40		mg CaCO3/L	P438222	
	SM 2540 C-2015	TDS	194		mg/L	P438382	
	SM 2540 D-2015	TSS	2	U	mg/L	P438372	
2452623	SM 4500-F- C-2011	Fluoride	0.12		mg F/L	P438335	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P438505	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.99		mg N/L	P438354	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.044		mg N/L	P438303	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P438212	
	SM 5310 B-2011	Organic Carbon	27		mg C/L	P438188	

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: UNNAMED BRANCH ABOVE ALLIGATOR CR Collection Date/Time: 11/20/2023 11:35

Field ID: G4NE0288

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2452620	DEP SOP: NU-094-1	Color (true)	270		PCU	P438139	
	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P438142	
	EPA 300.0 Rev. 2.1	Chloride	32		mg Cl/L	P438359	
		Sulfate	31		mg SO4/L	P438362	
	SM 2320 B-2011	Total Alkalinity	52		mg CaCO3/L	P438222	
	SM 2540 C-2015	TDS	223		mg/L	P438382	
	SM 2540 D-2015	TSS	4	I	mg/L	P438372	
2452621	SM 4500-F- C-2011	Fluoride	0.11		mg F/L	P438335	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P438505	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P438274	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P438303	
	EPA 365.1 Rev. 2.0	Total-P	0.35		mg P/L	P438212	
2452633	SM 5310 B-2011	Organic Carbon	29		mg C/L	P438188	
	EPA 200.7 Rev. 4.4	Calcium	20.8		mg/L	P438276	
		Iron	960		ug/L	P438276	
		Magnesium	7.69		mg/L	P438276	
		Potassium	6.3		mg/L	P438276	
		Sodium	17.1		mg/L	P438276	
		Strontium	98.6		ug/L	P438276	
		Tin	3.0	U	ug/L	P438276	
		Titanium	0.76	I	ug/L	P438276	
		Vanadium	2.0	U	ug/L	P438276	
		Zinc	5.0	U	ug/L	P438276	
	EPA 200.8 Rev. 5.4	Aluminum	164		ug/L	P438276	
		Antimony	0.10	I	ug/L	P438276	
		Arsenic	0.53		ug/L	P438276	
		Barium	28.8		ug/L	P438276	
		Beryllium	0.019	I	ug/L	P438276	
		Boron	52.9		ug/L	P438276	
		Cadmium	0.020	U	ug/L	P438276	
		Chromium	0.45	I	ug/L	P438453	
		Cobalt	0.515		ug/L	P438276	
		Copper	0.47	I	ug/L	P438276	
		Lead	0.27	I	ug/L	P438276	
		Manganese	332		ug/L	P438276	
		Molybdenum	0.15	U	ug/L	P438276	
		Nickel	0.50	U	ug/L	P438453	
		Selenium	0.20	U	ug/L	P438276	
		Silver	0.013	I	ug/L	P438276	
		Thallium	0.10	U	ug/L	P438276	
	SM 2340 B-2011	Hardness	83.6		mg/L	P438276	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for aluminum are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: PLUMMERS CR AT SR A1A

Collection Date/Time: 11/20/2023 12:25

Field ID: 19020064

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2452624	DEP SOP: NU-094-1	Color (true)	380		PCU	P438139	
	EPA 180.1 Rev. 2.0	Turbidity	4.4		NTU	P438142	
	EPA 300.0 Rev. 2.1	Chloride	930		mg Cl/L	P438359	
		Sulfate	39		mg SO4/L	P438362	
	SM 2320 B-2011	Total Alkalinity	25		mg CaCO3/L	P438222	
	SM 2540 C-2015	TDS	1.71E+03		mg/L	P438382	
	SM 2540 D-2015	TSS	8	I	mg/L	P438372	
2452625	SM 4500-F- C-2011	Fluoride	0.080	I	mg F/L	P438335	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P438505	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P438354	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P438303	
	EPA 365.1 Rev. 2.0	Total-P	0.040		mg P/L	P438212	
	SM 5310 B-2011	Organic Carbon	39		mg C/L	P438188	

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: P438139

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438142

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438276

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: P438276

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
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 200.8 Rev. 5.4
Batch ID: P438453

Component	Result	Code	Units
Chromium	0.40	U	ug/L
Nickel	0.50	U	ug/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438359

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438362

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438505

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438274

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438354

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438303

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438212

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

Reference Method: SM 2320 B-2011
Batch ID: P438222

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

Reference Method: SM 2540 C-2015
Batch ID: P438382

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2015
Batch ID: P438372

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P438335

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P438188

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: P438139

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.2		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438142

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438276

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	102		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	101		P	85 - 115
Sodium	102		P	85 - 115
Strontium	97.2		P	85 - 115
Tin	98.2		P	85 - 115
Titanium	96.3		P	85 - 115
Vanadium	97.1		P	85 - 115
Zinc	96.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438276

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	98.2		P	85 - 115
Barium	103		P	85 - 115
Beryllium	94.4		P	85 - 115
Boron	106		P	85 - 115
Cadmium	102		P	85 - 115
Cobalt	98.1		P	85 - 115
Copper	95.9		P	85 - 115
Lead	96.9		P	85 - 115
Manganese	102		P	85 - 115
Molybdenum	98.6		P	85 - 115
Nickel	97.8		P	85 - 115
Selenium	98.8		P	85 - 115
Silver	104		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438453

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	102		P	85 - 115
Nickel	98.5		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438359

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438362

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438505

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438274

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438354

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438303

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: P438212

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

Reference Method: SM 2320 B-2011
Batch ID: P438222

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.5		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P438382

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	96.4		P	85 - 115

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2540 D-2015
Batch ID: P438372

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

Reference Method: SM 4500-F- C-2011
Batch ID: P438335

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.1		P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P438188

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P438276

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452737	Calcium	103	102	P/P	80 - 120
2452737	Iron	103	102	P/P	80 - 120
2452737	Magnesium	105	104	P/P	80 - 120
2452737	Potassium	104	103	P/P	80 - 120
2452737	Sodium	101	99.7	P/P	80 - 120
2452737	Strontium	97.1	96.1	P/P	80 - 120
2452737	Tin	97.5	97.0	P/P	80 - 120
2452737	Titanium	96.1	94.7	P/P	80 - 120
2452737	Vanadium	96.1	95.3	P/P	80 - 120
2452737	Zinc	96.4	95.2	P/P	80 - 120
2453042	Calcium	101		P	80 - 120
2453042	Iron	102		P	80 - 120
2453042	Magnesium	103		P	80 - 120
2453042	Potassium	100		P	80 - 120
2453042	Sodium	101		P	80 - 120
2453042	Strontium	97.0		P	80 - 120
2453042	Tin	93.8		P	80 - 120
2453042	Titanium	93.2		P	80 - 120
2453042	Vanadium	96.7		P	80 - 120
2453042	Zinc	97.3		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P438276

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452737	Aluminum	100	101	P/P	80 - 120
2452737	Antimony	102	102	P/P	80 - 120
2452737	Arsenic	96.8	98.2	P/P	80 - 120
2452737	Barium	102	103	P/P	80 - 120
2452737	Beryllium	94.3	92.6	P/P	80 - 120
2452737	Boron	106	108	P/P	80 - 120
2452737	Cadmium	101	103	P/P	80 - 120
2452737	Cobalt	97.1	99.8	P/P	80 - 120
2452737	Copper	95.6	98.1	P/P	80 - 120
2452737	Lead	96.1	97.0	P/P	80 - 120
2452737	Manganese	101	103	P/P	80 - 120
2452737	Molybdenum	97.7	98.6	P/P	80 - 120
2452737	Nickel	103	99.8	P/P	80 - 120
2452737	Selenium	97.1	99.0	P/P	80 - 120
2452737	Silver	102	103	P/P	80 - 120
2452737	Thallium	101	102	P/P	80 - 120
2453042	Antimony	94.4		P	80 - 120
2453042	Arsenic	94.7		P	80 - 120
2453042	Barium	100		P	80 - 120
2453042	Beryllium	91.4		P	80 - 120
2453042	Boron	109		P	80 - 120
2453042	Cadmium	99.7		P	80 - 120
2453042	Cobalt	96.8		P	80 - 120
2453042	Copper	94.5		P	80 - 120
2453042	Lead	95.4		P	80 - 120
2453042	Manganese	90.7		P	80 - 120
2453042	Molybdenum	95.1		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438276

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453042	Nickel	97.4		P	80 - 120
2453042	Selenium	94.9		P	80 - 120
2453042	Silver	101		P	80 - 120
2453042	Thallium	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438453

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2454047	Chromium	101	102	P/P	80 - 120
2454047	Nickel	96.7	96.1	P/P	80 - 120
2454148	Chromium	102		P	80 - 120
2454148	Nickel	95.6		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438359

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452598	Chloride	104		P	90 - 110
2452883	Chloride	98.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438362

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452598	Sulfate	107		P	90 - 110
2452883	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452603	Ammonia-N	97.2	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438274

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452569	Kjeldahl Nitrogen	111	111	F/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438354

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452690	Kjeldahl Nitrogen	108	111	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452603	NO2NO3-N	101	98.8	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452603	Total-P	104	104	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P438335

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452499	Fluoride	101	103	P/P	94 - 106

Reference Method: SM 5310 B-2011
Batch ID: P438188

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2452507	Organic Carbon	98.8		P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P438139

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452600	Color (true)	2.19	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438142

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452502	Turbidity	7.27	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438276

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452737	Calcium	0.708	Spike	P	0 - 20
2452737	Iron	1.15	Spike	P	0 - 20
2452737	Magnesium	1.36	Spike	P	0 - 20
2452737	Potassium	0.972	Spike	P	0 - 20
2452737	Sodium	0.998	Spike	P	0 - 20
2452737	Strontium	0.984	Spike	P	0 - 20
2452737	Tin	0.509	Spike	P	0 - 20
2452737	Titanium	1.42	Spike	P	0 - 20
2452737	Vanadium	0.896	Spike	P	0 - 20
2452737	Zinc	1.26	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438276

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452737	Aluminum	0.656	Spike	P	0 - 20
2452737	Antimony	0.865	Spike	P	0 - 20
2452737	Arsenic	1.39	Spike	P	0 - 20
2452737	Barium	0.808	Spike	P	0 - 20
2452737	Beryllium	1.80	Spike	P	0 - 20
2452737	Boron	2.04	Spike	P	0 - 20
2452737	Cadmium	2.30	Spike	P	0 - 20
2452737	Cobalt	2.82	Spike	P	0 - 20
2452737	Copper	2.18	Spike	P	0 - 20
2452737	Lead	0.988	Spike	P	0 - 20
2452737	Manganese	1.75	Spike	P	0 - 20
2452737	Molybdenum	0.946	Spike	P	0 - 20
2452737	Nickel	3.24	Spike	P	0 - 20
2452737	Selenium	1.87	Spike	P	0 - 20
2452737	Silver	0.462	Spike	P	0 - 20
2452737	Thallium	1.23	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438453

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2454047	Chromium	0.374	Spike	P	0 - 20
2454047	Nickel	0.571	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438359

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452598	Chloride	1.15	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P438362

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452598	Sulfate	0.267	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452603	Ammonia-N	0.864	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438274

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452569	Kjeldahl Nitrogen	0.0634	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438354

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452690	Kjeldahl Nitrogen	1.66	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452603	NO2NO3-N	1.83	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452603	Total-P	0.674	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P438222

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452501	Total Alkalinity	0.210	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015
Batch ID: P438382

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452502	TDS	2.93	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P438335

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452499	Fluoride	0.947	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2011
Batch ID: P438188

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2452507	Organic Carbon	0.284	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: A122870

Included Lab Sample IDs: 2452620, 2452622, 2452624

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.4	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A122871

Included Lab Sample IDs: 2452620, 2452622, 2452624

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: SM 5310 B-2011

Run ID: A122895

Included Lab Sample IDs: 2452621, 2452623, 2452625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.3	95.0	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A122907

Included Lab Sample IDs: 2452620, 2452622, 2452624

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.9	95.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A122916

Included Lab Sample IDs: 2452621, 2452623

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.7	98.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A122927

Included Lab Sample IDs: 2452625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	97.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A122945

Included Lab Sample IDs: 2452621, 2452623, 2452625

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A122949

Included Lab Sample IDs: 2452620, 2452622, 2452624

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	103	P/P	90 - 110
Sulfate	101	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500-F- C-2011

Run ID: A122950

Included Lab Sample IDs: 2452620, 2452622, 2452624

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A122958

Included Lab Sample IDs: 2452621, 2452623, 2452625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.2	105	P/P	90 - 110
Kjeldahl Nitrogen	98.6	97.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A122975

Included Lab Sample IDs: 2452633, 2452634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	101	P/P	90 - 110
Antimony	102	102	P/P	90 - 110
Arsenic	99.1	98.7	P/P	90 - 110
Barium	101	101	P/P	90 - 110
Beryllium	97.7	95.7	P/P	90 - 110
Boron	104	107	P/P	90 - 110
Cadmium	103	103	P/P	90 - 110
Cobalt	99.4	99.1	P/P	90 - 110
Copper	97.3	97.3	P/P	90 - 110
Lead	97.7	98.0	P/P	90 - 110
Manganese	105	106	P/P	90 - 110
Molybdenum	101	100	P/P	90 - 110
Nickel	99.1	98.7	P/P	90 - 110
Selenium	102	101	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Thallium	99.4	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A123027

Included Lab Sample IDs: 2452621, 2452623, 2452625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	99.6	P/P	90 - 110
Ammonia-N	99.6	99.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A123042

Included Lab Sample IDs: 2452633, 2452634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	102	102	P/P	90 - 110
Nickel	97.0	96.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A123155

Included Lab Sample IDs: 2452633, 2452634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	95.5	97.2	P/P	90 - 110
Iron	96.1	98.3	P/P	90 - 110
Magnesium	96.2	98.2	P/P	90 - 110
Potassium	95.1	96.6	P/P	90 - 110
Sodium	94.2	95.8	P/P	90 - 110
Strontium	98.2	98.9	P/P	90 - 110
Tin	99.7	97.5	P/P	90 - 110
Titanium	98.5	96.8	P/P	90 - 110
Vanadium	98.2	96.5	P/P	90 - 110
Zinc	98.7	96.8	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
DEP SOP: NU-094-1	Color (true)	99.2					2.19	
EPA 180.1 Rev. 2.0	Turbidity	103					7.27	
EPA 200.7 Rev. 4.4	Calcium	103	103	102	101			0.708
	Iron	102	103	102	102			1.15
	Magnesium	105	105	104	103			1.36
	Potassium	101	104	103	100			0.972
	Sodium	102	101	101	99.7			0.998
	Strontium	97.2	97.1	96.1	97.0			0.984
	Tin	98.2	97.5	97.0	93.8			0.509
	Titanium	96.3	96.1	94.7	93.2			1.42
	Vanadium	97.1	96.1	95.3	96.7			0.896
	Zinc	96.7	96.4	95.2	97.3			1.26
EPA 200.8 Rev. 5.4	Aluminum	101	100	101				0.656
	Antimony	103	102	102	94.4			0.865
	Arsenic	98.2	96.8	98.2	94.7			1.39
	Barium	103	102	103	100			0.808
	Beryllium	94.4	94.3	92.6	91.4			1.80
	Boron	106	106	108	109			2.04
	Cadmium	102	101	103	99.7			2.30
	Chromium	102	101	102	102			0.374
	Cobalt	98.1	97.1	99.8	96.8			2.82
	Copper	95.9	95.6	98.1	94.5			2.18
	Lead	96.9	96.1	97.0	95.4			0.988
	Manganese	102	101	103	90.7			1.75
	Molybdenum	98.6	97.7	98.6	95.1			0.946
	Nickel	97.8	103	99.8	97.4			3.24
	Nickel	98.5	96.7	96.1	95.6			0.571
	Selenium	98.8	97.1	99.0	94.9			1.87
	Silver	104	102	103	101			0.462
	Thallium	100	101	102	101			1.23
EPA 300.0 Rev. 2.1	Chloride	101	104	98.5			1.15	
	Sulfate	101	107	104			0.267	
EPA 350.1 Rev. 2.0	Ammonia-N	95.0	97.2	98.2				0.864
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	111	111				0.0634
	Kjeldahl Nitrogen	105	108	111				1.66
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	101	98.8				1.83
EPA 365.1 Rev. 2.0	Total-P	103	104	104				0.674
SM 2320 B-2011	Total Alkalinity	97.5					0.210	
SM 2540 C-2015	TDS	96.4					2.93	
SM 2540 D-2015	TSS	96.8						
SM 4500-F- C-2011	Fluoride	99.1	101	103				0.947
SM 5310 B-2011	Organic Carbon	93.6	98.8					0.284

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2452620, 2452622, 2452624
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2452620, 2452622, 2452624
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2452633, 2452634
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2452633, 2452634
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2452620, 2452622, 2452624

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2452620, 2452622, 2452624
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2452621, 2452623, 2452625
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2452621, 2452623, 2452625
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2452621, 2452623, 2452625
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2452621, 2452623, 2452625
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2452620, 2452622, 2452624
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2452633, 2452634
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2452620, 2452622, 2452624
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2452620, 2452622, 2452624
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2452620, 2452622, 2452624
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2452621, 2452623, 2452625

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	11/21/2023			11/21/2023 15:01	Chandler E Cox	2452620
	11/21/2023			11/21/2023 15:03	Chandler E Cox	2452622
	11/21/2023			11/21/2023 15:04	Chandler E Cox	2452624
EPA 180.1 Rev. 2.0	11/21/2023			11/21/2023 14:47	Anna M. Plaviak	2452620
	11/21/2023			11/21/2023 14:48	Anna M. Plaviak	2452622
	11/21/2023			11/21/2023 14:49	Anna M. Plaviak	2452624
EPA 200.7 Rev. 4.4	11/21/2023	11/29/2023 13:50	George D Taylor	12/11/2023 18:22	McKinley C Carter	2452633
	11/21/2023	11/29/2023 13:50	George D Taylor	12/11/2023 18:30	McKinley C Carter	2452634
EPA 200.8 Rev. 5.4	11/21/2023	11/29/2023 13:50	George D Taylor	11/30/2023 19:06	Emily M Philpot	2452633
	11/21/2023	11/29/2023 13:50	George D Taylor	11/30/2023 19:15	Emily M Philpot	2452634
	11/21/2023	12/04/2023 13:55	George D Taylor	12/05/2023 16:28	Emily M Philpot	2452633
	11/21/2023	12/04/2023 13:55	George D Taylor	12/05/2023 16:38	Emily M Philpot	2452634
	11/21/2023			11/30/2023 03:01	James L Waggeberby	2452620
EPA 300.0 Rev. 2.1	11/21/2023			11/30/2023 03:16	James L Waggeberby	2452622
	11/21/2023			11/30/2023 03:31	James L Waggeberby	2452624
	11/21/2023			12/05/2023 14:30	Ping Hua	2452623
EPA 350.1 Rev. 2.0	11/21/2023			12/05/2023 14:31	Ping Hua	2452625
	11/21/2023			12/05/2023 14:58	Ping Hua	2452621
EPA 351.2 Rev. 2.0	11/21/2023	11/29/2023 14:15	Simonne.V. Calhoun	11/30/2023 10:40	Ping Hua	2452621
	11/21/2023	11/29/2023 14:15	Simonne.V. Calhoun	11/30/2023 11:20	Ping Hua	2452623
	11/21/2023	11/29/2023 14:15	Simonne.V. Calhoun	11/30/2023 11:22	Ping Hua	2452625
EPA 353.2 Rev. 2.0	11/21/2023			11/29/2023 12:23	Fadila Guebre	2452621
	11/21/2023			11/29/2023 12:24	Fadila Guebre	2452623
	11/21/2023			11/29/2023 12:25	Fadila Guebre	2452625
EPA 365.1 Rev. 2.0	11/21/2023	11/28/2023 10:59	Adam P Silver	11/28/2023 15:24	James L Waggeberby	2452621
	11/21/2023	11/28/2023 10:59	Adam P Silver	11/28/2023 15:25	James L Waggeberby	2452623
	11/21/2023	11/28/2023 10:59	Adam P Silver	11/29/2023 11:14	James L Waggeberby	2452625
SM 2320 B-2011	11/21/2023			11/28/2023 05:04	Adam P Silver	2452620
	11/21/2023			11/28/2023 05:17	Adam P Silver	2452622
	11/21/2023			11/28/2023 05:30	Adam P Silver	2452624
SM 2340 B-2011	11/21/2023			12/11/2023 18:22	McKinley C Carter	2452633
	11/21/2023			12/11/2023 18:30	McKinley C Carter	2452634
SM 2540 C-2015	11/21/2023			11/21/2023 16:31	Yijie Li	2452620, 2452622, 2452624
SM 2540 D-2015	11/21/2023			11/21/2023 16:31	Yijie Li	2452620, 2452622, 2452624
SM 4500-F- C-2011	11/21/2023			11/30/2023 07:33	Chandler E Cox	2452620
	11/21/2023			11/30/2023 07:38	Chandler E Cox	2452622
	11/21/2023			11/30/2023 07:43	Chandler E Cox	2452624
SM 5310 B-2011	11/21/2023			11/28/2023 00:20	Kenneth H Lee	2452621
	11/21/2023			11/28/2023 00:34	Kenneth H Lee	2452623
	11/21/2023			11/28/2023 00:48	Kenneth H Lee	2452625