Chemical Analysis Report

NW-DIST-2023-12-13-01

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

Event Description: **Local Run Make-up**
Request ID: **RQ-2023-12-11-18**
Customer: **NW-DIST**
Project ID: **SMP**

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Date Certified: 04-JAN-2024 13:57

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: BEAVER POND CREEK **Collection Date/Time: 12/12/2023 10:30**

Field ID: 33010066 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2456614	DEP SOP: NU-094-1	Color (true)	25		PCU	P438920	
	EPA 180.1 Rev. 2.0	Turbidity	20		NTU	P438924	
	EPA 300.0 Rev. 2.1	Chloride	17	A	mg Cl/L	P439405	
		Sulfate	35	A	mg SO4/L	P439408	
	SM 2320 B-2011	Total Alkalinity	24		mg CaCO3/L	P439119	
	SM 2540 C-2015	TDS	124		mg/L	P439353	
	SM 2540 D-2015	TSS	7	I	mg/L	P439295	
	SM 4500-F- C-2011	Fluoride	0.039	I	mg F/L	P439122	
2456616	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P439216	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.61		mg N/L	P439053	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.041		mg N/L	P439173	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P439044	
	SM 5310 B-2014	Organic Carbon	8.1		mg C/L	P439101	
2456623	EPA 200.7 Rev. 4.4	Calcium	17.2		mg/L	P438982	
		Iron	2.09E+03		ug/L	P438982	
		Magnesium	3.74		mg/L	P438982	
		Potassium	4.7		mg/L	P438982	
		Sodium	13.3		mg/L	P438982	
		Strontium	42.5		ug/L	P438982	
		Tin	3.0	U	ug/L	P438982	
		Titanium	3.4		ug/L	P438982	
		Vanadium	2.1	I	ug/L	P438982	
		Zinc	43		ug/L	P438982	
	EPA 200.8 Rev. 5.4	Aluminum	614		ug/L	P438982	
		Antimony	0.28		ug/L	P438982	
		Arsenic	0.90		ug/L	P438982	
		Barium	24.2		ug/L	P438982	
		Beryllium	0.037	I	ug/L	P438982	
		Boron	91.1		ug/L	P438982	
		Cadmium	0.020	U	ug/L	P438982	
		Chromium	1.4	I	ug/L	P439271	
		Cobalt	0.468		ug/L	P438982	
		Copper	0.93		ug/L	P438982	
		Lead	0.52		ug/L	P438982	
		Manganese	87.2		ug/L	P438982	
		Molybdenum	0.17	I	ug/L	P438982	
		Nickel	0.86	I	ug/L	P439271	
		Selenium	0.20	U	ug/L	P438982	
		Silver	0.010	U	ug/L	P438982	
		Thallium	0.10	U	ug/L	P438982	
	SM 2340 B-2011	Hardness	58.3		mg/L	P438982	

Field ID: 33010066 Matrix: W-SURF-FRH

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

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
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 manganese are unavailable because of high analyte concentration in the QC sample.

Sample Location: TRIBUTARY SOUTH OF PERDIDO LANDFILL **Collection Date/Time: 12/12/2023 11:00**

Field ID: G5NW0050 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2456615	DEP SOP: NU-094-1	Color (true)	22		PCU	P438920	
	EPA 180.1 Rev. 2.0	Turbidity	90		NTU	P438924	
	EPA 300.0 Rev. 2.1	Chloride	26		mg Cl/L	P439405	
		Sulfate	57		mg SO4/L	P439408	
	SM 2320 B-2011	Total Alkalinity	43		mg CaCO3/L	P439119	
	SM 2540 C-2015	TDS	215		mg/L	P439353	
	SM 2540 D-2015	TSS	26		mg/L	P439295	
	SM 4500-F- C-2011	Fluoride	0.050	I	mg F/L	P439122	
2456617	EPA 350.1 Rev. 2.0	Ammonia-N	0.64		mg N/L	P439216	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P439053	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.36		mg N/L	P439173	
	EPA 365.1 Rev. 2.0	Total-P	0.079		mg P/L	P439044	
	SM 5310 B-2014	Organic Carbon	11		mg C/L	P439101	
2456624	EPA 200.7 Rev. 4.4	Calcium	25.7		mg/L	P438982	
		Iron	1.69E+03		ug/L	P438982	
		Magnesium	4.77		mg/L	P438982	
		Potassium	10.0		mg/L	P438982	
		Sodium	24.3		mg/L	P438982	
		Strontium	60.9		ug/L	P438982	
		Tin	3.0	U	ug/L	P438982	
		Titanium	9.8		ug/L	P438982	
		Vanadium	3.1	I	ug/L	P438982	
		Zinc	21		ug/L	P438982	
	EPA 200.8 Rev. 5.4	Aluminum	1.34E+03		ug/L	P438982	
		Antimony	0.20		ug/L	P438982	
		Arsenic	1.39		ug/L	P438982	
		Barium	32.6		ug/L	P438982	
		Beryllium	0.033	I	ug/L	P438982	
		Boron	126		ug/L	P438982	
		Cadmium	0.020	U	ug/L	P438982	
		Chromium	4.1		ug/L	P439271	
		Cobalt	0.345		ug/L	P438982	
		Copper	1.94		ug/L	P438982	
		Lead	1.21		ug/L	P438982	
		Manganese	41.6		ug/L	P438982	
		Molybdenum	0.44	I	ug/L	P438982	
		Nickel	1.8	I	ug/L	P439271	
		Selenium	0.20	U	ug/L	P438982	
		Silver	0.023	I	ug/L	P438982	
		Thallium	0.10	U	ug/L	P438982	
	SM 2340 B-2011	Hardness	83.7		mg/L	P438982	

Field ID: G5NW0050 Matrix: W-SURF-FRH

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

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
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 manganese are unavailable because of high analyte concentration in the QC sample.

Sample Location: SANDY POINT CREEK BELOW SANDY POINT STREET **Collection Date/Time: 12/12/2023 11:55**

Field ID: G4NW0080 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2456625	EPA 200.7 Rev. 4.4	Calcium	11.7		mg/L	P438982	
		Iron	1.11E+03		ug/L	P438982	
		Magnesium	3.87		mg/L	P438982	
		Potassium	1.9		mg/L	P438982	
		Sodium	11.7		mg/L	P438982	
		Strontium	29.8		ug/L	P438982	
		Tin	3.0	U	ug/L	P438982	
		Titanium	3.3		ug/L	P438982	
		Vanadium	2.0	U	ug/L	P438982	
		Zinc	9.2	I	ug/L	P438982	
	EPA 200.8 Rev. 5.4	Aluminum	344		ug/L	P438982	
		Antimony	0.089	I	ug/L	P438982	
		Arsenic	0.57		ug/L	P438982	
		Barium	18.6		ug/L	P438982	
		Beryllium	0.026	I	ug/L	P438982	
		Boron	71.1		ug/L	P438982	
		Cadmium	0.025	I	ug/L	P438982	
		Chromium	0.59	I	ug/L	P439271	
		Cobalt	0.573		ug/L	P438982	
		Copper	0.47	I	ug/L	P438982	
		Lead	0.41		ug/L	P438982	
		Manganese	60.4		ug/L	P438982	
		Molybdenum	0.15	U	ug/L	P438982	
		Nickel	0.56	I	ug/L	P439271	
		Selenium	0.20	U	ug/L	P438982	
		Silver	0.010	U	ug/L	P438982	
		Thallium	0.10	U	ug/L	P438982	
	SM 2340 B-2011	Hardness	45.1		mg/L	P438982	

Ref. Method and Comment:
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for manganese are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P438920

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438924

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438982

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	40	I	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: P438982

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	0.023	I	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.14	I	ug/L
Molybdenum	0.15	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: P439271

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: P439405

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439408

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439216

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439053

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439173

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439044

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

Reference Method: SM 2320 B-2011
Batch ID: P439119

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

Reference Method: SM 2540 C-2015
Batch ID: P439353

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P439295

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500-F- C-2011
Batch ID: P439122

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2014
Batch ID: P439101

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: P438920

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438924

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438982

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	111		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	101		P	85 - 115
Sodium	102		P	85 - 115
Strontium	99.5		P	85 - 115
Tin	98.8		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	100		P	85 - 115
Zinc	97.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438982

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	102		P	85 - 115
Barium	103		P	85 - 115
Beryllium	96.0		P	85 - 115
Boron	103		P	85 - 115
Cadmium	101		P	85 - 115
Cobalt	99.7		P	85 - 115
Copper	98.2		P	85 - 115
Lead	95.5		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	98.7		P	85 - 115
Selenium	103		P	85 - 115
Silver	101		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P439271

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	104		P	85 - 115
Nickel	100		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439405

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439408

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439216

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439053

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: P439173

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439044

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

Reference Method: SM 2320 B-2011
Batch ID: P439119

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.3		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P439353

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	98.0		P	85 - 115

Reference Method: SM 2540 D-2015
Batch ID: P439295

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P439122

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	104		P	94 - 106

Reference Method: SM 5310 B-2014
Batch ID: P439101

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438982

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456623	Calcium	104		P	80 - 120
2456623	Iron	111	110	P/P	80 - 120
2456623	Magnesium	112	110	P/P	80 - 120
2456623	Potassium	102		P	80 - 120
2456623	Sodium	103		P	80 - 120
2456623	Strontium	100	99.4	P/P	80 - 120
2456623	Tin	94.9	94.6	P/P	80 - 120
2456623	Titanium	98.6	97.8	P/P	80 - 120
2456623	Vanadium	98.8	98.7	P/P	80 - 120
2456623	Zinc	94.5	95.7	P/P	80 - 120
2456625	Calcium	104		P	80 - 120
2456625	Iron	116		P	80 - 120
2456625	Magnesium	111		P	80 - 120
2456625	Potassium	102		P	80 - 120
2456625	Sodium	102		P	80 - 120
2456625	Strontium	98.4		P	80 - 120
2456625	Tin	96.4		P	80 - 120
2456625	Titanium	101		P	80 - 120
2456625	Vanadium	100		P	80 - 120
2456625	Zinc	96.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438982

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456623	Aluminum	95.0	103	P/P	80 - 120
2456623	Antimony	101	101	P/P	80 - 120
2456623	Arsenic	102	103	P/P	80 - 120
2456623	Barium	101	103	P/P	80 - 120
2456623	Beryllium	95.7	96.6	P/P	80 - 120
2456623	Boron	111	112	P/P	80 - 120
2456623	Cadmium	99.5	102	P/P	80 - 120
2456623	Cobalt	99.7	102	P/P	80 - 120
2456623	Copper	97.0	98.7	P/P	80 - 120
2456623	Lead	96.1	98.2	P/P	80 - 120
2456623	Molybdenum	97.8	100	P/P	80 - 120
2456623	Selenium	98.0	102	P/P	80 - 120
2456623	Silver	99.0	100	P/P	80 - 120
2456623	Thallium	104	106	P/P	80 - 120
2456625	Aluminum	99.6		P	80 - 120
2456625	Antimony	102		P	80 - 120
2456625	Arsenic	101		P	80 - 120
2456625	Barium	100		P	80 - 120
2456625	Beryllium	96.3		P	80 - 120
2456625	Boron	107		P	80 - 120
2456625	Cadmium	98.5		P	80 - 120
2456625	Cobalt	99.2		P	80 - 120
2456625	Copper	96.1		P	80 - 120
2456625	Lead	96.4		P	80 - 120
2456625	Molybdenum	101		P	80 - 120
2456625	Selenium	102		P	80 - 120
2456625	Silver	99.1		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438982

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456625	Thallium	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P439271

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456411	Chromium	107	106	P/P	80 - 120
2456411	Nickel	101	98.8	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439405

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456614	Chloride	99.8		P	90 - 110
2456615	Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439408

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456614	Sulfate	98.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439216

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456616	Ammonia-N	104	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439053

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456630	Kjeldahl Nitrogen	111	94.8	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439173

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456616	NO2NO3-N	98.3	97.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456517	Total-P	108	106	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P439122

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456913	Fluoride	103	102	P/P	94 - 106

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2014
Batch ID: P439101

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2455703	Organic Carbon	100	100	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P438920

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456402	Color (true)	3.37	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P438924

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456402	Turbidity	1.33	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P438982

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456623	Calcium	1.21	Spike	P	0 - 20
2456623	Iron	0.779	Spike	P	0 - 20
2456623	Magnesium	0.912	Spike	P	0 - 20
2456623	Potassium	0.477	Spike	P	0 - 20
2456623	Sodium	0.891	Spike	P	0 - 20
2456623	Strontium	0.853	Spike	P	0 - 20
2456623	Tin	0.277	Spike	P	0 - 20
2456623	Titanium	0.755	Spike	P	0 - 20
2456623	Vanadium	0.120	Spike	P	0 - 20
2456623	Zinc	1.16	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P438982

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456623	Aluminum	4.70	Spike	P	0 - 20
2456623	Antimony	0.264	Spike	P	0 - 20
2456623	Arsenic	0.497	Spike	P	0 - 20
2456623	Barium	2.04	Spike	P	0 - 20
2456623	Beryllium	0.842	Spike	P	0 - 20
2456623	Boron	0.629	Spike	P	0 - 20
2456623	Cadmium	2.79	Spike	P	0 - 20
2456623	Cobalt	1.85	Spike	P	0 - 20
2456623	Copper	1.62	Spike	P	0 - 20
2456623	Lead	2.14	Spike	P	0 - 20
2456623	Manganese	2.03	Spike	P	0 - 20
2456623	Molybdenum	2.52	Spike	P	0 - 20
2456623	Selenium	3.80	Spike	P	0 - 20
2456623	Silver	1.34	Spike	P	0 - 20
2456623	Thallium	1.96	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P439271

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P439271

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456411	Chromium	1.31	Spike	P	0 - 20
2456411	Nickel	2.08	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439405

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456614	Chloride	3.17	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456614	Sulfate	2.89	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439216

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456616	Ammonia-N	0.102	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439053

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456630	Kjeldahl Nitrogen	8.88	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439173

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456616	NO2NO3-N	0.844	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456517	Total-P	2.30	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P439119

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456913	Total Alkalinity	0.584	Sample	P	0 - 3.9

Quality Assurance Report
Precision

Reference Method: SM 2540 C-2015
Batch ID: P439353

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456018	TDS	0.0	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P439122

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456913	Fluoride	0.993	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2014
Batch ID: P439101

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2455703	Organic Carbon	0.130	Spike	P	0 - 15

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

Quality Assurance Report
Calibration Verification

Reference Method: DEP SOP: NU-094-1
Run ID: A123200
Included Lab Sample IDs: 2456614, 2456615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A123202
Included Lab Sample IDs: 2456614, 2456615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.0	P/P	95 - 105
Turbidity	99.0	99.5	P/P	95 - 105

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A123278
Included Lab Sample IDs: 2456623, 2456624, 2456625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	101	P/P	90 - 110
Iron	102	101	P/P	90 - 110
Magnesium	101	100	P/P	90 - 110
Potassium	101	100	P/P	90 - 110
Sodium	101	99.5	P/P	90 - 110
Strontium	98.8	99.7	P/P	90 - 110
Tin	102	102	P/P	90 - 110
Titanium	102	103	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	102	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A123279
Included Lab Sample IDs: 2456623, 2456624, 2456625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	101	P/P	90 - 110
Aluminum	103	101	P/P	90 - 110
Antimony	102	104	P/P	90 - 110
Antimony	104	102	P/P	90 - 110
Arsenic	103	104	P/P	90 - 110
Arsenic	104	102	P/P	90 - 110
Barium	100	101	P/P	90 - 110
Barium	103	100	P/P	90 - 110
Beryllium	102	98.4	P/P	90 - 110
Beryllium	98.4	99.1	P/P	90 - 110
Boron	105	105	P/P	90 - 110
Boron	99.8	105	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Cadmium	102	101	P/P	90 - 110
Cobalt	102	99.6	P/P	90 - 110
Cobalt	99.6	99.0	P/P	90 - 110
Copper	101	99.6	P/P	90 - 110
Copper	99.6	97.3	P/P	90 - 110
Lead	96.2	96.5	P/P	90 - 110
Lead	96.5	96.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A123279
Included Lab Sample IDs: 2456623, 2456624, 2456625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Manganese	102	102	P/P	90 - 110
Manganese	103	102	P/P	90 - 110
Molybdenum	101	103	P/P	90 - 110
Molybdenum	103	102	P/P	90 - 110
Selenium	103	104	P/P	90 - 110
Selenium	104	101	P/P	90 - 110
Silver	101	99.8	P/P	90 - 110
Silver	99.4	101	P/P	90 - 110
Thallium	98.5	99.3	P/P	90 - 110
Thallium	99.3	99.4	P/P	90 - 110

Reference Method: SM 5310 B-2014
Run ID: A123280
Included Lab Sample IDs: 2456616, 2456617

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	123	P/P	85 - 115

Reference Method: SM 2320 B-2011
Run ID: A123283
Included Lab Sample IDs: 2456614, 2456615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.1	98.2	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A123283
Included Lab Sample IDs: 2456614, 2456615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A123287
Included Lab Sample IDs: 2456617

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A123291
Included Lab Sample IDs: 2456616

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.2	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A123304
Included Lab Sample IDs: 2456616, 2456617

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A123304
Included Lab Sample IDs: 2456616, 2456617

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A123325
Included Lab Sample IDs: 2456616, 2456617

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.5	P/P	90 - 110
Ammonia-N	98.9	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A123338
Included Lab Sample IDs: 2456614, 2456615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.4	102	P/P	90 - 110
Sulfate	99.8	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A123343
Included Lab Sample IDs: 2456616, 2456617

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	97.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A123364
Included Lab Sample IDs: 2456623, 2456624, 2456625

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	97.2	98.0	P/P	90 - 110
Chromium	98.0	96.4	P/P	90 - 110
Nickel	96.4	96.0	P/P	90 - 110
Nickel	96.8	96.4	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)	101					3.37	
EPA 180.1 Rev. 2.0	Turbidity	104					1.33	
EPA 200.7 Rev. 4.4	Calcium	104	104	104				1.21
	Iron	111	111	110	116			0.779
	Magnesium	112	112	110	111			0.912
	Potassium	101	102	102				0.477
	Sodium	102	103	102				0.891
	Strontium	99.5	100	99.4	98.4			0.853
	Tin	98.8	94.9	94.6	96.4			0.277
	Titanium	102	98.6	97.8	101			0.755
	Vanadium	100	98.8	98.7	100			0.120
	Zinc	97.9	94.5	95.7	96.9			1.16
EPA 200.8 Rev. 5.4	Aluminum	101	95.0	103	99.6			4.70
	Antimony	102	101	101	102			0.264
	Arsenic	102	102	103	101			0.497
	Barium	103	101	103	100			2.04
	Beryllium	96.0	95.7	96.6	96.3			0.842
	Boron	103	111	112	107			0.629
	Cadmium	101	99.5	102	98.5			2.79
	Chromium	104	107	106				1.31
	Cobalt	99.7	99.7	102	99.2			1.85
	Copper	98.2	97.0	98.7	96.1			1.62
	Lead	95.5	96.1	98.2	96.4			2.14
	Manganese	101						2.03
	Molybdenum	98.7	97.8	100	101			2.52
	Nickel	100	101	98.8				2.08
	Selenium	103	98.0	102	102			3.80
	Silver	101	99.0	100	99.1			1.34
	Thallium	100	104	106	104			1.96
EPA 300.0 Rev. 2.1	Chloride	101	99.8	99.4			3.17	
	Sulfate	100	98.5				2.89	
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	104	104				0.102
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	111	94.8				8.88
EPA 353.2 Rev. 2.0	NO2NO3-N	101	98.3	97.3				0.844
EPA 365.1 Rev. 2.0	Total-P	106	108	106				2.30
SM 2320 B-2011	Total Alkalinity	99.3					0.584	
SM 2540 C-2015	TDS	98.0					0.0	
SM 2540 D-2015	TSS	96.0						
SM 4500-F- C-2011	Fluoride	104	103	102				0.993
SM 5310 B-2014	Organic Carbon	97.6	100	100				0.130

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2456614, 2456615
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2456614, 2456615
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2456623, 2456624, 2456625
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2456623, 2456624, 2456625
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2456614, 2456615
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2456614, 2456615
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2456616, 2456617

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2456616, 2456617
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2456616, 2456617
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2456616, 2456617
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2456614, 2456615
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2456623, 2456624, 2456625
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2456614, 2456615
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2456614, 2456615
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2456614, 2456615
SM 5310 B-2014	Nonpurgeable Organic Carbon in aqueous matrices	2456616, 2456617

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	12/13/2023			12/13/2023 16:00	Chandler E Cox	2456614
	12/13/2023			12/13/2023 16:01	Chandler E Cox	2456615
EPA 180.1 Rev. 2.0	12/13/2023			12/13/2023 14:47	Anna M. Plaviak	2456614
	12/13/2023			12/13/2023 16:20	Anna M. Plaviak	2456615
EPA 200.7 Rev. 4.4	12/13/2023	12/14/2023 13:30	George D Taylor	12/15/2023 20:36	Chase Roberts	2456623
	12/13/2023	12/14/2023 13:30	George D Taylor	12/15/2023 21:03	Chase Roberts	2456624
	12/13/2023	12/14/2023 13:30	George D Taylor	12/15/2023 21:10	Chase Roberts	2456625
EPA 200.8 Rev. 5.4	12/13/2023	12/14/2023 13:30	George D Taylor	12/15/2023 16:50	Emily M Philpot	2456623
	12/13/2023	12/14/2023 13:30	George D Taylor	12/15/2023 17:47	Emily M Philpot	2456624
	12/13/2023	12/14/2023 13:30	George D Taylor	12/15/2023 18:24	Emily M Philpot	2456625
	12/13/2023	12/20/2023 11:52	Vijayalakshmi Reddy	12/20/2023 16:07	Emily M Philpot	2456625
	12/13/2023	12/20/2023 11:52	Vijayalakshmi Reddy	12/20/2023 17:51	Emily M Philpot	2456623
	12/13/2023	12/20/2023 11:52	Vijayalakshmi Reddy	12/20/2023 18:01	Emily M Philpot	2456624
EPA 300.0 Rev. 2.1	12/13/2023			12/21/2023 12:06	James L Waggerby	2456614
	12/13/2023			12/21/2023 12:36	James L Waggerby	2456615
EPA 350.1 Rev. 2.0	12/13/2023			12/19/2023 12:37	Khloe J Berg	2456616
	12/13/2023			12/19/2023 15:18	Khloe J Berg	2456617
EPA 351.2 Rev. 2.0	12/13/2023	12/15/2023 13:48	Simonne.V. Calhoun	12/19/2023 15:03	Samantha L Bates	2456616
	12/13/2023	12/15/2023 13:48	Simonne.V. Calhoun	12/19/2023 15:05	Samantha L Bates	2456617
EPA 353.2 Rev. 2.0	12/13/2023			12/18/2023 12:48	Fadila Guebre	2456616
	12/13/2023			12/18/2023 12:54	Fadila Guebre	2456617
EPA 365.1 Rev. 2.0	12/13/2023	12/15/2023 12:55	Adam P Silver	12/18/2023 11:20	Chandler E Cox	2456617
	12/13/2023	12/15/2023 12:55	Adam P Silver	12/18/2023 13:05	Elise M. Gillis	2456616
SM 2320 B-2011	12/13/2023			12/16/2023 05:39	Chandler E Cox	2456614
	12/13/2023			12/16/2023 05:50	Chandler E Cox	2456615
SM 2340 B-2011	12/13/2023			12/15/2023 20:36	Chase Roberts	2456623
	12/13/2023			12/15/2023 21:03	Chase Roberts	2456624
	12/13/2023			12/15/2023 21:10	Chase Roberts	2456625
SM 2540 C-2015	12/13/2023			12/15/2023 15:49	Yijie Li	2456614, 2456615
SM 2540 D-2015	12/13/2023			12/15/2023 15:49	Yijie Li	2456614, 2456615
SM 4500-F- C-2011	12/13/2023			12/16/2023 05:39	Chandler E Cox	2456614
	12/13/2023			12/16/2023 05:50	Chandler E Cox	2456615
SM 5310 B-2014	12/13/2023			12/16/2023 09:43	Kenneth H Lee	2456616
	12/13/2023			12/16/2023 09:57	Kenneth H Lee	2456617