Chemical Analysis Report

NW-DIST-2023-12-20-01

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

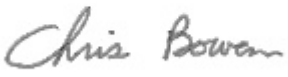
Event Description: **Rest Area Run Make-up**
Request ID: **RQ-2023-12-18-08**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government Street
Suite 208
Pensacola, FL 32502-5794
Attn: Myranda Butler

For additional information please contact
Colin Wright, Ph.D.
Chris Bowen, B.S.
Marek Topolski, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Chris Bowen, Environmental Administrator

Date Certified: 11-JAN-2024 10:47



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: 12/19/2023 10:35**

Field ID: 33010066 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2458077	DEP SOP: NU-094-1	Color (true)	25		PCU	P439277	RPD
	EPA 180.1 Rev. 2.0	Turbidity	20	A	NTU	P439270	
	EPA 300.0 Rev. 2.1	Chloride	15	A	mg Cl/L	P439530	
		Sulfate	29	A	mg SO4/L	P439533	
	SM 2320 B-2011	Total Alkalinity	24		mg CaCO3/L	P439420	
	SM 2540 C-2015	TDS	114		mg/L	P439635	
	SM 2540 D-2015	TSS	12		mg/L	P439572	
	SM 4500-F- C-2011	Fluoride	0.034	I	mg F/L	P439422	
2458079	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P439588	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P439448	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.053		mg N/L	P439480	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P439314	
	SM 5310 B-2014	Organic Carbon	6.5		mg C/L	P439528	
2458085	EPA 200.7 Rev. 4.4	Calcium	15.1		mg/L	P439262	
		Iron	2.66E+03		ug/L	P439262	
		Magnesium	3.33		mg/L	P439262	
		Potassium	3.3		mg/L	P439262	
		Sodium	11.0		mg/L	P439262	
		Strontium	38.8		ug/L	P439262	
		Tin	3.0	U	ug/L	P439262	
		Titanium	7.0		ug/L	P439262	
		Vanadium	2.0	U	ug/L	P439262	
		Zinc	9.8	I	ug/L	P439262	
	EPA 200.8 Rev. 5.4	Aluminum	476		ug/L	P439262	
		Antimony	0.15	I	ug/L	P439262	
		Arsenic	0.91		ug/L	P439262	
		Barium	22.1		ug/L	P439262	
		Beryllium	0.019	I	ug/L	P439262	
		Boron	67.3		ug/L	P439262	
		Cadmium	0.020	U	ug/L	P439262	
		Chromium	3.3		ug/L	P439262	
		Cobalt	0.801		ug/L	P439262	
		Copper	0.66	I	ug/L	P439262	
		Lead	0.48		ug/L	P439262	
		Manganese	198		ug/L	P439262	
		Molybdenum	0.15	U	ug/L	P439262	
		Nickel	1.3	I	ug/L	P439262	
		Selenium	0.20	U	ug/L	P439262	
		Silver	0.010	U	ug/L	P439262	
		Thallium	0.10	U	ug/L	P439262	
	SM 2340 B-2011	Hardness	51.5		mg/L	P439262	

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

Sample Location: Tributary South of Perdido Landfill **Collection Date/Time: 12/19/2023 11:10**

Field ID: G5NW0050 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2458078	DEP SOP: NU-094-1	Color (true)	15	AJ	PCU	P439277	RPD
	EPA 180.1 Rev. 2.0	Turbidity	35		NTU	P439270	
	EPA 300.0 Rev. 2.1	Chloride	32		mg Cl/L	P439530	
		Sulfate	41		mg SO4/L	P439533	
	SM 2320 B-2011	Total Alkalinity	61		mg CaCO3/L	P439420	
	SM 2540 C-2015	TDS	192		mg/L	P439635	
	SM 2540 D-2015	TSS	22		mg/L	P439572	
	SM 4500-F- C-2011	Fluoride	0.052	I	mg F/L	P439422	
2458080	EPA 350.1 Rev. 2.0	Ammonia-N	1.1		mg N/L	P439588	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.2		mg N/L	P439448	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.21		mg N/L	P439378	
	EPA 365.1 Rev. 2.0	Total-P	0.070		mg P/L	P439385	
	SM 5310 B-2014	Organic Carbon	9.5		mg C/L	P439529	
2458086	EPA 200.7 Rev. 4.4	Calcium	25.6		mg/L	P439262	
		Iron	1.22E+03		ug/L	P439262	
		Magnesium	4.29		mg/L	P439262	
		Potassium	8.9		mg/L	P439262	
		Sodium	26.6		mg/L	P439262	
		Strontium	64.5		ug/L	P439262	
		Tin	3.0	U	ug/L	P439262	
		Titanium	9.4		ug/L	P439262	
		Vanadium	2.0	U	ug/L	P439262	
		Zinc	5.0	U	ug/L	P439262	
	EPA 200.8 Rev. 5.4	Aluminum	514		ug/L	P439262	
		Antimony	0.14	I	ug/L	P439262	
		Arsenic	1.05		ug/L	P439262	
		Barium	29.3		ug/L	P439262	
		Beryllium	0.010	U	ug/L	P439262	
		Boron	120		ug/L	P439262	
		Cadmium	0.020	U	ug/L	P439262	
		Chromium	1.8		ug/L	P439262	
		Cobalt	0.295		ug/L	P439262	
		Copper	1.07		ug/L	P439262	
		Lead	0.64		ug/L	P439262	
		Manganese	42.0		ug/L	P439262	
		Molybdenum	0.40	I	ug/L	P439262	
		Nickel	1.4	I	ug/L	P439262	
		Selenium	0.20	U	ug/L	P439262	
		Silver	0.010	U	ug/L	P439262	
		Thallium	0.10	U	ug/L	P439262	
	SM 2340 B-2011	Hardness	81.7		mg/L	P439262	

Ref. Method and Comment:
DEP SOP: NU-094-1: Sample appears to be heterogeneous with respect to True Color analysis. Refer to the Lab Analysis Report for an explanation of QC Codes.
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: P439277

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P439270

Component	Result	Code	Units
Turbidity	0.10	U	NTU

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

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

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

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439530

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439533

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439588

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439448

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439378

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439480

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439314

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439385

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

Reference Method: SM 2320 B-2011
Batch ID: P439420

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

Reference Method: SM 2540 C-2015
Batch ID: P439635

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2015
Batch ID: P439572

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P439422

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Reference Method: SM 5310 B-2014
Batch ID: P439528

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

Reference Method: SM 5310 B-2014
Batch ID: P439529

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: P439277

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.6		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P439270

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

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

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

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

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439530

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439533

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439588

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439448

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	96.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439480

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439314

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439385

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

Reference Method: SM 2320 B-2011
Batch ID: P439420

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	92 - 105

Reference Method: SM 2540 C-2015
Batch ID: P439635

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: P439572

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	94.4		P	85 - 115

Reference Method: SM 4500-F- C-2011
Batch ID: P439422

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

Reference Method: SM 5310 B-2014
Batch ID: P439528

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

Reference Method: SM 5310 B-2014
Batch ID: P439529

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

Quality Assurance Report
Matrix Spike Accuracy

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

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

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

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

Quality Assurance Report
Matrix Spike Accuracy

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

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439530

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458077	Chloride	103		P	90 - 110
2458169	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439533

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458077	Sulfate	102		P	90 - 110
2458169	Sulfate	99.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439588

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458036	Ammonia-N	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458172	Kjeldahl Nitrogen	104	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439378

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458080	NO2NO3-N	93.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439480

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2456452	NO2NO3-N	94.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439314

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458049	Total-P	106	108	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439385

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458170	Total-P	108	110	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P439422

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458034	Fluoride	101	100	P/P	94 - 106

Reference Method: SM 5310 B-2014
Batch ID: P439528

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458035	Organic Carbon	103	103	P/P	85 - 115

Reference Method: SM 5310 B-2014
Batch ID: P439529

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2458172	Organic Carbon	101	100	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P439277

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458078	Color (true)	35.6	Sample	F	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P439270

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458077	Turbidity	4.53	Sample	P	0 - 20

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

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

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

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

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458077	Chloride	0.0665	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P439533

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458077	Sulfate	0.152	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P439588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458036	Ammonia-N	0.597	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P439448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458172	Kjeldahl Nitrogen	0.721	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458080	NO2NO3-N	0.253	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P439480

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2456452	NO2NO3-N	0.452	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439314

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458049	Total-P	1.65	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P439385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458170	Total-P	1.23	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-2011
Batch ID: P439420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458034	Total Alkalinity	2.11	Sample	P	0 - 3.9

Reference Method: SM 2540 C-2015
Batch ID: P439635

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458044	TDS	5.08	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P439422

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458034	Fluoride	0.492	Spike	P	0 - 1.9

Reference Method: SM 5310 B-2014
Batch ID: P439528

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458035	Organic Carbon	0.121	Spike	P	0 - 15

Reference Method: SM 5310 B-2014
Batch ID: P439529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2458172	Organic Carbon	0.752	Spike	P	0 - 15

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A123347
Included Lab Sample IDs: 2458077, 2458078

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

Reference Method: DEP SOP: NU-094-1
Run ID: A123350
Included Lab Sample IDs: 2458077, 2458078

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.4	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A123391
Included Lab Sample IDs: 2458085, 2458086

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.6	97.5	P/P	90 - 110
Antimony	97.9	98.1	P/P	90 - 110
Arsenic	94.8	95.3	P/P	90 - 110
Barium	95.7	96.1	P/P	90 - 110
Beryllium	94.1	94.9	P/P	90 - 110
Boron	99.5	100	P/P	90 - 110
Cadmium	95.3	95.7	P/P	90 - 110
Chromium	93.7	94.9	P/P	90 - 110
Cobalt	92.0	93.1	P/P	90 - 110
Copper	92.0	93.5	P/P	90 - 110
Lead	92.5	93.2	P/P	90 - 110
Manganese	93.9	95.6	P/P	90 - 110
Molybdenum	95.9	95.9	P/P	90 - 110
Nickel	91.8	93.3	P/P	90 - 110
Selenium	95.4	95.8	P/P	90 - 110
Silver	95.7	96.3	P/P	90 - 110
Thallium	97.5	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A123396
Included Lab Sample IDs: 2458080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.0	97.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A123399
Included Lab Sample IDs: 2458085, 2458086

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	106	P/P	90 - 110
Iron	99.5	103	P/P	90 - 110
Magnesium	99.1	103	P/P	90 - 110
Potassium	96.2	98.9	P/P	90 - 110
Sodium	97.8	100	P/P	90 - 110
Strontium	102	101	P/P	90 - 110
Tin	101	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A123399
Included Lab Sample IDs: 2458085, 2458086

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Titanium	102	102	P/P	90 - 110
Vanadium	101	101	P/P	90 - 110
Zinc	103	102	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A123400
Included Lab Sample IDs: 2458077, 2458078

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.1	96.5	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A123400
Included Lab Sample IDs: 2458077, 2458078

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A123402
Included Lab Sample IDs: 2458079

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A123403
Included Lab Sample IDs: 2458080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	98.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A123437
Included Lab Sample IDs: 2458079

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A123459
Included Lab Sample IDs: 2458079, 2458080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.9	99.6	P/P	90 - 110

Reference Method: SM 5310 B-2014
Run ID: A123465
Included Lab Sample IDs: 2458079, 2458080

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2014
Run ID: A123465
Included Lab Sample IDs: 2458079, 2458080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	122	96.2	P/P	70 - 130
Organic Carbon	96.2	101	P/P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A123466
Included Lab Sample IDs: 2458077, 2458078

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.5	P/P	90 - 110
Sulfate	100	99.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A123497
Included Lab Sample IDs: 2458079, 2458080

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.3	P/P	90 - 110
Ammonia-N	99.3	99.2	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)	98.6					35.6	
EPA 180.1 Rev. 2.0	Turbidity	104					4.53	
EPA 200.7 Rev. 4.4	Calcium	111	107	107	105			0.676
	Iron	106	103	104	104			0.705
	Magnesium	109	107	107	105			0.407
	Potassium	99.5	103	103	100			0.590
	Sodium	103	100	98.0	101			1.39
	Strontium	99.8	99.4	98.4	98.8			1.05
	Tin	102	98.4	98.9	97.2			0.506
	Titanium	102	100	100	101			0.0032
	Vanadium	101	100	99.8	101			0.316
	Zinc	102	99.7	99.9	99.0			0.220
EPA 200.8 Rev. 5.4	Aluminum	97.9	99.0	100	99.7			1.21
	Antimony	101	101	102	104			0.946
	Arsenic	99.8	101	102	99.7			0.476
	Barium	100	102	103	101			1.27
	Beryllium	95.1	94.7	94.8	94.3			0.105
	Boron	99.7	100	101	106			0.710
	Cadmium	100	103	101	101			0.0812
	Chromium	101	103	103	99.9			0.130
	Cobalt	98.5	100	101	99.5			1.21
	Copper	97.7	102	102	97.0			0.588
	Lead	94.9	96.3	96.6	96.2			0.329
	Manganese	99.9	99.4	102	102			1.57
	Molybdenum	98.4	99.1	99.5	101			0.428
	Nickel	99.2	101	102	100			0.635
	Selenium	99.3	100	103	99.5			2.98
	Silver	96.1	95.9	96.4	96.7			0.546
	Thallium	98.5	102	103	103			0.506
EPA 300.0 Rev. 2.1	Chloride	102	103	101			0.0665	
	Sulfate	100	102	99.8			0.152	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	100	101				0.597
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	104	105				0.721
EPA 353.2 Rev. 2.0	NO2NO3-N	96.5	93.0					0.253
	NO2NO3-N	100	94.8					0.452
EPA 365.1 Rev. 2.0	Total-P	104	106	108				1.65
	Total-P	105	108	110				1.23
SM 2320 B-2011	Total Alkalinity	102					2.11	
SM 2540 C-2015	TDS	96.4					5.08	
SM 2540 D-2015	TSS	94.4						
SM 4500-F- C-2011	Fluoride	101	101	100				0.492
SM 5310 B-2014	Organic Carbon	102	103	103				0.121
	Organic Carbon	102	101	100				0.752

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2458077, 2458078
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2458077, 2458078
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2458085, 2458086
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2458085, 2458086

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2458077, 2458078
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2458077, 2458078
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2458079, 2458080
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2458079, 2458080
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2458079, 2458080
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2458079, 2458080
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2458077, 2458078
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2458085, 2458086
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2458077, 2458078
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2458077, 2458078
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2458077, 2458078
SM 5310 B-2014	Nonpurgeable Organic Carbon in aqueous matrices	2458079, 2458080

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	12/20/2023			12/20/2023 14:09	Samantha L Bates	2458077
	12/20/2023			12/20/2023 14:10	Samantha L Bates	2458078
EPA 180.1 Rev. 2.0	12/20/2023			12/20/2023 13:01	Chandler E Cox	2458077
	12/20/2023			12/20/2023 13:03	Chandler E Cox	2458078
EPA 200.7 Rev. 4.4	12/20/2023	12/20/2023 13:15	George D Taylor	12/21/2023 19:49	Samatha Luckman	2458085
	12/20/2023	12/20/2023 13:15	George D Taylor	12/21/2023 19:55	Samatha Luckman	2458086
EPA 200.8 Rev. 5.4	12/20/2023	12/20/2023 13:15	George D Taylor	12/21/2023 20:29	Emily M Philpot	2458085
	12/20/2023	12/20/2023 13:15	George D Taylor	12/21/2023 20:39	Emily M Philpot	2458086
EPA 300.0 Rev. 2.1	12/20/2023			12/28/2023 19:27	Anna M. Plaviak	2458077
	12/20/2023			12/28/2023 21:13	Anna M. Plaviak	2458078
EPA 350.1 Rev. 2.0	12/20/2023			01/04/2024 14:47	Ping Hua	2458079
	12/20/2023			01/04/2024 15:04	Ping Hua	2458080
EPA 351.2 Rev. 2.0	12/20/2023	12/27/2023 10:50	Simonne.V. Calhoun	12/28/2023 14:25	Samantha L Bates	2458079
	12/20/2023	12/27/2023 10:50	Simonne.V. Calhoun	12/28/2023 14:27	Samantha L Bates	2458080
EPA 353.2 Rev. 2.0	12/20/2023			12/21/2023 13:46	Fadila Guebre	2458080
	12/20/2023			12/27/2023 12:05	Fadila Guebre	2458079
EPA 365.1 Rev. 2.0	12/20/2023	12/21/2023 15:43	Adam P Silver	12/22/2023 13:43	Elise M. Gillis	2458079
	12/20/2023	12/22/2023 09:57	Adam P Silver	12/22/2023 14:06	James L Waggerby	2458080
SM 2320 B-2011	12/20/2023			12/21/2023 22:31	Dale L. Simmons	2458077
	12/20/2023			12/21/2023 22:42	Dale L. Simmons	2458078
SM 2340 B-2011	12/20/2023			12/21/2023 19:49	Samatha Luckman	2458085
	12/20/2023			12/21/2023 19:55	Samatha Luckman	2458086
SM 2540 C-2015	12/20/2023			12/21/2023 15:04	Yijie Li	2458077, 2458078
SM 2540 D-2015	12/20/2023			12/21/2023 15:04	Yijie Li	2458077, 2458078
SM 4500-F- C-2011	12/20/2023			12/21/2023 22:31	Dale L. Simmons	2458077
	12/20/2023			12/21/2023 22:42	Dale L. Simmons	2458078
SM 5310 B-2014	12/20/2023			12/23/2023 13:18	Kenneth H Lee	2458079
	12/20/2023			12/23/2023 15:26	Kenneth H Lee	2458080