

Chemical Analysis Report

NW-DIST-2022-08-03-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

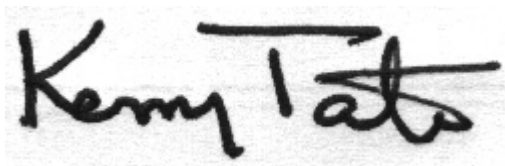
Event Description: **Escambia River Run**
Request ID: **RQ-2022-05-16-30**
Customer: **NW-DIST**
Project ID: **SMP**

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.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

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

Date Certified: 23-AUG-2022 11:44

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

NON-CONFORMANCE REPORT INCLUDED

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: Escambia River downstream of Cotton Lake

Collection Date/Time: 08/01/2022 10:22

Field ID: G4NW0403

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2345315	DEP SOP: NU-094-1	Color (true)	23	YAQ	PCU	P417577	
	EPA 180.1 Rev. 2.0	Turbidity	16	YQ	NTU	P417587	
	EPA 300.0 Rev. 2.1	Chloride	8.5		mg Cl/L	P417882	
		Sulfate	14	Y	mg SO4/L	P417887	
	SM 2320 B-2011	Total Alkalinity	31	Y	mg CaCO3/L	P417841	
	SM 2540 C-2011	TDS	82	Y	mg/L	P417986	
	SM 2540 D-2011	TSS	18	Y	mg/L	P418065	
	SM 4500-F- C-2011	Fluoride	0.035	I	mg F/L	P417846	
2345317	EPA 350.1 Rev. 2.0	Ammonia-N	0.048	Y	mg N/L	P417771	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45	Y	mg N/L	P417573	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.35	Y	mg N/L	P417717	
	EPA 365.1 Rev. 2.0	Total-P	0.058	Y	mg P/L	P417739	
	SM 5310 B-2011	Organic Carbon	4.7	Y	mg C/L	P417762	
2345325	EPA 200.7 Rev. 4.4	Calcium	11.0		mg/L	P417687	
		Iron	1.46E+03		ug/L	P417687	
		Magnesium	1.45		mg/L	P417687	
		Potassium	1.1	I	mg/L	P417687	
		Sodium	12.0		mg/L	P417687	
		Strontium	52.5		ug/L	P417687	
		Tin	3.0	U	ug/L	P417687	
		Titanium	6.5		ug/L	P417687	
	EPA 200.8 Rev. 5.4	Vanadium	2.0	U	ug/L	P417687	
		Zinc	5.0	U	ug/L	P417687	
		Aluminum	278		ug/L	P417687	
		Antimony	0.050	U	ug/L	P417687	
		Arsenic	0.79		ug/L	P417687	
		Barium	32.9		ug/L	P417687	
		Beryllium	0.062		ug/L	P417687	
		Boron	11.9		ug/L	P417687	
		Cadmium	0.020	U	ug/L	P417687	
		Chromium	0.71	I	ug/L	P417687	
		Cobalt	0.742		ug/L	P417687	
		Copper	0.40	U	ug/L	P417687	
		Lead	0.37	I	ug/L	P417687	
		Manganese	95.8		ug/L	P417687	
		Molybdenum	0.15	U	ug/L	P417687	
		Nickel	0.71	I	ug/L	P417687	
		Selenium	0.20	U	ug/L	P417687	
		Silver	0.010	U	ug/L	P417687	
		Thallium	0.10	U	ug/L	P417687	
	SM 2340 B-2011	Hardness	33.5		mg/L	P417687	

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
Ref. Method and Comment:							
DEP SOP: NU-094-1: Sample received outside of the acceptable temperature range. Please see NCR. The sample expired upon receipt.							
EPA 180.1 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR. The sample expired upon receipt.							
EPA 300.0 Rev. 2.1: Sulfate: Sample recieved outside of the acceptable temperature range. Please see NCR.							
SM 2320 B-2011: Sample received outside of the acceptable temperature range. Please see NCR.							
SM 2540 C-2011: Sample received outside of the acceptable temperature range. Please see NCR.							
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample received outside of the acceptable temperature range. Please see NCR.							
EPA 350.1 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.							
EPA 351.2 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.							
EPA 353.2 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.							
EPA 365.1 Rev. 2.0: Total-P: Sample received outside of the acceptable temperature range. Please see NCR.							
SM 5310 B-2011: Sample received outside of the acceptable temperature range. Please see NCR.							
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.							
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.							

Sample Location: FB

Collection Date/Time: 08/01/2022 10:23

Field ID: FB_08012022

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2345319	DEP SOP: NU-094-1	Color (true)	2.5	UYQ	PCU	P417576	
	EPA 180.1 Rev. 2.0	Turbidity	0.10	UYQ	NTU	P417587	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P417882	
		Sulfate	0.20	UY	mg SO4/L	P417887	
	SM 2320 B-2011	Total Alkalinity	0.65	UY	mg CaCO3/L	P417841	
	SM 2540 C-2011	TDS	15	UY	mg/L	P417985	
	SM 2540 D-2011	TSS	2	UY	mg/L	P418064	
	SM 4500-F- C-2011	Fluoride	0.035	U	mg F/L	P417846	
2345320	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	UY	mg N/L	P417771	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	UY	mg N/L	P417573	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	UY	mg N/L	P417717	
	EPA 365.1 Rev. 2.0	Total-P	0.002	UY	mg P/L	P417739	
	SM 5310 B-2011	Organic Carbon	0.61	IY	mg C/L	P417762	
2345327	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P417687	
		Iron	30	U	ug/L	P417687	
		Magnesium	0.040	U	mg/L	P417687	
		Potassium	0.30	U	mg/L	P417687	
		Sodium	0.50	U	mg/L	P417687	
		Strontium	2.0	U	ug/L	P417687	
		Tin	3.0	U	ug/L	P417687	
		Titanium	0.75	U	ug/L	P417687	
	EPA 200.8 Rev. 5.4	Vanadium	2.0	U	ug/L	P417687	
		Zinc	5.0	U	ug/L	P417687	
		Aluminum	5.0	U	ug/L	P417687	
		Antimony	0.050	U	ug/L	P417687	
		Arsenic	0.050	U	ug/L	P417687	
		Barium	0.20	U	ug/L	P417687	
		Beryllium	0.010	U	ug/L	P417687	
		Boron	2.0	U	ug/L	P417687	
		Cadmium	0.020	U	ug/L	P417687	
		Chromium	0.40	U	ug/L	P417687	
		Cobalt	0.020	U	ug/L	P417687	
		Copper	0.86		ug/L	P417687	
		Lead	0.20	U	ug/L	P417687	
		Manganese	0.10	U	ug/L	P417687	
		Molybdenum	0.15	U	ug/L	P417687	
		Nickel	0.50	U	ug/L	P417687	
		Selenium	0.20	U	ug/L	P417687	
		Silver	0.010	U	ug/L	P417687	
		Thallium	0.10	U	ug/L	P417687	
	SM 2340 B-2011	Hardness	0.35	U	mg/L	P417687	

Matrix: W-FIELD-BK

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

DEP SOP: NU-094-1: Sample received outside of the acceptable temperature range. Please see NCR. The sample expired upon receipt.

EPA 180.1 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR. The sample expired upon receipt.

EPA 300.0 Rev. 2.1: Sulfate: Sample recieved outside of the acceptable temperature range. Please see NCR.

SM 2320 B-2011: Sample received outside of the acceptable temperature range. Please see NCR.

SM 2540 C-2011: Sample received outside of the acceptable temperature range. Please see NCR.

SM 2540 D-2021: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample received outside of the acceptable temperature range. Please see NCR.

EPA 350.1 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.

EPA 351.2 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.

EPA 353.2 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.

EPA 365.1 Rev. 2.0: Total-P: Sample received outside of the acceptable temperature range. Please see NCR.

SM 5310 B-2011: The result was confirmed on 08/09/2022. Sample received outside of the acceptable temperature range. Please see NCR.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable for one of two spiked samples because of high analyte concentration in the QC sample. The copper result was confirmed in the undigested sample on 08/16/2022.

Sample Location: Escambia River upstream of Mitchell Creek

Collection Date/Time: 08/01/2022 11:40

Field ID: G4NW0404

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2345316	DEP SOP: NU-094-1	Color (true)	50	Y	PCU	P417576	
	EPA 180.1 Rev. 2.0	Turbidity	14	Y	NTU	P417587	
	EPA 300.0 Rev. 2.1	Chloride	8.0		mg Cl/L	P417882	
		Sulfate	14	Y	mg SO4/L	P417887	
	SM 2320 B-2011	Total Alkalinity	33	Y	mg CaCO3/L	P417841	
	SM 2540 C-2011	TDS	80	Y	mg/L	P417986	
	SM 2540 D-2011	TSS	17	Y	mg/L	P418065	
	SM 4500-F- C-2011	Fluoride	0.035	I	mg F/L	P417846	
2345318	EPA 350.1 Rev. 2.0	Ammonia-N	0.053	Y	mg N/L	P417771	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.51	Y	mg N/L	P417573	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.34	Y	mg N/L	P417717	
	EPA 365.1 Rev. 2.0	Total-P	0.057	Y	mg P/L	P417739	
	SM 5310 B-2011	Organic Carbon	4.4	Y	mg C/L	P417762	
2345326	EPA 200.7 Rev. 4.4	Calcium	12.0		mg/L	P417687	
		Iron	1.31E+03		ug/L	P417687	
		Magnesium	1.48		mg/L	P417687	
		Potassium	1.1	I	mg/L	P417687	
		Sodium	11.8		mg/L	P417687	
		Strontium	50.3		ug/L	P417687	
		Tin	3.0	U	ug/L	P417687	
		Titanium	3.9		ug/L	P417687	
	EPA 200.8 Rev. 5.4	Vanadium	2.0	U	ug/L	P417687	
		Zinc	5.0	U	ug/L	P417687	
		Aluminum	193		ug/L	P417687	
		Antimony	0.050	U	ug/L	P417687	
		Arsenic	0.72		ug/L	P417687	
		Barium	32.2		ug/L	P417687	
		Beryllium	0.056		ug/L	P417687	
		Boron	11.2		ug/L	P417687	
		Cadmium	0.020	U	ug/L	P417687	
		Chromium	0.59	I	ug/L	P417687	
		Cobalt	0.694		ug/L	P417687	
		Copper	0.40	U	ug/L	P417687	
		Lead	0.30	I	ug/L	P417687	
		Manganese	90.6		ug/L	P417687	
		Molybdenum	0.15	U	ug/L	P417687	
		Nickel	0.78	I	ug/L	P417687	
		Selenium	0.20	U	ug/L	P417687	
		Silver	0.010	U	ug/L	P417687	
		Thallium	0.10	U	ug/L	P417687	
	SM 2340 B-2011	Hardness	36.0		mg/L	P417687	

Matrix: W-SURF-FRH

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

DEP SOP: NU-094-1: Sample received outside of the acceptable temperature range. Please see NCR.

EPA 180.1 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.

EPA 300.0 Rev. 2.1: Sulfate: Sample recieved outside of the acceptable temperature range. Please see NCR.

SM 2320 B-2011: Sample received outside of the acceptable temperature range. Please see NCR.

SM 2540 C-2011: Sample received outside of the acceptable temperature range. Please see NCR.

SM 2540 D-2021: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample received outside of the acceptable temperature range. Please see NCR.

EPA 350.1 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.

EPA 351.2 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.

EPA 353.2 Rev. 2.0: Sample received outside of the acceptable temperature range. Please see NCR.

EPA 365.1 Rev. 2.0: Total-P: Sample received outside of the acceptable temperature range. Please see NCR.

SM 5310 B-2011: Sample received outside of the acceptable temperature range. Please see NCR.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

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

Non-Conformance Report

NCR ID: 9506

Event(s)

NW-DIST-2022-08-03-01

Job(s)

Sample(s)

Test(s)

NCR Type: SHIPPING/RECEIVING

NCR Category: Samples arrived late

Observation: Samples arrived late, samples received outside the acceptable temperature range.

Resolution: Samples will be qualified as appropriate.

Authorized by/Date: Kyle Klug 8/11/2022

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P417576

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: DEP SOP: NU-094-1
Batch ID: P417577

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417587

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417687

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: P417687

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417882

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417887

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417771

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P417573

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417717

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417739

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

Reference Method: SM 2320 B-2011
Batch ID: P417841

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

Reference Method: SM 2540 C-2011
Batch ID: P417985

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P417986

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P418064

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P418065

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P417846

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P417762

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: P417576

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

Reference Method: DEP SOP: NU-094-1
Batch ID: P417577

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: P417587

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	96.6		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417687

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	109		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	107		P	85 - 115
Sodium	97.6		P	85 - 115
Strontium	106		P	85 - 115
Tin	102		P	85 - 115
Titanium	106		P	85 - 115
Vanadium	104		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417687

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.6		P	80 - 120
Antimony	100		P	80 - 120
Arsenic	97.0		P	80 - 120
Barium	102		P	80 - 120
Beryllium	91.3		P	80 - 120
Boron	95.5		P	80 - 120
Cadmium	96.4		P	80 - 120
Chromium	96.3		P	80 - 120
Cobalt	94.7		P	80 - 120
Copper	92.2		P	80 - 120
Lead	93.3		P	80 - 120
Manganese	96.6		P	80 - 120
Molybdenum	94.3		P	80 - 120
Nickel	94.8		P	80 - 120
Selenium	95.0		P	80 - 120
Silver	97.0		P	80 - 120
Thallium	93.5		P	80 - 120

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417882

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417887

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417771

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: P417573

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417717

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417739

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

Reference Method: SM 2320 B-2011
Batch ID: P417841

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

Reference Method: SM 4500-F- C-2011
Batch ID: P417846

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P417762

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P417687

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2346296	Calcium	103		P	80 - 120
2346296	Iron	109	107	P/P	80 - 120
2346296	Magnesium	110	105	P/P	80 - 120
2346296	Potassium	101	96.9	P/P	80 - 120
2346296	Sodium	98.1		P	80 - 120
2346296	Strontium	101	99.6	P/P	80 - 120
2346296	Tin	103	102	P/P	80 - 120
2346296	Titanium	106	103	P/P	80 - 120
2346296	Vanadium	105	102	P/P	80 - 120
2346296	Zinc	103	100	P/P	80 - 120
2346340	Calcium	103		P	80 - 120
2346340	Iron	109		P	80 - 120
2346340	Magnesium	107		P	80 - 120
2346340	Sodium	101		P	80 - 120
2346340	Strontium	100		P	80 - 120
2346340	Tin	102		P	80 - 120
2346340	Titanium	105		P	80 - 120
2346340	Vanadium	104		P	80 - 120
2346340	Zinc	99.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P417687

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2346296	Aluminum	95.7	95.3	P/P	80 - 120
2346296	Antimony	101	102	P/P	80 - 120
2346296	Arsenic	98.6	98.7	P/P	80 - 120
2346296	Barium	102	101	P/P	80 - 120
2346296	Beryllium	94.4	93.1	P/P	80 - 120
2346296	Boron	96.5	95.6	P/P	80 - 120
2346296	Cadmium	97.4	96.5	P/P	80 - 120
2346296	Chromium	97.5	98.2	P/P	80 - 120
2346296	Cobalt	94.7	94.8	P/P	80 - 120
2346296	Copper	94.3	95.3	P/P	80 - 120
2346296	Lead	93.7	93.2	P/P	80 - 120
2346296	Manganese	97.6	97.9	P/P	80 - 120
2346296	Molybdenum	95.1	94.2	P/P	80 - 120
2346296	Nickel	93.7	94.8	P/P	80 - 120
2346296	Selenium	95.4	95.1	P/P	80 - 120
2346296	Silver	95.2	95.2	P/P	80 - 120
2346296	Thallium	96.1	95.9	P/P	80 - 120
2346340	Aluminum	99.2		P	80 - 120
2346340	Antimony	104		P	80 - 120
2346340	Arsenic	100		P	80 - 120
2346340	Barium	103		P	80 - 120
2346340	Beryllium	91.2		P	80 - 120
2346340	Cadmium	99.9		P	80 - 120
2346340	Chromium	100		P	80 - 120
2346340	Cobalt	97.7		P	80 - 120
2346340	Copper	94.2		P	80 - 120
2346340	Lead	95.5		P	80 - 120
2346340	Manganese	100		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417687

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2346340	Molybdenum	99.3		P	80 - 120
2346340	Nickel	95.5		P	80 - 120
2346340	Selenium	97.2		P	80 - 120
2346340	Silver	96.6		P	80 - 120
2346340	Thallium	97.5		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417882

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344988	Chloride	96.5		P	90 - 110
2345203	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417887

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344988	Sulfate	94.0		P	90 - 110
2345203	Sulfate	94.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417771

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2345111	Ammonia-N	97.0	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P417573

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2344748	Kjeldahl Nitrogen	101	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417717

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2345317	NO2NO3-N	95.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417739

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2345207	Total-P	105	104	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P417846

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2345203	Fluoride	99.8	100	P/P	94 - 104

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P417762

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2345344	Organic Carbon	94.7	96.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P417576

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345198	Color (true)	1.42	Sample	P	0 - 20

Reference Method: DEP SOP: NU-094-1
Batch ID: P417577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345315	Color (true)	0.0172	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417587

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345198	Turbidity	9.00	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417687

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2346296	Calcium	3.17	Spike	P	0 - 20
2346296	Iron	1.74	Spike	P	0 - 20
2346296	Magnesium	2.86	Spike	P	0 - 20
2346296	Potassium	2.56	Spike	P	0 - 20
2346296	Sodium	3.36	Spike	P	0 - 20
2346296	Strontium	1.87	Spike	P	0 - 20
2346296	Tin	1.45	Spike	P	0 - 20
2346296	Titanium	2.43	Spike	P	0 - 20
2346296	Vanadium	2.71	Spike	P	0 - 20
2346296	Zinc	2.57	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417687

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2346296	Aluminum	0.438	Spike	P	0 - 20
2346296	Antimony	1.14	Spike	P	0 - 20
2346296	Arsenic	0.0924	Spike	P	0 - 20
2346296	Barium	0.332	Spike	P	0 - 20
2346296	Beryllium	1.29	Spike	P	0 - 20
2346296	Boron	0.652	Spike	P	0 - 20
2346296	Cadmium	0.950	Spike	P	0 - 20
2346296	Chromium	0.642	Spike	P	0 - 20
2346296	Cobalt	0.0197	Spike	P	0 - 20
2346296	Copper	1.11	Spike	P	0 - 20
2346296	Lead	0.480	Spike	P	0 - 20
2346296	Manganese	0.299	Spike	P	0 - 20
2346296	Molybdenum	0.928	Spike	P	0 - 20
2346296	Nickel	1.13	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417687

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2346296	Selenium	0.282	Spike	P	0 - 20
2346296	Silver	0.0216	Spike	P	0 - 20
2346296	Thallium	0.275	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417882

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344988	Chloride	2.44	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P417887

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344988	Sulfate	3.34	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P417771

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345111	Ammonia-N	2.81	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P417573

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344748	Kjeldahl Nitrogen	5.11	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345317	NO2NO3-N	0.183	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417739

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345207	Total-P	0.722	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P417841

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P417841

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345203	Total Alkalinity	1.40	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2011
Batch ID: P417985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2344745	TDS	4.37	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
Batch ID: P417986

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345201	TDS	3.06	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P417846

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345203	Fluoride	0.516	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P417762

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345344	Organic Carbon	1.17	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: A113879

Included Lab Sample IDs: 2345315, 2345316, 2345319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	90 - 110
Color (true)	103	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A113882

Included Lab Sample IDs: 2345315, 2345316, 2345319

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A113931

Included Lab Sample IDs: 2345317, 2345318, 2345320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A113942

Included Lab Sample IDs: 2345325, 2345326, 2345327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	104	P/P	90 - 110
Calcium	103	103	P/P	90 - 110
Iron	103	105	P/P	90 - 110
Iron	104	103	P/P	90 - 110
Magnesium	104	106	P/P	90 - 110
Magnesium	105	104	P/P	90 - 110
Potassium	101	102	P/P	90 - 110
Potassium	102	104	P/P	90 - 110
Sodium	97.7	98.4	P/P	90 - 110
Sodium	98.4	101	P/P	90 - 110
Strontium	97.2	98.2	P/P	90 - 110
Strontium	98.2	101	P/P	90 - 110
Tin	101	98.1	P/P	90 - 110
Tin	98.1	98.8	P/P	90 - 110
Titanium	101	101	P/P	90 - 110
Titanium	101	101	P/P	90 - 110
Vanadium	100	101	P/P	90 - 110
Vanadium	100	100	P/P	90 - 110
Zinc	96.4	97.4	P/P	90 - 110
Zinc	96.9	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A113954

Included Lab Sample IDs: 2345317, 2345318

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

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-2011

Run ID: A113961

Included Lab Sample IDs: 2345317, 2345318, 2345320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	97.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A113965

Included Lab Sample IDs: 2345320

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A113967

Included Lab Sample IDs: 2345317, 2345318, 2345320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	98.2	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A113988

Included Lab Sample IDs: 2345315, 2345316, 2345319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.7	100	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A113988

Included Lab Sample IDs: 2345315, 2345316, 2345319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A113990

Included Lab Sample IDs: 2345317, 2345318, 2345320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	90.6	92.4	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A114002

Included Lab Sample IDs: 2345315, 2345316, 2345319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	100	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A114134

Included Lab Sample IDs: 2345325, 2345326, 2345327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.6	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A114134

Included Lab Sample IDs: 2345325, 2345326, 2345327

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.2	96.6	P/P	90 - 110
Antimony	100	99.7	P/P	90 - 110
Antimony	101	100	P/P	90 - 110
Arsenic	101	102	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Barium	101	99.5	P/P	90 - 110
Barium	99.5	99.4	P/P	90 - 110
Beryllium	93.9	97.6	P/P	90 - 110
Beryllium	97.6	94.0	P/P	90 - 110
Boron	95.3	96.1	P/P	90 - 110
Boron	96.1	101	P/P	90 - 110
Cadmium	101	102	P/P	90 - 110
Cadmium	103	101	P/P	90 - 110
Chromium	102	102	P/P	90 - 110
Chromium	102	101	P/P	90 - 110
Cobalt	98.0	98.3	P/P	90 - 110
Cobalt	99.8	98.0	P/P	90 - 110
Copper	97.7	97.9	P/P	90 - 110
Copper	98.3	97.7	P/P	90 - 110
Lead	93.0	94.1	P/P	90 - 110
Lead	94.1	93.0	P/P	90 - 110
Manganese	101	101	P/P	90 - 110
Manganese	99.9	101	P/P	90 - 110
Molybdenum	96.6	97.0	P/P	90 - 110
Molybdenum	97.9	96.6	P/P	90 - 110
Nickel	98.7	97.3	P/P	90 - 110
Nickel	98.8	98.7	P/P	90 - 110
Selenium	102	102	P/P	90 - 110
Selenium	102	102	P/P	90 - 110
Silver	97.0	97.7	P/P	90 - 110
Silver	98.6	97.0	P/P	90 - 110
Thallium	97.9	98.6	P/P	90 - 110
Thallium	98.0	97.9	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 SMP	MS
			LCS				
DEP SOP: NU-094-1	Color (true)	101				1.42	
	Color (true)	101				0.0172	
EPA 180.1 Rev. 2.0	Turbidity	96.6				9.00	
EPA 200.7 Rev. 4.4	Calcium	104	103	103			3.17
	Iron	109	109	107	109		1.74
	Magnesium	112	110	105	107		2.86
	Potassium	107	101	96.9			2.56
	Sodium	97.6	98.1	101			3.36
	Strontium	106	101	99.6	100		1.87
	Tin	102	103	102	102		1.45
	Titanium	106	106	103	105		2.43
	Vanadium	104	105	102	104		2.71
	Zinc	101	103	100	99.9		2.57
EPA 200.8 Rev. 5.4	Aluminum	94.6	95.7	95.3	99.2		0.438
	Antimony	100	101	102	104		1.14
	Arsenic	97.0	98.6	98.7	100		0.0924
	Barium	102	102	101	103		0.332
	Beryllium	91.3	94.4	93.1	91.2		1.29
	Boron	95.5	96.5	95.6			0.652
	Cadmium	96.4	97.4	96.5	99.9		0.950
	Chromium	96.3	97.5	98.2	100		0.642
	Cobalt	94.7	94.7	94.8	97.7		0.0197
	Copper	92.2	94.3	95.3	94.2		1.11
	Lead	93.3	93.7	93.2	95.5		0.480
	Manganese	96.6	97.6	97.9	100		0.299
	Molybdenum	94.3	95.1	94.2	99.3		0.928
	Nickel	94.8	93.7	94.8	95.5		1.13
	Selenium	95.0	95.4	95.1	97.2		0.282
	Silver	97.0	95.2	95.2	96.6		0.0216
	Thallium	93.5	97.5	96.1	95.9		0.275
EPA 300.0 Rev. 2.1	Chloride	101	96.5	100		2.44	
	Sulfate	98.7	94.0	94.0		3.34	
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	97.0	100			2.81
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	101	108			5.11
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	95.5				0.183
EPA 365.1 Rev. 2.0	Total-P	104	105	104			0.722
SM 2320 B-2011	Total Alkalinity	100				1.40	
SM 2540 C-2011	TDS					4.37	
	TDS					3.06	
SM 4500-F- C-2011	Fluoride	102	99.8	100			0.516
SM 5310 B-2011	Organic Carbon	96.5	94.7	96.7			1.17

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2345315, 2345316, 2345319
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2345315, 2345316, 2345319
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2345325, 2345326, 2345327
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2345325, 2345326, 2345327
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2345315, 2345316, 2345319
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2345315, 2345316, 2345319

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2345317, 2345318, 2345320
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2345317, 2345318, 2345320
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2345317, 2345318, 2345320
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2345317, 2345318, 2345320
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2345315, 2345316, 2345319
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2345325, 2345326, 2345327
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2345315, 2345316, 2345319
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2345315, 2345316, 2345319
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2345315, 2345316, 2345319
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2345317, 2345318, 2345320

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	08/03/2022			08/03/2022 10:42	Anna M. Plaviak	2345316
	08/03/2022			08/03/2022 10:48	Anna M. Plaviak	2345319
	08/03/2022			08/03/2022 10:59	Anna M. Plaviak	2345315
EPA 180.1 Rev. 2.0	08/03/2022			08/03/2022 10:35	Khloe J Berg	2345316
	08/03/2022			08/03/2022 10:42	Khloe J Berg	2345315
	08/03/2022			08/03/2022 10:43	Khloe J Berg	2345319
EPA 200.7 Rev. 4.4	08/03/2022	08/05/2022 09:45	Mackenzie Hunt	08/05/2022 18:17	McKinley C Carter	2345327
	08/03/2022	08/05/2022 09:45	Mackenzie Hunt	08/05/2022 19:37	McKinley C Carter	2345325
	08/03/2022	08/05/2022 09:45	Mackenzie Hunt	08/05/2022 19:43	McKinley C Carter	2345326
EPA 200.8 Rev. 5.4	08/03/2022	08/05/2022 09:45	Mackenzie Hunt	08/16/2022 13:35	Emily M Philpot	2345327
	08/03/2022	08/05/2022 09:45	Mackenzie Hunt	08/16/2022 15:23	Emily M Philpot	2345325
	08/03/2022	08/05/2022 09:45	Mackenzie Hunt	08/16/2022 15:32	Emily M Philpot	2345326
EPA 300.0 Rev. 2.1	08/03/2022			08/09/2022 03:45	Anna M. Plaviak	2345315
	08/03/2022			08/09/2022 03:57	Anna M. Plaviak	2345316
	08/03/2022			08/09/2022 04:09	Anna M. Plaviak	2345319
EPA 350.1 Rev. 2.0	08/03/2022			08/08/2022 14:50	Ping Hua	2345317
	08/03/2022			08/08/2022 14:51	Ping Hua	2345318
	08/03/2022			08/08/2022 14:55	Ping Hua	2345320
EPA 351.2 Rev. 2.0	08/03/2022	08/04/2022 12:05	Samantha L Bates	08/09/2022 14:44	Samantha L Bates	2345317
	08/03/2022	08/04/2022 12:05	Samantha L Bates	08/09/2022 14:45	Samantha L Bates	2345318
	08/03/2022	08/04/2022 12:05	Samantha L Bates	08/09/2022 14:47	Samantha L Bates	2345320
EPA 353.2 Rev. 2.0	08/03/2022			08/05/2022 09:22	Beverly Y. Sanders	2345317
	08/03/2022			08/05/2022 09:28	Beverly Y. Sanders	2345318
	08/03/2022			08/05/2022 09:29	Beverly Y. Sanders	2345320
EPA 365.1 Rev. 2.0	08/03/2022	08/05/2022 18:15	Adam P Silver	08/08/2022 10:05	James L Waggeberby	2345317
	08/03/2022	08/05/2022 18:15	Adam P Silver	08/08/2022 10:06	James L Waggeberby	2345318
	08/03/2022	08/05/2022 18:15	Adam P Silver	08/08/2022 14:37	Simonne.V. Calhoun	2345320
SM 2320 B-2011	08/03/2022			08/05/2022 15:20	Adam P Silver	2345315
	08/03/2022			08/05/2022 15:32	Adam P Silver	2345316
	08/03/2022			08/05/2022 15:41	Adam P Silver	2345319
SM 2340 B-2011	08/03/2022			08/05/2022 18:17	McKinley C Carter	2345327
	08/03/2022			08/05/2022 19:37	McKinley C Carter	2345325
	08/03/2022			08/05/2022 19:43	McKinley C Carter	2345326
SM 2540 C-2011	08/03/2022			08/05/2022 16:02	Yijie Li	2345315, 2345316, 2345319
SM 2540 D-2011	08/03/2022			08/05/2022 16:02	Yijie Li	2345315, 2345316, 2345319
SM 4500-F- C-2011	08/03/2022			08/05/2022 15:20	Adam P Silver	2345315
	08/03/2022			08/05/2022 15:32	Adam P Silver	2345316
	08/03/2022			08/05/2022 15:41	Adam P Silver	2345319
SM 5310 B-2011	08/03/2022			08/05/2022 20:31	Khloe J Berg	2345317
	08/03/2022			08/05/2022 20:45	Khloe J Berg	2345318

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-2011	08/03/2022			08/05/2022 20:59	Khloe J Berg	2345320