Chemical Analysis Report

NW-DIST-2021-05-06-01

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

Event Description: **Yellow River Run**
Request ID: **RQ-2021-05-03-57**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

For additional information please contact
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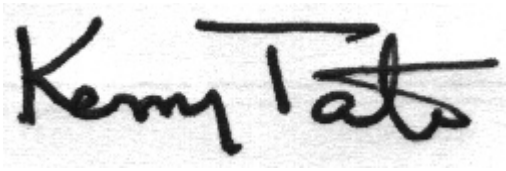
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 26-MAY-2021 10:21



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: Yellow River below Malone Creek **Collection Date/Time: 05/04/2021 09:45**

Field ID: G4NW0373 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2245873	EPA 200.7 Rev. 4.4	Barium	15.0		ug/L	P398257	
		Calcium	4.32		mg/L	P398257	
		Iron	830		ug/L	P398257	
		Magnesium	1.08		mg/L	P398257	
		Manganese	34.8		ug/L	P398257	
		Potassium	0.53	I	mg/L	P398257	
		Sodium	1.9	I	mg/L	P398257	
		Zinc	5.0	U	ug/L	P398257	
	EPA 200.8 Rev. 5.4	Aluminum	341		ug/L	P398257	
		Antimony	0.053	I	ug/L	P398257	
		Arsenic	0.48		ug/L	P398257	
		Beryllium	0.036	I	ug/L	P398257	
		Boron**	9.0		ug/L	P398257	
		Cadmium	0.020	U	ug/L	P398257	
		Chromium	0.52	I	ug/L	P398257	
		Copper	0.40	U	ug/L	P398257	
		Lead	0.35	I	ug/L	P398257	
		Nickel	0.50	U	ug/L	P398257	
		Selenium	0.20	U	ug/L	P398257	
		Silver	0.010	U	ug/L	P398257	
		Thallium	0.10	U	ug/L	P398257	
	SM 2340B	Hardness	15.2		mg/L	P398257	

Sample Location: Yellow River upstream of Miller Bluff Landing **Collection Date/Time: 05/04/2021 10:55**

Field ID: G4NW0534 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2245863	EPA 300.0 Rev. 2.1	Chloride	3.2		mg Cl/L	P398561	
		Sulfate	1.1		mg SO4/L	P398564	
	SM 2320 B-2011	Total Alkalinity	9.2		mg CaCO3/L	P398273	
	SM 2540 C-2011	TDS	28		mg/L	P398299	RPD
	SM 2540 D-2011	TSS	8	I	mg/L	P398294	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P398695	
2245864	EPA 350.1 Rev. 2.0	Ammonia-N	0.028		mg N/L	P398215	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P398160	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.14		mg N/L	P397885	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P398281	
	SM 5310 B-2011	Organic Carbon	5.1		mg C/L	P397942	
2245872	EPA 200.7 Rev. 4.4	Barium	15.0		ug/L	P398257	
		Calcium	3.84		mg/L	P398257	
		Iron	840		ug/L	P398257	
		Magnesium	1.00		mg/L	P398257	
		Manganese	32.2		ug/L	P398257	
		Potassium	0.53	I	mg/L	P398257	
		Sodium	1.9	I	mg/L	P398257	
		Zinc	5.0	U	ug/L	P398257	
	EPA 200.8 Rev. 5.4	Aluminum	409		ug/L	P398257	
		Antimony	0.050	U	ug/L	P398257	
		Arsenic	0.43		ug/L	P398257	
		Beryllium	0.034	I	ug/L	P398257	
		Boron**	8.6		ug/L	P398257	
		Cadmium	0.020	U	ug/L	P398257	
		Chromium	0.57	I	ug/L	P398257	
		Copper	0.40	U	ug/L	P398257	
		Lead	0.42		ug/L	P398257	
		Nickel	0.50	U	ug/L	P398257	
		Selenium	0.20	U	ug/L	P398257	
		Silver	0.010	U	ug/L	P398257	
		Thallium	0.10	U	ug/L	P398257	
	SM 2340B	Hardness	13.7		mg/L	P398257	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Non-Conformance Report

NCR ID: 8817

Event(s)	Job(s)	Sample(s)	Test(s)
NW-DIST-2021-05-06-01	TLH-2021-05-06-79	2245863	
NW-DIST-2021-05-06-01	TLH-2021-05-06-79	2245864	
NW-DIST-2021-05-06-01	TLH-2021-05-06-82	2245872	
NW-DIST-2021-05-06-01	TLH-2021-05-06-82	2245873	

NCR Type: SHIPPING/RECEIVING **NCR Category: Samples arrived late**

Observation: Samples arrived one or more days late by UPS, samples received within the acceptable temperature range.

Resolution: Samples logged in according to SMP Protocol.
Samples will be qualified as appropriate.
Customer contacted, email correspondence attached to sample submittal forms.
Biology and Chemistry supervisors were notified by email.

Authorized by/Date: Joshua Ayres 5/10/2021

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: EPA 200.7 Rev. 4.4
Batch ID: P398257

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P398257

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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
Copper	0.40	U	ug/L
Lead	0.20	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: P398561

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398564

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398215

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398160

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397885

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398281

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

Reference Method: SM 2320 B-2011
Batch ID: P398273

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

Reference Method: SM 2540 C-2011
Batch ID: P398299

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P398294

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P398695

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P397942

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P398257

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	106		P	85 - 115
Iron	102		P	85 - 115
Magnesium	102		P	85 - 115
Manganese	104		P	85 - 115
Potassium	97.4		P	85 - 115
Sodium	101		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P398257

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.3		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	98.8		P	85 - 115
Beryllium	93.0		P	85 - 115
Boron	98.6		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	96.9		P	85 - 115
Copper	99.8		P	85 - 115
Lead	90.7		P	85 - 115
Nickel	98.0		P	85 - 115
Selenium	95.5		P	85 - 115
Silver	99.7		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398561

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398564

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398215

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398160

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.2		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397885

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: P398281

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

Reference Method: SM 2320 B-2011
Batch ID: P398273

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.0		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P398695

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.7		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P397942

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P398257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245897	Barium	101		P	80 - 120
2245897	Calcium	103		P	80 - 120
2245897	Iron	105		P	80 - 120
2245897	Magnesium	105		P	80 - 120
2245897	Manganese	104		P	80 - 120
2245897	Potassium	98.3		P	80 - 120
2245897	Sodium	101		P	80 - 120
2245897	Zinc	103		P	80 - 120
2245949	Barium	101	106	P/P	80 - 120
2245949	Calcium	106	109	P/P	80 - 120
2245949	Iron	104	108	P/P	80 - 120
2245949	Magnesium	103	107	P/P	80 - 120
2245949	Manganese	103	107	P/P	80 - 120
2245949	Potassium	97.3	102	P/P	80 - 120
2245949	Sodium	100	105	P/P	80 - 120
2245949	Zinc	100	104	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P398257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245897	Aluminum	95.8		P	80 - 120
2245897	Antimony	101		P	80 - 120
2245897	Arsenic	97.3		P	80 - 120
2245897	Beryllium	89.8		P	80 - 120
2245897	Boron	96.3		P	80 - 120
2245897	Cadmium	101		P	80 - 120
2245897	Chromium	96.1		P	80 - 120
2245897	Copper	99.9		P	80 - 120
2245897	Lead	89.3		P	80 - 120
2245897	Nickel	95.7		P	80 - 120
2245897	Selenium	91.7		P	80 - 120
2245897	Silver	99.2		P	80 - 120
2245897	Thallium	102		P	80 - 120
2245949	Aluminum	97.2	97.0	P/P	80 - 120
2245949	Antimony	100	99.6	P/P	80 - 120
2245949	Arsenic	97.1	97.7	P/P	80 - 120
2245949	Beryllium	87.4	86.5	P/P	80 - 120
2245949	Boron	98.2	97.6	P/P	80 - 120
2245949	Cadmium	102	102	P/P	80 - 120
2245949	Chromium	95.5	95.9	P/P	80 - 120
2245949	Copper	100	101	P/P	80 - 120
2245949	Lead	90.0	89.8	P/P	80 - 120
2245949	Nickel	96.4	97.6	P/P	80 - 120
2245949	Selenium	95.5	95.2	P/P	80 - 120
2245949	Silver	97.2	93.8	P/P	80 - 120
2245949	Thallium	101	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398561

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398561

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245630	Chloride	98.6		P	90 - 110
2245939	Chloride	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398564

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245630	Sulfate	101		P	90 - 110
2245939	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398215

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245660	Ammonia-N	96.2	96.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398160

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245894	Kjeldahl Nitrogen	106	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397885

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245704	NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398281

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245864	Total-P	108	107	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P398695

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245618	Fluoride	94.5	98.7	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P397942

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245373	Organic Carbon	95.5	94.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P398257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245949	Barium	3.84	Spike	P	0 - 20
2245949	Calcium	2.87	Spike	P	0 - 20
2245949	Iron	3.30	Spike	P	0 - 20
2245949	Magnesium	3.60	Spike	P	0 - 20
2245949	Manganese	3.53	Spike	P	0 - 20
2245949	Potassium	3.59	Spike	P	0 - 20
2245949	Sodium	2.56	Spike	P	0 - 20
2245949	Zinc	3.83	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P398257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245949	Aluminum	0.157	Spike	P	0 - 20
2245949	Antimony	0.474	Spike	P	0 - 20
2245949	Arsenic	0.654	Spike	P	0 - 20
2245949	Beryllium	0.742	Spike	P	0 - 20
2245949	Boron	0.593	Spike	P	0 - 20
2245949	Cadmium	0.401	Spike	P	0 - 20
2245949	Chromium	0.469	Spike	P	0 - 20
2245949	Copper	0.187	Spike	P	0 - 20
2245949	Lead	0.169	Spike	P	0 - 20
2245949	Nickel	1.10	Spike	P	0 - 20
2245949	Selenium	0.254	Spike	P	0 - 20
2245949	Silver	3.54	Spike	P	0 - 20
2245949	Thallium	0.500	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398561

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245630	Chloride	0.648	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245630	Sulfate	0.146	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398215

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245660	Ammonia-N	0.375	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398160

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245894	Kjeldahl Nitrogen	2.63	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397885

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245704	NO2NO3-N	0.496	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398281

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245864	Total-P	0.990	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P398273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245659	Total Alkalinity	0.454	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P398299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245659	TDS	10.8	Sample	F	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P398695

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245618	Fluoride	0.951	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P397942

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245373	Organic Carbon	0.809	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A105281
Included Lab Sample IDs: 2245864

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A105310
Included Lab Sample IDs: 2245864

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	97.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105429
Included Lab Sample IDs: 2245864

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	98.3	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A105458
Included Lab Sample IDs: 2245863

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	96.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105465
Included Lab Sample IDs: 2245864

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.8	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A105504
Included Lab Sample IDs: 2245864

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A105518
Included Lab Sample IDs: 2245872, 2245873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	101	103	P/P	90 - 110
Aluminum	104	101	P/P	90 - 110
Antimony	102	103	P/P	90 - 110
Antimony	103	102	P/P	90 - 110
Arsenic	102	102	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Beryllium	98.8	98.3	P/P	90 - 110
Beryllium	99.3	98.8	P/P	90 - 110
Boron	100	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A105518
Included Lab Sample IDs: 2245872, 2245873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	103	100	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Cadmium	102	104	P/P	90 - 110
Chromium	97.6	99.3	P/P	90 - 110
Chromium	98.1	97.6	P/P	90 - 110
Copper	101	99.3	P/P	90 - 110
Copper	99.3	100	P/P	90 - 110
Nickel	101	99.1	P/P	90 - 110
Nickel	99.1	100	P/P	90 - 110
Silver	98.9	99.2	P/P	90 - 110
Silver	99.2	99.4	P/P	90 - 110
Thallium	96.9	98.4	P/P	90 - 110
Thallium	97.1	96.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A105539
Included Lab Sample IDs: 2245872, 2245873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	105	101	P/P	95 - 105
Calcium	100	103	P/P	95 - 105
Iron	99.3	101	P/P	95 - 105
Magnesium	99.0	100	P/P	95 - 105
Manganese	104	99.9	P/P	95 - 105
Potassium	99.5	99.7	P/P	95 - 105
Sodium	100	101	P/P	95 - 105
Zinc	102	98.1	P/P	95 - 105

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A105541
Included Lab Sample IDs: 2245872, 2245873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	91.4	91.6	P/P	90 - 110
Lead	91.6	91.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A105550
Included Lab Sample IDs: 2245863

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A105578
Included Lab Sample IDs: 2245872, 2245873

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Selenium	94.3	97.1	P/P	90 - 110
Selenium	95.2	94.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-2011
Run ID: A105626
Included Lab Sample IDs: 2245863

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.1	98.6	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
EPA 200.7 Rev. 4.4	Barium	102	101	101	106			3.84
	Calcium	106	103	106	109			2.87
	Iron	102	105	104	108			3.30
	Magnesium	102	105	103	107			3.60
	Manganese	104	104	103	107			3.53
	Potassium	97.4	98.3	97.3	102			3.59
	Sodium	101	101	100	105			2.56
	Zinc	102	103	100	104			3.83
EPA 200.8 Rev. 5.4	Aluminum	97.3	97.2	97.0	95.8			0.157
	Antimony	101	100	99.6	101			0.474
	Arsenic	98.8	97.1	97.7	97.3			0.654
	Beryllium	93.0	87.4	86.5	89.8			0.742
	Boron	98.6	98.2	97.6	96.3			0.593
	Cadmium	101	102	102	101			0.401
	Chromium	96.9	95.5	95.9	96.1			0.469
	Copper	99.8	100	101	99.9			0.187
	Lead	90.7	90.0	89.8	89.3			0.169
	Nickel	98.0	96.4	97.6	95.7			1.10
	Selenium	95.5	95.5	95.2	91.7			0.254
	Silver	99.7	97.2	93.8	99.2			3.54
	Thallium	103	101	101	102			0.500
EPA 300.0 Rev. 2.1	Chloride	102	98.6	103			0.648	
	Sulfate	101	101	103			0.146	
EPA 350.1 Rev. 2.0	Ammonia-N	99.4	96.2	96.6				0.375
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.2	106	102				2.63
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	101				0.496
EPA 365.1 Rev. 2.0	Total-P	104	108	107				0.990
SM 2320 B-2011	Total Alkalinity	99.0					0.454	
SM 2540 C-2011	TDS						10.8	
SM 4500 F-C-2011	Fluoride	94.7	94.5	98.7				0.951
SM 5310 B-2011	Organic Carbon	96.0	95.5	94.2				0.809

Reference Method Descriptions

Method	Description	Associated Samples
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2245872, 2245873
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2245872, 2245873
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2245863
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2245863
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2245864
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2245864
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2245864
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2245864
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2245863
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2245872, 2245873
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2245863
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2245863
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2245863
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2245864

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	05/06/2021	05/17/2021 14:45	Elliott D. Healy	05/19/2021 12:54	Betina Topolski	2245872
	05/06/2021	05/17/2021 14:45	Elliott D. Healy	05/19/2021 12:59	Betina Topolski	2245873
EPA 200.8 Rev. 5.4	05/06/2021	05/17/2021 14:45	Elliott D. Healy	05/18/2021 17:27	McKinley C Carter	2245872
	05/06/2021	05/17/2021 14:45	Elliott D. Healy	05/18/2021 18:26	McKinley C Carter	2245873
	05/06/2021	05/17/2021 14:45	Elliott D. Healy	05/19/2021 17:18	Alexander Thompson	2245872
	05/06/2021	05/17/2021 14:45	Elliott D. Healy	05/19/2021 18:10	Alexander Thompson	2245873
	05/06/2021	05/17/2021 14:45	Elliott D. Healy	05/20/2021 17:09	Alexander Thompson	2245872
	05/06/2021	05/17/2021 14:45	Elliott D. Healy	05/20/2021 17:55	Alexander Thompson	2245873
EPA 300.0 Rev. 2.1	05/06/2021			05/21/2021 04:38	Lipi Saha	2245863
EPA 350.1 Rev. 2.0	05/06/2021			05/14/2021 12:43	Roberta Tatti	2245864
EPA 351.2 Rev. 2.0	05/06/2021	05/13/2021 14:43	Benjamin T. Nordmann	05/17/2021 12:22	Virginia P. Brown	2245864
EPA 353.2 Rev. 2.0	05/06/2021			05/10/2021 10:05	Beverly Y. Sanders	2245864
EPA 365.1 Rev. 2.0	05/06/2021	05/17/2021 13:26	Yen Ta	05/18/2021 14:25	Shengyu Ding	2245864
SM 2320 B-2011	05/06/2021			05/14/2021 03:05	Dale L. Simmons	2245863
SM 2340B	05/06/2021			05/19/2021 12:54	Betina Topolski	2245872
	05/06/2021			05/19/2021 12:59	Betina Topolski	2245873
SM 2540 C-2011	05/06/2021			05/11/2021 10:20	Yijie Li	2245863
SM 2540 D-2011	05/06/2021			05/11/2021 10:20	Yijie Li	2245863
SM 4500 F-C-2011	05/06/2021			05/24/2021 15:30	Dale L. Simmons	2245863
SM 5310 B-2011	05/06/2021			05/11/2021 01:12	Madeline Gruver	2245864