Chemical Analysis Report

NW-DIST-2021-05-27-02

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

Event Description: **Eglin West Run**
Request ID: **RQ-2021-05-24-34**
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
Colin Wright, Ph.D.
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Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 18-JUN-2021 11:31

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: Juniper Creek Upstream of Eglin Rd. 221 **Collection Date/Time: 05/25/2021 10:20**

Field ID: G3NW0170 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2250718	EPA 180.1 Rev. 2.0	Turbidity	1.1	Q	NTU	P398943	
	EPA 300.0 Rev. 2.1	Chloride	2.3		mg Cl/L	P399476	
		Sulfate	0.71		mg SO4/L	P399479	
	SM 2120 B-2011	Color (true)	6.6	Q	PCU	P398933	
	SM 2320 B-2011	Total Alkalinity	1.4	I	mg CaCO3/L	P399026	
	SM 2540 C-2011	TDS	18	I	mg/L	P399519	
	SM 2540 D-2011	TSS	2	I	mg/L	P399105	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P399028	
2250719	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P399371	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P399037	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P398985	
	EPA 365.1 Rev. 2.0	Total-P	0.003	I	mg P/L	P399032	
	SM 5310 B-2011	Organic Carbon	0.76	I	mg C/L	P399096	
2250720	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	UQ	mg P/L	P398939	
2250726	EPA 200.7 Rev. 4.4	Barium	8.1		ug/L	P398941	
		Calcium	0.51		mg/L	P398941	
		Iron	30	U	ug/L	P398941	
		Magnesium	0.35		mg/L	P398941	
		Manganese	2.8	I	ug/L	P398941	
		Potassium	0.30	U	mg/L	P398941	
		Sodium	1.8	I	mg/L	P398941	
		Zinc	5.0	U	ug/L	P398941	
	EPA 200.8 Rev. 5.4	Aluminum	52		ug/L	P398941	
		Antimony	0.050	U	ug/L	P398941	
		Arsenic	0.050	U	ug/L	P398941	
		Beryllium	0.010	U	ug/L	P398941	
		Boron**	6.6	I	ug/L	P398941	
		Cadmium	0.020	U	ug/L	P398941	
		Chromium	0.40	U	ug/L	P398941	
		Copper	0.40	U	ug/L	P398941	
		Lead	0.20	U	ug/L	P398941	
		Nickel	0.50	U	ug/L	P398941	
		Selenium	0.20	U	ug/L	P398941	
		Silver	0.010	U	ug/L	P398941	
		Thallium	0.10	U	ug/L	P398941	
	SM 2340B	Hardness	2.73		mg/L	P398941	

Ref. Method and Comment:
EPA 180.1 Rev. 2.0: The sample expired upon receipt.
SM 2120 B-2011: The sample expired upon receipt.
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.

Non-Conformance Report

NCR ID: 8860

Event(s)	Job(s)	Sample(s)	Test(s)
NW-DIST-2021-05-27-02			

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

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

Resolution: Samples will be qualified as appropriate.

Authorized by/Date: Joshua Ayres 6/3/2021

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 180.1 Rev. 2.0
Batch ID: P398943

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P398941

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: P398941

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: P399476

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399479

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399371

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P399037

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398985

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399032

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398939

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B-2011
Batch ID: P398933

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P399026

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

Reference Method: SM 2540 C-2011
Batch ID: P399519

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P399105

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P399028

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P399096

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: P398941

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	100		P	85 - 115
Calcium	110		P	85 - 115
Iron	108		P	85 - 115
Magnesium	109		P	85 - 115
Manganese	103		P	85 - 115
Potassium	103		P	85 - 115
Sodium	110		P	85 - 115
Zinc	97.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P398941

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.5		P	85 - 115
Antimony	99.4		P	85 - 115
Arsenic	97.6		P	85 - 115
Beryllium	101		P	85 - 115
Boron	96.9		P	85 - 115
Cadmium	98.1		P	85 - 115
Chromium	94.3		P	85 - 115
Copper	96.0		P	85 - 115
Lead	106		P	85 - 115
Nickel	96.3		P	85 - 115
Selenium	95.2		P	85 - 115
Silver	98.2		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399476

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399479

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399371

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P399037

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398985

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399032

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398939

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

Reference Method: SM 2120 B-2011
Batch ID: P398933

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.2		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P399026

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

Reference Method: SM 4500 F-C-2011
Batch ID: P399028

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.2		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P399096

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P398941

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2249958	Barium	98.7		P	80 - 120
2249958	Calcium	100		P	80 - 120
2249958	Iron	103		P	80 - 120
2249958	Magnesium	104		P	80 - 120
2249958	Manganese	99.9		P	80 - 120
2249958	Potassium	93.9		P	80 - 120
2249958	Sodium	92.6		P	80 - 120
2249958	Zinc	95.2		P	80 - 120
2250726	Barium	97.6	92.9	P/P	80 - 120
2250726	Calcium	105	100	P/P	80 - 120
2250726	Iron	105	101	P/P	80 - 120
2250726	Magnesium	106	102	P/P	80 - 120
2250726	Manganese	98.7	94.1	P/P	80 - 120
2250726	Potassium	99.8	95.2	P/P	80 - 120
2250726	Sodium	101	95.3	P/P	80 - 120
2250726	Zinc	93.3	89.0	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P398941

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2249958	Aluminum	83.3		P	80 - 120
2249958	Antimony	94.4		P	80 - 120
2249958	Arsenic	94.5		P	80 - 120
2249958	Beryllium	100		P	80 - 120
2249958	Boron	97.5		P	80 - 120
2249958	Cadmium	97.7		P	80 - 120
2249958	Chromium	93.2		P	80 - 120
2249958	Copper	96.4		P	80 - 120
2249958	Lead	106		P	80 - 120
2249958	Nickel	94.0		P	80 - 120
2249958	Selenium	93.3		P	80 - 120
2249958	Silver	96.8		P	80 - 120
2249958	Thallium	103		P	80 - 120
2250726	Aluminum	96.1	94.8	P/P	80 - 120
2250726	Antimony	99.8	97.1	P/P	80 - 120
2250726	Arsenic	99.6	96.7	P/P	80 - 120
2250726	Beryllium	99.8	100	P/P	80 - 120
2250726	Boron	99.4	96.4	P/P	80 - 120
2250726	Cadmium	101	99.7	P/P	80 - 120
2250726	Chromium	97.1	94.6	P/P	80 - 120
2250726	Copper	99.2	96.1	P/P	80 - 120
2250726	Lead	107	107	P/P	80 - 120
2250726	Nickel	97.8	95.4	P/P	80 - 120
2250726	Selenium	97.6	95.0	P/P	80 - 120
2250726	Silver	99.7	97.6	P/P	80 - 120
2250726	Thallium	104	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399476

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: P399476

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2250461	Chloride	92.8		P	90 - 110
2250718	Chloride	97.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399479

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2250461	Sulfate	91.8		P	90 - 110
2250718	Sulfate	94.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399371

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2250594	Ammonia-N	96.2	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P399037

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2250597	Kjeldahl Nitrogen	94.4	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398985

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2250659	NO2NO3-N	99.4	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399032

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2249753	Total-P	102	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398939

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2250720	O-Phosphate-P	101	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P399028

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2250731	Fluoride	97.9	96.9	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P399096

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2251053	Organic Carbon	101	101	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P398943

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250593	Turbidity	3.25	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P398941

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250726	Barium	4.78	Spike	P	0 - 20
2250726	Calcium	3.99	Spike	P	0 - 20
2250726	Iron	3.68	Spike	P	0 - 20
2250726	Magnesium	3.97	Spike	P	0 - 20
2250726	Manganese	4.75	Spike	P	0 - 20
2250726	Potassium	4.77	Spike	P	0 - 20
2250726	Sodium	4.07	Spike	P	0 - 20
2250726	Zinc	4.82	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P398941

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250726	Aluminum	1.24	Spike	P	0 - 20
2250726	Antimony	2.74	Spike	P	0 - 20
2250726	Arsenic	2.97	Spike	P	0 - 20
2250726	Beryllium	0.630	Spike	P	0 - 20
2250726	Boron	2.91	Spike	P	0 - 20
2250726	Cadmium	1.21	Spike	P	0 - 20
2250726	Chromium	2.68	Spike	P	0 - 20
2250726	Copper	3.16	Spike	P	0 - 20
2250726	Lead	0.770	Spike	P	0 - 20
2250726	Nickel	2.46	Spike	P	0 - 20
2250726	Selenium	2.76	Spike	P	0 - 20
2250726	Silver	2.13	Spike	P	0 - 20
2250726	Thallium	1.75	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399476

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250461	Chloride	0.637	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P399479

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250461	Sulfate	1.61	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P399371

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250594	Ammonia-N	2.77	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P399037

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250597	Kjeldahl Nitrogen	8.25	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250659	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P399032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2249753	Total-P	1.16	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398939

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250720	O-Phosphate-P	0.992	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P398933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250657	Color (true)	1.02	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P399026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250731	Total Alkalinity	0.673	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P399519

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250731	TDS	4.29	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P399028

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2250731	Fluoride	0.929	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P399096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2251053	Organic Carbon	0.461	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B-2011
Run ID: A105738
Included Lab Sample IDs: 2250718

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.0	99.4	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A105742
Included Lab Sample IDs: 2250720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A105744
Included Lab Sample IDs: 2250718

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A105761
Included Lab Sample IDs: 2250719

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

Reference Method: SM 2320 B-2011
Run ID: A105786
Included Lab Sample IDs: 2250718

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.7	93.1	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A105786
Included Lab Sample IDs: 2250718

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A105802
Included Lab Sample IDs: 2250726

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.2	97.7	P/P	90 - 110
Antimony	102	98.3	P/P	90 - 110
Arsenic	100	97.5	P/P	90 - 110
Boron	99.1	96.7	P/P	90 - 110
Cadmium	101	98.0	P/P	90 - 110
Chromium	96.5	94.6	P/P	90 - 110
Copper	96.1	95.6	P/P	90 - 110
Nickel	96.7	95.9	P/P	90 - 110
Selenium	101	99.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A105802
Included Lab Sample IDs: 2250726

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	97.3	95.5	P/P	90 - 110
Thallium	96.4	94.6	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A105818
Included Lab Sample IDs: 2250719

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.6	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105840
Included Lab Sample IDs: 2250719

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.2	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A105858
Included Lab Sample IDs: 2250719

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A105871
Included Lab Sample IDs: 2250726

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	103	P/P	90 - 110
Calcium	103	104	P/P	90 - 110
Iron	101	101	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Manganese	104	105	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	103	100	P/P	90 - 110
Zinc	95.0	96.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105942
Included Lab Sample IDs: 2250719

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A105956
Included Lab Sample IDs: 2250718

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.5	99.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A105956
Included Lab Sample IDs: 2250718

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	98.7	99.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A105975
Included Lab Sample IDs: 2250726

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Beryllium	101	95.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A106003
Included Lab Sample IDs: 2250726

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	104	102	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 180.1 Rev. 2.0	Turbidity						3.25	
EPA 200.7 Rev. 4.4	Barium	100	98.7	97.6	92.9			4.78
	Calcium	110	100	105	100			3.99
	Iron	108	103	105	101			3.68
	Magnesium	109	104	106	102			3.97
	Manganese	103	99.9	98.7	94.1			4.75
	Potassium	103	93.9	99.8	95.2			4.77
	Sodium	110	92.6	101	95.3			4.07
	Zinc	97.0	95.2	93.3	89.0			4.82
EPA 200.8 Rev. 5.4	Aluminum	94.5	96.1	94.8	83.3			1.24
	Antimony	99.4	99.8	97.1	94.4			2.74
	Arsenic	97.6	99.6	96.7	94.5			2.97
	Beryllium	101	99.8	100	100			0.630
	Boron	96.9	99.4	96.4	97.5			2.91
	Cadmium	98.1	101	99.7	97.7			1.21
	Chromium	94.3	97.1	94.6	93.2			2.68
	Copper	96.0	99.2	96.1	96.4			3.16
	Lead	106	107	107	106			0.770
	Nickel	96.3	97.8	95.4	94.0			2.46
	Selenium	95.2	97.6	95.0	93.3			2.76
	Silver	98.2	99.7	97.6	96.8			2.13
	Thallium	103	104	102	103			1.75
EPA 300.0 Rev. 2.1	Chloride	97.3	92.8	97.2			0.637	
	Sulfate	96.2	91.8	94.9			1.61	
EPA 350.1 Rev. 2.0	Ammonia-N	98.8	96.2	99.4				2.77
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	94.4	108				8.25
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.4	99.4				0.0
EPA 365.1 Rev. 2.0	Total-P	106	102	104				1.16
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	101	100				0.992
SM 2120 B-2011	Color (true)	98.2					1.02	
SM 2320 B-2011	Total Alkalinity	101					0.673	
SM 2540 C-2011	TDS						4.29	
SM 4500 F-C-2011	Fluoride	99.2	97.9	96.9				0.929
SM 5310 B-2011	Organic Carbon	97.6	101	101				0.461

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2250718
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2250726
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2250726
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2250718
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2250718
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2250719
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2250719
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2250719
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2250719
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2250720
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2250718
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2250718

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2250726
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2250718
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2250718
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2250718
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2250719

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	05/27/2021			05/27/2021 15:49	Yen Ta	2250718
EPA 200.7 Rev. 4.4	05/27/2021	05/27/2021 17:00	Elliott D. Healy	06/03/2021 15:58	Josef B Mick	2250726
EPA 200.8 Rev. 5.4	05/27/2021	05/27/2021 17:00	Elliott D. Healy	06/01/2021 17:03	McKinley C Carter	2250726
	05/27/2021	05/27/2021 17:00	Elliott D. Healy	06/09/2021 19:24	Alexander Thompson	2250726
	05/27/2021	05/27/2021 17:00	Elliott D. Healy	06/10/2021 12:54	Alexander Thompson	2250726
EPA 300.0 Rev. 2.1	05/27/2021			06/09/2021 11:53	Lipi Saha	2250718
EPA 350.1 Rev. 2.0	05/27/2021			06/08/2021 13:41	Roberta Tatti	2250719
EPA 351.2 Rev. 2.0	05/27/2021	06/01/2021 13:29	Benjamin T. Nordmann	06/02/2021 16:40	Virginia P. Brown	2250719
EPA 353.2 Rev. 2.0	05/27/2021			05/28/2021 10:40	Beverly Y. Sanders	2250719
EPA 365.1 Rev. 2.0	05/27/2021	06/01/2021 13:09	Yen Ta	06/03/2021 15:59	Shengyu Ding	2250719
EPA 365.1 Rev. 2.0 dissolved	05/27/2021			05/27/2021 15:41	Blanca Fach	2250720
SM 2120 B-2011	05/27/2021			05/27/2021 15:17	Sarah A Nixon	2250718
SM 2320 B-2011	05/27/2021			05/28/2021 23:11	Dale L. Simmons	2250718
SM 2340B	05/27/2021			06/03/2021 15:58	Josef B Mick	2250726
SM 2540 C-2011	05/27/2021			06/01/2021 10:01	Yijie Li	2250718
SM 2540 D-2011	05/27/2021			06/01/2021 10:01	Yijie Li	2250718
SM 4500 F-C-2011	05/27/2021			05/28/2021 23:11	Dale L. Simmons	2250718
SM 5310 B-2011	05/27/2021			06/02/2021 04:08	Madeline Gruver	2250719