

Chemical Analysis Report

NE-DIST-2021-03-17-01

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

Event Description: **Nassau West 2**
Request ID: **RQ-2021-03-15-16**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 06-APR-2021 11:54

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular background.

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: St. Marys S Prong @ US 90

Collection Date/Time: 03/16/2021 10:55

Field ID: 19010021

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2231989	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P395105	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P395299	
		Sulfate	0.73		mg SO4/L	P395303	
		Color (true)	330		PCU	P395109	
	SM 2120 B-2011	Total Alkalinity	2.0	I	mg CaCO3/L	P395227	
	SM 2540 C-2011	TDS	84		mg/L	P395592	
	SM 2540 D-2011	TSS	2	I	mg/L	P395600	
	SM 4500 F-C-2011	Fluoride	0.046	I	mg F/L	P395233	
2231990	EPA 350.1 Rev. 2.0	Ammonia-N	0.037		mg N/L	P395449	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.98		mg N/L	P395415	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.078		mg N/L	P395127	
	EPA 365.1 Rev. 2.0	Total-P	0.070		mg P/L	P395481	
	SM 5310 B-2011	Organic Carbon	33		mg C/L	P395580	
2231991	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.049		mg P/L	P395132	
2232006	EPA 200.7 Rev. 4.4	Barium	20.7		ug/L	P395098	
		Calcium	3.99		mg/L	P395098	
		Iron	970		ug/L	P395098	
		Magnesium	1.39		mg/L	P395098	
		Potassium	0.66	I	mg/L	P395098	
		Sodium	6.5		mg/L	P395098	
		Zinc	5.9	I	ug/L	P395098	
	EPA 200.8 Rev. 5.4	Aluminum	653		ug/L	P395098	
		Antimony	0.050	U	ug/L	P395098	
		Arsenic	0.40		ug/L	P395098	
		Boron**	19.9		ug/L	P395098	
		Cadmium	0.020	U	ug/L	P395098	
		Chromium	0.78	I	ug/L	P395098	
		Copper	0.46	I	ug/L	P395098	
		Lead	0.69		ug/L	P395098	
		Nickel	0.69	I	ug/L	P395098	
		Selenium	0.20	U	ug/L	P395098	
		Silver	0.010	U	ug/L	P395098	
		Thallium	0.10	U	ug/L	P395098	
		Hardness	15.7		mg/L	P395098	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 03/24/2021.

Sample Location: Deep CR @ US 90

Collection Date/Time: 03/16/2021 12:40

Field ID: 19010085

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2231992	EPA 180.1 Rev. 2.0	Turbidity	12	A	NTU	P395106	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P395299	
		Sulfate	5.2		mg SO4/L	P395303	
		Color (true)	430		PCU	P395109	
	SM 2320 B-2011	Total Alkalinity	21		mg CaCO3/L	P395227	
	SM 2540 C-2011	TDS	91		mg/L	P395592	
	SM 2540 D-2011	TSS	4	I	mg/L	P395600	
	SM 4500 F-C-2011	Fluoride	0.062	I	mg F/L	P395233	
2231993	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P395449	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P395415	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.088		mg N/L	P395127	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P395481	
	SM 5310 B-2011	Organic Carbon	32		mg C/L	P395580	
2231994	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.087		mg P/L	P395132	
2232007	EPA 200.7 Rev. 4.4	Barium	19.5		ug/L	P395098	
		Calcium	9.93		mg/L	P395098	
		Iron	1.52E+03		ug/L	P395098	
		Magnesium	2.28		mg/L	P395098	
		Potassium	1.6		mg/L	P395098	
		Sodium	9.9		mg/L	P395098	
		Zinc	11	I	ug/L	P395098	
	EPA 200.8 Rev. 5.4	Aluminum	621		ug/L	P395098	
		Antimony	0.10	I	ug/L	P395098	
		Arsenic	0.55		ug/L	P395098	
		Boron**	35.2		ug/L	P395098	
		Cadmium	0.020	U	ug/L	P395098	
		Chromium	1.4	I	ug/L	P395098	
		Copper	0.89		ug/L	P395098	
		Lead	1.20		ug/L	P395098	
		Nickel	0.96	I	ug/L	P395098	
		Selenium	0.20	U	ug/L	P395098	
		Silver	0.010	U	ug/L	P395098	
		Thallium	0.10	U	ug/L	P395098	
	SM 2340B	Hardness	34.2		mg/L	P395098	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 03/24/2021.

Sample Location: South Prong St. Mays at Richardson Rd.

Collection Date/Time: 03/16/2021 10:10

Field ID: G4NE0307

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2232008	EPA 200.7 Rev. 4.4	Barium	17.4		ug/L	P395098	
		Calcium	2.46		mg/L	P395098	
		Iron	920		ug/L	P395098	
		Magnesium	0.95		mg/L	P395098	
		Manganese	17.7		ug/L	P395098	
		Potassium	0.30	U	mg/L	P395098	
		Sodium	5.2		mg/L	P395098	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P395098	
		Aluminum	653		ug/L	P395098	
		Antimony	0.050	U	ug/L	P395098	
		Arsenic	0.29		ug/L	P395098	
		Beryllium	0.041		ug/L	P395098	
		Boron**	16.9		ug/L	P395098	
		Cadmium	0.020	U	ug/L	P395098	
		Chromium	0.66	I	ug/L	P395098	
		Copper	0.40	U	ug/L	P395098	
		Lead	0.50		ug/L	P395098	
		Nickel	0.68	I	ug/L	P395098	
		Selenium	0.20	U	ug/L	P395098	
		Silver	0.010	U	ug/L	P395098	
		Thallium	0.10	U	ug/L	P395098	
	SM 2340B	Hardness	10.1		mg/L	P395098	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 03/24/2021.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P395105

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P395106

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P395098

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: P395098

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: P395299

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395303

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395449

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395415

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395127

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395481

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395132

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

Reference Method: SM 2120 B-2011
Batch ID: P395109

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P395227

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

Reference Method: SM 2540 C-2011
Batch ID: P395592

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P395600

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P395233

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P395580

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: P395098

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	95.2		P	85 - 115
Calcium	101		P	85 - 115
Iron	100		P	85 - 115
Magnesium	98.1		P	85 - 115
Manganese	96.8		P	85 - 115
Potassium	97.6		P	85 - 115
Sodium	98.9		P	85 - 115
Zinc	92.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P395098

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	96.2		P	85 - 115
Antimony	99.6		P	85 - 115
Arsenic	99.4		P	85 - 115
Beryllium	91.7		P	85 - 115
Boron	96.2		P	85 - 115
Cadmium	98.1		P	85 - 115
Chromium	97.0		P	85 - 115
Copper	99.7		P	85 - 115
Lead	105		P	85 - 115
Nickel	98.1		P	85 - 115
Selenium	98.4		P	85 - 115
Silver	105		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395299

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395303

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395449

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395415

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395127

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: P395481

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395132

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.1		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P395109

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.9		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P395227

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.9		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P395233

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	103		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P395580

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P395098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231676	Barium	99.5		P	80 - 120
2231676	Calcium	90.3		P	80 - 120
2231676	Iron	107		P	80 - 120
2231676	Magnesium	87.0		P	80 - 120
2231676	Manganese	101		P	80 - 120
2231676	Zinc	101		P	80 - 120
2232092	Barium	99.4	103	P/P	80 - 120
2232092	Calcium	105	107	P/P	80 - 120
2232092	Iron	105	107	P/P	80 - 120
2232092	Magnesium	103	105	P/P	80 - 120
2232092	Manganese	99.7	103	P/P	80 - 120
2232092	Potassium	104	106	P/P	80 - 120
2232092	Sodium	103	106	P/P	80 - 120
2232092	Zinc	98.0	102	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P395098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231676	Aluminum	97.2		P	80 - 120
2231676	Antimony	105		P	80 - 120
2231676	Arsenic	106		P	80 - 120
2231676	Beryllium	87.1		P	80 - 120
2231676	Boron	99.5		P	80 - 120
2231676	Cadmium	101		P	80 - 120
2231676	Chromium	98.6		P	80 - 120
2231676	Copper	98.3		P	80 - 120
2231676	Lead	108		P	80 - 120
2231676	Nickel	93.9		P	80 - 120
2231676	Selenium	99.2		P	80 - 120
2231676	Silver	99.4		P	80 - 120
2231676	Thallium	104		P	80 - 120
2232092	Aluminum	90.8	94.0	P/P	80 - 120
2232092	Antimony	99.3	99.7	P/P	80 - 120
2232092	Arsenic	97.1	99.2	P/P	80 - 120
2232092	Beryllium	92.3	94.4	P/P	80 - 120
2232092	Boron	94.5	96.8	P/P	80 - 120
2232092	Cadmium	99.1	97.8	P/P	80 - 120
2232092	Chromium	95.9	97.2	P/P	80 - 120
2232092	Copper	98.8	99.1	P/P	80 - 120
2232092	Lead	105	106	P/P	80 - 120
2232092	Nickel	96.8	97.1	P/P	80 - 120
2232092	Selenium	94.5	96.6	P/P	80 - 120
2232092	Silver	105	105	P/P	80 - 120
2232092	Thallium	103	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P395299

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231861	Chloride	101		P	90 - 110
2231989	Chloride	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231861	Sulfate	96.7		P	90 - 110
2231989	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395449

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2232017	Ammonia-N	95.6	97.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395415

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231952	Kjeldahl Nitrogen	103	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395127

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231913	NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395481

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231962	Total-P	106	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395132

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231991	O-Phosphate-P	96.4	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P395233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2232044	Fluoride	101	102	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P395580

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2232047	Organic Carbon	96.7	96.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P395105

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231882	Turbidity	14.7	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P395106

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231992	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P395098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232092	Barium	3.82	Spike	P	0 - 20
2232092	Calcium	1.87	Spike	P	0 - 20
2232092	Iron	2.29	Spike	P	0 - 20
2232092	Magnesium	2.18	Spike	P	0 - 20
2232092	Manganese	3.34	Spike	P	0 - 20
2232092	Potassium	2.20	Spike	P	0 - 20
2232092	Sodium	1.84	Spike	P	0 - 20
2232092	Zinc	3.88	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P395098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232092	Aluminum	3.17	Spike	P	0 - 20
2232092	Antimony	0.398	Spike	P	0 - 20
2232092	Arsenic	2.08	Spike	P	0 - 20
2232092	Beryllium	2.20	Spike	P	0 - 20
2232092	Boron	2.18	Spike	P	0 - 20
2232092	Cadmium	1.39	Spike	P	0 - 20
2232092	Chromium	1.35	Spike	P	0 - 20
2232092	Copper	0.344	Spike	P	0 - 20
2232092	Lead	0.506	Spike	P	0 - 20
2232092	Nickel	0.309	Spike	P	0 - 20
2232092	Selenium	2.12	Spike	P	0 - 20
2232092	Silver	0.442	Spike	P	0 - 20
2232092	Thallium	2.07	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395299

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231861	Chloride	0.710	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P395303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231861	Sulfate	0.845	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395449

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232017	Ammonia-N	1.75	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395415

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231952	Kjeldahl Nitrogen	2.16	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395127

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231913	NO2NO3-N	0.504	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395481

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231962	Total-P	1.48	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395132

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231991	O-Phosphate-P	1.10	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P395109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232044	Color (true)	1.07	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P395227

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232044	Total Alkalinity	0.136	Sample	P	0 - 8.1

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P395592

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231901	TDS	2.58	Sample	P	0 - 10

Reference Method: SM 2540 D-2011
Batch ID: P395600

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231901	TSS	6.25	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P395233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232044	Fluoride	0.462	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P395580

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232047	Organic Carbon	0.164	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A104110

Included Lab Sample IDs: 2231989, 2231992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105
Turbidity	101	102	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A104111

Included Lab Sample IDs: 2231989, 2231992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.0	100	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A104129

Included Lab Sample IDs: 2231990, 2231993

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A104131

Included Lab Sample IDs: 2231991, 2231994

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.1	96.4	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A104153

Included Lab Sample IDs: 2231989, 2231992

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

Reference Method: SM 2320 B-2011

Run ID: A104172

Included Lab Sample IDs: 2231989, 2231992

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.9	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A104172

Included Lab Sample IDs: 2231989, 2231992

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A104188

Included Lab Sample IDs: 2232006, 2232007, 2232008

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.3	96.4	P/P	90 - 110
Antimony	98.7	95.9	P/P	90 - 110
Arsenic	98.9	96.9	P/P	90 - 110
Beryllium	94.3	91.1	P/P	90 - 110
Boron	109	96.9	P/P	90 - 110
Cadmium	99.8	97.4	P/P	90 - 110
Chromium	95.6	91.9	P/P	90 - 110
Copper	96.8	93.7	P/P	90 - 110
Lead	108	106	P/P	90 - 110
Nickel	96.6	93.7	P/P	90 - 110
Selenium	98.9	96.8	P/P	90 - 110
Silver	101	98.9	P/P	90 - 110
Thallium	102	99.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A104231

Included Lab Sample IDs: 2232006, 2232007, 2232008

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	102	P/P	90 - 110
Barium	98.4	100	P/P	90 - 110
Calcium	102	103	P/P	90 - 110
Calcium	103	103	P/P	90 - 110
Iron	104	104	P/P	90 - 110
Iron	104	105	P/P	90 - 110
Magnesium	100	101	P/P	90 - 110
Magnesium	99.6	100	P/P	90 - 110
Manganese	101	103	P/P	90 - 110
Potassium	104	104	P/P	90 - 110
Potassium	104	105	P/P	90 - 110
Sodium	100	101	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Zinc	100	102	P/P	90 - 110
Zinc	102	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A104259

Included Lab Sample IDs: 2231990, 2231993

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.8	97.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A104295

Included Lab Sample IDs: 2231990, 2231993

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.1	94.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A104299

Included Lab Sample IDs: 2231990, 2231993

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

Reference Method: SM 5310 B-2011

Run ID: A104316

Included Lab Sample IDs: 2231990, 2231993

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.4	96.9	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	
						LCS	MS
EPA 180.1 Rev. 2.0	Turbidity					14.7	
	Turbidity					0.0	
EPA 200.7 Rev. 4.4	Barium	95.2	99.5	99.4	103		3.82
	Calcium	101	90.3	105	107		1.87
	Iron	100	107	105	107		2.29
	Magnesium	98.1	87.0	103	105		2.18
	Manganese	96.8	101	99.7	103		3.34
	Potassium	97.6	104	106			2.20
	Sodium	98.9	103	106			1.84
	Zinc	92.6	101	98.0	102		3.88
EPA 200.8 Rev. 5.4	Aluminum	96.2	90.8	94.0	97.2		3.17
	Antimony	99.6	99.3	99.7	105		0.398
	Arsenic	99.4	97.1	99.2	106		2.08
	Beryllium	91.7	92.3	94.4	87.1		2.20
	Boron	96.2	94.5	96.8	99.5		2.18
	Cadmium	98.1	99.1	97.8	101		1.39
	Chromium	97.0	95.9	97.2	98.6		1.35
	Copper	99.7	98.8	99.1	98.3		0.344
	Lead	105	105	106	108		0.506
	Nickel	98.1	96.8	97.1	93.9		0.309
	Selenium	98.4	94.5	96.6	99.2		2.12
	Silver	105	105	105	99.4		0.442
	Thallium	102	103	105	104		2.07
	Chloride	101	101	101		0.710	
	Sulfate	99.8	96.7	100		0.845	
EPA 300.0 Rev. 2.1	Ammonia-N	98.6	95.6	97.4			1.75
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.5	103	100			2.16
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	99.0	99.5			0.504
EPA 365.1 Rev. 2.0	Total-P	105	106	104			1.48
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	96.4	98.0			1.10
SM 2120 B-2011	Color (true)	98.9				1.07	
SM 2320 B-2011	Total Alkalinity	99.9				0.136	
SM 2540 C-2011	TDS					2.58	
SM 2540 D-2011	TSS					6.25	
SM 4500 F-C-2011	Fluoride	103	101	102			0.462
SM 5310 B-2011	Organic Carbon	95.2	96.7	96.4			0.164

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2231989, 2231992
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2232006, 2232007, 2232008
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2232006, 2232007, 2232008
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2231989, 2231992
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2231989, 2231992
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2231990, 2231993
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2231990, 2231993
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2231990, 2231993
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2231990, 2231993
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2231991, 2231994

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2231989, 2231992
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2231989, 2231992
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2232006, 2232007, 2232008
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2231989, 2231992
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2231989, 2231992
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2231989, 2231992
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2231990, 2231993

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	03/17/2021			03/17/2021 15:32	Yen Ta	2231989, 2231992
EPA 200.7 Rev. 4.4	03/17/2021	03/17/2021 16:35	Elliott D. Healy	03/23/2021 15:36	Betina Topolski	2232006
	03/17/2021	03/17/2021 16:35	Elliott D. Healy	03/23/2021 15:41	Betina Topolski	2232007
	03/17/2021	03/17/2021 16:35	Elliott D. Healy	03/23/2021 16:06	Betina Topolski	2232008
EPA 200.8 Rev. 5.4	03/17/2021	03/17/2021 16:35	Elliott D. Healy	03/19/2021 19:31	McKinley C Carter	2232006
	03/17/2021	03/17/2021 16:35	Elliott D. Healy	03/19/2021 19:39	McKinley C Carter	2232007
	03/17/2021	03/17/2021 16:35	Elliott D. Healy	03/19/2021 19:46	McKinley C Carter	2232008
EPA 300.0 Rev. 2.1	03/17/2021			03/20/2021 02:14	Lipi Saha	2231989
	03/17/2021			03/20/2021 05:04	Lipi Saha	2231992
EPA 350.1 Rev. 2.0	03/17/2021			03/24/2021 17:42	Ping Hua	2231990
	03/17/2021			03/24/2021 17:43	Ping Hua	2231993
EPA 351.2 Rev. 2.0	03/17/2021	03/24/2021 12:15	Benjamin T. Nordmann	03/25/2021 19:26	Julia Storbeck	2231990
	03/17/2021	03/24/2021 12:15	Benjamin T. Nordmann	03/25/2021 19:28	Julia Storbeck	2231993
EPA 353.2 Rev. 2.0	03/17/2021			03/18/2021 09:28	Beverly Y. Sanders	2231990
	03/17/2021			03/18/2021 09:29	Beverly Y. Sanders	2231993
EPA 365.1 Rev. 2.0	03/17/2021	03/25/2021 12:45	Yen Ta	03/26/2021 13:12	Shengyu Ding	2231990
	03/17/2021	03/25/2021 12:45	Yen Ta	03/26/2021 13:13	Shengyu Ding	2231993
EPA 365.1 Rev. 2.0 dissolved	03/17/2021			03/17/2021 19:58	Patrick M. Roche	2231991
	03/17/2021			03/17/2021 20:01	Patrick M. Roche	2231994
SM 2120 B-2011	03/17/2021			03/17/2021 17:09	Benjamin T. Nordmann	2231989
	03/17/2021			03/17/2021 17:10	Benjamin T. Nordmann	2231992
SM 2320 B-2011	03/17/2021			03/19/2021 07:16	Dale L. Simmons	2231989
	03/17/2021			03/19/2021 07:29	Dale L. Simmons	2231992
SM 2340B	03/17/2021			03/23/2021 15:36	Betina Topolski	2232006
	03/17/2021			03/23/2021 15:41	Betina Topolski	2232007
	03/17/2021			03/23/2021 16:06	Betina Topolski	2232008
SM 2540 C-2011	03/17/2021			03/19/2021 15:21	Yijie Li	2231989, 2231992
SM 2540 D-2011	03/17/2021			03/19/2021 15:21	Yijie Li	2231989, 2231992
SM 4500 F-C-2011	03/17/2021			03/19/2021 07:16	Dale L. Simmons	2231989
	03/17/2021			03/19/2021 07:29	Dale L. Simmons	2231992
SM 5310 B-2011	03/17/2021			03/26/2021 21:37	Madeline Gruver	2231990
	03/17/2021			03/26/2021 21:48	Madeline Gruver	2231993