

Chemical Analysis Report

NE-DIST-2021-04-21-02

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

Event Description: **Nassau North Boat**
Request ID: **RQ-2021-04-05-31**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Suite 100
Jacksonville, FL 32256
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Certified by: Colin Wright, Program Administrator

Date Certified: 13-MAY-2021 09:07

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: Plummer Creek @ Second Island

Collection Date/Time: 04/20/2021 09:10

Field ID: G4NE0301

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2241304	EPA 180.1 Rev. 2.0	Turbidity	9.7		NTU	P396929	
	SM 2320 B-2011	Total Alkalinity	30		mg CaCO3/L	P397029	
	SM 2540 D-2011	TSS	14		mg/L	P397165	
	SM 4500 F-C-2011	Fluoride	0.094	I	mg F/L	P397030	
2241305	EPA 350.1 Rev. 2.0	Ammonia-N	0.029		mg N/L	P397511	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P397110	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.060		mg N/L	P397176	
	EPA 365.1 Rev. 2.0	Total-P	0.12	J	mg P/L	P397015	MS
	SM 5310 B-2011	Organic Carbon	26		mg C/L	P397240	
2241306	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.054		mg P/L	P396925	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0: Total-P: Refer to the Lab Analysis Report for an explanation of QC Codes.

Sample Location: SMR 3.2mi S Tracy Rd.

Collection Date/Time: 04/20/2021 10:45

Field ID: 19010157

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2241328	EPA 200.7 Rev. 4.4	Barium	19.4		ug/L	P397699	
		Calcium	5.24		mg/L	P397699	
		Iron	1.0E+03		ug/L	P397699	
		Magnesium	1.78		mg/L	P397699	
		Manganese	13.5		ug/L	P397699	
		Potassium	0.82	I	mg/L	P397699	
		Sodium	6.3		mg/L	P397699	
	EPA 200.8 Rev. 5.4	Zinc	5.3	I	ug/L	P397699	
		Aluminum	580		ug/L	P397699	
		Antimony	0.064	I	ug/L	P397699	
		Arsenic	0.42		ug/L	P397699	
		Beryllium	0.041		ug/L	P397699	
		Boron**	16.4		ug/L	P397699	
		Cadmium	0.020	U	ug/L	P397699	
		Chromium	0.74	I	ug/L	P397699	
		Copper	0.45	I	ug/L	P397699	
		Lead	0.63		ug/L	P397699	
		Nickel	0.58	I	ug/L	P397699	
		Selenium	0.20	U	ug/L	P397699	
		Silver	0.010	U	ug/L	P397699	
		Thallium	0.10	U	ug/L	P397699	
	SM 2340B	Hardness	20.4		mg/L	P397699	

Ref. Method and Comment:

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 05/11/2021.

Sample Location: SMR 0.3mi S Tracy Rd.

Collection Date/Time: 04/20/2021 11:00

Field ID: 19010156

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2241307	EPA 180.1 Rev. 2.0	Turbidity	6.7		NTU	P396929	
	EPA 300.0 Rev. 2.1	Chloride	9.7		mg Cl/L	P397124	
		Sulfate	2.3		mg SO4/L	P397127	
	SM 2120 B-2011	Color (true)	280		PCU	P396934	
	SM 2320 B-2011	Total Alkalinity	6.0		mg CaCO3/L	P397029	
	SM 2540 C-2011	TDS	104		mg/L	P397415	
	SM 2540 D-2011	TSS	6	I	mg/L	P397163	
	SM 4500 F-C-2011	Fluoride	0.048	I	mg F/L	P397030	
2241308	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P397511	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.81		mg N/L	P397110	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.067		mg N/L	P397177	
	EPA 365.1 Rev. 2.0	Total-P	0.048		mg P/L	P397015	MS
	SM 5310 B-2011	Organic Carbon	24		mg C/L	P397240	
2241309	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.022		mg P/L	P396925	
2241327	EPA 200.7 Rev. 4.4	Barium	19.4		ug/L	P397699	
		Calcium	5.39		mg/L	P397699	
		Iron	950		ug/L	P397699	
		Magnesium	1.80		mg/L	P397699	
		Manganese	12.7		ug/L	P397699	
		Potassium	0.69	I	mg/L	P397699	
		Sodium	6.3		mg/L	P397699	
	EPA 200.8 Rev. 5.4	Zinc	6.0	I	ug/L	P397699	
		Aluminum	523		ug/L	P397699	
		Antimony	0.057	I	ug/L	P397699	
		Arsenic	0.42		ug/L	P397699	
		Beryllium	0.040	I	ug/L	P397699	
		Boron**	17.2		ug/L	P397699	
		Cadmium	0.020	U	ug/L	P397699	
		Chromium	0.71	I	ug/L	P397699	
		Copper	0.40	I	ug/L	P397699	
		Lead	0.58		ug/L	P397699	
		Nickel	0.63	I	ug/L	P397699	
		Selenium	0.20	U	ug/L	P397699	
		Silver	0.010	U	ug/L	P397699	
		Thallium	0.10	U	ug/L	P397699	
		Hardness	20.9		mg/L	P397699	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 05/11/2021.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P396929

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P397699

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: P397699

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: P397124

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P397127

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397511

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: P397110

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397176

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397177

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397015

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396925

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

Reference Method: SM 2120 B-2011
Batch ID: P396934

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P397029

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

Reference Method: SM 2540 C-2011
Batch ID: P397415

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P397163

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P397165

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P397030

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P397240

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: P397699

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	109		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Manganese	104		P	85 - 115
Potassium	104		P	85 - 115
Sodium	110		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P397699

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	90.1		P	85 - 115
Antimony	99.2		P	85 - 115
Arsenic	91.4		P	85 - 115
Beryllium	91.9		P	85 - 115
Boron	94.9		P	85 - 115
Cadmium	92.5		P	85 - 115
Chromium	90.9		P	85 - 115
Copper	91.2		P	85 - 115
Lead	98.1		P	85 - 115
Nickel	89.3		P	85 - 115
Selenium	91.8		P	85 - 115
Silver	95.7		P	85 - 115
Thallium	100		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P397124

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P397127

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397511

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: P397110

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397176

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397177

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: P397015

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396925

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P396934

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P397029

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P397030

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P397240

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.3		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P397699

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241376	Barium	100	101	P/P	80 - 120
2241376	Calcium	107	107	P/P	80 - 120
2241376	Iron	106	106	P/P	80 - 120
2241376	Magnesium	105	105	P/P	80 - 120
2241376	Manganese	102	103	P/P	80 - 120
2241376	Potassium	105	107	P/P	80 - 120
2241376	Sodium	107	106	P/P	80 - 120
2241376	Zinc	104	104	P/P	80 - 120
2241409	Barium	102		P	80 - 120
2241409	Calcium	105		P	80 - 120
2241409	Iron	105		P	80 - 120
2241409	Magnesium	104		P	80 - 120
2241409	Manganese	105		P	80 - 120
2241409	Potassium	105		P	80 - 120
2241409	Sodium	106		P	80 - 120
2241409	Zinc	107		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P397699

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241376	Aluminum	100	97.6	P/P	80 - 120
2241376	Antimony	103	104	P/P	80 - 120
2241376	Arsenic	97.4	98.0	P/P	80 - 120
2241376	Beryllium	94.5	92.3	P/P	80 - 120
2241376	Boron	103	100	P/P	80 - 120
2241376	Cadmium	102	101	P/P	80 - 120
2241376	Chromium	100	100	P/P	80 - 120
2241376	Copper	99.3	100	P/P	80 - 120
2241376	Lead	109	103	P/P	80 - 120
2241376	Nickel	96.8	97.9	P/P	80 - 120
2241376	Selenium	99.8	97.4	P/P	80 - 120
2241376	Silver	99.1	99.2	P/P	80 - 120
2241376	Thallium	105	105	P/P	80 - 120
2241409	Aluminum	86.8		P	80 - 120
2241409	Antimony	103		P	80 - 120
2241409	Arsenic	98.1		P	80 - 120
2241409	Beryllium	90.4		P	80 - 120
2241409	Boron	102		P	80 - 120
2241409	Cadmium	105		P	80 - 120
2241409	Chromium	101		P	80 - 120
2241409	Copper	97.4		P	80 - 120
2241409	Lead	108		P	80 - 120
2241409	Nickel	98.6		P	80 - 120
2241409	Selenium	97.5		P	80 - 120
2241409	Silver	100		P	80 - 120
2241409	Thallium	105		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P397124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P397124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241184	Chloride	98.9		P	90 - 110
2241315	Chloride	99.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P397127

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241184	Sulfate	98.6		P	90 - 110
2241315	Sulfate	99.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397511

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241316	Ammonia-N	93.8	95.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397110

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241299	Kjeldahl Nitrogen	104	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397176

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241212	NO2NO3-N	99.8	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397177

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241318	NO2NO3-N	96.0	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397015

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241305	Total-P	111	109	F/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396925

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241300	O-Phosphate-P	97.0	96.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P397030

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241298	Fluoride	98.2	98.9	P/P	94 - 107

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P397240

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241209	Organic Carbon	98.5	98.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P396929

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241184	Turbidity	4.52	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P397699

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241376	Barium	0.483	Spike	P	0 - 20
2241376	Calcium	0.230	Spike	P	0 - 20
2241376	Iron	0.376	Spike	P	0 - 20
2241376	Magnesium	0.116	Spike	P	0 - 20
2241376	Manganese	0.406	Spike	P	0 - 20
2241376	Potassium	2.38	Spike	P	0 - 20
2241376	Sodium	0.739	Spike	P	0 - 20
2241376	Zinc	0.196	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P397699

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241376	Aluminum	2.29	Spike	P	0 - 20
2241376	Antimony	0.374	Spike	P	0 - 20
2241376	Arsenic	0.597	Spike	P	0 - 20
2241376	Beryllium	2.30	Spike	P	0 - 20
2241376	Boron	2.10	Spike	P	0 - 20
2241376	Cadmium	0.856	Spike	P	0 - 20
2241376	Chromium	0.113	Spike	P	0 - 20
2241376	Copper	0.979	Spike	P	0 - 20
2241376	Lead	5.85	Spike	P	0 - 20
2241376	Nickel	1.16	Spike	P	0 - 20
2241376	Selenium	2.39	Spike	P	0 - 20
2241376	Silver	0.0470	Spike	P	0 - 20
2241376	Thallium	0.684	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P397124

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241315	Chloride	0.530	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P397127

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241315	Sulfate	0.298	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397511

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241316	Ammonia-N	1.46	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397110

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241299	Kjeldahl Nitrogen	1.98	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397176

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241212	NO2NO3-N	1.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241318	NO2NO3-N	0.466	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397015

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241305	Total-P	1.65	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396925

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241300	O-Phosphate-P	0.477	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P396934

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241314	Color (true)	0.696	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P397029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241298	Total Alkalinity	0.205	Sample	P	0 - 8.1

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P397415

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241312	TDS	1.01	Sample	P	0 - 10

Reference Method: SM 2540 D-2011
Batch ID: P397165

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241567	TSS	8.96	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P397030

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241298	Fluoride	0.486	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P397240

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241209	Organic Carbon	0.107	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A104869

Included Lab Sample IDs: 2241307

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.9	99.6	P/P	90 - 110
Sulfate	98.0	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A104886

Included Lab Sample IDs: 2241306, 2241309

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A104887

Included Lab Sample IDs: 2241304, 2241307

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.5	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A104888

Included Lab Sample IDs: 2241307

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 115

Reference Method: SM 2320 B-2011

Run ID: A104923

Included Lab Sample IDs: 2241304, 2241307

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.5	99.3	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A104923

Included Lab Sample IDs: 2241304, 2241307

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A104942

Included Lab Sample IDs: 2241305

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A104993

Included Lab Sample IDs: 2241308

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A104995

Included Lab Sample IDs: 2241305, 2241308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110
NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A105018

Included Lab Sample IDs: 2241305, 2241308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.5	95.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A105021

Included Lab Sample IDs: 2241305, 2241308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	97.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A105117

Included Lab Sample IDs: 2241305, 2241308

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	97.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A105239

Included Lab Sample IDs: 2241327, 2241328

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	103	P/P	90 - 110
Calcium	102	103	P/P	90 - 110
Iron	102	104	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Manganese	103	103	P/P	90 - 110
Potassium	104	106	P/P	90 - 110
Sodium	104	106	P/P	90 - 110
Zinc	104	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105242

Included Lab Sample IDs: 2241327, 2241328

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	103	103	P/P	90 - 110
Aluminum	103	103	P/P	90 - 110
Antimony	104	105	P/P	90 - 110
Antimony	105	105	P/P	90 - 110
Arsenic	99.0	99.6	P/P	90 - 110
Arsenic	99.6	98.8	P/P	90 - 110
Beryllium	99.5	98.6	P/P	90 - 110
Beryllium	99.6	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105242

Included Lab Sample IDs: 2241327, 2241328

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	101	103	P/P	90 - 110
Boron	103	104	P/P	90 - 110
Cadmium	102	103	P/P	90 - 110
Cadmium	103	102	P/P	90 - 110
Chromium	102	101	P/P	90 - 110
Chromium	99.9	102	P/P	90 - 110
Copper	97.3	98.7	P/P	90 - 110
Copper	98.7	98.1	P/P	90 - 110
Nickel	97.9	99.2	P/P	90 - 110
Nickel	99.2	99.4	P/P	90 - 110
Selenium	101	103	P/P	90 - 110
Selenium	103	100	P/P	90 - 110
Silver	100	100	P/P	90 - 110
Silver	99.4	100	P/P	90 - 110
Thallium	101	102	P/P	90 - 110
Thallium	102	102	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105268

Included Lab Sample IDs: 2241327, 2241328

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	105	95.0	P/P	90 - 110
Lead	95.0	93.3	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			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						4.52	
EPA 200.7 Rev. 4.4	Barium	101	100	101	102			0.483
	Calcium	109	107	107	105			0.230
	Iron	105	106	106	105			0.376
	Magnesium	105	105	105	104			0.116
	Manganese	104	102	103	105			0.406
	Potassium	104	105	107	105			2.38
	Sodium	110	107	106	106			0.739
	Zinc	105	104	104	107			0.196
EPA 200.8 Rev. 5.4	Aluminum	90.1	100	97.6	86.8			2.29
	Antimony	99.2	103	104	103			0.374
	Arsenic	91.4	97.4	98.0	98.1			0.597
	Beryllium	91.9	94.5	92.3	90.4			2.30
	Boron	94.9	103	100	102			2.10
	Cadmium	92.5	102	101	105			0.856
	Chromium	90.9	100	100	101			0.113
	Copper	91.2	99.3	100	97.4			0.979
	Lead	98.1	109	103	108			5.85
	Nickel	89.3	96.8	97.9	98.6			1.16
	Selenium	91.8	99.8	97.4	97.5			2.39
	Silver	95.7	99.1	99.2	100			0.0470
	Thallium	100	105	105	105			0.684
EPA 300.0 Rev. 2.1	Chloride	99.5	99.7	98.9			0.530	
	Sulfate	98.2	99.3	98.6			0.298	
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	93.8	95.4				1.46
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	104	106				1.98
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	99.8	97.8				1.94
	NO ₂ NO ₃ -N	99.5	96.0	97.0				0.466
EPA 365.1 Rev. 2.0	Total-P	110	111	109				1.65
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	97.0	96.4				0.477
SM 2120 B-2011	Color (true)	100					0.696	
SM 2320 B-2011	Total Alkalinity	102					0.205	
SM 2540 C-2011	TDS						1.01	
SM 2540 D-2011	TSS						8.96	
SM 4500 F-C-2011	Fluoride	100	98.2	98.9				0.486
SM 5310 B-2011	Organic Carbon	97.3	98.5	98.6				0.107

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2241304, 2241307
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2241327, 2241328
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2241327, 2241328
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2241307
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2241307
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2241305, 2241308
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2241305, 2241308
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2241305, 2241308
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2241305, 2241308
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2241306, 2241309

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2241307
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2241304, 2241307
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2241327, 2241328
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2241307
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2241304, 2241307
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2241304, 2241307
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2241305, 2241308

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	04/21/2021			04/21/2021 15:18	Yen Ta	2241304, 2241307
EPA 200.7 Rev. 4.4	04/21/2021	05/05/2021 17:10	Elliott D. Healy	05/06/2021 19:31	Betina Topolski	2241327
	04/21/2021	05/05/2021 17:10	Elliott D. Healy	05/06/2021 19:39	Betina Topolski	2241328
EPA 200.8 Rev. 5.4	04/21/2021	05/05/2021 17:10	Elliott D. Healy	05/06/2021 19:26	McKinley C Carter	2241327
	04/21/2021	05/05/2021 17:10	Elliott D. Healy	05/06/2021 20:09	McKinley C Carter	2241328
	04/21/2021	05/05/2021 17:10	Elliott D. Healy	05/08/2021 06:17	Alexander Thompson	2241327
	04/21/2021	05/05/2021 17:10	Elliott D. Healy	05/08/2021 06:55	Alexander Thompson	2241328
EPA 300.0 Rev. 2.1	04/21/2021			04/24/2021 00:24	Lipi Saha	2241307
EPA 350.1 Rev. 2.0	04/21/2021			05/01/2021 11:27	Ping Hua	2241305
	04/21/2021			05/01/2021 11:28	Ping Hua	2241308
EPA 351.2 Rev. 2.0	04/21/2021	04/25/2021 14:48	Benjamin T. Nordmann	04/27/2021 13:51	Virginia P. Brown	2241305
	04/21/2021	04/25/2021 14:48	Benjamin T. Nordmann	04/27/2021 13:53	Virginia P. Brown	2241308
EPA 353.2 Rev. 2.0	04/21/2021			04/26/2021 16:39	Touraj Touran	2241308
	04/21/2021			04/26/2021 17:00	Touraj Touran	2241305
EPA 365.1 Rev. 2.0	04/21/2021	04/22/2021 16:03	Yen Ta	04/23/2021 14:14	Shengyu Ding	2241305
	04/21/2021	04/22/2021 16:03	Yen Ta	04/26/2021 16:34	Shengyu Ding	2241308
EPA 365.1 Rev. 2.0 dissolved	04/21/2021			04/21/2021 14:37	Blanca Fach	2241306
	04/21/2021			04/21/2021 14:38	Blanca Fach	2241309
SM 2120 B-2011	04/21/2021			04/21/2021 17:03	Madeline Gruver	2241307
SM 2320 B-2011	04/21/2021			04/22/2021 23:11	Dale L. Simmons	2241307
	04/21/2021			04/22/2021 23:25	Dale L. Simmons	2241304
SM 2340B	04/21/2021			05/06/2021 19:31	Betina Topolski	2241327
	04/21/2021			05/06/2021 19:39	Betina Topolski	2241328
SM 2540 C-2011	04/21/2021			04/23/2021 15:31	Yijie Li	2241307
SM 2540 D-2011	04/21/2021			04/23/2021 15:31	Yijie Li	2241304, 2241307
SM 4500 F-C-2011	04/21/2021			04/22/2021 23:11	Dale L. Simmons	2241307
	04/21/2021			04/22/2021 23:25	Dale L. Simmons	2241304
SM 5310 B-2011	04/21/2021			04/24/2021 04:35	Lauren Lees	2241305
	04/21/2021			04/24/2021 04:46	Lauren Lees	2241308