

Chemical Analysis Report

NE-DIST-2022-08-09-01

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

Event Description: **Callahan Boat**
Request ID: **RQ-2022-07-18-33**
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: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 30-AUG-2022 09:39

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

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: CUSHING CR @ STRATTON RD

Collection Date/Time: 08/08/2022 12:45

Field ID: NE400002

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2347319	DEP SOP: NU-094-1	Color (true)	120		PCU	P417852	
	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P417855	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P418210	
		Sulfate	29		mg SO4/L	P418213	
	SM 2320 B-2011	Total Alkalinity	88		mg CaCO3/L	P418286	
	SM 2540 C-2011	TDS	211		mg/L	P418253	
	SM 2540 D-2011	TSS	2	U	mg/L	P418125	
2347320	SM 4500-F- C-2011	Fluoride	0.19		mg F/L	P418593	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.040		mg N/L	P418056	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.66		mg N/L	P418445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.077		mg N/L	P417963	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P418187	
2347329	SM 5310 B-2011	Organic Carbon	15		mg C/L	P418224	
	EPA 200.7 Rev. 4.4	Calcium	32.8		mg/L	P417935	
		Iron	250		ug/L	P417935	
		Magnesium	9.84		mg/L	P417935	
		Potassium	3.8		mg/L	P417935	
		Sodium	12.7		mg/L	P417935	
		Strontium	178		ug/L	P417935	
		Tin	3.0	U	ug/L	P417935	
		Titanium	1.4	I	ug/L	P417935	
		Vanadium	2.0	U	ug/L	P417935	
		Zinc	5.0	U	ug/L	P417935	
	EPA 200.8 Rev. 5.4	Aluminum	41		ug/L	P417935	
		Antimony	0.092	I	ug/L	P417935	
		Arsenic	0.81		ug/L	P417935	
		Barium	38.9		ug/L	P417935	
		Beryllium	0.015	I	ug/L	P417935	
		Boron	33.8		ug/L	P417935	
		Cadmium	0.020	U	ug/L	P417935	
		Chromium	0.40	U	ug/L	P417935	
		Cobalt	0.152		ug/L	P417935	
		Copper	0.40	U	ug/L	P417935	
		Lead	0.20	U	ug/L	P417935	
		Manganese	78.3		ug/L	P417935	
		Molybdenum	0.22	I	ug/L	P417935	
		Nickel	0.50	U	ug/L	P417935	
		Selenium	0.20	U	ug/L	P417935	
		Silver	0.010	U	ug/L	P417935	
		Thallium	0.10	U	ug/L	P417935	
	SM 2340 B-2011	Hardness	122		mg/L	P417935	

Ref. Method and Comment:

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

Sample Location: Alligator CR at SR200

Collection Date/Time: 08/08/2022 13:05

Field ID: 19021007

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2347321	DEP SOP: NU-094-1	Color (true)	230		PCU	P417852	
	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P417855	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P418210	
		Sulfate	17		mg SO4/L	P418213	
	SM 2320 B-2011	Total Alkalinity	39		mg CaCO3/L	P418288	
	SM 2540 C-2011	TDS	149	A	mg/L	P418393	
	SM 2540 D-2011	TSS	2	IA	mg/L	P418319	
	SM 4500-F- C-2011	Fluoride	0.095	I	mg F/L	P418593	
2347322	EPA 350.1 Rev. 2.0	Ammonia-N	0.035		mg N/L	P418056	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P418445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.048		mg N/L	P418107	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P417991	
	SM 5310 B-2011	Organic Carbon	23		mg C/L	P418224	

Ref. Method and Comment:

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

Sample Location: Thomas Creek 7 miles Down from Ethel

Collection Date/Time: 08/08/2022 11:30

Field ID: G4NE0299

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2347317	EPA 180.1 Rev. 2.0	Turbidity	10		NTU	P417855	
	SM 2320 B-2011	Total Alkalinity	27		mg CaCO3/L	P418286	
	SM 2540 D-2011	TSS	11		mg/L	P418321	
	SM 4500-F- C-2011	Fluoride	0.091	I	mg F/L	P418593	
2347318	EPA 350.1 Rev. 2.0	Ammonia-N	0.043		mg N/L	P418056	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P418445	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P417963	
	EPA 365.1 Rev. 2.0	Total-P	0.22		mg P/L	P418187	
	SM 5310 B-2011	Organic Carbon	30		mg C/L	P418224	

Ref. Method and Comment:

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

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P417852

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417855

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417935

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417935

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418210

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418213

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418056

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418445

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417963

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418107

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417991

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418187

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

Reference Method: SM 2320 B-2011
Batch ID: P418286

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

Reference Method: SM 2320 B-2011
Batch ID: P418288

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P418253

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-2011
Batch ID: P418393

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P418125

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P418319

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P418321

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P418593

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P418224

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P417852

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417855

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	96.5		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417935

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	101		P	85 - 115
Iron	107		P	85 - 115
Magnesium	107		P	85 - 115
Potassium	106		P	85 - 115
Sodium	105		P	85 - 115
Strontium	106		P	85 - 115
Tin	105		P	85 - 115
Titanium	107		P	85 - 115
Vanadium	106		P	85 - 115
Zinc	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417935

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	101		P	85 - 115
Barium	106		P	85 - 115
Beryllium	96.1		P	85 - 115
Boron	101		P	85 - 115
Cadmium	98.2		P	85 - 115
Chromium	101		P	85 - 115
Cobalt	99.0		P	85 - 115
Copper	99.4		P	85 - 115
Lead	95.0		P	85 - 115
Manganese	101		P	85 - 115
Molybdenum	98.8		P	85 - 115
Nickel	101		P	85 - 115
Selenium	97.6		P	85 - 115
Silver	98.9		P	85 - 115
Thallium	99.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418210

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418213

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418056

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	93.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418445

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418107

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417991

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418187

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

Reference Method: SM 2320 B-2011
Batch ID: P418286

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.4		P	94 - 106

Reference Method: SM 2320 B-2011
Batch ID: P418288

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.6		P	94 - 106

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 4500-F- C-2011
Batch ID: P418593

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.7		P	96 - 104

Reference Method: SM 5310 B-2011
Batch ID: P418224

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: P417935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347436	Calcium	104		P	80 - 120
2347436	Iron	107	107	P/P	80 - 120
2347436	Magnesium	107	106	P/P	80 - 120
2347436	Potassium	105	107	P/P	80 - 120
2347436	Sodium	103	105	P/P	80 - 120
2347436	Strontium	103	105	P/P	80 - 120
2347436	Tin	101	102	P/P	80 - 120
2347436	Titanium	105	105	P/P	80 - 120
2347436	Vanadium	103	104	P/P	80 - 120
2347436	Zinc	101	103	P/P	80 - 120
2347500	Calcium	106		P	80 - 120
2347500	Iron	106		P	80 - 120
2347500	Magnesium	106		P	80 - 120
2347500	Potassium	110		P	80 - 120
2347500	Sodium	103		P	80 - 120
2347500	Strontium	105		P	80 - 120
2347500	Tin	104		P	80 - 120
2347500	Titanium	105		P	80 - 120
2347500	Vanadium	104		P	80 - 120
2347500	Zinc	105		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P417935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347436	Aluminum	101	101	P/P	80 - 120
2347436	Antimony	103	104	P/P	80 - 120
2347436	Arsenic	99.5	101	P/P	80 - 120
2347436	Barium	104	105	P/P	80 - 120
2347436	Beryllium	98.2	94.3	P/P	80 - 120
2347436	Boron	100	102	P/P	80 - 120
2347436	Cadmium	96.8	99.4	P/P	80 - 120
2347436	Chromium	101	102	P/P	80 - 120
2347436	Cobalt	98.6	99.3	P/P	80 - 120
2347436	Copper	99.4	101	P/P	80 - 120
2347436	Lead	95.7	95.6	P/P	80 - 120
2347436	Manganese	102	103	P/P	80 - 120
2347436	Molybdenum	95.4	101	P/P	80 - 120
2347436	Nickel	100	99.5	P/P	80 - 120
2347436	Selenium	97.9	97.2	P/P	80 - 120
2347436	Silver	98.1	98.5	P/P	80 - 120
2347436	Thallium	102	102	P/P	80 - 120
2347500	Aluminum	104		P	80 - 120
2347500	Antimony	103		P	80 - 120
2347500	Arsenic	99.6		P	80 - 120
2347500	Barium	105		P	80 - 120
2347500	Beryllium	93.0		P	80 - 120
2347500	Boron	106		P	80 - 120
2347500	Cadmium	100		P	80 - 120
2347500	Chromium	100		P	80 - 120
2347500	Cobalt	97.3		P	80 - 120
2347500	Copper	97.8		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347500	Lead	96.3		P	80 - 120
2347500	Manganese	103		P	80 - 120
2347500	Molybdenum	99.1		P	80 - 120
2347500	Nickel	97.7		P	80 - 120
2347500	Selenium	94.6		P	80 - 120
2347500	Silver	99.9		P	80 - 120
2347500	Thallium	102		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418210

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347243	Chloride	99.5		P	90 - 110
2347333	Chloride	99.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418213

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347243	Sulfate	98.9		P	90 - 110
2347333	Sulfate	98.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418056

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347318	Ammonia-N	97.4	97.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418445

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347505	Kjeldahl Nitrogen	99.6	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347439	NO2NO3-N	95.5	95.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418107

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2346527	NO2NO3-N	96.4	96.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417991

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2346278	Total-P	106	105	P/P	90 - 110

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418187

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2345819	Total-P	106	106	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P418593

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347762	Fluoride	97.2	98.3	P/P	94 - 104

Reference Method: SM 5310 B-2011
Batch ID: P418224

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347281	Organic Carbon	97.8	98.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P417852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347244	Color (true)	1.27	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P417855

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347244	Turbidity	4.40	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P417935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347436	Calcium	0.527	Spike	P	0 - 20
2347436	Iron	0.288	Spike	P	0 - 20
2347436	Magnesium	0.764	Spike	P	0 - 20
2347436	Potassium	1.21	Spike	P	0 - 20
2347436	Sodium	0.856	Spike	P	0 - 20
2347436	Strontium	1.25	Spike	P	0 - 20
2347436	Tin	1.30	Spike	P	0 - 20
2347436	Titanium	0.227	Spike	P	0 - 20
2347436	Vanadium	0.508	Spike	P	0 - 20
2347436	Zinc	1.78	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P417935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347436	Aluminum	0.0245	Spike	P	0 - 20
2347436	Antimony	0.933	Spike	P	0 - 20
2347436	Arsenic	1.56	Spike	P	0 - 20
2347436	Barium	1.42	Spike	P	0 - 20
2347436	Beryllium	4.06	Spike	P	0 - 20
2347436	Boron	1.24	Spike	P	0 - 20
2347436	Cadmium	2.65	Spike	P	0 - 20
2347436	Chromium	1.34	Spike	P	0 - 20
2347436	Cobalt	0.778	Spike	P	0 - 20
2347436	Copper	1.26	Spike	P	0 - 20
2347436	Lead	0.0303	Spike	P	0 - 20
2347436	Manganese	1.40	Spike	P	0 - 20
2347436	Molybdenum	2.12	Spike	P	0 - 20
2347436	Nickel	0.445	Spike	P	0 - 20
2347436	Selenium	0.657	Spike	P	0 - 20
2347436	Silver	0.460	Spike	P	0 - 20
2347436	Thallium	0.419	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418210

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347243	Chloride	1.15	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P418213

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347243	Sulfate	0.284	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418056

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347318	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347505	Kjeldahl Nitrogen	0.912	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P417963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347439	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2346527	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P417991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2346278	Total-P	0.705	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418187

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2345819	Total-P	0.152	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P418286

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347814	Total Alkalinity	0.447	Sample	P	0 - 3.8

Reference Method: SM 2320 B-2011
Batch ID: P418288

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347762	Total Alkalinity	0.143	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2011
Batch ID: P418253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347243	TDS	0.0	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
Batch ID: P418393

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347321	TDS	4.03	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P418593

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347762	Fluoride	1.01	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P418224

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347281	Organic Carbon	0.340	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A113991

Included Lab Sample IDs: 2347319, 2347321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	104	P/P	90 - 110
Color (true)	104	104	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A113992

Included Lab Sample IDs: 2347317, 2347319, 2347321

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A114023

Included Lab Sample IDs: 2347318, 2347320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	97.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A114047

Included Lab Sample IDs: 2347329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	102	P/P	90 - 110
Antimony	98.9	103	P/P	90 - 110
Arsenic	101	103	P/P	90 - 110
Barium	100	102	P/P	90 - 110
Beryllium	99.9	98.3	P/P	90 - 110
Boron	101	99.7	P/P	90 - 110
Cadmium	101	105	P/P	90 - 110
Chromium	102	104	P/P	90 - 110
Cobalt	99.9	102	P/P	90 - 110
Copper	101	101	P/P	90 - 110
Lead	93.8	94.6	P/P	90 - 110
Manganese	104	106	P/P	90 - 110
Molybdenum	98.3	101	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Selenium	102	104	P/P	90 - 110
Silver	97.9	100	P/P	90 - 110
Thallium	106	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A114064

Included Lab Sample IDs: 2347318, 2347320, 2347322

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.5	98.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A114090

Included Lab Sample IDs: 2347322

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.0	96.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A114098

Included Lab Sample IDs: 2347329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	99.9	P/P	95 - 105
Iron	101	100	P/P	95 - 105
Magnesium	100	100	P/P	95 - 105
Potassium	100	102	P/P	95 - 105
Sodium	97.7	100	P/P	95 - 105
Strontium	99.8	102	P/P	95 - 105
Tin	99.4	102	P/P	95 - 105
Titanium	97.0	101	P/P	95 - 105
Vanadium	99.3	101	P/P	95 - 105
Zinc	101	102	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A114099

Included Lab Sample IDs: 2347322

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A114142

Included Lab Sample IDs: 2347319, 2347321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.8	99.4	P/P	90 - 110
Sulfate	100	100	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A114152

Included Lab Sample IDs: 2347318, 2347320, 2347322

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	96.3	P/P	90 - 110
Organic Carbon	96.3	96.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A114163

Included Lab Sample IDs: 2347318, 2347320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	98.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-2011

Run ID: A114177

Included Lab Sample IDs: 2347317, 2347319, 2347321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.4	98.2	P/P	90 - 110
Total Alkalinity	98.6	97.4	P/P	90 - 110

Reference Method: SM 4500-F- C-2011

Run ID: A114295

Included Lab Sample IDs: 2347317, 2347319, 2347321

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A114298

Included Lab Sample IDs: 2347318, 2347320, 2347322

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.8	94.5	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
DEP SOP: NU-094-1	Color (true)	104				1.27	
EPA 180.1 Rev. 2.0	Turbidity	96.5				4.40	
EPA 200.7 Rev. 4.4	Calcium	101	104	106			0.527
	Iron	107	107	107	106		0.288
	Magnesium	107	107	106	106		0.764
	Potassium	106	105	107	110		1.21
	Sodium	105	103	105	103		0.856
	Strontium	106	103	105	105		1.25
	Tin	105	101	102	104		1.30
	Titanium	107	105	105	105		0.227
	Vanadium	106	103	104	104		0.508
	Zinc	106	101	103	105		1.78
EPA 200.8 Rev. 5.4	Aluminum	102	101	101	104		0.0245
	Antimony	102	103	104	103		0.933
	Arsenic	101	99.5	101	99.6		1.56
	Barium	106	104	105	105		1.42
	Beryllium	96.1	98.2	94.3	93.0		4.06
	Boron	101	100	102	106		1.24
	Cadmium	98.2	96.8	99.4	100		2.65
	Chromium	101	101	102	100		1.34
	Cobalt	99.0	98.6	99.3	97.3		0.778
	Copper	99.4	99.4	101	97.8		1.26
	Lead	95.0	95.7	95.6	96.3		0.0303
	Manganese	101	102	103	103		1.40
	Molybdenum	98.8	95.4	101	99.1		2.12
	Nickel	101	100	99.5	97.7		0.445
	Selenium	97.6	97.9	97.2	94.6		0.657
	Silver	98.9	98.1	98.5	99.9		0.460
	Thallium	99.3	102	102	102		0.419
EPA 300.0 Rev. 2.1	Chloride	102	99.5	99.1		1.15	
	Sulfate	101	98.9	98.7		0.284	
EPA 350.1 Rev. 2.0	Ammonia-N	93.4	97.4	97.4			0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	99.6	101			0.912
EPA 353.2 Rev. 2.0	NO2NO3-N	97.5	95.5	95.5			0.0
	NO2NO3-N	97.0	96.4	96.4			0.0
EPA 365.1 Rev. 2.0	Total-P	105	106	105			0.705
	Total-P	105	106	106			0.152
SM 2320 B-2011	Total Alkalinity	99.4				0.447	
	Total Alkalinity	99.6				0.143	
SM 2540 C-2011	TDS					0.0	
	TDS					4.03	
SM 4500-F- C-2011	Fluoride	99.7	97.2	98.3			1.01
SM 5310 B-2011	Organic Carbon	95.2	97.8	98.3			0.340

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2347319, 2347321
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2347317, 2347319, 2347321
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2347329
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2347329

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2347319, 2347321
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2347319, 2347321
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2347318, 2347320, 2347322
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2347318, 2347320, 2347322
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2347318, 2347320, 2347322
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2347318, 2347320, 2347322
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2347317, 2347319, 2347321
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2347329
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2347319, 2347321
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2347317, 2347319, 2347321
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2347317, 2347319, 2347321
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2347318, 2347320, 2347322

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	08/09/2022			08/09/2022 15:46	Anna M. Plaviak	2347319
	08/09/2022			08/09/2022 16:19	Anna M. Plaviak	2347321
EPA 180.1 Rev. 2.0	08/09/2022			08/09/2022 14:44	Khloe J Berg	2347317
	08/09/2022			08/09/2022 14:46	Khloe J Berg	2347319
	08/09/2022			08/09/2022 14:47	Khloe J Berg	2347321
EPA 200.7 Rev. 4.4	08/09/2022	08/11/2022 09:36	Mackenzie Hunt	08/11/2022 18:26	McKinley C Carter	2347329
EPA 200.8 Rev. 5.4	08/09/2022	08/11/2022 09:36	Mackenzie Hunt	08/11/2022 16:41	Alexander Thompson	2347329
EPA 300.0 Rev. 2.1	08/09/2022			08/16/2022 22:01	Anna M. Plaviak	2347319
	08/09/2022			08/16/2022 22:13	Anna M. Plaviak	2347321
EPA 350.1 Rev. 2.0	08/09/2022			08/12/2022 13:31	Judith K. Clark	2347318
	08/09/2022			08/12/2022 13:35	Judith K. Clark	2347320
	08/09/2022			08/12/2022 13:36	Judith K. Clark	2347322
EPA 351.2 Rev. 2.0	08/09/2022	08/23/2022 16:31	Samantha L Bates	08/24/2022 11:56	Samantha L Bates	2347318
	08/09/2022	08/23/2022 16:31	Samantha L Bates	08/24/2022 11:57	Samantha L Bates	2347320
	08/09/2022	08/23/2022 16:31	Samantha L Bates	08/24/2022 11:59	Samantha L Bates	2347322
EPA 353.2 Rev. 2.0	08/09/2022			08/11/2022 09:40	Beverly Y. Sanders	2347318
	08/09/2022			08/11/2022 09:41	Beverly Y. Sanders	2347320
	08/09/2022			08/15/2022 09:47	Beverly Y. Sanders	2347322
EPA 365.1 Rev. 2.0	08/09/2022	08/12/2022 15:00	Simonne.V. Calhoun	08/15/2022 09:53	James L Waggeberby	2347322
	08/09/2022	08/17/2022 08:50	Simonne.V. Calhoun	08/17/2022 14:10	James L Waggeberby	2347318
	08/09/2022	08/17/2022 08:50	Simonne.V. Calhoun	08/17/2022 14:11	James L Waggeberby	2347320
SM 2320 B-2011	08/09/2022			08/16/2022 23:22	Adam P Silver	2347317
	08/09/2022			08/17/2022 00:13	Adam P Silver	2347319
	08/09/2022			08/17/2022 01:56	Adam P Silver	2347321
SM 2340 B-2011	08/09/2022			08/11/2022 18:26	McKinley C Carter	2347329
SM 2540 C-2011	08/09/2022			08/12/2022 14:14	Ping Hua	2347319
	08/09/2022			08/12/2022 15:21	Yijie Li	2347321
SM 2540 D-2011	08/09/2022			08/12/2022 14:14	Ping Hua	2347319
	08/09/2022			08/12/2022 15:21	Yijie Li	2347317, 2347321
SM 4500-F- C-2011	08/09/2022			08/24/2022 00:56	Dale L. Simmons	2347317
	08/09/2022			08/24/2022 01:01	Dale L. Simmons	2347319
	08/09/2022			08/24/2022 01:06	Dale L. Simmons	2347321
SM 5310 B-2011	08/09/2022			08/15/2022 19:10	Khloe J Berg	2347320
	08/09/2022			08/15/2022 21:27	Khloe J Berg	2347318
	08/09/2022			08/15/2022 21:42	Khloe J Berg	2347322