Chemical Analysis Report

SW-DIST-2022-04-21-01

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

Event Description: **SMP: Run 19 Nutrients**
Request ID: **RQ-2022-03-07-19**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
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13051 N. Telecom Parkway
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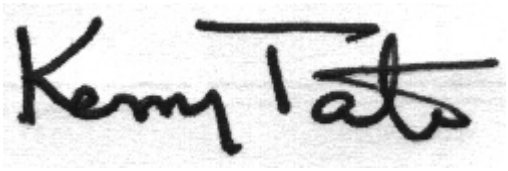
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 19-MAY-2022 12:07



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: Clark Lake @ NW end of Southern Quarter **Collection Date/Time: 04/20/2022 12:10**

Field ID: G3SW0105 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2321118	DEP SOP: NU-094-1	Color (true)**	55	J	PCU	P412727	
	EPA 180.1 Rev. 2.0	Turbidity	80		NTU	P412723	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P413119	
		Sulfate	120		mg SO4/L	P413122	
	SM 2320 B-2011	Total Alkalinity	87		mg CaCO3/L	P413184	
	SM 2540 C-2011	TDS	400		mg/L	P413196	
	SM 2540 D-2011	TSS	56		mg/L	P413199	
	SM 4500-F- C-2011	Fluoride	0.82		mg F/L	P413189	
2321119	EPA 350.1 Rev. 2.0	Ammonia-N	0.030		mg N/L	P413067	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	7.4		mg N/L	P413657	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P412880	
	EPA 365.1 Rev. 2.0	Total-P	0.66		mg P/L	P413540	
	SM 5310 B-2011	Organic Carbon	27		mg C/L	P412971	

Ref. Method and Comment:
DEP SOP: NU-094-1: The result may be biased high because of matrix interference.
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Hudson Bayou Tidal by Marie Selby Botanical Gardens **Collection Date/Time: 04/20/2022 13:10**

Field ID: G3SW0108 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2321121	EPA 180.1 Rev. 2.0	Turbidity	5.3		NTU	P412723	
	SM 2320 B-2011	Total Alkalinity	127		mg CaCO3/L	P413143	
	SM 2540 D-2011	TSS	8	I	mg/L	P413124	
	SM 4500-F- C-2011	Fluoride	1.2		mg F/L	P413150	
2321122	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P413069	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25	I	mg N/L	P413212	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P412757	
	EPA 365.1 Rev. 2.0	Total-P	0.063		mg P/L	P413334	
	SM 5310 B-2011	Organic Carbon	4.0		mg C/L	P412972	

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: Island Park Boat Basin off Dock **Collection Date/Time: 04/20/2022 13:45**

Field ID: G3SW0061 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2321124	EPA 180.1 Rev. 2.0	Turbidity	7.0		NTU	P412724	
	SM 2320 B-2011	Total Alkalinity	119		mg CaCO3/L	P413143	
	SM 2540 D-2011	TSS	10	I	mg/L	P413124	
	SM 4500-F- C-2011	Fluoride	1.2		mg F/L	P413150	
2321125	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P413069	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31	I	mg N/L	P413212	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P412757	
	EPA 365.1 Rev. 2.0	Total-P	0.059		mg P/L	P413334	
	SM 5310 B-2011	Organic Carbon	3.3	I	mg C/L	P412972	
2321132	EPA 200.7 Rev. 4.4	Calcium	410		mg/L	P412869	
		Iron	120	U	ug/L	P412869	
		Magnesium	1.49E+03		mg/L	P412869	
		Strontium	7.81E+03		ug/L	P412869	
		Tin	150	U	ug/L	P412869	
		Titanium	6.0	I	ug/L	P412869	
		Vanadium	8.0	U	ug/L	P412869	
		Zinc	20	U	ug/L	P412869	
	EPA 200.8 Rev. 5.4	Aluminum	100	I	ug/L	P412869	
		Antimony	0.25	I	ug/L	P412869	
		Arsenic	2.23		ug/L	P412869	
		Beryllium	0.040	U	ug/L	P412869	
		Cadmium	0.080	U	ug/L	P412869	
		Chromium	1.6	U	ug/L	P412869	
		Cobalt	0.080	U	ug/L	P412869	
		Copper	5.9		ug/L	P412869	
		Lead	2.0	U	ug/L	P412869	
		Manganese	3.7		ug/L	P412869	
		Molybdenum	12.5		ug/L	P412869	
		Nickel	2.0	U	ug/L	P412869	
		Selenium	0.80	U	ug/L	P412869	
		Silver	0.040	U	ug/L	P412869	
		Thallium	1.0	U	ug/L	P412869	

Ref. Method and Comment:
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium and strontium are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The copper result was confirmed in the undigested sample on 05/03/2022.

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P412727

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412723

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412724

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412869

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	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: P412869

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.012	I	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: P413119

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: P413122

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413067

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413069

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413212

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413657

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412757

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412880

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413334

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413540

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-2011
Batch ID: P413143

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

Reference Method: SM 2320 B-2011
Batch ID: P413184

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

Reference Method: SM 2540 C-2011
Batch ID: P413196

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P413124

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P413199

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P413150

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500-F- C-2011
Batch ID: P413189

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P412971

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

Reference Method: SM 5310 B-2011
Batch ID: P412972

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: P412727

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.8		P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412723

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412724

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	95.8		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412869

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	102		P	85 - 115
Magnesium	101		P	85 - 115
Strontium	105		P	85 - 115
Tin	99.5		P	85 - 115
Titanium	102		P	85 - 115
Vanadium	95.3		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412869

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.1		P	85 - 115
Antimony	98.1		P	85 - 115
Arsenic	97.7		P	85 - 115
Beryllium	91.8		P	85 - 115
Cadmium	96.2		P	85 - 115
Chromium	92.4		P	85 - 115
Cobalt	98.5		P	85 - 115
Copper	95.9		P	85 - 115
Lead	93.8		P	85 - 115
Manganese	97.7		P	85 - 115
Molybdenum	98.2		P	85 - 115
Nickel	97.6		P	85 - 115
Selenium	97.3		P	85 - 115
Silver	95.8		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413119

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413122

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413067

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413069

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: P413212

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413657

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412757

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: P412880

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413334

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413540

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-2011
Batch ID: P413143

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.0		P	94 - 106

Reference Method: SM 2320 B-2011
Batch ID: P413184

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	94 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P413150

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.6		P	93 - 104

Reference Method: SM 4500-F- C-2011
Batch ID: P413189

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P412971

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

Reference Method: SM 5310 B-2011
Batch ID: P412972

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.6		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321057	Iron	99.8	103	P/P	70 - 130
2321057	Tin	79.4	77.6	P/P	70 - 130
2321057	Titanium	98.1	94.5	P/P	70 - 130
2321057	Vanadium	96.8	92.3	P/P	70 - 130
2321057	Zinc	96.5	90.6	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321057	Aluminum	107	107	P/P	70 - 130
2321057	Antimony	104	105	P/P	70 - 130
2321057	Arsenic	109	111	P/P	70 - 130
2321057	Beryllium	123	126	P/P	70 - 130
2321057	Cadmium	97.1	99.1	P/P	70 - 130
2321057	Chromium	101	102	P/P	70 - 130
2321057	Cobalt	106	107	P/P	70 - 130
2321057	Copper	110	111	P/P	70 - 130
2321057	Lead	96.8	95.4	P/P	70 - 130
2321057	Manganese	91.7	91.6	P/P	70 - 130
2321057	Molybdenum	109	111	P/P	70 - 130
2321057	Nickel	107	108	P/P	70 - 130
2321057	Selenium	100	101	P/P	70 - 130
2321057	Silver	86.9	87.3	P/P	70 - 130
2321057	Thallium	104	103	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413119

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321136	Chloride	101		P	90 - 110
2321216	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413122

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321136	Sulfate	99.7		P	90 - 110
2321216	Sulfate	98.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413067

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320891	Ammonia-N	98.4	97.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413069

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321182	Ammonia-N	103	105	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321047	Kjeldahl Nitrogen	101	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321122	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412880

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321060	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413334

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321151	Total-P	97.6	94.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323299	Total-P	101	101	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P413150

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2318659	Fluoride	96.8	97.7	P/P	92 - 107

Reference Method: SM 4500-F- C-2011
Batch ID: P413189

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2320888	Fluoride	102	102	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P412971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321000	Organic Carbon	93.6	94.2	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P412972

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321150	Organic Carbon	91.1	93.1	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P412727

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321013	Color (true)	0.326	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412723

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321046	Turbidity	2.04	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P412724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321153	Turbidity	6.58	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P412869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321057	Calcium	3.38	Spike	P	0 - 20
2321057	Iron	3.13	Spike	P	0 - 20
2321057	Magnesium	3.16	Spike	P	0 - 20
2321057	Strontium	3.89	Spike	P	0 - 20
2321057	Tin	2.33	Spike	P	0 - 20
2321057	Titanium	3.45	Spike	P	0 - 20
2321057	Vanadium	4.77	Spike	P	0 - 20
2321057	Zinc	6.21	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P412869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321057	Aluminum	0.747	Spike	P	0 - 20
2321057	Antimony	0.704	Spike	P	0 - 20
2321057	Arsenic	1.81	Spike	P	0 - 20
2321057	Beryllium	2.58	Spike	P	0 - 20
2321057	Cadmium	2.04	Spike	P	0 - 20
2321057	Chromium	1.26	Spike	P	0 - 20
2321057	Cobalt	1.81	Spike	P	0 - 20
2321057	Copper	1.17	Spike	P	0 - 20
2321057	Lead	1.42	Spike	P	0 - 20
2321057	Manganese	0.0793	Spike	P	0 - 20
2321057	Molybdenum	1.70	Spike	P	0 - 20
2321057	Nickel	0.776	Spike	P	0 - 20
2321057	Selenium	0.488	Spike	P	0 - 20
2321057	Silver	0.444	Spike	P	0 - 20
2321057	Thallium	0.190	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413119

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321136	Chloride	0.535	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P413122

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321136	Sulfate	0.671	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320891	Ammonia-N	0.704	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413069

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321182	Ammonia-N	1.20	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321047	Kjeldahl Nitrogen	4.57	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413657

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323554	Kjeldahl Nitrogen	0.590	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321122	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P412880

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321060	NO2NO3-N	0.0	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413334

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321151	Total-P	2.43	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323299	Total-P	0.0975	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P413143

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320394	Total Alkalinity	0.806	Sample	P	0 - 5.2

Reference Method: SM 2320 B-2011
Batch ID: P413184

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320888	Total Alkalinity	0.974	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P413196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321059	TDS	7.55	Sample	P	0 - 10

Reference Method: SM 4500-F- C-2011
Batch ID: P413150

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2318659	Fluoride	0.520	Spike	P	0 - 2.1

Reference Method: SM 4500-F- C-2011
Batch ID: P413189

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2320888	Fluoride	0.0	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P412971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321000	Organic Carbon	0.466	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 5310 B-2011
Batch ID: P412972

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321150	Organic Carbon	2.01	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: A111613
Included Lab Sample IDs: 2321118, 2321121, 2321124

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.0	P/P	95 - 105
Turbidity	99.0	99.0	P/P	95 - 105
Turbidity	99.5	99.0	P/P	95 - 105

Reference Method: DEP SOP: NU-094-1
Run ID: A111614
Included Lab Sample IDs: 2321118

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	85 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A111628
Included Lab Sample IDs: 2321122, 2321125

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A111688
Included Lab Sample IDs: 2321119

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A111715
Included Lab Sample IDs: 2321118

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.9	P/P	90 - 110
Sulfate	102	101	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A111725
Included Lab Sample IDs: 2321119, 2321122, 2321125

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.3	96.1	P/P	90 - 110
Organic Carbon	98.7	98.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111749
Included Lab Sample IDs: 2321132

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	101	100	P/P	90 - 110
Beryllium	103	105	P/P	90 - 110
Cadmium	98.4	98.0	P/P	90 - 110
Cobalt	103	104	P/P	90 - 110
Copper	105	106	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111749
Included Lab Sample IDs: 2321132

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	92.9	92.4	P/P	90 - 110
Manganese	101	100	P/P	90 - 110
Nickel	104	105	P/P	90 - 110
Silver	98.7	98.8	P/P	90 - 110
Thallium	96.5	96.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111765
Included Lab Sample IDs: 2321119, 2321122, 2321125

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	98.1	P/P	90 - 110
Ammonia-N	98.1	97.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111785
Included Lab Sample IDs: 2321132

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	99.6	99.1	P/P	90 - 110
Chromium	96.8	96.0	P/P	90 - 110
Molybdenum	95.6	95.3	P/P	90 - 110
Selenium	96.5	96.6	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A111807
Included Lab Sample IDs: 2321121, 2321124

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.4	98.5	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A111807
Included Lab Sample IDs: 2321121, 2321124

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A111821
Included Lab Sample IDs: 2321132

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

Reference Method: SM 2320 B-2011
Run ID: A111826
Included Lab Sample IDs: 2321118

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.5	96.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500-F- C-2011
Run ID: A111826
Included Lab Sample IDs: 2321118

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A111897
Included Lab Sample IDs: 2321132

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.1	99.5	P/P	90 - 110
Iron	101	102	P/P	90 - 110
Magnesium	103	103	P/P	90 - 110
Strontium	99.2	99.5	P/P	90 - 110
Tin	103	99.6	P/P	90 - 110
Titanium	100	101	P/P	90 - 110
Vanadium	100	103	P/P	90 - 110
Zinc	101	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A111960
Included Lab Sample IDs: 2321122, 2321125

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A111973
Included Lab Sample IDs: 2321122, 2321125

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A112031
Included Lab Sample IDs: 2321119

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A112112
Included Lab Sample IDs: 2321119

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.2	92.4	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
DEP SOP: NU-094-1	Color (true)	99.8				0.326	
EPA 180.1 Rev. 2.0	Turbidity	95.5				2.04	
	Turbidity	95.8				6.58	
EPA 200.7 Rev. 4.4	Calcium	103					3.38
	Iron	102	99.8	103			3.13
	Magnesium	101					3.16
	Strontium	105					3.89
	Tin	99.5	77.6	79.4			2.33
	Titanium	102	98.1	94.5			3.45
	Vanadium	95.3	96.8	92.3			4.77
	Zinc	100	96.5	90.6			6.21
EPA 200.8 Rev. 5.4	Aluminum	98.1	107	107			0.747
	Antimony	98.1	104	105			0.704
	Arsenic	97.7	109	111			1.81
	Beryllium	91.8	123	126			2.58
	Cadmium	96.2	97.1	99.1			2.04
	Chromium	92.4	101	102			1.26
	Cobalt	98.5	106	107			1.81
	Copper	95.9	110	111			1.17
	Lead	93.8	96.8	95.4			1.42
	Manganese	97.7	91.7	91.6			0.0793
	Molybdenum	98.2	109	111			1.70
	Nickel	97.6	107	108			0.776
	Selenium	97.3	100	101			0.488
	Silver	95.8	86.9	87.3			0.444
	Thallium	101	104	103			0.190
EPA 300.0 Rev. 2.1	Chloride	100	101	100		0.535	
	Sulfate	99.6	99.7	98.7		0.671	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	98.4	97.6			0.704
	Ammonia-N	97.4	103	105			1.20
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	101	107			4.57
	Kjeldahl Nitrogen	103					0.590
EPA 353.2 Rev. 2.0	NO2NO3-N	100	102	102			0.0
	NO2NO3-N	99.0	100	100			0.0
EPA 365.1 Rev. 2.0	Total-P	103	97.6	94.6			2.43
	Total-P	101	101	101			0.0975
SM 2320 B-2011	Total Alkalinity	99.0				0.806	
	Total Alkalinity	101				0.974	
SM 2540 C-2011	TDS					7.55	
SM 4500-F- C-2011	Fluoride	99.6	96.8	97.7			0.520
	Fluoride	101	102	102			0.0
SM 5310 B-2011	Organic Carbon	95.5	93.6	94.2			0.466
	Organic Carbon	96.6	91.1	93.1			2.01

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2321118
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2321118, 2321121, 2321124
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2321132
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2321132

Reference Method Descriptions

Method	Description	Associated Samples
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2321118
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2321118
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2321119, 2321122, 2321125
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2321119, 2321122, 2321125
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2321119, 2321122, 2321125
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2321119, 2321122, 2321125
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2321118, 2321121, 2321124
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2321118
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2321118, 2321121, 2321124
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2321118, 2321121, 2321124
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2321119, 2321122, 2321125

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	04/21/2022			04/21/2022 16:34	Samantha L Bates	2321118
EPA 180.1 Rev. 2.0	04/21/2022			04/21/2022 15:02	Khloe J Berg	2321121
	04/21/2022			04/21/2022 15:10	Khloe J Berg	2321124
	04/21/2022			04/21/2022 16:09	Khloe J Berg	2321118
EPA 200.7 Rev. 4.4	04/21/2022	04/26/2022 10:05	Megan Whitefoot	05/03/2022 19:43	Josef B Mick	2321132
	04/21/2022	04/26/2022 10:05	Megan Whitefoot	05/03/2022 20:22	Josef B Mick	2321132
EPA 200.8 Rev. 5.4	04/21/2022	04/26/2022 10:05	Megan Whitefoot	04/27/2022 23:47	Emily M Philpot	2321132
	04/21/2022	04/26/2022 10:05	Megan Whitefoot	04/28/2022 03:06	Emily M Philpot	2321132
	04/21/2022	04/26/2022 10:05	Megan Whitefoot	04/28/2022 19:33	Alexander Thompson	2321132
	04/21/2022	04/26/2022 10:05	Megan Whitefoot	04/29/2022 11:09	Alexander Thompson	2321132
EPA 300.0 Rev. 2.1	04/21/2022			04/28/2022 00:27	James L Waggerby	2321118
EPA 350.1 Rev. 2.0	04/21/2022			04/28/2022 14:13	Judith K. Clark	2321119
	04/21/2022			04/28/2022 14:29	Judith K. Clark	2321122
	04/21/2022			04/28/2022 14:30	Judith K. Clark	2321125
EPA 351.2 Rev. 2.0	04/21/2022	05/03/2022 16:44	Samantha L Bates	05/05/2022 12:24	Samantha L Bates	2321122
	04/21/2022	05/03/2022 16:44	Samantha L Bates	05/05/2022 12:25	Samantha L Bates	2321125
	04/21/2022	05/11/2022 15:45	Samantha L Bates	05/12/2022 18:27	Alexandra J Mattheus	2321119
EPA 353.2 Rev. 2.0	04/21/2022			04/22/2022 10:37	Beverly Y. Sanders	2321122
	04/21/2022			04/22/2022 10:47	Beverly Y. Sanders	2321125
	04/21/2022			04/26/2022 10:04	Beverly Y. Sanders	2321119
EPA 365.1 Rev. 2.0	04/21/2022	05/04/2022 17:30	Simonne.V. Calhoun	05/06/2022 14:59	James L Waggerby	2321122
	04/21/2022	05/04/2022 17:30	Simonne.V. Calhoun	05/06/2022 15:00	James L Waggerby	2321125
	04/21/2022	05/09/2022 14:45	Simonne.V. Calhoun	05/10/2022 11:52	Sarah A Nixon	2321119
SM 2320 B-2011	04/21/2022			04/29/2022 05:10	Dale L. Simmons	2321121
	04/21/2022			04/29/2022 05:23	Dale L. Simmons	2321124
	04/21/2022			04/30/2022 19:21	Dale L. Simmons	2321118
SM 2540 C-2011	04/21/2022			04/22/2022 15:36	Yijie Li	2321118
SM 2540 D-2011	04/21/2022			04/22/2022 15:36	Yijie Li	2321118, 2321121, 2321124
SM 4500-F- C-2011	04/21/2022			04/29/2022 02:17	Dale L. Simmons	2321121
	04/21/2022			04/29/2022 02:22	Dale L. Simmons	2321124
	04/21/2022			04/30/2022 19:21	Dale L. Simmons	2321118
SM 5310 B-2011	04/21/2022			04/26/2022 20:19	Khloe J Berg	2321119
	04/21/2022			04/26/2022 23:10	Khloe J Berg	2321122
	04/21/2022			04/26/2022 23:25	Khloe J Berg	2321125