Chemical Analysis Report

SO-DIST-2021-01-15-02

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

Event Description: **2021 SMP : Charlotte Harbor**
Request ID: **RQ-2021-01-11-39**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: Chris Hormuth

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 08-FEB-2021 08:38

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: Coral Creek (east) Upstream Of Golf Course **Collection Date/Time: 01/14/2021 10:30**

Field ID: G2SD0039 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2219681	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P392476	
	EPA 300.0 Rev. 2.1	Bromide	50		mg Br/L	P393037	
	SM 2320 B-2011	Total Alkalinity	128		mg CaCO3/L	P392589	
	SM 2540 D-2011	TSS	3	I A	mg/L	P392971	
	SM 4500 F-C-2011	Fluoride	0.93		mg F/L	P392591	
2219682	EPA 350.1 Rev. 2.0	Ammonia-N	0.057		mg N/L	P393203	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.53		mg N/L	P393179	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.010		mg N/L	P392741	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P392719	
	SM 5310 B-2011	Organic Carbon	8.5		mg C/L	P392644	
2219683	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P392482	

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: Trailer Park Canal **Collection Date/Time: 01/14/2021 12:15**

Field ID: G3SD0072 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2219678	EPA 180.1 Rev. 2.0	Turbidity	4.3		NTU	P392475	
	EPA 300.0 Rev. 2.1	Bromide	34		mg Br/L	P393037	
	SM 2320 B-2011	Total Alkalinity	102		mg CaCO3/L	P392589	
	SM 2540 D-2011	TSS	13	A	mg/L	P392974	
	SM 4500 F-C-2011	Fluoride	0.79		mg F/L	P392591	
2219679	EPA 350.1 Rev. 2.0	Ammonia-N	0.041		mg N/L	P393204	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.75		mg N/L	P392992	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P392521	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P392720	
	SM 5310 B-2011	Organic Carbon	10		mg C/L	P392645	
2219680	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P392481	
2219692	EPA 200.7 Rev. 4.4	Calcium	239		mg/L	P392522	
		Chromium	8.1	I	ug/L	P392522	
		Iron	290	I	ug/L	P392522	
		Magnesium	669		mg/L	P392522	
		Manganese	6.6	I	ug/L	P392522	
		Zinc	15	U	ug/L	P392522	
	EPA 200.8 Rev. 5.4	Aluminum	221		ug/L	P392522	
		Antimony	0.20	U	ug/L	P392522	
		Arsenic	1.53		ug/L	P392522	
		Beryllium	0.060	I	ug/L	P392522	
		Cadmium	0.080	U	ug/L	P392522	
		Copper	1.6	U	ug/L	P392522	
		Lead	0.80	U	ug/L	P392522	
		Nickel	2.0	U	ug/L	P392522	
		Selenium	0.80	U	ug/L	P392522	
		Silver	0.040	U	ug/L	P392522	
		Thallium	0.40	U	ug/L	P392522	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and magnesium are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392475

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392476

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P392522

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Chromium	1.0	U	ug/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392522

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
Cadmium	0.020	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: P393037

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393203

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393204

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: P392992

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393179

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392521

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392741

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392719

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392720

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392481

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392482

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

Reference Method: SM 2320 B-2011
Batch ID: P392589

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P392971

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P392974

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P392591

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P392644

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

Reference Method: SM 5310 B-2011
Batch ID: P392645

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: P392522

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	105		P	85 - 115
Chromium	102		P	85 - 115
Iron	105		P	85 - 115
Magnesium	104		P	85 - 115
Manganese	101		P	85 - 115
Zinc	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392522

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.7		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	97.6		P	85 - 115
Beryllium	88.8		P	85 - 115
Cadmium	95.2		P	85 - 115
Copper	100		P	85 - 115
Lead	100		P	85 - 115
Nickel	95.4		P	85 - 115
Selenium	96.0		P	85 - 115
Silver	103		P	85 - 115
Thallium	99.6		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P393037

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393203

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393204

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392992

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393179

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: P392521

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392741

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392719

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392720

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392481

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392482

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

Reference Method: SM 2320 B-2011
Batch ID: P392589

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	95.9		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P392591

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.0		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P392644

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P392645

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P392522

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217629	Chromium	98.9	100	P/P	70 - 130
2217629	Iron	106	109	P/P	70 - 130
2217629	Manganese	98.2	97.4	P/P	70 - 130
2217629	Zinc	105	105	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392522

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217629	Aluminum	103	108	P/P	70 - 130
2217629	Antimony	106	108	P/P	70 - 130
2217629	Arsenic	104	108	P/P	70 - 130
2217629	Beryllium	112	119	P/P	70 - 130
2217629	Cadmium	91.2	93.5	P/P	70 - 130
2217629	Copper	111	111	P/P	70 - 130
2217629	Lead	105	106	P/P	70 - 130
2217629	Nickel	99.3	100	P/P	70 - 130
2217629	Selenium	102	105	P/P	70 - 130
2217629	Silver	96.2	98.2	P/P	70 - 130
2217629	Thallium	103	106	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P393037

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219957	Bromide	90.3		P	90 - 110
2220312	Bromide	97.8	97.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393203

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219479	Ammonia-N	101	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393204

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219552	Ammonia-N	107	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392992

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219553	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219476	Kjeldahl Nitrogen	107	103	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392521

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219560	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392741

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219601	NO2NO3-N	98.4	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392719

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219723	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392720

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219555	Total-P	97.7	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392481

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219454	O-Phosphate-P	90.3	92.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392482

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219683	O-Phosphate-P	93.7	96.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P392591

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219363	Fluoride	99.4	102	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P392644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2219337	Organic Carbon	101	100	P/P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P392645

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2218990	Organic Carbon	97.2	95.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392475

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219475	Turbidity	4.10	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P392476

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219752	Turbidity	0.832	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P392522

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217629	Calcium	2.31	Spike	P	0 - 20
2217629	Chromium	1.34	Spike	P	0 - 20
2217629	Iron	2.12	Spike	P	0 - 20
2217629	Magnesium	2.72	Spike	P	0 - 20
2217629	Manganese	0.685	Spike	P	0 - 20
2217629	Zinc	0.0614	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P392522

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217629	Aluminum	4.63	Spike	P	0 - 20
2217629	Antimony	1.61	Spike	P	0 - 20
2217629	Arsenic	3.76	Spike	P	0 - 20
2217629	Beryllium	5.70	Spike	P	0 - 20
2217629	Cadmium	2.47	Spike	P	0 - 20
2217629	Copper	0.0114	Spike	P	0 - 20
2217629	Lead	1.38	Spike	P	0 - 20
2217629	Nickel	0.659	Spike	P	0 - 20
2217629	Selenium	2.58	Spike	P	0 - 20
2217629	Silver	2.04	Spike	P	0 - 20
2217629	Thallium	3.07	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P393037

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2220312	Bromide	0.421	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393203

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219479	Ammonia-N	0.734	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393204

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219552	Ammonia-N	1.21	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392992

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219553	Kjeldahl Nitrogen	0.452	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219476	Kjeldahl Nitrogen	3.64	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219560	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392741

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219601	NO2NO3-N	0.803	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392719

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219723	Total-P	1.39	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392720

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219555	Total-P	0.221	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392481

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219454	O-Phosphate-P	2.73	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392482

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219683	O-Phosphate-P	2.12	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P392589

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219363	Total Alkalinity	1.76	Sample	P	0 - 8.1

Reference Method: SM 2540 D-2011
Batch ID: P392974

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219678	TSS	6.25	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P392591

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219363	Fluoride	1.91	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P392644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2219337	Organic Carbon	0.447	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P392645

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2218990	Organic Carbon	2.16	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: A103090
Included Lab Sample IDs: 2219678, 2219681

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A103092
Included Lab Sample IDs: 2219680, 2219683

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A103107
Included Lab Sample IDs: 2219679

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	91.0	103	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A103130
Included Lab Sample IDs: 2219678, 2219681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	93.2	96.2	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A103130
Included Lab Sample IDs: 2219678, 2219681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	102	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A103143
Included Lab Sample IDs: 2219679, 2219682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	101	101	P/P	90 - 110
Organic Carbon	97.8	99.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A103146
Included Lab Sample IDs: 2219692

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	102	P/P	90 - 110
Chromium	99.5	100	P/P	90 - 110
Iron	100	104	P/P	90 - 110
Magnesium	100	102	P/P	90 - 110
Manganese	99.7	103	P/P	90 - 110
Zinc	104	104	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A103180
Included Lab Sample IDs: 2219682

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A103190
Included Lab Sample IDs: 2219679

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A103204
Included Lab Sample IDs: 2219692

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.0	99.4	P/P	90 - 110
Antimony	100	101	P/P	90 - 110
Arsenic	100	100	P/P	90 - 110
Beryllium	101	107	P/P	90 - 110
Cadmium	97.1	97.0	P/P	90 - 110
Copper	105	105	P/P	90 - 110
Lead	99.9	99.3	P/P	90 - 110
Nickel	97.5	98.7	P/P	90 - 110
Selenium	100	100	P/P	90 - 110
Silver	104	104	P/P	90 - 110
Thallium	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A103218
Included Lab Sample IDs: 2219682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	96.2	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A103266
Included Lab Sample IDs: 2219678, 2219681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	96.0	96.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A103298
Included Lab Sample IDs: 2219679

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.5	97.3	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A103348
Included Lab Sample IDs: 2219679, 2219682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	101	P/P	90 - 110
Ammonia-N	103	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A103349
Included Lab Sample IDs: 2219682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.5	96.0	P/P	90 - 110

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					4.10	
	Turbidity					0.832	
EPA 200.7 Rev. 4.4	Calcium	105					2.31
	Chromium	102	98.9	100			1.34
	Iron	105	106	109			2.12
	Magnesium	104					2.72
	Manganese	101	98.2	97.4			0.685
	Zinc	106	105	105			0.0614
EPA 200.8 Rev. 5.4	Aluminum	94.7	103	108			4.63
	Antimony	102	106	108			1.61
	Arsenic	97.6	104	108			3.76
	Beryllium	88.8	112	119			5.70
	Cadmium	95.2	91.2	93.5			2.47
	Copper	100	111	111			0.0114
	Lead	100	105	106			1.38
	Nickel	95.4	99.3	100			0.659
	Selenium	96.0	102	105			2.58
	Silver	103	96.2	98.2			2.04
	Thallium	99.6	103	106			3.07
EPA 300.0 Rev. 2.1	Bromide	99.0	97.8	97.3	90.3		0.421
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	100			0.734
	Ammonia-N	100	107	105			1.21
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	103	104			0.452
	Kjeldahl Nitrogen	102	107	103			3.64
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	102			0.0
	NO2NO3-N	102	98.4	99.4			0.803
EPA 365.1 Rev. 2.0	Total-P	104	106	105			1.39
	Total-P	105	97.7	98.0			0.221
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.1	90.3	92.8			2.73
	O-Phosphate-P	103	93.7	96.0			2.12
SM 2320 B-2011	Total Alkalinity	95.9				1.76	
SM 2540 D-2011	TSS					6.25	
SM 4500 F-C-2011	Fluoride	97.0	99.4	102			1.91
SM 5310 B-2011	Organic Carbon	101	101	100			0.447
	Organic Carbon	99.0	97.2	95.0			2.16

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2219678, 2219681
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2219692
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2219692
EPA 300.0 Rev. 2.1	Bromide in aqueous matrices	2219678, 2219681
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2219679, 2219682
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2219679, 2219682
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2219679, 2219682
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2219679, 2219682
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2219680, 2219683
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2219678, 2219681
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2219678, 2219681

Reference Method Descriptions

Method	Description	Associated Samples
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2219678, 2219681
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2219679, 2219682

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	01/15/2021			01/15/2021 14:50	Yen Ta	2219678, 2219681
EPA 200.7 Rev. 4.4	01/15/2021	01/19/2021 15:45	Elliott D. Healy	01/20/2021 18:48	Betina Topolski	2219692
	01/15/2021	01/19/2021 15:45	Elliott D. Healy	01/20/2021 18:56	Betina Topolski	2219692
EPA 200.8 Rev. 5.4	01/15/2021	01/19/2021 15:45	Elliott D. Healy	01/22/2021 19:09	Alexander Thompson	2219692
EPA 300.0 Rev. 2.1	01/15/2021			01/27/2021 16:43	Lipi Saha	2219678
	01/15/2021			01/27/2021 17:01	Lipi Saha	2219681
EPA 350.1 Rev. 2.0	01/15/2021			02/01/2021 17:48	Ping Hua	2219682
	01/15/2021			02/01/2021 18:21	Ping Hua	2219679
EPA 351.2 Rev. 2.0	01/15/2021	01/27/2021 13:15	Yen Ta	01/28/2021 19:02	Julia Storbeck	2219679
	01/15/2021	02/01/2021 09:53	Yen Ta	02/01/2021 18:47	Julia Storbeck	2219682
EPA 353.2 Rev. 2.0	01/15/2021			01/19/2021 10:23	Beverly Y. Sanders	2219679
	01/15/2021			01/22/2021 10:00	Beverly Y. Sanders	2219682
EPA 365.1 Rev. 2.0	01/15/2021	01/21/2021 17:45	Madeline Gruver	01/22/2021 12:40	Lipi Saha	2219679
	01/15/2021	01/21/2021 17:45	Madeline Gruver	01/25/2021 14:59	Shengyu Wang	2219682
EPA 365.1 Rev. 2.0 dissolved	01/15/2021			01/15/2021 16:33	Ping Hua	2219680
	01/15/2021			01/15/2021 16:35	Ping Hua	2219683
SM 2320 B-2011	01/15/2021			01/20/2021 00:29	Dale L. Simmons	2219678
	01/15/2021			01/20/2021 00:42	Dale L. Simmons	2219681
SM 2540 D-2011	01/15/2021			01/19/2021 14:52	Yijie Li	2219678, 2219681
SM 4500 F-C-2011	01/15/2021			01/19/2021 23:07	Dale L. Simmons	2219678
	01/15/2021			01/19/2021 23:12	Dale L. Simmons	2219681
SM 5310 B-2011	01/15/2021			01/20/2021 07:26	Touraj Touran	2219682
	01/15/2021			01/20/2021 11:20	Touraj Touran	2219679