

Chemical Analysis Report

SW-DIST-2020-12-04-01

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

Event Description: **Run 14 North Pinellas**
Request ID: **RQ-2020-12-07-67**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Ben Paswater

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: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 22-DEC-2020 18:51



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: Stevenson Creek Tidal @ Overlea St

Collection Date/Time: 12/03/2020 13:40

Field ID: G5SW0164

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2211055	EPA 180.1 Rev. 2.0	Turbidity	5.8	A	NTU	P390799	
	EPA 300.0 Rev. 2.1	Bromide	26		mg Br/L	P391044	
	SM 2320 B-2011	Total Alkalinity	141		mg CaCO3/L	P390811	
	SM 2540 D-2011	TSS	7	I	mg/L	P391151	
	SM 4500 F-C-2011	Fluoride	0.72		mg F/L	P390971	
2211057	EPA 350.1 Rev. 2.0	Ammonia-N	0.26		mg N/L	P391079	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P390833	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.096		mg N/L	P390889	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P390981	
	SM 5310 B-2011	Organic Carbon	8.9		mg C/L	P390898	
2211059	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P390720	

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: Moccasin Creek Tidal

Collection Date/Time: 12/03/2020 12:00

Field ID: G1SW0051

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2211061	EPA 180.1 Rev. 2.0	Turbidity	5.5		NTU	P390799	
	EPA 300.0 Rev. 2.1	Bromide	9.9		mg Br/L	P391044	
	SM 2320 B-2011	Total Alkalinity	140		mg CaCO3/L	P390810	
	SM 2540 D-2011	TSS	6	I	mg/L	P391149	
	SM 4500 F-C-2011	Fluoride	0.32		mg F/L	P390970	
2211062	EPA 350.1 Rev. 2.0	Ammonia-N	0.093		mg N/L	P391079	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P391034	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.067		mg N/L	P390889	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P390981	
	SM 5310 B-2011	Organic Carbon	17		mg C/L	P390897	
2211063	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P390720	
2211072	EPA 200.7 Rev. 4.4	Chromium	4.2	I	ug/L	P390919	
		Iron	330	I	ug/L	P390919	
		Manganese	22		ug/L	P390919	
		Zinc	15	U	ug/L	P390919	
	EPA 200.8 Rev. 5.4	Aluminum	134		ug/L	P390919	
		Antimony	0.20	I	ug/L	P390919	
		Arsenic	1.94		ug/L	P390919	
		Barium	30.9		ug/L	P390919	
		Beryllium	0.040	U	ug/L	P390919	
		Boron**	564		ug/L	P390919	
		Cadmium	0.080	U	ug/L	P390919	
		Cobalt	0.11	I	ug/L	P390919	
		Copper	1.6	U	ug/L	P390919	
		Lead	0.80	U	ug/L	P390919	
		Molybdenum	2.2	I	ug/L	P390919	
		Nickel	2.0	U	ug/L	P390919	
		Selenium	0.80	U	ug/L	P390919	
		Silver	0.040	U	ug/L	P390919	
		Thallium	0.40	U	ug/L	P390919	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable because of high analyte concentration in the QC sample.

Sample Location: Curlew Creek Tidal @ Pirates Cove

Collection Date/Time: 12/03/2020 12:40

Field ID: G5SW0162

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2211056	EPA 180.1 Rev. 2.0	Turbidity	8.4		NTU	P390799	
	EPA 300.0 Rev. 2.1	Bromide	59		mg Br/L	P391044	
	SM 2320 B-2011	Total Alkalinity	130		mg CaCO3/L	P390811	
	SM 2540 D-2011	TSS	9	I	mg/L	P391151	
	SM 4500 F-C-2011	Fluoride	1.1		mg F/L	P390971	
2211058	EPA 350.1 Rev. 2.0	Ammonia-N	0.090		mg N/L	P391079	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.93		mg N/L	P391034	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.094		mg N/L	P390889	
	EPA 365.1 Rev. 2.0	Total-P	0.077		mg P/L	P390981	
	SM 5310 B-2011	Organic Carbon	4.0		mg C/L	P390898	
2211060	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.086		mg P/L	P390720	

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: EPA 180.1 Rev. 2.0
Batch ID: P390799

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390919

Component	Result	Code	Units
Chromium	1.0	U	ug/L
Iron	30	U	ug/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390919

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
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	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: P391044

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391079

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390833

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391034

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390889

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390981

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390720

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

Reference Method: SM 2320 B-2011
Batch ID: P390810

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

Reference Method: SM 2320 B-2011
Batch ID: P390811

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

Reference Method: SM 2540 D-2011
Batch ID: P391149

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P391151

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P390970

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P390971

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P390897

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

Reference Method: SM 5310 B-2011
Batch ID: P390898

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: P390919

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	103		P	85 - 115
Iron	104		P	85 - 115
Manganese	105		P	85 - 115
Zinc	107		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390919

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.6		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	98.5		P	85 - 115
Barium	103		P	85 - 115
Beryllium	95.8		P	85 - 115
Boron	98.6		P	85 - 115
Cadmium	96.1		P	85 - 115
Cobalt	103		P	85 - 115
Copper	101		P	85 - 115
Lead	103		P	85 - 115
Molybdenum	101		P	85 - 115
Nickel	94.2		P	85 - 115
Selenium	96.8		P	85 - 115
Silver	108		P	85 - 115
Thallium	106		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391044

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: P391079

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: P390833

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: P391034

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.8		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390889

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390981

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390720

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

Reference Method: SM 2320 B-2011
Batch ID: P390810

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

Reference Method: SM 2320 B-2011
Batch ID: P390811

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

Reference Method: SM 4500 F-C-2011
Batch ID: P390970

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	90 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P390971

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.3		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P390897

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P390898

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	102		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390919

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209592	Chromium	103	103	P/P	70 - 130
2209592	Iron	104	102	P/P	70 - 130
2209592	Manganese	101	101	P/P	70 - 130
2209592	Zinc	108	109	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390919

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2209592	Aluminum	107	108	P/P	70 - 130
2209592	Antimony	113	113	P/P	70 - 130
2209592	Arsenic	104	105	P/P	70 - 130
2209592	Barium	109	111	P/P	70 - 130
2209592	Beryllium	106	104	P/P	70 - 130
2209592	Cadmium	97.3	97.8	P/P	70 - 130
2209592	Cobalt	106	107	P/P	70 - 130
2209592	Copper	111	112	P/P	70 - 130
2209592	Lead	110	112	P/P	70 - 130
2209592	Molybdenum	110	111	P/P	70 - 130
2209592	Nickel	94.6	95.9	P/P	70 - 130
2209592	Selenium	104	105	P/P	70 - 130
2209592	Silver	101	101	P/P	70 - 130
2209592	Thallium	107	109	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391044

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211714	Bromide	96.3	95.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211854	Ammonia-N	101	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390833

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210284	Kjeldahl Nitrogen	115	112	F/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391034

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211433	Kjeldahl Nitrogen	96.9	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390889

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
---------------	-----------	---------	---------	-----------	----------------

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390889

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211057	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211057	Total-P	107	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390720

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210943	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P390970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211416	Fluoride	97.7	99.0	P/P	94 - 107

Reference Method: SM 4500 F-C-2011
Batch ID: P390971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2211425	Fluoride	97.8	99.3	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P390897

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210789	Organic Carbon	101		P	85 - 115

Reference Method: SM 5310 B-2011
Batch ID: P390898

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2210942	Organic Carbon	99.4	98.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P390799

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211055	Turbidity	5.51	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P390919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209592	Chromium	0.544	Spike	P	0 - 20
2209592	Iron	1.31	Spike	P	0 - 20
2209592	Manganese	0.0487	Spike	P	0 - 20
2209592	Zinc	1.49	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P390919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2209592	Aluminum	1.06	Spike	P	0 - 20
2209592	Antimony	0.0461	Spike	P	0 - 20
2209592	Arsenic	1.25	Spike	P	0 - 20
2209592	Barium	1.39	Spike	P	0 - 20
2209592	Beryllium	1.94	Spike	P	0 - 20
2209592	Boron	0.420	Spike	P	0 - 20
2209592	Cadmium	0.524	Spike	P	0 - 20
2209592	Cobalt	0.382	Spike	P	0 - 20
2209592	Copper	0.734	Spike	P	0 - 20
2209592	Lead	1.82	Spike	P	0 - 20
2209592	Molybdenum	0.804	Spike	P	0 - 20
2209592	Nickel	1.32	Spike	P	0 - 20
2209592	Selenium	0.550	Spike	P	0 - 20
2209592	Silver	0.202	Spike	P	0 - 20
2209592	Thallium	2.25	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P391044

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211714	Bromide	0.596	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211854	Ammonia-N	1.16	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P390833

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210284	Kjeldahl Nitrogen	2.02	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391034

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211433	Kjeldahl Nitrogen	1.90	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P390889

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211057	NO2NO3-N	0.336	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P390981

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211057	Total-P	1.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P390720

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210943	O-Phosphate-P	0.200	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P390810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210831	Total Alkalinity	2.14	Sample	P	0 - 8.1

Reference Method: SM 2320 B-2011
Batch ID: P390811

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210941	Total Alkalinity	0.271	Sample	P	0 - 8.1

Reference Method: SM 4500 F-C-2011
Batch ID: P390970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211416	Fluoride	0.982	Spike	P	0 - 2.8

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P390971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2211425	Fluoride	0.959	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P390897

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210789	Organic Carbon	0.311	Spike	P	0 - 20

Reference Method: SM 5310 B-2011
Batch ID: P390898

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2210942	Organic Carbon	0.753	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A102425

Included Lab Sample IDs: 2211059, 2211060, 2211063

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	99.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A102456

Included Lab Sample IDs: 2211055, 2211056, 2211061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	98.0	102	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A102457

Included Lab Sample IDs: 2211055, 2211056, 2211061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	103	102	P/P	95 - 105

Reference Method: SM 2320 B-2011

Run ID: A102461

Included Lab Sample IDs: 2211055, 2211056, 2211061

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	98.8	P/P	90 - 110
Total Alkalinity	98.8	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A102485

Included Lab Sample IDs: 2211057, 2211058, 2211062

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

Reference Method: SM 5310 B-2011

Run ID: A102488

Included Lab Sample IDs: 2211057, 2211058, 2211062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	102	100	P/P	90 - 110
Organic Carbon	97.2	98.8	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A102518

Included Lab Sample IDs: 2211055, 2211056, 2211061

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A102529

Included Lab Sample IDs: 2211072

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	102	99.1	P/P	90 - 110
Iron	98.9	101	P/P	90 - 110
Manganese	101	101	P/P	90 - 110
Zinc	105	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A102547

Included Lab Sample IDs: 2211057, 2211058, 2211062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	107	P/P	90 - 110
Kjeldahl Nitrogen	98.8	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A102553

Included Lab Sample IDs: 2211057, 2211058, 2211062

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.5	95.5	P/P	90 - 110
Ammonia-N	97.2	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A102569

Included Lab Sample IDs: 2211057, 2211062

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A102574

Included Lab Sample IDs: 2211058

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	97.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102600

Included Lab Sample IDs: 2211072

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.0	98.5	P/P	90 - 110
Antimony	103	105	P/P	90 - 110
Arsenic	97.2	95.9	P/P	90 - 110
Barium	107	108	P/P	90 - 110
Boron	97.8	95.4	P/P	90 - 110
Cadmium	96.6	96.5	P/P	90 - 110
Cobalt	104	102	P/P	90 - 110
Copper	106	106	P/P	90 - 110
Lead	99.0	98.6	P/P	90 - 110
Molybdenum	100	99.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102600

Included Lab Sample IDs: 2211072

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	94.4	91.8	P/P	90 - 110
Selenium	99.7	100	P/P	90 - 110
Silver	102	102	P/P	90 - 110
Thallium	101	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102629

Included Lab Sample IDs: 2211072

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

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

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					5.51	
EPA 200.7 Rev. 4.4	Chromium	103	103	103			0.544
	Iron	104	104	102			1.31
	Manganese	105	101	101			0.0487
	Zinc	107	108	109			1.49
EPA 200.8 Rev. 5.4	Aluminum	97.6	107	108			1.06
	Antimony	105	113	113			0.0461
	Arsenic	98.5	104	105			1.25
	Barium	103	109	111			1.39
	Beryllium	95.8	106	104			1.94
	Boron	98.6					0.420
	Cadmium	96.1	97.3	97.8			0.524
	Cobalt	103	106	107			0.382
	Copper	101	111	112			0.734
	Lead	103	110	112			1.82
	Molybdenum	101	110	111			0.804
	Nickel	94.2	94.6	95.9			1.32
	Selenium	96.8	104	105			0.550
	Silver	108	101	101			0.202
	Thallium	106	107	109			2.25
EPA 300.0 Rev. 2.1	Bromide	99.0	96.3	95.4			0.596
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	101	99.2			1.16
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	115	112			2.02
	Kjeldahl Nitrogen	97.8	96.9	98.9			1.90
EPA 353.2 Rev. 2.0	NO2NO3-N	100	101	100			0.336
EPA 365.1 Rev. 2.0	Total-P	106	107	106			1.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	100	100			0.200
SM 2320 B-2011	Total Alkalinity	101				2.14	
	Total Alkalinity	102				0.271	
SM 4500 F-C-2011	Fluoride	97.9	97.7	99.0			0.982
	Fluoride	98.3	97.8	99.3			0.959
SM 5310 B-2011	Organic Carbon	102	101				0.311
	Organic Carbon	102	99.4	98.6			0.753

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2211055, 2211056, 2211061
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2211072
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2211072
EPA 300.0 Rev. 2.1	Bromide in aqueous matrices	2211055, 2211056, 2211061
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2211057, 2211058, 2211062
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2211057, 2211058, 2211062
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2211057, 2211058, 2211062
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2211057, 2211058, 2211062
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2211059, 2211060, 2211063
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2211055, 2211056, 2211061
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2211055, 2211056, 2211061
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2211055, 2211056, 2211061
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2211057, 2211058, 2211062

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	12/04/2020			12/04/2020 16:23	Blanca Fach	2211055, 2211056, 2211061
EPA 200.7 Rev. 4.4	12/04/2020	12/09/2020 14:55	Elliott D. Healy	12/10/2020 16:21	Betina Topolski	2211072
EPA 200.8 Rev. 5.4	12/04/2020	12/09/2020 14:55	Elliott D. Healy	12/15/2020 17:07	Alexander Thompson	2211072
	12/04/2020	12/09/2020 14:55	Elliott D. Healy	12/16/2020 23:09	Alexander Thompson	2211072
EPA 300.0 Rev. 2.1	12/04/2020			12/10/2020 16:40	Lipi Saha	2211055
	12/04/2020			12/10/2020 16:58	Lipi Saha	2211056
	12/04/2020			12/10/2020 17:16	Lipi Saha	2211061
EPA 350.1 Rev. 2.0	12/04/2020			12/13/2020 14:02	Ping Hua	2211058
	12/04/2020			12/13/2020 14:03	Ping Hua	2211062
	12/04/2020			12/13/2020 15:01	Ping Hua	2211057
EPA 351.2 Rev. 2.0	12/04/2020	12/07/2020 15:00	David Boose	12/11/2020 17:15	Julia Storbeck	2211057
	12/04/2020	12/09/2020 12:17	David Boose	12/11/2020 16:32	Julia Storbeck	2211058
	12/04/2020	12/09/2020 12:17	David Boose	12/11/2020 16:34	Julia Storbeck	2211062
EPA 353.2 Rev. 2.0	12/04/2020			12/09/2020 09:35	Beverly Y. Sanders	2211057
	12/04/2020			12/09/2020 09:41	Beverly Y. Sanders	2211058
	12/04/2020			12/09/2020 09:42	Beverly Y. Sanders	2211062
EPA 365.1 Rev. 2.0	12/04/2020	12/10/2020 12:58	Yen Ta	12/14/2020 09:33	Benjamin T. Nordmann	2211057
	12/04/2020	12/10/2020 12:58	Yen Ta	12/14/2020 09:41	Benjamin T. Nordmann	2211062
	12/04/2020	12/10/2020 12:58	Yen Ta	12/14/2020 13:59	Lipi Saha	2211058
EPA 365.1 Rev. 2.0 dissolved	12/04/2020			12/04/2020 16:28	Ping Hua	2211059, 2211060
	12/04/2020			12/04/2020 16:29	Ping Hua	2211063
SM 2320 B-2011	12/04/2020			12/07/2020 21:52	Dale L. Simmons	2211061
	12/04/2020			12/08/2020 01:00	Dale L. Simmons	2211055
	12/04/2020			12/08/2020 01:13	Dale L. Simmons	2211056
SM 2540 D-2011	12/04/2020			12/09/2020 14:21	Yijie Li	2211055, 2211056, 2211061
SM 4500 F-C-2011	12/04/2020			12/09/2020 20:29	Dale L. Simmons	2211061
	12/04/2020			12/09/2020 22:29	Dale L. Simmons	2211055
	12/04/2020			12/09/2020 22:34	Dale L. Simmons	2211056
SM 5310 B-2011	12/04/2020			12/09/2020 03:17	David Boose	2211062
	12/04/2020			12/09/2020 08:12	David Boose	2211057
	12/04/2020			12/09/2020 08:24	David Boose	2211058