

Chemical Analysis Report

SO-DIST-2019-08-20-01

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

Event Description: **2019 SMP : Charlotte Harbor**
Request ID: **RQ-2019-08-12-21**
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: Nicole Reistad

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: Liang Lin, Environmental Administrator

Date Certified: 13-SEP-2019 16:46

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: TrailerParkCanal@Mouth

Collection Date/Time: 08/19/2019 10:00

Field ID: G3SD0072

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112871	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P369373	
	EPA 300.0	Bromide	1.4		mg Br/L	P369499	
	SM 2320 B-97	Total Alkalinity	67		mg CaCO3/L	P369866	
	SM 2540 D-97	TSS	3	I	mg/L	P369704	
	SM 4500 F-C-97	Fluoride	0.20		mg F/L	P369869	
2112872	EPA 350.1 Rev. 2.0	Ammonia-N	0.088		mg N/L	P369759	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P369514	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.074		mg N/L	P369472	
	EPA 365.1 Rev. 2.0	Total-P	0.44		mg P/L	P369515	
	SM 5310 B-00	Organic Carbon	26		mg C/L	P369459	
2112873	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.35		mg P/L	P369413	
2112907	EPA 200.7 Rev. 4.4	Iron	680		ug/L	P369429	
		Manganese	13.9		ug/L	P369429	
		Zinc	5.0	U	ug/L	P369429	
	EPA 200.8 Rev. 5.4	Aluminum	114		ug/L	P369429	
		Antimony	0.088	I	ug/L	P369429	
		Arsenic	1.87		ug/L	P369429	
		Boron**	141		ug/L	P369429	
		Cadmium	0.020	U	ug/L	P369429	
		Chromium	0.61	I	ug/L	P369429	
		Copper	1.05		ug/L	P369429	
		Lead	0.21	I	ug/L	P369429	
		Nickel	0.50	U	ug/L	P369429	
		Selenium	0.20	U	ug/L	P369429	
		Silver	0.010	U	ug/L	P369429	
		Thallium	0.10	U	ug/L	P369429	

Sample Location: MyakkaCutoff(Western)

Collection Date/Time: 08/19/2019 10:15

Field ID: G3SD0073

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112874	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P369373	
	EPA 300.0	Bromide	5.1		mg Br/L	P369499	
	SM 2320 B-97	Total Alkalinity	80		mg CaCO3/L	P369866	
	SM 2540 D-97	TSS	3	I	mg/L	P369704	
	SM 4500 F-C-97	Fluoride	0.31		mg F/L	P369869	
2112876	EPA 350.1 Rev. 2.0	Ammonia-N	0.13		mg N/L	P369759	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P369514	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.075		mg N/L	P369472	
	EPA 365.1 Rev. 2.0	Total-P	0.49		mg P/L	P369515	
	SM 5310 B-00	Organic Carbon	23		mg C/L	P369459	
2112878	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.40		mg P/L	P369413	

Sample Location: MyakkaCutoff(Western)

Collection Date/Time: 08/19/2019 10:50

Field ID: FB_08192019

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112880	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P369373	
	EPA 300.0	Bromide	0.013	U	mg Br/L	P369760	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P369866	
	SM 2540 D-97	TSS	2	U	mg/L	P369704	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P369869	
2112881	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P369759	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P369514	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P369472	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P369515	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P369459	
2112882	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369413	

Sample Location: Whidden Creek South Pt

Collection Date/Time: 08/19/2019 11:45

Field ID: G2SD0029

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112875	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P369373	
	EPA 300.0	Bromide	45		mg Br/L	P369499	
	SM 2320 B-97	Total Alkalinity	177		mg CaCO3/L	P369891	
	SM 2540 D-97	TSS	12		mg/L	P369705	
	SM 4500 F-C-97	Fluoride	0.80		mg F/L	P369892	
2112877	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P369693	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P369508	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P369577	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P369510	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P369460	
2112879	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P369410	

Ref. Method and Comment:

SM 2540 D-97: Sample contains high density particulates with sandy appearance that settle out quickly.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P369373

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P369429

Component	Result	Code	Units
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: P369429

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

Reference Method: EPA 300.0
Batch ID: P369499

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 300.0
Batch ID: P369760

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369693

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369759

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: P369508

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369514

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369472

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369577

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369510

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369515

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369410

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369413

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

Reference Method: SM 2320 B-97
Batch ID: P369866

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P369891

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 D-97
Batch ID: P369704

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P369705

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P369869

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P369892

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P369459

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

Reference Method: SM 5310 B-00
Batch ID: P369460

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: P369429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	107		P	85 - 115
Manganese	102		P	85 - 115
Zinc	99.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P369429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	97.8		P	85 - 115
Arsenic	101		P	85 - 115
Boron	109		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	99.6		P	85 - 115
Copper	99.6		P	85 - 115
Lead	101		P	85 - 115
Nickel	101		P	85 - 115
Selenium	104		P	85 - 115
Silver	106		P	85 - 115
Thallium	99.0		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P369499

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Bromide	96.9		P	90 - 110

Reference Method: EPA 300.0
Batch ID: P369760

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Bromide	98.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369693

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369759

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: P369508

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369514

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: P369472

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: P369577

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: P369510

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369515

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: P369410

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369413

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.7		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P369866

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	98 - 106

Reference Method: SM 2320 B-97
Batch ID: P369891

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P369869

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.9		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P369892

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P369459

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

Reference Method: SM 5310 B-00
Batch ID: P369460

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P369429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112740	Iron	107	107	P/P	80 - 120
2112740	Manganese	99.9	101	P/P	80 - 120
2112740	Zinc	98.5	99.8	P/P	80 - 120
2112836	Iron	104		P	80 - 120
2112836	Manganese	99.0		P	80 - 120
2112836	Zinc	99.9		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P369429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112740	Aluminum	102	102	P/P	80 - 120
2112740	Antimony	99.0	98.5	P/P	80 - 120
2112740	Arsenic	101	102	P/P	80 - 120
2112740	Boron	109	107	P/P	80 - 120
2112740	Cadmium	101	102	P/P	80 - 120
2112740	Chromium	100	101	P/P	80 - 120
2112740	Copper	99.4	100	P/P	80 - 120
2112740	Lead	102	101	P/P	80 - 120
2112740	Nickel	101	102	P/P	80 - 120
2112740	Selenium	101	102	P/P	80 - 120
2112740	Silver	108	106	P/P	80 - 120
2112740	Thallium	101	102	P/P	80 - 120
2112836	Aluminum	102		P	80 - 120
2112836	Antimony	98.2		P	80 - 120
2112836	Arsenic	104		P	80 - 120
2112836	Boron	112		P	80 - 120
2112836	Cadmium	104		P	80 - 120
2112836	Chromium	101		P	80 - 120
2112836	Copper	100		P	80 - 120
2112836	Lead	105		P	80 - 120
2112836	Nickel	104		P	80 - 120
2112836	Selenium	106		P	80 - 120
2112836	Silver	106		P	80 - 120
2112836	Thallium	111		P	80 - 120

Reference Method: EPA 300.0
Batch ID: P369499

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112216	Bromide	94.7	93.3	P/P	90 - 110
2112811	Bromide	94.8		P	90 - 110

Reference Method: EPA 300.0
Batch ID: P369760

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2113204	Bromide	94.1	96.3	P/P	90 - 110
2113615	Bromide	97.3		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369693

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112043	Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369759

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2113025	Ammonia-N	103	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369508

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112967	Kjeldahl Nitrogen	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369514

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112851	Kjeldahl Nitrogen	93.7	110	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369472

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112856	NO2NO3-N	101	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112043	NO2NO3-N	99.8	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112681	Total-P	92.6	93.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369515

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112849	Total-P	108	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369410

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112682	O-Phosphate-P	97.0	97.8	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369413

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112805	O-Phosphate-P	97.4	98.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P369869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2113198	Fluoride	99.5	98.8	P/P	89 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P369892

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2111922	Fluoride	98.7	101	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P369459

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112856	Organic Carbon	96.2	96.3	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P369460

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112798	Organic Carbon	90.7	91.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P369373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112923	Turbidity	3.87	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P369429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112740	Iron	0.567	Spike	P	0 - 20
2112740	Manganese	0.822	Spike	P	0 - 20
2112740	Zinc	1.24	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P369429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112740	Aluminum	0.498	Spike	P	0 - 20
2112740	Antimony	0.493	Spike	P	0 - 20
2112740	Arsenic	0.443	Spike	P	0 - 20
2112740	Boron	1.26	Spike	P	0 - 20
2112740	Cadmium	0.483	Spike	P	0 - 20
2112740	Chromium	0.672	Spike	P	0 - 20
2112740	Copper	0.757	Spike	P	0 - 20
2112740	Lead	0.558	Spike	P	0 - 20
2112740	Nickel	0.781	Spike	P	0 - 20
2112740	Selenium	0.890	Spike	P	0 - 20
2112740	Silver	1.34	Spike	P	0 - 20
2112740	Thallium	1.18	Spike	P	0 - 20

Reference Method: EPA 300.0
 Batch ID: P369499

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112216	Bromide	1.36	Spike	P	0 - 20

Reference Method: EPA 300.0
 Batch ID: P369760

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113204	Bromide	1.88	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P369693

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112043	Ammonia-N	0.685	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369759

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113025	Ammonia-N	2.98	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112967	Kjeldahl Nitrogen	0.0641	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369514

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112851	Kjeldahl Nitrogen	9.58	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112856	NO2NO3-N	2.11	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112043	NO2NO3-N	1.90	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369510

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112681	Total-P	1.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369515

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112849	Total-P	4.74	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369410

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112682	O-Phosphate-P	0.782	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369413

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112805	O-Phosphate-P	1.12	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P369866

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113198	Total Alkalinity	0.463	Sample	P	0 - 2.8

Reference Method: SM 2320 B-97
Batch ID: P369891

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113602	Total Alkalinity	0.622	Sample	P	0 - 2.8

Reference Method: SM 2540 D-97
Batch ID: P369704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112855	TSS	5.00	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P369705

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112797	TSS	5.13	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P369869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2113198	Fluoride	0.476	Spike	P	0 - 2.5

Reference Method: SM 4500 F-C-97
Batch ID: P369892

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2111922	Fluoride	1.91	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P369459

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112856	Organic Carbon	0.0672	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P369460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112798	Organic Carbon	1.07	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A93657

Included Lab Sample IDs: 2112871, 2112874, 2112875, 2112880

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A93683

Included Lab Sample IDs: 2112873, 2112878, 2112879, 2112882

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	100	P/P	90 - 110
O-Phosphate-P	101	100	P/P	90 - 110
O-Phosphate-P	99.4	99.2	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A93704

Included Lab Sample IDs: 2112872, 2112876, 2112877, 2112881

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.0	96.6	P/P	90 - 110
Organic Carbon	98.0	95.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A93712

Included Lab Sample IDs: 2112872, 2112876, 2112881

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

Reference Method: EPA 300.0

Run ID: A93718

Included Lab Sample IDs: 2112871, 2112874, 2112875

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A93732

Included Lab Sample IDs: 2112907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	101	100	P/P	90 - 110
Manganese	99.2	99.4	P/P	90 - 110
Zinc	96.7	96.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A93747

Included Lab Sample IDs: 2112877

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A93750

Included Lab Sample IDs: 2112877

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	108	107	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A93762

Included Lab Sample IDs: 2112872, 2112876, 2112881

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A93776

Included Lab Sample IDs: 2112877, 2112881

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	101	P/P	90 - 110
Total-P	98.8	99.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A93783

Included Lab Sample IDs: 2112872, 2112876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.8	97.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A93798

Included Lab Sample IDs: 2112877

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A93816

Included Lab Sample IDs: 2112872, 2112876, 2112881

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

Reference Method: EPA 300.0

Run ID: A93817

Included Lab Sample IDs: 2112880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	107	106	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A93845

Included Lab Sample IDs: 2112871, 2112874, 2112880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	106	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A93845

Included Lab Sample IDs: 2112871, 2112874, 2112880

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

Reference Method: SM 4500 F-C-97

Run ID: A93845

Included Lab Sample IDs: 2112871, 2112874, 2112880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	99.0	P/P	90 - 110
Fluoride	101	101	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A93863

Included Lab Sample IDs: 2112875

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A93863

Included Lab Sample IDs: 2112875

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	101	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94112

Included Lab Sample IDs: 2112907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	105	106	P/P	90 - 110
Antimony	96.8	98.2	P/P	90 - 110
Arsenic	104	104	P/P	90 - 110
Cadmium	103	104	P/P	90 - 110
Chromium	104	99.7	P/P	90 - 110
Copper	105	103	P/P	90 - 110
Lead	105	105	P/P	90 - 110
Nickel	105	104	P/P	90 - 110
Silver	106	106	P/P	90 - 110
Thallium	97.4	96.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94138

Included Lab Sample IDs: 2112907

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	107	108	P/P	90 - 110
Selenium	105	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 SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						3.87	
EPA 200.7 Rev. 4.4	Iron	107	107	107	104			0.567
	Manganese	102	99.9	101	99.0			0.822
	Zinc	99.0	98.5	99.8	99.9			1.24
EPA 200.8 Rev. 5.4	Aluminum	102	102	102	102			0.498
	Antimony	97.8	99.0	98.5	98.2			0.493
	Arsenic	101	101	102	104			0.443
	Boron	109	109	107	112			1.26
	Cadmium	101	101	102	104			0.483
	Chromium	99.6	100	101	101			0.672
	Copper	99.6	99.4	100	100			0.757
	Lead	101	102	101	105			0.558
	Nickel	101	101	102	104			0.781
	Selenium	104	101	102	106			0.890
	Silver	106	108	106	106			1.34
	Thallium	99.0	101	102	111			1.18
EPA 300.0	Bromide	96.9	94.7	93.3	94.8			1.36
	Bromide	98.7	94.1	96.3	97.3			1.88
EPA 350.1 Rev. 2.0	Ammonia-N	100	103	104				0.685
	Ammonia-N	100	103	97.9				2.98
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	102	102				0.0641
	Kjeldahl Nitrogen	103	93.7	110				9.58
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	98.2				2.11
	NO2NO3-N	102	99.8	102				1.90
EPA 365.1 Rev. 2.0	Total-P	97.2	92.6	93.6				1.10
	Total-P	105	108	102				4.74
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	97.0	97.8				0.782
	O-Phosphate-P	99.7	97.4	98.5				1.12
SM 2320 B-97	Total Alkalinity	105					0.463	
	Total Alkalinity	103					0.622	
SM 2540 D-97	TSS						5.00	
	TSS						5.13	
SM 4500 F-C-97	Fluoride	98.9	99.5	98.8				0.476
	Fluoride	96.7	98.7	101				1.91
SM 5310 B-00	Organic Carbon	97.2	96.2	96.3				0.0672
	Organic Carbon	93.2	90.7	91.9				1.07

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2112871, 2112874, 2112875, 2112880
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2112907
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2112907
EPA 300.0 / E31780	Bromide in aqueous matrices	2112871, 2112874, 2112875, 2112880
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2112872, 2112876, 2112877, 2112881
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2112872, 2112876, 2112877, 2112881
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2112872, 2112876, 2112877, 2112881

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2112872, 2112876, 2112877, 2112881
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2112873, 2112878, 2112879, 2112882
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2112871, 2112874, 2112875, 2112880
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2112871, 2112874, 2112875, 2112880
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2112871, 2112874, 2112875, 2112880
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2112872, 2112876, 2112877, 2112881

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	08/20/2019			08/20/2019 16:54	Rosalyn Ballman	2112871, 2112874, 2112875, 2112880
EPA 200.7 Rev. 4.4	08/20/2019	08/21/2019 15:30	Elliott D. Healy	08/22/2019 18:17	Alexander Thompson	2112907
EPA 200.8 Rev. 5.4	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/10/2019 21:17	Robert K Palmer	2112907
	08/20/2019	08/21/2019 15:30	Elliott D. Healy	09/11/2019 20:12	Robert K Palmer	2112907
EPA 300.0	08/20/2019			08/22/2019 03:00	Julia Storbeck	2112871
	08/20/2019			08/22/2019 03:17	Julia Storbeck	2112874
	08/20/2019			08/22/2019 03:34	Julia Storbeck	2112875
	08/20/2019			08/27/2019 02:33	Jhamieka S. Greenwood	2112880
EPA 350.1 Rev. 2.0	08/20/2019			08/26/2019 12:24	Ping Hua	2112877
	08/20/2019			08/27/2019 13:14	Ping Hua	2112872
	08/20/2019			08/27/2019 13:16	Ping Hua	2112876
	08/20/2019			08/27/2019 13:17	Ping Hua	2112881
EPA 351.2 Rev. 2.0	08/20/2019	08/22/2019 11:15	Sima Feizi	08/23/2019 11:00	Joseph Suarez	2112877
	08/20/2019	08/22/2019 12:30	Sima Feizi	08/23/2019 15:12	Joseph Suarez	2112872
	08/20/2019	08/22/2019 12:30	Sima Feizi	08/23/2019 15:13	Joseph Suarez	2112876
	08/20/2019	08/22/2019 12:30	Sima Feizi	08/23/2019 15:15	Joseph Suarez	2112881
EPA 353.2 Rev. 2.0	08/20/2019			08/22/2019 09:24	Beverly Y. Sanders	2112872
	08/20/2019			08/22/2019 09:25	Beverly Y. Sanders	2112876
	08/20/2019			08/22/2019 09:27	Beverly Y. Sanders	2112881
	08/20/2019			08/23/2019 10:44	Beverly Y. Sanders	2112877
EPA 365.1 Rev. 2.0	08/20/2019	08/22/2019 12:30	Lipi Saha	08/23/2019 16:57	Lipi Saha	2112872
	08/20/2019	08/22/2019 12:30	Lipi Saha	08/23/2019 16:58	Lipi Saha	2112876
	08/20/2019	08/22/2019 12:30	Lipi Saha	08/26/2019 11:31	Lipi Saha	2112877
	08/20/2019	08/22/2019 12:30	Lipi Saha	08/26/2019 12:19	Lipi Saha	2112881
EPA 365.1 Rev. 2.0 dissolved	08/20/2019			08/20/2019 16:10	Jhamieka S. Greenwood	2112879
	08/20/2019			08/20/2019 16:33	Jhamieka S. Greenwood	2112882
	08/20/2019			08/20/2019 16:57	Jhamieka S. Greenwood	2112873
	08/20/2019			08/20/2019 16:58	Jhamieka S. Greenwood	2112878
SM 2320 B-97	08/20/2019			08/28/2019 10:33	Dale L. Simmons	2112880
	08/20/2019			08/28/2019 14:16	Dale L. Simmons	2112871
	08/20/2019			08/28/2019 14:29	Dale L. Simmons	2112874
	08/20/2019			08/29/2019 00:58	Dale L. Simmons	2112875
SM 2540 D-97	08/20/2019			08/21/2019 14:21	Yijie Li	2112871, 2112874, 2112875, 2112880
SM 4500 F-C-97	08/20/2019			08/28/2019 10:33	Dale L. Simmons	2112880
	08/20/2019			08/28/2019 14:16	Dale L. Simmons	2112871
	08/20/2019			08/28/2019 14:29	Dale L. Simmons	2112874
	08/20/2019			08/28/2019 21:58	Dale L. Simmons	2112875
SM 5310 B-00	08/20/2019			08/21/2019 21:38	Madeline Funaro	2112872
	08/20/2019			08/21/2019 21:51	Madeline Funaro	2112876
	08/20/2019			08/21/2019 22:03	Madeline Funaro	2112881

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	08/20/2019			08/22/2019 01:57	Madeline Funaro	2112877