Chemical Analysis Report

SO-DIST-2018-08-08-01

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

Event Description: **Charlotte Harbor**
Request ID: **RQ-2018-07-30-11**
Customer: **SO-DIST**
Project ID: **SMP**

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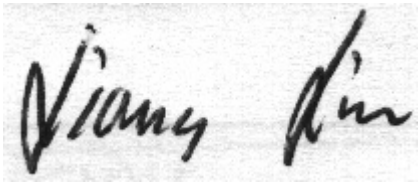
Date Certified: 29-AUG-2018 14:34



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 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: 08/07/2018 10:00**

Field ID: G3SD0072 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2015134	EPA 180.1 Rev. 2.0	Turbidity	2.5	A	NTU	P349816	
	SM 2320 B-97	Total Alkalinity	50		mg CaCO3/L	P350186	
	SM 2540 D-97	TSS	4	I	mg/L	P350314	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P350109	
2015135	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P350000	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P349991	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.044		mg N/L	P349891	
	EPA 365.1 Rev. 2.0	Total-P	0.29		mg P/L	P350136	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P349963	
2015136	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.22		mg P/L	P349894	
2015149	EPA 200.7 Rev. 4.4	Iron	420		ug/L	P349792	
		Zinc	5.0	U	ug/L	P349792	
	EPA 200.8 Rev. 5.4	Arsenic	1.45		ug/L	P349792	
		Cadmium	0.020	U	ug/L	P349792	
		Chromium	0.48	I	ug/L	P349792	
		Copper	0.86		ug/L	P349792	
		Lead	0.15	I	ug/L	P349792	
		Nickel	0.40	I	ug/L	P349792	
		Silver	0.010	U	ug/L	P350464	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Myakka Cutoff (Western) **Collection Date/Time: 08/07/2018 10:25**

Field ID: G3SD0073 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2015137	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P349816	
	SM 2320 B-97	Total Alkalinity	62		mg CaCO3/L	P350106	
	SM 2540 D-97	TSS	3	I	mg/L	P350314	
	SM 4500 F-C-97	Fluoride	0.31		mg F/L	P350110	
2015139	EPA 350.1 Rev. 2.0	Ammonia-N	0.024		mg N/L	P350002	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P350033	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.073		mg N/L	P349984	
	EPA 365.1 Rev. 2.0	Total-P	0.30		mg P/L	P350065	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P349963	
2015141	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.26		mg P/L	P349895	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Whidden Creek-South Pt **Collection Date/Time: 08/07/2018 12:20**

Field ID: G2SD0029 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2015138	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P349816	
	SM 2320 B-97	Total Alkalinity	136		mg CaCO3/L	P350107	
	SM 2540 D-97	TSS	3	U	mg/L	P350320	
	SM 4500 F-C-97	Fluoride	1.0		mg F/L	P350111	
2015140	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P350117	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.98		mg N/L	P350033	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P349984	
	EPA 365.1 Rev. 2.0	Total-P	0.068		mg P/L	P350065	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P349964	
2015142	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P349895	

Ref. Method and Comment:
SM 2540 D-97: 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: P349816

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P349792

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349792

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350464

Component	Result	Code	Units
Silver	0.010	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350000

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350002

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350117

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349991

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: P350033

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349891

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349984

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350065

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350136

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349894

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349895

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

Reference Method: SM 2320 B-97
Batch ID: P350106

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

Reference Method: SM 2320 B-97
Batch ID: P350107

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: P350186

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

Reference Method: SM 2540 D-97
Batch ID: P350314

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P350320

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P350109

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P350110

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P350111

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P349963

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

Reference Method: SM 5310 B-00
Batch ID: P349964

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: P349792

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	101		P	85 - 115
Zinc	98.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349792

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	97.9		P	85 - 115
Copper	99.6		P	85 - 115
Lead	96.9		P	85 - 115
Nickel	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350464

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Silver	90.9		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350000

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350002

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350117

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349991

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: P350033

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349891

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: P349984

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350065

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350136

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349894

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349895

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.3		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P350106

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P350107

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P350186

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P350109

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P350110

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P350111

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.4		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P349963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.8		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P349964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P349792

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2014202	Iron	104	102	P/P	80 - 120
2014202	Zinc	101	99.1	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349792

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2014202	Arsenic	102	101	P/P	80 - 120
2014202	Cadmium	100	99.4	P/P	80 - 120
2014202	Chromium	101	97.6	P/P	80 - 120
2014202	Copper	101	99.3	P/P	80 - 120
2014202	Lead	96.3	95.8	P/P	80 - 120
2014202	Nickel	103	100	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350464

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2014241	Silver	88.9	89.3	P/P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350000

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015045	Ammonia-N	97.2	97.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350117

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015140	Ammonia-N	98.0	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349991

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015135	Kjeldahl Nitrogen	99.3	96.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350033

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015125	Kjeldahl Nitrogen	99.2	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349891

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015788	NO2NO3-N	101	101	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349984

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015126	NO2NO3-N	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350065

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015464	Total-P	93.4	95.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350136

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015474	Total-P	103	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015236	O-Phosphate-P	94.6	95.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349895

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015142	O-Phosphate-P	95.8	96.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P350109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2014647	Fluoride	98.6	99.3	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P350110

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015773	Fluoride	99.2	97.9	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P350111

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2012772	Fluoride	98.5	98.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P349963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015161	Organic Carbon	103		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P349964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2015114	Organic Carbon	94.2	94.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P349816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015134	Turbidity	4.07	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P349792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2014202	Iron	2.06	Spike	P	0 - 20
2014202	Zinc	1.71	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P349792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2014202	Arsenic	1.35	Spike	P	0 - 20
2014202	Cadmium	0.624	Spike	P	0 - 20
2014202	Chromium	3.01	Spike	P	0 - 20
2014202	Copper	2.19	Spike	P	0 - 20
2014202	Lead	0.555	Spike	P	0 - 20
2014202	Nickel	2.64	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350464

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2014241	Silver	0.459	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350000

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015045	Ammonia-N	0.385	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350002

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2014585	Ammonia-N	0.597	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350117

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015140	Ammonia-N	0.659	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P349991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015135	Kjeldahl Nitrogen	1.27	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350033

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015125	Kjeldahl Nitrogen	4.39	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349891

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015788	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P349984

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015126	NO2NO3-N	0.926	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350065

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015464	Total-P	2.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350136

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015474	Total-P	4.45	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349894

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015236	O-Phosphate-P	0.899	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P349895

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015142	O-Phosphate-P	0.664	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P350106

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015773	Total Alkalinity	0.492	Sample	P	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P350107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2012772	Total Alkalinity	0.231	Sample	P	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P350186

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2014647	Total Alkalinity	0.655	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P350109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2014647	Fluoride	0.473	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P350110

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015773	Fluoride	0.986	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P350111

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2012772	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P349963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015161	Organic Carbon	0.235	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P349964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2015114	Organic Carbon	0.128	Spike	P	0 - 20

Quality Assurance Report
Precision

* 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: A85756
Included Lab Sample IDs: 2015134, 2015137, 2015138

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A85780
Included Lab Sample IDs: 2015149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	100	98.5	P/P	90 - 110
Zinc	98.0	99.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A85796
Included Lab Sample IDs: 2015149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	102	P/P	90 - 110
Cadmium	99.0	99.3	P/P	90 - 110
Copper	100	101	P/P	90 - 110
Lead	99.8	101	P/P	90 - 110
Nickel	99.9	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A85797
Included Lab Sample IDs: 2015135

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A85798
Included Lab Sample IDs: 2015136, 2015141, 2015142

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	93.1	92.0	P/P	90 - 110
O-Phosphate-P	97.8	95.2	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A85825
Included Lab Sample IDs: 2015135, 2015139, 2015140

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	96.0	P/P	90 - 110
Organic Carbon	96.9	94.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A85831
Included Lab Sample IDs: 2015139, 2015140

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A85836
Included Lab Sample IDs: 2015135, 2015139

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

Reference Method: SM 2320 B-97
Run ID: A85868
Included Lab Sample IDs: 2015137, 2015138

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	104	P/P	90 - 110
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A85868
Included Lab Sample IDs: 2015134, 2015137, 2015138

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A85872
Included Lab Sample IDs: 2015140

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A85877
Included Lab Sample IDs: 2015139

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A85891
Included Lab Sample IDs: 2015140

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A85903
Included Lab Sample IDs: 2015135, 2015139, 2015140

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.9	96.4	P/P	90 - 110
Kjeldahl Nitrogen	96.4	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A85905
Included Lab Sample IDs: 2015134

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A85911
Included Lab Sample IDs: 2015135

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A85912
Included Lab Sample IDs: 2015149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	92.9	92.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A86106
Included Lab Sample IDs: 2015149

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	98.9	97.8	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					4.07	
EPA 200.7 Rev. 4.4	Iron	101	104	102			2.06
	Zinc	98.3	101	99.1			1.71
EPA 200.8 Rev. 5.4	Arsenic	102	102	101			1.35
	Cadmium	101	100	99.4			0.624
	Chromium	97.9	101	97.6			3.01
	Copper	99.6	101	99.3			2.19
	Lead	96.9	96.3	95.8			0.555
	Nickel	102	103	100			2.64
	Silver	90.9	88.9	89.3			0.459
EPA 350.1 Rev. 2.0	Ammonia-N	97.3	97.2	97.7			0.385
	Ammonia-N	96.9					0.597
	Ammonia-N	98.2	98.0	98.7			0.659
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	99.3	96.9			1.27
	Kjeldahl Nitrogen	98.7	99.2	105			4.39
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101	101			0.0
	NO2NO3-N	104	104	105			0.926
EPA 365.1 Rev. 2.0	Total-P	96.6	93.4	95.3			2.02
	Total-P	102	103	98.2			4.45
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.4	94.6	95.5			0.899
	O-Phosphate-P	98.3	95.8	96.6			0.664
SM 2320 B-97	Total Alkalinity	103				0.492	
	Total Alkalinity	103				0.231	
	Total Alkalinity	103				0.655	
SM 4500 F-C-97	Fluoride	97.9	98.6	99.3			0.473
	Fluoride	99.3	99.2	97.9			0.986
	Fluoride	97.4	98.5	98.5			0.0
SM 5310 B-00	Organic Carbon	95.8	103				0.235
	Organic Carbon	94.0	94.2	94.4			0.128

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2015134, 2015137, 2015138
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2015149
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2015149
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2015135, 2015139, 2015140
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2015135, 2015139, 2015140
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2015135, 2015139, 2015140
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2015135, 2015139, 2015140
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2015136, 2015141, 2015142
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2015134, 2015137, 2015138
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2015134, 2015137, 2015138
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2015134, 2015137, 2015138
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2015135, 2015139, 2015140

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	08/08/2018			08/08/2018 15:53	William L. Brown IV	2015134, 2015137, 2015138
EPA 200.7 Rev. 4.4	08/08/2018	08/08/2018 15:00	Elliott D. Healy	08/09/2018 14:44	Betina Topolski	2015149
EPA 200.8 Rev. 5.4	08/08/2018	08/08/2018 15:00	Elliott D. Healy	08/09/2018 18:28	Allison Taylor	2015149
	08/08/2018	08/08/2018 15:00	Elliott D. Healy	08/15/2018 21:32	Allison Taylor	2015149
	08/08/2018	08/20/2018 16:10	Elliott D. Healy	08/24/2018 03:11	Allison Taylor	2015149
EPA 350.1 Rev. 2.0	08/08/2018			08/10/2018 14:56	Julia Storbeck	2015135
	08/08/2018			08/10/2018 16:02	Julia Storbeck	2015139
	08/08/2018			08/14/2018 14:19	Ping Hua	2015140
EPA 351.2 Rev. 2.0	08/08/2018	08/13/2018 16:00	Adrian Shelby	08/15/2018 14:26	Joseph Suarez	2015135
	08/08/2018	08/14/2018 15:30	Adrian Shelby	08/15/2018 14:03	Joseph Suarez	2015139
	08/08/2018	08/14/2018 15:30	Adrian Shelby	08/15/2018 14:04	Joseph Suarez	2015140
EPA 353.2 Rev. 2.0	08/08/2018			08/10/2018 10:03	Beverly Y. Sanders	2015135
	08/08/2018			08/13/2018 12:38	Lauren Bottorf	2015139
	08/08/2018			08/13/2018 12:39	Lauren Bottorf	2015140
EPA 365.1 Rev. 2.0	08/08/2018	08/14/2018 13:40	Sima Feizi	08/15/2018 08:02	Beverly Y. Sanders	2015139
	08/08/2018	08/14/2018 13:40	Sima Feizi	08/15/2018 11:06	Beverly Y. Sanders	2015140
	08/08/2018	08/15/2018 13:20	Sima Feizi	08/16/2018 07:51	Beverly Y. Sanders	2015135
EPA 365.1 Rev. 2.0 dissolved	08/08/2018			08/08/2018 14:54	Megan Treadwell	2015142
	08/08/2018			08/08/2018 17:34	Megan Treadwell	2015136
	08/08/2018			08/08/2018 17:35	Megan Treadwell	2015141
SM 2320 B-97	08/08/2018			08/14/2018 11:10	Dale L. Simmons	2015137
	08/08/2018			08/14/2018 13:38	Dale L. Simmons	2015138
	08/08/2018			08/16/2018 05:29	Dale L. Simmons	2015134
SM 2540 D-97	08/08/2018			08/10/2018 16:03	Yijie Li	2015134, 2015137, 2015138
SM 4500 F-C-97	08/08/2018			08/14/2018 07:30	Dale L. Simmons	2015134
	08/08/2018			08/14/2018 11:10	Dale L. Simmons	2015137
	08/08/2018			08/14/2018 13:00	Dale L. Simmons	2015138
SM 5310 B-00	08/08/2018			08/10/2018 03:23	Julia Storbeck	2015135
	08/08/2018			08/10/2018 03:37	Julia Storbeck	2015139
	08/08/2018			08/10/2018 12:25	Julia Storbeck	2015140