

Chemical Analysis Report

SE-DIST-2018-08-21-01

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

Event Description: **SMP- Martin Boat**
Request ID: **RQ-2018-08-13-83**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
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2199 South Rock Road
Fort Pierce, FL 34945
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 05-SEP-2018 11:34



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: South Fork SLR @ Hosford Park

Collection Date/Time: 08/20/2018 12:00

Field ID: G2SE0043

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018615	EPA 180.1 Rev. 2.0	Turbidity	9.9		NTU	P350634	
	SM 2320 B-97	Total Alkalinity	123		mg CaCO3/L	P350792	
	SM 2540 D-97	TSS	8	I	mg/L	P350810	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P350795	
2018619	EPA 350.1 Rev. 2.0	Ammonia-N	0.085		mg N/L	P350661	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P350704	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P350668	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P350714	
	SM 5310 B-00	Organic Carbon	17		mg C/L	P350673	
2018623	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.091		mg P/L	P350534	
2018631	EPA 200.7 Rev. 4.4	Iron	1.34E+03		ug/L	P350621	
		Zinc	5.0	U	ug/L	P350621	
	EPA 200.8 Rev. 5.4	Arsenic	1.51		ug/L	P350621	
		Cadmium	0.020	U	ug/L	P350621	
		Chromium	0.88	I	ug/L	P350621	
		Copper	1.34		ug/L	P350621	
		Lead	0.45		ug/L	P350621	
		Nickel	0.68	I	ug/L	P350621	
		Silver	0.010	U	ug/L	P350621	

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: South Fork SLR @ Gaines Ave

Collection Date/Time: 08/20/2018 12:30

Field ID: G2SE0039

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018616	EPA 180.1 Rev. 2.0	Turbidity	10		NTU	P350634	
	SM 2320 B-97	Total Alkalinity	125		mg CaCO3/L	P350792	
	SM 2540 D-97	TSS	10	I	mg/L	P350811	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P350795	
2018620	EPA 350.1 Rev. 2.0	Ammonia-N	0.080		mg N/L	P350661	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P350704	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P350668	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P350714	
	SM 5310 B-00	Organic Carbon	17		mg C/L	P350674	
2018624	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.092		mg P/L	P350534	
2018632	EPA 200.7 Rev. 4.4	Iron	1.27E+03		ug/L	P350621	
		Zinc	5.0	U	ug/L	P350621	
	EPA 200.8 Rev. 5.4	Arsenic	1.44		ug/L	P350621	
		Cadmium	0.020	U	ug/L	P350621	
		Chromium	0.92	I	ug/L	P350621	
		Copper	1.26		ug/L	P350621	
		Lead	0.44		ug/L	P350621	
		Nickel	0.65	I	ug/L	P350621	
		Silver	0.010	U	ug/L	P350621	

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: South Fork SLR @ St. Lucie Settlement

Collection Date/Time: 08/20/2018 14:40

Field ID: G2SE0040

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018617	EPA 180.1 Rev. 2.0	Turbidity	9.7		NTU	P350634	
	SM 2320 B-97	Total Alkalinity	107		mg CaCO3/L	P350792	
	SM 2540 D-97	TSS	8	I	mg/L	P350811	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P350795	
2018621	EPA 350.1 Rev. 2.0	Ammonia-N	0.091		mg N/L	P350718	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P350704	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P350669	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P350714	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P350674	
2018625	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P350534	
2018633	EPA 200.7 Rev. 4.4	Iron	1.21E+03		ug/L	P350621	
		Zinc	5.5	I	ug/L	P350621	
	EPA 200.8 Rev. 5.4	Arsenic	1.75		ug/L	P350621	
		Cadmium	0.020	U	ug/L	P350621	
		Chromium	0.90	I	ug/L	P350621	
		Copper	2.22		ug/L	P350621	
		Lead	0.47		ug/L	P350621	
		Nickel	0.64	I	ug/L	P350621	
		Silver	0.010	U	ug/L	P350621	

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: South Fork SLR @ SW Fuge

Collection Date/Time: 08/20/2018 15:00

Field ID: G2SE0041

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2018618	EPA 180.1 Rev. 2.0	Turbidity	9.9		NTU	P350634	
	SM 2320 B-97	Total Alkalinity	109		mg CaCO3/L	P350792	
	SM 2540 D-97	TSS	8	IA	mg/L	P350811	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P350795	
2018622	EPA 350.1 Rev. 2.0	Ammonia-N	0.083		mg N/L	P350718	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P350704	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P350669	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P350861	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P350674	
2018626	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.098		mg P/L	P350534	
2018634	EPA 200.7 Rev. 4.4	Iron	1.20E+03		ug/L	P350621	
		Zinc	5.0	U	ug/L	P350621	
	EPA 200.8 Rev. 5.4	Arsenic	1.87		ug/L	P350621	
		Cadmium	0.020	U	ug/L	P350621	
		Chromium	0.79	I	ug/L	P350621	
		Copper	1.97		ug/L	P350621	
		Lead	0.42		ug/L	P350621	
		Nickel	0.61	I	ug/L	P350621	
		Silver	0.010	U	ug/L	P350621	

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: P350634

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350621

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: P350621

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
Silver	0.010	U	ug/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350661

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350718

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350704

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350668

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350669

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350714

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350861

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350534

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

Reference Method: SM 2320 B-97
Batch ID: P350792

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

Reference Method: SM 2540 D-97
Batch ID: P350810

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P350811

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P350795

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P350673

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

Reference Method: SM 5310 B-00
Batch ID: P350674

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: P350621

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	104		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350621

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	98.0		P	85 - 115
Copper	99.3		P	85 - 115
Lead	99.6		P	85 - 115
Nickel	101		P	85 - 115
Silver	98.3		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350661

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350718

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: P350704

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: P350668

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350669

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350714

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350861

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.9		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350534

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

Reference Method: SM 2320 B-97
Batch ID: P350792

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

Reference Method: SM 4500 F-C-97
Batch ID: P350795

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.6		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P350673

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P350674

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.0		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018787	Iron	107		P	80 - 120
2018787	Zinc	106		P	80 - 120
2019049	Iron	104	101	P/P	80 - 120
2019049	Zinc	105	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350621

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018787	Arsenic	102		P	80 - 120
2018787	Cadmium	105		P	80 - 120
2018787	Chromium	99.4		P	80 - 120
2018787	Copper	99.5		P	80 - 120
2018787	Lead	101		P	80 - 120
2018787	Nickel	101		P	80 - 120
2018787	Silver	100		P	80 - 120
2019049	Arsenic	102	106	P/P	80 - 120
2019049	Cadmium	100	105	P/P	80 - 120
2019049	Chromium	92.5	94.9	P/P	80 - 120
2019049	Copper	94.6	97.7	P/P	80 - 120
2019049	Lead	99.3	103	P/P	80 - 120
2019049	Nickel	97.1	101	P/P	80 - 120
2019049	Silver	96.9	99.2	P/P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350661

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018605	Ammonia-N	98.0	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350718

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018767	Ammonia-N	102	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350704

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018611	Kjeldahl Nitrogen	105	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350668

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018546	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018621	NO2NO3-N	98.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350714

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018602	Total-P	99.2	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350861

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018672	Total-P	100	97.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350534

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018547	O-Phosphate-P	98.8	99.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P350795

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018523	Fluoride	99.1	98.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P350673

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018333	Organic Carbon	96.0	97.8	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P350674

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2018620	Organic Carbon	95.8	96.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P350634

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018603	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019049	Iron	2.40	Spike	P	0 - 20
2019049	Zinc	3.76	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350621

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2019049	Arsenic	3.07	Spike	P	0 - 20
2019049	Cadmium	4.07	Spike	P	0 - 20
2019049	Chromium	2.52	Spike	P	0 - 20
2019049	Copper	3.14	Spike	P	0 - 20
2019049	Lead	3.87	Spike	P	0 - 20
2019049	Nickel	3.50	Spike	P	0 - 20
2019049	Silver	2.35	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018605	Ammonia-N	1.04	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P350718

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018767	Ammonia-N	0.625	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018611	Kjeldahl Nitrogen	1.63	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350668

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018546	NO2NO3-N	2.47	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P350669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018621	NO2NO3-N	1.57	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018602	Total-P	1.46	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350861

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018672	Total-P	1.75	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350534

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018547	O-Phosphate-P	0.505	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P350792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018523	Total Alkalinity	0.207	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P350795

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018523	Fluoride	0.484	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P350673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018333	Organic Carbon	1.16	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P350674

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2018620	Organic Carbon	0.356	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 365.1 Rev. 2.0 dissolved

Run ID: A86033

Included Lab Sample IDs: 2018623, 2018624, 2018625, 2018626

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A86035

Included Lab Sample IDs: 2018615, 2018616, 2018617, 2018618

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86083

Included Lab Sample IDs: 2018619, 2018620

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A86085

Included Lab Sample IDs: 2018619, 2018620, 2018621, 2018622

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

Reference Method: SM 5310 B-00

Run ID: A86088

Included Lab Sample IDs: 2018619, 2018620, 2018621, 2018622

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.3	96.1	P/P	90 - 110
Organic Carbon	96.4	96.3	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A86093

Included Lab Sample IDs: 2018631, 2018632, 2018633, 2018634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	103	106	P/P	90 - 110
Zinc	104	107	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86114

Included Lab Sample IDs: 2018621, 2018622

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86117

Included Lab Sample IDs: 2018619, 2018620, 2018621

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86128

Included Lab Sample IDs: 2018619, 2018620, 2018621, 2018622

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	104	P/P	90 - 110
Kjeldahl Nitrogen	95.8	101	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A86129

Included Lab Sample IDs: 2018615, 2018616, 2018617, 2018618

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

Reference Method: SM 4500 F-C-97

Run ID: A86129

Included Lab Sample IDs: 2018615, 2018616, 2018617, 2018618

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A86159

Included Lab Sample IDs: 2018631, 2018632, 2018633, 2018634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.2	96.4	P/P	90 - 110
Cadmium	95.4	96.2	P/P	90 - 110
Chromium	95.1	96.3	P/P	90 - 110
Copper	97.5	96.1	P/P	90 - 110
Lead	101	101	P/P	90 - 110
Nickel	96.8	95.5	P/P	90 - 110
Silver	96.4	96.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86163

Included Lab Sample IDs: 2018622

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.6	101	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					0.0	
EPA 200.7 Rev. 4.4	Iron	104	107	104	101		2.40
	Zinc	102	106	105	101		3.76
EPA 200.8 Rev. 5.4	Arsenic	102	102	102	106		3.07
	Cadmium	100	105	100	105		4.07
	Chromium	98.0	99.4	92.5	94.9		2.52
	Copper	99.3	99.5	94.6	97.7		3.14
	Lead	99.6	101	99.3	103		3.87
	Nickel	101	101	97.1	101		3.50
	Silver	98.3	100	96.9	99.2		2.35
EPA 350.1 Rev. 2.0	Ammonia-N	101	98.0	99.6			1.04
	Ammonia-N	100	102	101			0.625
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	105	108			1.63
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	102			2.47
	NO2NO3-N	101	98.0	100			1.57
EPA 365.1 Rev. 2.0	Total-P	98.1	99.2	101			1.46
	Total-P	99.9	100	97.4			1.75
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.4	98.8	99.3			0.505
SM 2320 B-97	Total Alkalinity	103				0.207	
SM 4500 F-C-97	Fluoride	99.6	99.1	98.6			0.484
SM 5310 B-00	Organic Carbon	96.4	96.0	97.8			1.16
	Organic Carbon	98.0	95.8	96.4			0.356

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2018615, 2018616, 2018617, 2018618
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2018631, 2018632, 2018633, 2018634
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2018631, 2018632, 2018633, 2018634
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2018619, 2018620, 2018621, 2018622
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2018619, 2018620, 2018621, 2018622
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2018619, 2018620, 2018621, 2018622
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2018619, 2018620, 2018621, 2018622
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2018623, 2018624, 2018625, 2018626
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2018615, 2018616, 2018617, 2018618
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2018615, 2018616, 2018617, 2018618
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2018615, 2018616, 2018617, 2018618
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2018619, 2018620, 2018621, 2018622

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	08/21/2018			08/21/2018 16:11	Megan Treadwell	2018615, 2018616, 2018617, 2018618
EPA 200.7 Rev. 4.4	08/21/2018	08/22/2018 18:00	Elliott D. Healy	08/23/2018 16:57	Betina Topolski	2018631
	08/21/2018	08/22/2018 18:00	Elliott D. Healy	08/23/2018 17:03	Betina Topolski	2018632
	08/21/2018	08/22/2018 18:00	Elliott D. Healy	08/23/2018 17:11	Betina Topolski	2018633
	08/21/2018	08/22/2018 18:00	Elliott D. Healy	08/23/2018 17:18	Betina Topolski	2018634
EPA 200.8 Rev. 5.4	08/21/2018	08/22/2018 18:00	Elliott D. Healy	08/28/2018 21:44	Allison Taylor	2018631
	08/21/2018	08/22/2018 18:00	Elliott D. Healy	08/28/2018 21:54	Allison Taylor	2018632
	08/21/2018	08/22/2018 18:00	Elliott D. Healy	08/28/2018 22:03	Allison Taylor	2018633
	08/21/2018	08/22/2018 18:00	Elliott D. Healy	08/28/2018 22:13	Allison Taylor	2018634
EPA 350.1 Rev. 2.0	08/21/2018			08/23/2018 12:20	Adrian Shelby	2018619
	08/21/2018			08/23/2018 12:22	Adrian Shelby	2018620
	08/21/2018			08/24/2018 10:52	Ping Hua	2018621
	08/21/2018			08/24/2018 10:56	Ping Hua	2018622
EPA 351.2 Rev. 2.0	08/21/2018	08/24/2018 11:15	Adrian Shelby	08/27/2018 15:16	Joseph Suarez	2018619
	08/21/2018	08/24/2018 11:15	Adrian Shelby	08/27/2018 15:21	Joseph Suarez	2018620
	08/21/2018	08/24/2018 11:15	Adrian Shelby	08/27/2018 15:22	Joseph Suarez	2018621
	08/21/2018	08/24/2018 11:15	Adrian Shelby	08/27/2018 15:24	Joseph Suarez	2018622
EPA 353.2 Rev. 2.0	08/21/2018			08/23/2018 13:37	Lauren Bottorf	2018619
	08/21/2018			08/23/2018 13:38	Lauren Bottorf	2018620
	08/21/2018			08/23/2018 13:45	Lauren Bottorf	2018621
	08/21/2018			08/23/2018 13:55	Lauren Bottorf	2018622
EPA 365.1 Rev. 2.0	08/21/2018	08/24/2018 12:31	Sima Feizi	08/27/2018 08:52	Beverly Y. Sanders	2018619
	08/21/2018	08/24/2018 12:31	Sima Feizi	08/27/2018 08:53	Beverly Y. Sanders	2018620
	08/21/2018	08/24/2018 12:31	Sima Feizi	08/27/2018 08:54	Beverly Y. Sanders	2018621
	08/21/2018	08/28/2018 15:06	Sima Feizi	08/29/2018 08:02	Beverly Y. Sanders	2018622
EPA 365.1 Rev. 2.0 dissolved	08/21/2018			08/21/2018 15:14	Virginia P. Brown	2018623
	08/21/2018			08/21/2018 15:15	Virginia P. Brown	2018624, 2018625
	08/21/2018			08/21/2018 15:16	Virginia P. Brown	2018626
SM 2320 B-97	08/21/2018			08/25/2018 04:22	Dale L. Simmons	2018615
	08/21/2018			08/25/2018 04:33	Dale L. Simmons	2018616
	08/21/2018			08/25/2018 04:43	Dale L. Simmons	2018617
	08/21/2018			08/25/2018 04:54	Dale L. Simmons	2018618
SM 2540 D-97	08/21/2018			08/22/2018 15:33	Yijie Li	2018615, 2018616, 2018617, 2018618
SM 4500 F-C-97	08/21/2018			08/25/2018 04:22	Dale L. Simmons	2018615
	08/21/2018			08/25/2018 04:33	Dale L. Simmons	2018616
	08/21/2018			08/25/2018 04:43	Dale L. Simmons	2018617
	08/21/2018			08/25/2018 04:54	Dale L. Simmons	2018618
SM 5310 B-00	08/21/2018			08/23/2018 03:51	Megan Treadwell	2018619
	08/21/2018			08/23/2018 04:58	Megan Treadwell	2018620
	08/21/2018			08/23/2018 05:54	Megan Treadwell	2018621

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	08/21/2018			08/23/2018 06:07	Megan Treadwell	2018622