Chemical Analysis Report

SE-DIST-2019-09-27-01

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

Event Description: **SMP-SLE Boat**
Request ID: **RQ-2019-09-30-71**
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: Colin Wright, Program Administrator

Date Certified: 25-OCT-2019 12:14

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: Manatee Pocket Center **Collection Date/Time: 09/26/2019 13:05**

Field ID: G2SE0052 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2123092	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P371483	
	EPA 300.0	Bromide	56		mg Br/L	P371835	
	SM 2320 B-97	Total Alkalinity	131		mg CaCO3/L	P371988	
	SM 2540 D-97	TSS	10	I	mg/L	P372073	
	SM 4500 F-C-97	Fluoride	0.94		mg F/L	P371991	
2123093	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P371970	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P391620	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P372083	
	EPA 365.1 Rev. 2.0	Total-P	0.065		mg P/L	P371580	MS
	SM 5310 B-00	Organic Carbon	7.1		mg C/L	P371644	
2123094	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P371491	
2123109	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P371550	
		Manganese	7.1	I	ug/L	P371550	
		Zinc	20	U	ug/L	P371550	
	EPA 200.8 Rev. 5.4	Aluminum	73	I	ug/L	P371550	
		Antimony	0.20	U	ug/L	P371550	
		Arsenic	2.42		ug/L	P371550	
		Cadmium	0.080	U	ug/L	P371550	
		Chromium	4.0	U	ug/L	P371550	
		Copper	7.6		ug/L	P371550	
		Lead	0.94	I	ug/L	P371550	
		Nickel	2.0	U	ug/L	P371550	
		Selenium	2.0	U	ug/L	P371550	
		Silver	0.040	U	ug/L	P371550	
		Thallium	0.40	U	ug/L	P371550	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The copper result was confirmed in the undigested sample on 10/24/2019.

Sample Location: Great Pocket @ Marker 8 **Collection Date/Time: 09/26/2019 13:30**

Field ID: G2SE0033 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2123089	EPA 180.1 Rev. 2.0	Turbidity	7.4		NTU	P371483	
	EPA 300.0	Bromide	66		mg Br/L	P371835	
	SM 2320 B-97	Total Alkalinity	136		mg CaCO3/L	P371988	
	SM 2540 D-97	TSS	10		mg/L	P372073	
	SM 4500 F-C-97	Fluoride	1.1		mg F/L	P371991	
2123090	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P371869	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.51		mg N/L	P391620	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P372083	
	EPA 365.1 Rev. 2.0	Total-P	0.055		mg P/L	P371580	MS
	SM 5310 B-00	Organic Carbon	5.5		mg C/L	P371644	
2123091	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.020		mg P/L	P371491	

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: SLE near Hoggs Cove **Collection Date/Time: 09/26/2019 14:00**

Field ID: G2SE0046 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2123086	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P371483	
	EPA 300.0	Bromide	36		mg Br/L	P371835	
	SM 2320 B-97	Total Alkalinity	133		mg CaCO3/L	P371988	
	SM 2540 D-97	TSS	7	I A	mg/L	P372073	
	SM 4500 F-C-97	Fluoride	0.70		mg F/L	P371991	
2123087	EPA 350.1 Rev. 2.0	Ammonia-N	0.016		mg N/L	P371869	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P391620	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P372083	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P371580	MS
	SM 5310 B-00	Organic Carbon	11		mg C/L	P371644	
2123088	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.092		mg P/L	P371491	

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: P371483

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P371550

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: P371550

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	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: P371835

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371869

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371970

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391620

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372083

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371580

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371491

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

Reference Method: SM 2320 B-97
Batch ID: P371988

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

Reference Method: SM 2540 D-97
Batch ID: P372073

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P371991

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P371644

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: P371550

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	103		P	85 - 115
Manganese	97.5		P	85 - 115
Zinc	96.4		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P371550

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	99.2		P	85 - 115
Arsenic	97.7		P	85 - 115
Cadmium	94.5		P	85 - 115
Chromium	102		P	85 - 115
Copper	95.6		P	85 - 115
Lead	96.8		P	85 - 115
Nickel	95.6		P	85 - 115
Selenium	101		P	85 - 115
Silver	97.1		P	85 - 115
Thallium	98.4		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P371835

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Bromide	99.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371869

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: P371970

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.4		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372083

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371580

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371491

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: P371988

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P371991

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P371644

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P371550

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122950	Iron	101	99.7	P/P	70 - 130
2122950	Manganese	90.8	91.1	P/P	70 - 130
2122950	Zinc	98.0	98.5	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P371550

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122950	Aluminum	118	122	P/P	70 - 130
2122950	Antimony	98.4	99.1	P/P	70 - 130
2122950	Arsenic	96.4	97.1	P/P	70 - 130
2122950	Cadmium	88.1	87.9	P/P	70 - 130
2122950	Chromium	91.6	91.4	P/P	70 - 130
2122950	Copper	96.4	96.3	P/P	70 - 130
2122950	Lead	104	105	P/P	70 - 130
2122950	Nickel	95.8	95.8	P/P	70 - 130
2122950	Selenium	100	105	P/P	70 - 130
2122950	Silver	90.9	91.8	P/P	70 - 130
2122950	Thallium	104	107	P/P	70 - 130

Reference Method: EPA 300.0
Batch ID: P371835

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122392	Bromide	97.4	97.1	P/P	90 - 110
2123040	Bromide	97.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371869

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122488	Ammonia-N	102	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123153	Ammonia-N	101	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122808	Kjeldahl Nitrogen	90.3	91.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123087	NO2NO3-N	101	100	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371580

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122808	Total-P	88.8	90.9	F/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371491

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123091	O-Phosphate-P	96.0	96.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P371991

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122805	Fluoride	93.6	92.1	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P371644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2122491	Organic Carbon	92.3	91.7	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P371483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123048	Turbidity	1.92	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P371550

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122950	Iron	0.913	Spike	P	0 - 20
2122950	Manganese	0.256	Spike	P	0 - 20
2122950	Zinc	0.571	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P371550

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122950	Aluminum	2.83	Spike	P	0 - 20
2122950	Antimony	0.675	Spike	P	0 - 20
2122950	Arsenic	0.669	Spike	P	0 - 20
2122950	Cadmium	0.170	Spike	P	0 - 20
2122950	Chromium	0.201	Spike	P	0 - 20
2122950	Copper	0.140	Spike	P	0 - 20
2122950	Lead	0.600	Spike	P	0 - 20
2122950	Nickel	0.0154	Spike	P	0 - 20
2122950	Selenium	4.09	Spike	P	0 - 20
2122950	Silver	0.960	Spike	P	0 - 20
2122950	Thallium	2.74	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P371835

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122392	Bromide	0.319	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371869

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122488	Ammonia-N	0.218	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P371970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123153	Ammonia-N	2.41	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122808	Kjeldahl Nitrogen	0.903	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123087	NO2NO3-N	0.623	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P371580

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122808	Total-P	2.37	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P371491

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123091	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P371988

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122805	Total Alkalinity	0.730	Sample	P	0 - 2.8

Reference Method: SM 4500 F-C-97
Batch ID: P371991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122805	Fluoride	0.960	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P371644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2122491	Organic Carbon	0.570	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A94558
Included Lab Sample IDs: 2123086, 2123089, 2123092

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A94560
Included Lab Sample IDs: 2123088, 2123091, 2123094

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.2	P/P	90 - 110
O-Phosphate-P	96.4	96.3	P/P	90 - 110
O-Phosphate-P	99.4	100	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A94634
Included Lab Sample IDs: 2123087, 2123090, 2123093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.6	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A94656
Included Lab Sample IDs: 2123087

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A94659
Included Lab Sample IDs: 2123090, 2123093

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A94665
Included Lab Sample IDs: 2123087, 2123090, 2123093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.9	95.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A94690
Included Lab Sample IDs: 2123109

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	100	101	P/P	90 - 110
Manganese	99.1	99.8	P/P	90 - 110
Zinc	97.1	98.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0
Run ID: A94704
Included Lab Sample IDs: 2123086, 2123089, 2123092

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A94715
Included Lab Sample IDs: 2123087, 2123090

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A94750
Included Lab Sample IDs: 2123093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.7	98.0	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A94754
Included Lab Sample IDs: 2123086, 2123089, 2123092

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A94754
Included Lab Sample IDs: 2123086, 2123089, 2123092

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A94791
Included Lab Sample IDs: 2123087, 2123090, 2123093

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A95034
Included Lab Sample IDs: 2123109

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	104	106	P/P	90 - 110
Antimony	100	101	P/P	90 - 110
Arsenic	101	101	P/P	90 - 110
Cadmium	97.9	98.0	P/P	90 - 110
Copper	100	99.7	P/P	90 - 110
Lead	101	101	P/P	90 - 110
Nickel	99.2	98.4	P/P	90 - 110
Silver	97.0	96.9	P/P	90 - 110
Thallium	95.0	94.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A95109
Included Lab Sample IDs: 2123109

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	99.5	99.0	P/P	90 - 110
Selenium	98.6	99.6	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						1.92	
EPA 200.7 Rev. 4.4	Iron	103	101	99.7				0.913
	Manganese	97.5	90.8	91.1				0.256
	Zinc	96.4	98.0	98.5				0.571
EPA 200.8 Rev. 5.4	Aluminum	101	118	122				2.83
	Antimony	99.2	98.4	99.1				0.675
	Arsenic	97.7	96.4	97.1				0.669
	Cadmium	94.5	88.1	87.9				0.170
	Chromium	102	91.6	91.4				0.201
	Copper	95.6	96.4	96.3				0.140
	Lead	96.8	104	105				0.600
	Nickel	95.6	95.8	95.8				0.0154
	Selenium	101	100	105				4.09
	Silver	97.1	90.9	91.8				0.960
	Thallium	98.4	104	107				2.74
EPA 300.0	Bromide	99.8	97.4	97.1	97.2			0.319
EPA 350.1 Rev. 2.0	Ammonia-N	101	102	103				0.218
	Ammonia-N	97.3	101	104				2.41
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	92.4	90.3	91.2				0.903
EPA 353.2 Rev. 2.0	NO2NO3-N	100	101	100				0.623
EPA 365.1 Rev. 2.0	Total-P	97.0	88.8	90.9				2.37
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.4	96.0	96.0				0.0
SM 2320 B-97	Total Alkalinity	104					0.730	
SM 4500 F-C-97	Fluoride	98.2	93.6	92.1				0.960
SM 5310 B-00	Organic Carbon	95.0	92.3	91.7				0.570

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2123086, 2123089, 2123092
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2123109
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2123109
EPA 300.0 / E31780	Bromide in aqueous matrices	2123086, 2123089, 2123092
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2123087, 2123090, 2123093
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2123087, 2123090, 2123093
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2123087, 2123090, 2123093
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2123087, 2123090, 2123093
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2123088, 2123091, 2123094
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2123086, 2123089, 2123092
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2123086, 2123089, 2123092
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2123086, 2123089, 2123092
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2123087, 2123090, 2123093

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	09/27/2019			09/27/2019 16:08	Samantha Davila	2123086, 2123089, 2123092
EPA 200.7 Rev. 4.4	09/27/2019	09/30/2019 14:15	Elliott D. Healy	10/03/2019 13:07	Betina Topolski	2123109
EPA 200.8 Rev. 5.4	09/27/2019	09/30/2019 14:15	Elliott D. Healy	10/16/2019 22:27	Robert K Palmer	2123109
	09/27/2019	09/30/2019 14:15	Elliott D. Healy	10/16/2019 23:46	Robert K Palmer	2123109
	09/27/2019	09/30/2019 14:15	Elliott D. Healy	10/21/2019 17:18	Robert K Palmer	2123109
EPA 300.0	09/27/2019			10/03/2019 13:56	Julia Storbeck	2123086
	09/27/2019			10/03/2019 14:13	Julia Storbeck	2123089
	09/27/2019			10/03/2019 14:31	Julia Storbeck	2123092
EPA 350.1 Rev. 2.0	09/27/2019			10/03/2019 12:45	Ping Hua	2123087
	09/27/2019			10/03/2019 12:47	Ping Hua	2123090
	09/27/2019			10/04/2019 12:59	Ping Hua	2123093
EPA 351.2 Rev. 2.0	09/27/2019	10/01/2019 11:12	Sima Feizi	10/02/2019 14:39	Julia Storbeck	2123087
	09/27/2019	10/01/2019 11:12	Sima Feizi	10/02/2019 14:41	Julia Storbeck	2123090
	09/27/2019	10/01/2019 11:12	Sima Feizi	10/02/2019 14:42	Julia Storbeck	2123093
EPA 353.2 Rev. 2.0	09/27/2019			10/08/2019 09:52	Beverly Y. Sanders	2123087
	09/27/2019			10/08/2019 09:58	Beverly Y. Sanders	2123090
	09/27/2019			10/08/2019 09:59	Beverly Y. Sanders	2123093
EPA 365.1 Rev. 2.0	09/27/2019	10/01/2019 12:41	Vijayalakshmi Reddy	10/02/2019 10:45	Lipi Saha	2123087
	09/27/2019	10/01/2019 12:41	Vijayalakshmi Reddy	10/02/2019 12:51	Lipi Saha	2123090
	09/27/2019	10/01/2019 12:41	Vijayalakshmi Reddy	10/02/2019 12:52	Lipi Saha	2123093
EPA 365.1 Rev. 2.0 dissolved	09/27/2019			09/27/2019 16:40	Virginia P. Brown	2123091
	09/27/2019			09/27/2019 16:56	Virginia P. Brown	2123094
	09/27/2019			09/27/2019 17:31	Virginia P. Brown	2123088
SM 2320 B-97	09/27/2019			10/04/2019 11:52	Dale L. Simmons	2123086
	09/27/2019			10/04/2019 12:05	Dale L. Simmons	2123089
	09/27/2019			10/04/2019 12:17	Dale L. Simmons	2123092
SM 2540 D-97	09/27/2019			10/02/2019 15:09	Yijie Li	2123086, 2123089, 2123092
SM 4500 F-C-97	09/27/2019			10/04/2019 07:39	Dale L. Simmons	2123086
	09/27/2019			10/04/2019 07:43	Dale L. Simmons	2123089
	09/27/2019			10/04/2019 07:47	Dale L. Simmons	2123092
SM 5310 B-00	09/27/2019			10/01/2019 08:58	Madeline Funaro	2123087
	09/27/2019			10/01/2019 09:12	Madeline Funaro	2123090
	09/27/2019			10/01/2019 09:26	Madeline Funaro	2123093