Chemical Analysis Report

SE-DIST-2018-09-27-01

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

Event Description: **SMP- Upper Keys**
Request ID: **RQ-2018-09-24-17**
Customer: **SE-DIST**
Project ID: **SMP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 25-OCT-2018 14:45

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: 6S1 Key A **Collection Date/Time: 09/26/2018 10:50**

Field ID: G4SE0004 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2028682	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P352471	
	SM 2320 B-97	Total Alkalinity	166		mg CaCO3/L	P352885	
	SM 2540 D-97	TSS	3	U	mg/L	P353078	
	SM 4500 F-C-97	Fluoride	0.77		mg F/L	P352888	
2028683	EPA 350.1 Rev. 2.0	Ammonia-N	0.083		mg N/L	P352625	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P352485	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.030		mg N/L	P352469	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P352463	
	SM 5310 B-00	Organic Carbon	9.0		mg C/L	P352977	
2028684	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P352436	
2028700	EPA 200.7 Rev. 4.4	Iron	90	U	ug/L	P352620	
		Zinc	15	U	ug/L	P352620	
	EPA 200.8 Rev. 5.4	Arsenic	2.77		ug/L	P352620	
		Cadmium	0.060	U	ug/L	P352620	
		Chromium	4.0	U	ug/L	P352620	
		Copper	5.2		ug/L	P352620	
		Lead	0.15	U	ug/L	P352620	
		Nickel	0.60	U	ug/L	P352620	
		Silver	0.030	U	ug/L	P352620	

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 10/22/2018.

Sample Location: Atlantic Ocean "North by Cesar" **Collection Date/Time: 09/26/2018 12:45**

Field ID: G4SE0104 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2028670	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P352471	
	SM 2320 B-97	Total Alkalinity	120		mg CaCO3/L	P352885	
	SM 2540 D-97	TSS	3	U	mg/L	P353078	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P352888	
2028674	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P352625	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25	I	mg N/L	P352485	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P352468	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P352463	
	SM 5310 B-00	Organic Carbon	2.0		mg C/L	P352977	
2028678	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P352436	

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: Atlantic Ocean "North by red4" **Collection Date/Time: 09/26/2018 13:00**

Field ID: G4SE0105 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2028671	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P352471	
	SM 2320 B-97	Total Alkalinity	121		mg CaCO3/L	P352885	
	SM 2540 D-97	TSS	3	U	mg/L	P353078	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P352888	
2028675	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P352625	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.16	U	mg N/L	P352485	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P352468	
	EPA 365.1 Rev. 2.0	Total-P	0.010	I	mg P/L	P352463	
	SM 5310 B-00	Organic Carbon	1.5	I	mg C/L	P352977	
2028679	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P352436	

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: Atlantic Ocean "South by red2" **Collection Date/Time: 09/26/2018 14:00**

Field ID: G4SE0102 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2028672	EPA 180.1 Rev. 2.0	Turbidity	0.50		NTU	P352471	
	SM 2320 B-97	Total Alkalinity	121		mg CaCO3/L	P352885	
	SM 2540 D-97	TSS	3	U	mg/L	P353078	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P352888	
2028676	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P352625	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.16	U	mg N/L	P352485	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P352468	
	EPA 365.1 Rev. 2.0	Total-P	0.007	I	mg P/L	P352463	
	SM 5310 B-00	Organic Carbon	1.5	I	mg C/L	P352977	
2028680	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P352436	

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: Atlantic Ocean "South by broad creek" **Collection Date/Time: 09/26/2018 14:30**

Field ID: G4SE0103 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2028673	EPA 180.1 Rev. 2.0	Turbidity	0.80		NTU	P352471	
	SM 2320 B-97	Total Alkalinity	120		mg CaCO3/L	P352885	
	SM 2540 D-97	TSS	3	U	mg/L	P353078	
	SM 4500 F-C-97	Fluoride	1.3		mg F/L	P352888	
2028677	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P352625	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.21	I	mg N/L	P352485	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P352468	
	EPA 365.1 Rev. 2.0	Total-P	0.008	I	mg P/L	P352463	
	SM 5310 B-00	Organic Carbon	1.8	I	mg C/L	P352977	
2028681	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P352436	

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: P352471

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352620

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: P352620

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: P352625

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352485

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352468

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352469

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352463

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352436

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

Reference Method: SM 2320 B-97
Batch ID: P352885

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

Reference Method: SM 2540 D-97
Batch ID: P353078

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P352888

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P352977

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: P352620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	99.1		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	107		P	85 - 115
Cadmium	106		P	85 - 115
Chromium	103		P	85 - 115
Copper	105		P	85 - 115
Lead	93.9		P	85 - 115
Nickel	105		P	85 - 115
Silver	99.9		P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352625

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352485

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352468

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352469

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: P352463

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352436

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P352885

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	105		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P352888

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P352977

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.5		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028700	Iron	94.3	94.8	P/P	70 - 130
2028700	Zinc	99.8	102	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028700	Arsenic	118	115	P/P	80 - 120
2028700	Cadmium	103	105	P/P	80 - 120
2028700	Chromium	111	106	P/P	80 - 120
2028700	Copper	105	102	P/P	80 - 120
2028700	Lead	107	105	P/P	80 - 120
2028700	Nickel	112	107	P/P	80 - 120
2028700	Silver	93.5	99.7	P/P	80 - 120

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352625

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2027433	Ammonia-N	101	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352485

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2027001	Kjeldahl Nitrogen	107	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352468

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2027001	NO2NO3-N	102	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352469

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028954	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352463

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028677	Total-P	94.7	91.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352436

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028679	O-Phosphate-P	96.3	98.2	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P352888

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028833	Fluoride	96.7	96.7	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P352977

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2028674	Organic Carbon	94.7	96.1	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P352471

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028837	Turbidity	3.39	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P352620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028700	Iron	0.613	Spike	P	0 - 20
2028700	Zinc	1.71	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P352620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028700	Arsenic	1.93	Spike	P	0 - 20
2028700	Cadmium	2.32	Spike	P	0 - 20
2028700	Chromium	4.45	Spike	P	0 - 20
2028700	Copper	2.34	Spike	P	0 - 20
2028700	Lead	2.48	Spike	P	0 - 20
2028700	Nickel	4.03	Spike	P	0 - 20
2028700	Silver	6.36	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P352625

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027433	Ammonia-N	0.838	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P352485

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027001	Kjeldahl Nitrogen	2.72	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352468

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2027001	NO2NO3-N	1.46	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P352469

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028954	NO2NO3-N	0.564	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P352463

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028677	Total-P	3.22	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P352436

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028679	O-Phosphate-P	1.95	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P352885

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028833	Total Alkalinity	0.108	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P352888

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028833	Fluoride	0.0	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P352977

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2028674	Organic Carbon	1.34	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 365.1 Rev. 2.0 dissolved
Run ID: A86767
Included Lab Sample IDs: 2028678, 2028679, 2028680, 2028681, 2028684

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	99.5	P/P	90 - 110
O-Phosphate-P	99.8	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A86784
Included Lab Sample IDs: 2028674, 2028675, 2028676, 2028677, 2028683

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	98.5	P/P	90 - 110
NO2NO3-N	98.5	98.5	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A86787
Included Lab Sample IDs: 2028670, 2028671, 2028672, 2028673, 2028682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	102	P/P	95 - 105

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A86819
Included Lab Sample IDs: 2028674, 2028675, 2028676, 2028677, 2028683

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	103	P/P	90 - 110
Kjeldahl Nitrogen	103	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A86831
Included Lab Sample IDs: 2028674, 2028675, 2028676, 2028677, 2028683

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A86854
Included Lab Sample IDs: 2028674, 2028675, 2028676, 2028677, 2028683

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A86888
Included Lab Sample IDs: 2028700

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	95.9	94.4	P/P	90 - 110
Zinc	103	104	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A86959
Included Lab Sample IDs: 2028670, 2028671, 2028672, 2028673, 2028682

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

Reference Method: SM 4500 F-C-97
Run ID: A86959
Included Lab Sample IDs: 2028670, 2028671, 2028672, 2028673, 2028682

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

Reference Method: SM 5310 B-00
Run ID: A86991
Included Lab Sample IDs: 2028674, 2028675, 2028676, 2028677, 2028683

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.4	94.4	P/P	90 - 110
Organic Carbon	95.5	95.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A87196
Included Lab Sample IDs: 2028700

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	104	104	P/P	90 - 110
Cadmium	102	103	P/P	90 - 110
Copper	105	102	P/P	90 - 110
Lead	92.5	92.2	P/P	90 - 110
Nickel	104	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A87239
Included Lab Sample IDs: 2028700

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	99.1	98.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A87274
Included Lab Sample IDs: 2028700

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	97.7	97.7	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					3.39	
EPA 200.7 Rev. 4.4	Iron	99.1	94.3	94.8			0.613
	Zinc	102	99.8	102			1.71
EPA 200.8 Rev. 5.4	Arsenic	107	118	115			1.93
	Cadmium	106	103	105			2.32
	Chromium	103	111	106			4.45
	Copper	105	105	102			2.34
	Lead	93.9	107	105			2.48
	Nickel	105	112	107			4.03
	Silver	99.9	93.5	99.7			6.36
EPA 350.1 Rev. 2.0	Ammonia-N	101	101	99.4			0.838
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	107	104			2.72
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	102	104			1.46
	NO2NO3-N	102	100	102			0.564
EPA 365.1 Rev. 2.0	Total-P	104	94.7	91.7			3.22
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	96.3	98.2			1.95
SM 2320 B-97	Total Alkalinity	105				0.108	
SM 4500 F-C-97	Fluoride	100	96.7	96.7			0.0
SM 5310 B-00	Organic Carbon	99.5	94.7	96.1			1.34

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2028670, 2028671, 2028672, 2028673, 2028682
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2028700
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2028700
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2028674, 2028675, 2028676, 2028677, 2028683
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2028674, 2028675, 2028676, 2028677, 2028683
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2028674, 2028675, 2028676, 2028677, 2028683
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2028674, 2028675, 2028676, 2028677, 2028683
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2028678, 2028679, 2028680, 2028681, 2028684
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2028670, 2028671, 2028672, 2028673, 2028682
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2028670, 2028671, 2028672, 2028673, 2028682
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2028670, 2028671, 2028672, 2028673, 2028682
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2028674, 2028675, 2028676, 2028677, 2028683

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	09/27/2018			09/27/2018 15:54	Megan Treadwell	2028670, 2028671, 2028672, 2028673, 2028682
EPA 200.7 Rev. 4.4	09/27/2018	10/02/2018 18:00	Elliott D. Healy	10/03/2018 14:55	Betina Topolski	2028700
EPA 200.8 Rev. 5.4	09/27/2018	10/02/2018 18:00	Elliott D. Healy	10/20/2018 09:51	Allison Taylor	2028700
	09/27/2018	10/02/2018 18:00	Elliott D. Healy	10/22/2018 19:59	Allison Taylor	2028700
	09/27/2018	10/02/2018 18:00	Elliott D. Healy	10/24/2018 14:36	Allison Taylor	2028700
EPA 350.1 Rev. 2.0	09/27/2018			10/01/2018 13:00	Ping Hua	2028674
	09/27/2018			10/01/2018 13:01	Ping Hua	2028675
	09/27/2018			10/01/2018 13:03	Ping Hua	2028676
	09/27/2018			10/01/2018 13:04	Ping Hua	2028677
	09/27/2018			10/01/2018 13:06	Ping Hua	2028683
EPA 351.2 Rev. 2.0	09/27/2018	09/28/2018 12:45	Adrian Shelby	10/01/2018 12:20	Joseph Suarez	2028674
	09/27/2018	09/28/2018 12:45	Adrian Shelby	10/01/2018 12:22	Joseph Suarez	2028675
	09/27/2018	09/28/2018 12:45	Adrian Shelby	10/01/2018 12:23	Joseph Suarez	2028676
	09/27/2018	09/28/2018 12:45	Adrian Shelby	10/01/2018 12:28	Joseph Suarez	2028677
	09/27/2018	09/28/2018 12:45	Adrian Shelby	10/01/2018 12:29	Joseph Suarez	2028683
EPA 353.2 Rev. 2.0	09/27/2018			09/28/2018 11:13	Lauren Bottorf	2028674
	09/27/2018			09/28/2018 11:14	Lauren Bottorf	2028675
	09/27/2018			09/28/2018 11:16	Lauren Bottorf	2028676
	09/27/2018			09/28/2018 11:17	Lauren Bottorf	2028677
	09/27/2018			09/28/2018 11:30	Lauren Bottorf	2028683
EPA 365.1 Rev. 2.0	09/27/2018	09/28/2018 12:15	Sima Feizi	10/01/2018 14:29	Beverly Y. Sanders	2028674
	09/27/2018	09/28/2018 12:15	Sima Feizi	10/01/2018 14:37	Beverly Y. Sanders	2028675
	09/27/2018	09/28/2018 12:15	Sima Feizi	10/01/2018 14:38	Beverly Y. Sanders	2028676
	09/27/2018	09/28/2018 12:15	Sima Feizi	10/01/2018 14:39	Beverly Y. Sanders	2028677
	09/27/2018	09/28/2018 12:15	Sima Feizi	10/01/2018 14:40	Beverly Y. Sanders	2028683
EPA 365.1 Rev. 2.0 dissolved	09/27/2018			09/27/2018 15:25	Julia Storbeck	2028679
	09/27/2018			09/27/2018 16:02	Julia Storbeck	2028678
	09/27/2018			09/27/2018 16:03	Julia Storbeck	2028680
	09/27/2018			09/27/2018 16:04	Julia Storbeck	2028681
	09/27/2018			09/27/2018 16:05	Julia Storbeck	2028684
SM 2320 B-97	09/27/2018			10/06/2018 07:17	Dale L. Simmons	2028670
	09/27/2018			10/06/2018 07:27	Dale L. Simmons	2028671
	09/27/2018			10/06/2018 07:36	Dale L. Simmons	2028672
	09/27/2018			10/06/2018 07:46	Dale L. Simmons	2028673
	09/27/2018			10/06/2018 07:56	Dale L. Simmons	2028682
SM 2540 D-97	09/27/2018			10/01/2018 11:35	DeAsia Armster	2028670, 2028671, 2028672, 2028673, 2028682
SM 4500 F-C-97	09/27/2018			10/06/2018 05:57	Dale L. Simmons	2028670
	09/27/2018			10/06/2018 06:01	Dale L. Simmons	2028671

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 4500 F-C-97	09/27/2018			10/06/2018 06:04	Dale L. Simmons	2028672
	09/27/2018			10/06/2018 06:44	Dale L. Simmons	2028673
	09/27/2018			10/06/2018 06:48	Dale L. Simmons	2028682
SM 5310 B-00	09/27/2018			10/04/2018 11:01	Megan Treadwell	2028674
	09/27/2018			10/04/2018 11:45	Megan Treadwell	2028675
	09/27/2018			10/04/2018 12:02	Megan Treadwell	2028676
	09/27/2018			10/04/2018 12:35	Megan Treadwell	2028677
	09/27/2018			10/04/2018 13:22	Megan Treadwell	2028683