Chemical Analysis Report

SO-DIST-2018-11-13-02

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

Event Description: **SMP Resample: 2081 & 2046**
Request ID: **RQ-2018-11-12-62**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901-3381
Attn: Nicole Reistad

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 04-DEC-2018 13:51

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: Little Alligator@Midway **Collection Date/Time: 11/12/2018 09:25**

Field ID: G3SD0071 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2040864	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P354628	
	SM 2320 B-97	Total Alkalinity	155		mg CaCO3/L	P354930	
	SM 2540 D-97	TSS	4	IA	mg/L	P354869	
	SM 4500 F-C-97	Fluoride	0.76		mg F/L	P354932	
2040865	EPA 350.1 Rev. 2.0	Ammonia-N	0.085		mg N/L	P354696	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.74		mg N/L	P354904	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.033		mg N/L	P354756	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P354911	
	SM 5310 B-00	Organic Carbon	8.5		mg C/L	P354838	
2040866	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P354617	
2040870	EPA 200.7 Rev. 4.4	Calcium	233		mg/L	P354664	
		Iron	90	U	ug/L	P354664	
		Magnesium	558		mg/L	P354664	
		Potassium	162		mg/L	P354664	
		Sodium	4.53E+03		mg/L	P354664	
		Zinc	15	U	ug/L	P354664	
	EPA 200.8 Rev. 5.4	Arsenic	2.73		ug/L	P354664	
		Cadmium	0.060	U	ug/L	P354664	
		Chromium	4.0	UJ	ug/L	P354664	MS, RPD
		Copper	0.76	I	ug/L	P354664	
		Lead	0.15	U	ug/L	P354664	
		Nickel	0.71	I	ug/L	P354664	
		Silver	0.030	U	ug/L	P354664	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium, potassium, and sodium are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Refer to the narrative for an explanation of QC Codes.

Sample Location: Alligator @ Burnt Store **Collection Date/Time: 11/12/2018 10:00**

Field ID: G2SD0016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2040861	EPA 180.1 Rev. 2.0	Turbidity	7.4	A	NTU	P354628	
	EPA 300.0 Rev. 2.1	Chloride	41		mg Cl/L	P355177	
		Sulfate	15		mg SO4/L	P355179	
	SM 2120 B	Color (true)	50		PCU	P354603	
	SM 2320 B-97	Total Alkalinity	182		mg CaCO3/L	P354960	
	SM 2540 C-97	TDS	310	A	mg/L	P354852	
	SM 2540 D-97	TSS	9	IA	mg/L	P354865	
	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P354962	
2040862	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P354697	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P354716	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.093		mg N/L	P354818	
	EPA 365.1 Rev. 2.0	Total-P	0.058		mg P/L	P354827	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P354836	
2040863	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P354616	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P354628

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354664

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354664

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 300.0 Rev. 2.1
Batch ID: P355177

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355179

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354696

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354697

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354716

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354904

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354756

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354818

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354827

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354911

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354616

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354617

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

Reference Method: SM 2120 B
Batch ID: P354603

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P354930

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

Reference Method: SM 2320 B-97
Batch ID: P354960

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

Reference Method: SM 2540 C-97
Batch ID: P354852

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P354865

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P354869

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P354932

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P354962

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P354836

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

Reference Method: SM 5310 B-00
Batch ID: P354838

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: P354664

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	85 - 115
Iron	110		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	102		P	85 - 115
Sodium	104		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354664

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	109		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	109		P	85 - 115
Copper	107		P	85 - 115
Lead	103		P	85 - 115
Nickel	107		P	85 - 115
Silver	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355177

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355179

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354696

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354697

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354716

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354904

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: P354756

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: P354818

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354827

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354911

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354616

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354617

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

Reference Method: SM 2120 B
Batch ID: P354603

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.8		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P354930

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P354960

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P354932

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P354962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.7		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354836

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.2		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P354838

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040870	Iron	103	103	P/P	70 - 130
2040870	Zinc	99.0	100	P/P	70 - 130

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040870	Arsenic	118	119	P/P	80 - 120
2040870	Cadmium	99.3	98.5	P/P	80 - 120
2040870	Chromium	128	91.6	F/P	80 - 120
2040870	Copper	106	107	P/P	80 - 120
2040870	Lead	110	110	P/P	80 - 120
2040870	Nickel	111	113	P/P	80 - 120
2040870	Silver	90.7	91.5	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355177

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2039266	Chloride	92.9		P	90 - 110
2040877	Chloride	98.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2039266	Sulfate	97.3		P	90 - 110
2040877	Sulfate	98.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354696

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040037	Ammonia-N	102	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040262	Ammonia-N	101	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354904

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040865	Kjeldahl Nitrogen	97.4	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040865	NO2NO3-N	102	103	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354818

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040485	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354827

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040848	Total-P	98.2	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354911

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041026	Total-P	109	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354616

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040879	O-Phosphate-P	92.5	94.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P354932

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2039192	Fluoride	98.4	97.7	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P354962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040905	Fluoride	100	99.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354836

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040844	Organic Carbon	96.4	96.0	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P354838

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2040865	Organic Carbon	101	98.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P354628

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040861	Turbidity	4.07	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P354664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040870	Calcium	0.934	Spike	P	0 - 20
2040870	Iron	0.102	Spike	P	0 - 20
2040870	Magnesium	1.74	Spike	P	0 - 20
2040870	Potassium	0.0419	Spike	P	0 - 20
2040870	Sodium	1.04	Spike	P	0 - 20
2040870	Zinc	1.39	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P354664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040870	Arsenic	0.555	Spike	P	0 - 20
2040870	Cadmium	0.830	Spike	P	0 - 20
2040870	Chromium	32.9	Spike	F	0 - 20
2040870	Copper	0.690	Spike	P	0 - 20
2040870	Lead	0.557	Spike	P	0 - 20
2040870	Nickel	2.01	Spike	P	0 - 20
2040870	Silver	0.792	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2039266	Chloride	0.816	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2039266	Sulfate	0.812	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354696

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040037	Ammonia-N	0.962	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P354697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040262	Ammonia-N	0.237	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354716

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040720	Kjeldahl Nitrogen	3.36	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354904

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040865	Kjeldahl Nitrogen	3.23	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040865	NO2NO3-N	1.26	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P354818

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040485	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354827

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040848	Total-P	2.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354911

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041026	Total-P	2.24	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354616

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040879	O-Phosphate-P	1.67	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040866	O-Phosphate-P	0.314	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P354603

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040840	Color (true)	0.627	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P354930

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040840	Total Alkalinity	0.820	Sample	P	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P354960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040905	Total Alkalinity	1.24	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P354852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040861	TDS	6.76	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P354932

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2039192	Fluoride	0.476	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P354962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040905	Fluoride	0.473	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P354836

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040844	Organic Carbon	0.212	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P354838

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2040865	Organic Carbon	1.61	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: SM 2120 B
Run ID: A87723
Included Lab Sample IDs: 2040861

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.2	99.9	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A87727
Included Lab Sample IDs: 2040863, 2040866

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	98.4	P/P	90 - 110
O-Phosphate-P	99.7	99.1	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A87734
Included Lab Sample IDs: 2040861, 2040864

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A87762
Included Lab Sample IDs: 2040862, 2040865

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.3	98.8	P/P	90 - 110
Ammonia-N	98.8	97.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A87796
Included Lab Sample IDs: 2040865

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A87800
Included Lab Sample IDs: 2040870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	103	P/P	90 - 110
Iron	102	101	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	100	101	P/P	90 - 110
Sodium	103	102	P/P	90 - 110
Zinc	99.4	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A87823
Included Lab Sample IDs: 2040862

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A87828
Included Lab Sample IDs: 2040862, 2040865

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.2	95.0	P/P	90 - 110
Organic Carbon	95.8	95.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A87842
Included Lab Sample IDs: 2040862

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A87853
Included Lab Sample IDs: 2040862

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

Reference Method: SM 2320 B-97
Run ID: A87869
Included Lab Sample IDs: 2040864

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	97.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A87869
Included Lab Sample IDs: 2040864

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

Reference Method: SM 2320 B-97
Run ID: A87886
Included Lab Sample IDs: 2040861

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A87886
Included Lab Sample IDs: 2040861

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A87893
Included Lab Sample IDs: 2040865

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.6	100	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A87899
Included Lab Sample IDs: 2040865

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.0	99.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A87903
Included Lab Sample IDs: 2040870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	107	107	P/P	90 - 110
Cadmium	102	102	P/P	90 - 110
Chromium	105	100	P/P	90 - 110
Copper	106	106	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Nickel	106	105	P/P	90 - 110
Silver	99.0	98.4	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A87993
Included Lab Sample IDs: 2040861

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Sulfate	101	102	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	Calcium	104					0.934
	Iron	110	103	103			0.102
	Magnesium	103					1.74
	Potassium	102					0.0419
	Sodium	104					1.04
	Zinc	103	99.0	100			1.39
EPA 200.8 Rev. 5.4	Arsenic	109	118	119			0.555
	Cadmium	104	99.3	98.5			0.830
	Chromium	109	128	91.6			32.9
	Copper	107	106	107			0.690
	Lead	103	110	110			0.557
	Nickel	107	111	113			2.01
	Silver	101	90.7	91.5			0.792
EPA 300.0 Rev. 2.1	Chloride	99.5	92.9	98.9		0.816	
	Sulfate	99.6	97.3	98.8		0.812	
EPA 350.1 Rev. 2.0	Ammonia-N	98.4	102	101			0.962
	Ammonia-N	99.5	101	101			0.237
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107					3.36
	Kjeldahl Nitrogen	103	97.4	102			3.23
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	103			1.26
	NO2NO3-N	99.5	104	104			0.0
EPA 365.1 Rev. 2.0	Total-P	102	98.2	101			2.10
	Total-P	110	109	106			2.24
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.4	92.5	94.2			1.67
	O-Phosphate-P	101					0.314
SM 2120 B	Color (true)	98.8				0.627	
SM 2320 B-97	Total Alkalinity	102				0.820	
	Total Alkalinity	101				1.24	
SM 2540 C-97	TDS					6.76	
SM 4500 F-C-97	Fluoride	96.1	98.4	97.7			0.476
	Fluoride	97.7	100	99.5			0.473
SM 5310 B-00	Organic Carbon	99.2	96.4	96.0			0.212
	Organic Carbon	97.8	101	98.8			1.61

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2040861, 2040864
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2040870
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2040870
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2040861
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2040861
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2040862, 2040865
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2040862, 2040865
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2040862, 2040865

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2040862, 2040865
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2040863, 2040866
SM 2120 B / E31780	True Color measured at 450 nm	2040861
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2040861, 2040864
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2040861
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2040861, 2040864
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2040861, 2040864
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2040862, 2040865

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	11/13/2018			11/13/2018 17:04	Megan Treadwell	2040861, 2040864
EPA 200.7 Rev. 4.4	11/13/2018	11/14/2018 15:00	Elliott D. Healy	11/15/2018 14:58	Betina Topolski	2040870
	11/13/2018	11/14/2018 15:00	Elliott D. Healy	11/15/2018 16:13	Betina Topolski	2040870
EPA 200.8 Rev. 5.4	11/13/2018	11/14/2018 15:00	Elliott D. Healy	11/21/2018 04:02	Allison Taylor	2040870
	11/13/2018	11/14/2018 15:00	Elliott D. Healy	11/21/2018 07:34	Allison Taylor	2040870
EPA 300.0 Rev. 2.1	11/13/2018			11/27/2018 19:27	Lipi Saha	2040861
EPA 350.1 Rev. 2.0	11/13/2018			11/14/2018 13:22	Ping Hua	2040865
	11/13/2018			11/14/2018 13:43	Ping Hua	2040862
EPA 351.2 Rev. 2.0	11/13/2018	11/15/2018 11:30	Adrian Shelby	11/17/2018 00:25	Joseph Suarez	2040862
	11/13/2018	11/19/2018 11:15	Adrian Shelby	11/20/2018 13:56	Joseph Suarez	2040865
EPA 353.2 Rev. 2.0	11/13/2018			11/15/2018 13:10	Lauren Bottorf	2040865
	11/13/2018			11/16/2018 10:50	Beverly Y. Sanders	2040862
EPA 365.1 Rev. 2.0	11/13/2018	11/16/2018 12:50	Sima Feizi	11/19/2018 09:37	Beverly Y. Sanders	2040862
	11/13/2018	11/19/2018 13:00	Sima Feizi	11/20/2018 11:09	Beverly Y. Sanders	2040865
EPA 365.1 Rev. 2.0 dissolved	11/13/2018			11/13/2018 18:15	Jhamieka S. Greenwood	2040866
	11/13/2018			11/13/2018 18:22	Jhamieka S. Greenwood	2040863
SM 2120 B	11/13/2018			11/13/2018 14:37	Chelsea Hernandez	2040861
SM 2320 B-97	11/13/2018			11/15/2018 00:32	Dale L. Simmons	2040864
	11/13/2018			11/16/2018 00:39	Dale L. Simmons	2040861
SM 2540 C-97	11/13/2018			11/15/2018 14:02	Yijie Li	2040861
SM 2540 D-97	11/13/2018			11/15/2018 14:02	Yijie Li	2040861, 2040864
SM 4500 F-C-97	11/13/2018			11/15/2018 02:20	Dale L. Simmons	2040864
	11/13/2018			11/16/2018 00:39	Dale L. Simmons	2040861
SM 5310 B-00	11/13/2018			11/15/2018 04:07	Megan Treadwell	2040862
	11/13/2018			11/16/2018 02:23	Megan Treadwell	2040865