Chemical Analysis Report

SW-DIST-2019-05-16-03

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

Event Description: **SMP - Hernado/Citrus Run**
Request ID: **RQ-2019-05-13-06**
Customer: **SW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926
Attn: Ben Paswater

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: 03-JUN-2019 11:08

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 group are included in this report: 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: CATO LAKE SOUTH **Collection Date/Time: 05/15/2019 12:05**

Field ID: G4SW0102 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2086918	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P364094	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P364272	
		Sulfate	0.20	U	mg SO4/L	P364273	
	SM 2120 B	Color (true)	24	A	PCU	P364100	
	SM 2320 B-97	Total Alkalinity	164		mg CaCO3/L	P364424	
	SM 2540 C-97	TDS	229	A	mg/L	P364442	
	SM 2540 D-97	TSS	3	IA	mg/L	P364348	
	SM 4500 F-C-97	Fluoride	0.094	I	mg F/L	P364427	
2086922	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P364331	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P364682	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364303	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P364594	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P364289	
2086926	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P364087	

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: IRVIN LAKE CENTER **Collection Date/Time: 05/15/2019 14:30**

Field ID: G4SW0025 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2086919	EPA 180.1 Rev. 2.0	Turbidity	8.6		NTU	P364094	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P364272	
		Sulfate	3.6		mg SO4/L	P364273	
	SM 2120 B	Color (true)	38		PCU	P364100	
	SM 2320 B-97	Total Alkalinity	54		mg CaCO3/L	P364425	
	SM 2540 C-97	TDS	97		mg/L	P364442	
	SM 2540 D-97	TSS	17		mg/L	P364348	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P364428	
2086923	EPA 350.1 Rev. 2.0	Ammonia-N	0.056		mg N/L	P364331	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P364682	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.066		mg N/L	P364303	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P364594	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P364289	
2086927	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P364088	

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: BLUE SPRINGS RUN **Collection Date/Time: 05/15/2019 10:50**

Field ID: G4SW0100 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2086920	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P364094	
	EPA 300.0 Rev. 2.1	Chloride	7.3		mg Cl/L	P364272	
		Sulfate	14		mg SO4/L	P364273	
	SM 2120 B	Color (true)	2.5	U	PCU	P364100	
	SM 2320 B-97	Total Alkalinity	160	A	mg CaCO3/L	P364425	
	SM 2540 C-97	TDS	194	A	mg/L	P364443	
	SM 2540 D-97	TSS	2	UA	mg/L	P364349	
	SM 4500 F-C-97	Fluoride	0.053	I	mg F/L	P364428	
2086924	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P364331	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P364682	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.71		mg N/L	P364303	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P364594	
	SM 5310 B-00	Organic Carbon	0.52	I	mg C/L	P364289	
2086928	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.028		mg P/L	P364088	

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: McKETHAN LAKE @ CENTER **Collection Date/Time: 05/15/2019 13:35**

Field ID: G4SW0021 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2086921	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P364094	
	EPA 300.0 Rev. 2.1	Chloride	1.8		mg Cl/L	P364272	
		Sulfate	0.20	U	mg SO4/L	P364273	
	SM 2120 B	Color (true)	20		PCU	P364100	
	SM 2320 B-97	Total Alkalinity	7.9		mg CaCO3/L	P364425	
	SM 2540 C-97	TDS	20	I	mg/L	P364443	
	SM 2540 D-97	TSS	2	U	mg/L	P364349	
	SM 4500 F-C-97	Fluoride	0.043	I	mg F/L	P364428	
2086925	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P364331	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.50		mg N/L	P364682	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P364303	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P364594	
	SM 5310 B-00	Organic Carbon	7.1		mg C/L	P364289	
2086929	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P364088	

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: P364094

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364272

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364273

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364331

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364682

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364303

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364594

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364087

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364088

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2120 B
Batch ID: P364100

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P364424

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

Reference Method: SM 2320 B-97
Batch ID: P364425

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

Reference Method: SM 2540 C-97
Batch ID: P364442

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P364443

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P364348

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P364349

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P364427

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P364428

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P364289

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364272

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364273

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	99.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364331

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	105		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364682

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: P364303

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364594

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	95.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364087

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364088

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

Reference Method: SM 2120 B
Batch ID: P364100

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P364424

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 106

Reference Method: SM 2320 B-97
Batch ID: P364425

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P364427

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P364428

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P364289

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 300.0 Rev. 2.1
Batch ID: P364272

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086860	Chloride	98.4		P	90 - 110
2086971	Chloride	97.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086860	Sulfate	102		P	90 - 110
2086971	Sulfate	98.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364331

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086924	Ammonia-N	105	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364682

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086861	Kjeldahl Nitrogen	98.7	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086834	NO2NO3-N	95.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364594

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086861	Total-P	102	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364087

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086750	O-Phosphate-P	97.1	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364088

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086929	O-Phosphate-P	94.5	95.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P364427

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2087142	Fluoride	98.9	102	P/P	89 - 106

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P364428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086920	Fluoride	97.9	99.0	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P364289

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086831	Organic Carbon	94.9	94.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P364094

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086904	Turbidity	3.51	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364272

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086860	Chloride	0.203	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P364273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086860	Sulfate	0.387	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P364331

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086924	Ammonia-N	1.34	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P364682

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086861	Kjeldahl Nitrogen	2.13	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P364303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086834	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364594

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086861	Total-P	2.67	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364087

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086750	O-Phosphate-P	1.74	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P364088

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086929	O-Phosphate-P	1.47	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P364100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086918	Color (true)	0.888	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P364424

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2087142	Total Alkalinity	0.627	Sample	P	0 - 2.8

Reference Method: SM 2320 B-97
Batch ID: P364425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086920	Total Alkalinity	0.272	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P364442

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086918	TDS	1.75	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P364443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086920	TDS	2.06	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P364427

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2087142	Fluoride	1.90	Spike	P	0 - 2.5

Reference Method: SM 4500 F-C-97
Batch ID: P364428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086920	Fluoride	0.998	Spike	P	0 - 2.5

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P364289

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086831	Organic Carbon	0.359	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: A91479
Included Lab Sample IDs: 2086926, 2086927, 2086928, 2086929

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.6	96.1	P/P	90 - 110
O-Phosphate-P	99.3	97.9	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A91482
Included Lab Sample IDs: 2086918, 2086919, 2086920, 2086921

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A91486
Included Lab Sample IDs: 2086918, 2086919, 2086920, 2086921

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A91550
Included Lab Sample IDs: 2086918, 2086919, 2086920, 2086921

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

Reference Method: SM 5310 B-00
Run ID: A91559
Included Lab Sample IDs: 2086922, 2086923, 2086924, 2086925

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.6	95.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A91563
Included Lab Sample IDs: 2086922, 2086923, 2086924, 2086925

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A91568
Included Lab Sample IDs: 2086922, 2086923, 2086924, 2086925

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	105	105	P/P	90 - 110
Ammonia-N	105	105	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A91614
Included Lab Sample IDs: 2086918, 2086919, 2086920, 2086921

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

Reference Method: SM 4500 F-C-97
Run ID: A91614
Included Lab Sample IDs: 2086918, 2086919, 2086920, 2086921

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A91713
Included Lab Sample IDs: 2086923

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A91726
Included Lab Sample IDs: 2086922, 2086924, 2086925

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A91745
Included Lab Sample IDs: 2086922, 2086923, 2086924, 2086925

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.5	95.2	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					3.51	
EPA 300.0 Rev. 2.1	Chloride	100	98.4	97.4		0.203	
	Sulfate	99.7	102	98.3		0.387	
EPA 350.1 Rev. 2.0	Ammonia-N	105	105	106			1.34
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	98.7	102			2.13
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	95.2				0.0
EPA 365.1 Rev. 2.0	Total-P	95.8	102	98.9			2.67
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.2	97.1	98.8			1.74
	O-Phosphate-P	98.7	94.5	95.9			1.47
SM 2120 B	Color (true)	101				0.888	
SM 2320 B-97	Total Alkalinity	101				0.627	
	Total Alkalinity	103				0.272	
SM 2540 C-97	TDS					1.75	
	TDS					2.06	
SM 4500 F-C-97	Fluoride	99.4	98.9	102			1.90
	Fluoride	100	97.9	99.0			0.998
SM 5310 B-00	Organic Carbon	95.0	94.9	94.4			0.359

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2086918, 2086919, 2086920, 2086921
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2086918, 2086919, 2086920, 2086921
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2086918, 2086919, 2086920, 2086921
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2086922, 2086923, 2086924, 2086925
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2086922, 2086923, 2086924, 2086925
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2086922, 2086923, 2086924, 2086925
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2086922, 2086923, 2086924, 2086925
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2086926, 2086927, 2086928, 2086929
SM 2120 B / E31780	True Color measured at 450 nm	2086918, 2086919, 2086920, 2086921
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2086918, 2086919, 2086920, 2086921
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2086918, 2086919, 2086920, 2086921
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2086918, 2086919, 2086920, 2086921
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2086918, 2086919, 2086920, 2086921
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2086922, 2086923, 2086924, 2086925

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	05/16/2019			05/16/2019 16:15	Sima Feizi	2086918, 2086919, 2086920, 2086921
EPA 300.0 Rev. 2.1	05/16/2019			05/20/2019 21:36	Lipi Saha	2086918
	05/16/2019			05/20/2019 21:48	Lipi Saha	2086919
	05/16/2019			05/20/2019 22:01	Lipi Saha	2086920
	05/16/2019			05/20/2019 22:13	Lipi Saha	2086921
EPA 350.1 Rev. 2.0	05/16/2019			05/20/2019 12:34	Ping Hua	2086924
	05/16/2019			05/20/2019 12:52	Ping Hua	2086922
	05/16/2019			05/20/2019 12:54	Ping Hua	2086923
	05/16/2019			05/20/2019 12:55	Ping Hua	2086925
EPA 351.2 Rev. 2.0	05/16/2019	05/29/2019 14:15	Adrian Shelby	05/30/2019 10:17	Joseph Suarez	2086922
	05/16/2019	05/29/2019 14:15	Adrian Shelby	05/30/2019 10:19	Joseph Suarez	2086923
	05/16/2019	05/29/2019 14:15	Adrian Shelby	05/30/2019 10:20	Joseph Suarez	2086924
	05/16/2019	05/29/2019 14:15	Adrian Shelby	05/30/2019 10:22	Joseph Suarez	2086925
EPA 353.2 Rev. 2.0	05/16/2019			05/21/2019 11:24	Beverly Y. Sanders	2086922
	05/16/2019			05/21/2019 11:25	Beverly Y. Sanders	2086923
	05/16/2019			05/21/2019 11:26	Beverly Y. Sanders	2086924
	05/16/2019			05/21/2019 11:28	Beverly Y. Sanders	2086925
EPA 365.1 Rev. 2.0	05/16/2019	05/28/2019 16:20	Adrian Shelby	05/29/2019 10:27	Rosalyn Ballman	2086923
	05/16/2019	05/28/2019 16:20	Adrian Shelby	05/29/2019 13:16	Rosalyn Ballman	2086922
	05/16/2019	05/28/2019 16:20	Adrian Shelby	05/29/2019 13:17	Rosalyn Ballman	2086924
	05/16/2019	05/28/2019 16:20	Adrian Shelby	05/29/2019 13:18	Rosalyn Ballman	2086925
EPA 365.1 Rev. 2.0 dissolved	05/16/2019			05/16/2019 14:56	Jhamieka S. Greenwood	2086929
	05/16/2019			05/16/2019 15:31	Jhamieka S. Greenwood	2086926
	05/16/2019			05/16/2019 15:35	Jhamieka S. Greenwood	2086928
	05/16/2019			05/16/2019 15:36	Jhamieka S. Greenwood	2086927
SM 2120 B	05/16/2019			05/16/2019 16:30	Madeline Funaro	2086918
	05/16/2019			05/16/2019 16:31	Madeline Funaro	2086919
	05/16/2019			05/16/2019 16:32	Madeline Funaro	2086920, 2086921
SM 2320 B-97	05/16/2019			05/23/2019 00:37	Dale L. Simmons	2086918
	05/16/2019			05/23/2019 01:45	Dale L. Simmons	2086920
	05/16/2019			05/23/2019 02:06	Dale L. Simmons	2086919
	05/16/2019			05/23/2019 02:18	Dale L. Simmons	2086921
SM 2540 C-97	05/16/2019			05/17/2019 16:30	Sima Feizi	2086918, 2086919, 2086920, 2086921
SM 2540 D-97	05/16/2019			05/17/2019 16:30	Sima Feizi	2086918, 2086919, 2086920, 2086921
SM 4500 F-C-97	05/16/2019			05/23/2019 00:37	Dale L. Simmons	2086918
	05/16/2019			05/23/2019 01:34	Dale L. Simmons	2086920
	05/16/2019			05/23/2019 02:06	Dale L. Simmons	2086919
	05/16/2019			05/23/2019 02:18	Dale L. Simmons	2086921
SM 5310 B-00	05/16/2019			05/20/2019 07:07	Julia Storbeck	2086922
	05/16/2019			05/20/2019 07:21	Julia Storbeck	2086923

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	05/16/2019			05/20/2019 07:36	Julia Storbeck	2086924
	05/16/2019			05/20/2019 07:49	Julia Storbeck	2086925