

Chemical Analysis Report

SW-DIST-2018-02-20-02

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

Event Description: **Kit A North Lakes**
Request ID: **RQ-2018-02-19-07**
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: Judy Ashton

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 13-MAR-2018 11:42

A handwritten signature in black ink, appearing to read "Colin Wright", is placed over a light gray rectangular background.

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 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: Lake Armistead Center

Collection Date/Time: 02/19/2018 11:25

Field ID: G1SW0030

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1968845	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P340290	
	EPA 300.0 Rev. 2.1	Chloride	29		mg Cl/L	P340650	
		Sulfate	6.0		mg SO4/L	P340652	
	SM 2120 B	Color (true)	130		PCU	P340592	
	SM 2320 B-97	Total Alkalinity	29		mg CaCO3/L	P340689	
	SM 2540 C-97	TDS	123		mg/L	P340598	
	SM 2540 D-97	TSS	2	U	mg/L	P340443	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P340690	
1968850	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P340855	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P340406	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P340589	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P340512	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P340535	
1968855	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P340311	

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: Lake Magdalene Ctr

Collection Date/Time: 02/19/2018 10:00

Field ID: G1SW0059

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1968846	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P340291	
	EPA 300.0 Rev. 2.1	Chloride	34		mg Cl/L	P340650	
		Sulfate	13		mg SO4/L	P340652	
	SM 2120 B	Color (true)	42		PCU	P340592	
	SM 2320 B-97	Total Alkalinity	41		mg CaCO3/L	P340689	
	SM 2540 C-97	TDS	143		mg/L	P340598	
	SM 2540 D-97	TSS	2	U	mg/L	P340443	
	SM 4500 F-C-97	Fluoride	0.085	I	mg F/L	P340690	
1968851	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P340855	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.75		mg N/L	P340406	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P340490	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P340512	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P340535	
1968856	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P340311	

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: Lake Wastena

Collection Date/Time: 02/19/2018 12:05

Field ID: G1SW0020

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1968847	EPA 180.1 Rev. 2.0	Turbidity	2.2	A	NTU	P340291	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P340650	
		Sulfate	5.8		mg SO4/L	P340652	

Field ID: G1SW0020

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1968847	SM 2120 B	Color (true)	47		PCU	P340592	
	SM 2320 B-97	Total Alkalinity	21		mg CaCO3/L	P340764	
	SM 2540 C-97	TDS	94		mg/L	P340598	
	SM 2540 D-97	TSS	2	IA	mg/L	P340443	
	SM 4500 F-C-97	Fluoride	0.063	I	mg F/L	P340765	
1968852	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P340855	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.88		mg N/L	P340406	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P340490	
	EPA 365.1 Rev. 2.0	Total-P	0.038		mg P/L	P340512	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P340535	
1968857	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P340311	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Little Lake Wilson South

Collection Date/Time: 02/19/2018 13:23

Field ID: G1SW0009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1968848	EPA 180.1 Rev. 2.0	Turbidity	1.9		NTU	P340291	
	EPA 300.0 Rev. 2.1	Chloride	49		mg Cl/L	P340650	
		Sulfate	2.7		mg SO4/L	P340652	
	SM 2120 B	Color (true)	61		PCU	P340592	
	SM 2320 B-97	Total Alkalinity	58		mg CaCO3/L	P340764	
	SM 2540 C-97	TDS	171		mg/L	P340598	
	SM 2540 D-97	TSS	2	I	mg/L	P340444	
	SM 4500 F-C-97	Fluoride	0.068	I	mg F/L	P340765	
1968853	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P340855	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.93		mg N/L	P340406	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P340490	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P340512	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P340535	
1968858	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P340311	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Little Lake Wilson Ctr

Collection Date/Time: 02/19/2018 13:15

Field ID: G1SW0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1968849	EPA 180.1 Rev. 2.0	Turbidity	2.2		NTU	P340291	
	EPA 300.0 Rev. 2.1	Chloride	48		mg Cl/L	P340650	
		Sulfate	2.6		mg SO4/L	P340652	
	SM 2120 B	Color (true)	61		PCU	P340592	
	SM 2320 B-97	Total Alkalinity	58		mg CaCO3/L	P340764	

Field ID: G1SW0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1968849	SM 2540 C-97	TDS	172	A	mg/L	P340598	
	SM 2540 D-97	TSS	3	IA	mg/L	P340444	
	SM 4500 F-C-97	Fluoride	0.067	I	mg F/L	P340765	
1968854	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P340855	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.98		mg N/L	P340506	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P340490	
	EPA 365.1 Rev. 2.0	Total-P	0.056		mg P/L	P340513	
	SM 5310 B-00	Organic Carbon	13		mg C/L	P340535	
1968859	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P340312	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 4500 F-C-97: 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: P340290

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P340291

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340650

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340652

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P340855

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340406

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340506

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340490

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340589

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340512

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340513

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340311

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340312

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

Reference Method: SM 2120 B
Batch ID: P340592

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P340689

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P340764

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P340598

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P340443

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P340444

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P340690

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P340765

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P340535

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: P340650

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340652

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
-----------	---------	---------	-----------	----------------

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340652

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P340855

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340406

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340506

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: P340490

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: P340589

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: P340512

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340513

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340311

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340312

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

Reference Method: SM 2320 B-97
Batch ID: P340689

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.6		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P340764

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.4		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P340690

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	93.6		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P340765

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P340535

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340650

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968823	Chloride	92.3		P	90 - 110
1968992	Chloride	92.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P340652

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968823	Sulfate	91.1		P	90 - 110
1968992	Sulfate	90.3		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P340855

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968850	Ammonia-N	96.1	96.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340406

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968831	Kjeldahl Nitrogen	94.8	96.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340506

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968854	Kjeldahl Nitrogen	109	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340490

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968452	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340589

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1969876	NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340512

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968852	Total-P	99.2	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340513

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968900	Total-P	99.4	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340311

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968766	O-Phosphate-P	96.0	96.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968859	O-Phosphate-P	96.5	97.9	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
 Batch ID: P340690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968777	Fluoride	100	96.5	P/P	91 - 105

Reference Method: SM 5310 B-00
 Batch ID: P340535

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1968827	Organic Carbon	94.2	95.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P340290

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968777	Turbidity	0.236	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P340291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968847	Turbidity	3.62	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P340650

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968992	Chloride	1.39	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P340652

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968992	Sulfate	1.38	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P340855

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968850	Ammonia-N	0.279	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P340406

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340406

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968831	Kjeldahl Nitrogen	1.32	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P340506

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968854	Kjeldahl Nitrogen	1.47	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340490

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968452	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P340589

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1969876	NO2NO3-N	0.407	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340512

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968852	Total-P	0.254	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P340513

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968900	Total-P	0.261	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340311

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968766	O-Phosphate-P	0.452	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P340312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968859	O-Phosphate-P	1.37	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P340592

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968826	Color (true)	5.52	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P340689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968777	Total Alkalinity	0.172	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P340764

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1969029	Total Alkalinity	0.135	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P340598

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968849	TDS	0.583	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P340690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968777	Fluoride	2.92	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P340765

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1969029	Fluoride	0.516	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P340535

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1968827	Organic Carbon	1.42	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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B

Run ID: A82179

Included Lab Sample IDs: 1968845, 1968846, 1968847, 1968848, 1968849

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	105	103	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A82181

Included Lab Sample IDs: 1968845, 1968846, 1968847, 1968848, 1968849

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	101	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A82188

Included Lab Sample IDs: 1968855, 1968856, 1968857, 1968858, 1968859

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	100	P/P	90 - 110
O-Phosphate-P	98.8	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A82251

Included Lab Sample IDs: 1968851, 1968852, 1968853, 1968854

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82265

Included Lab Sample IDs: 1968850, 1968851, 1968852, 1968853

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

Reference Method: SM 5310 B-00

Run ID: A82268

Included Lab Sample IDs: 1968850, 1968851, 1968852, 1968853, 1968854

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.1	95.6	P/P	90 - 110
Organic Carbon	95.6	96.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82271

Included Lab Sample IDs: 1968854

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.3	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82281

Included Lab Sample IDs: 1968854

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
-----------	---------	---------	------------	----------------

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A82281

Included Lab Sample IDs: 1968854

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A82286

Included Lab Sample IDs: 1968850

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A82300

Included Lab Sample IDs: 1968850, 1968851, 1968852, 1968853

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A82311

Included Lab Sample IDs: 1968845, 1968846, 1968847, 1968848, 1968849

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.7	91.5	P/P	90 - 110
Sulfate	96.5	94.3	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A82320

Included Lab Sample IDs: 1968845, 1968846

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

Reference Method: SM 4500 F-C-97

Run ID: A82320

Included Lab Sample IDs: 1968845, 1968846

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	96.6	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A82351

Included Lab Sample IDs: 1968847, 1968848, 1968849

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.9	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A82351

Included Lab Sample IDs: 1968847, 1968848, 1968849

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	96.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A82391

Included Lab Sample IDs: 1968850, 1968851, 1968852, 1968853, 1968854

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.7	P/P	90 - 110
Ammonia-N	99.7	101	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				0.236	
	Turbidity				3.62	
EPA 300.0 Rev. 2.1	Chloride	95.8	92.5 92.3		1.39	
	Sulfate	94.5	90.3 91.1		1.38	
EPA 350.1 Rev. 2.0	Ammonia-N	96.7	96.1 96.4			0.279
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	94.8 96.3			1.32
	Kjeldahl Nitrogen	103	109 106			1.47
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101 101			0.0
	NO2NO3-N	102	101 102			0.407
EPA 365.1 Rev. 2.0	Total-P	103	99.2 98.9			0.254
	Total-P	102	99.4 99.0			0.261
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.4	96.0 96.7			0.452
	O-Phosphate-P	101	96.5 97.9			1.37
SM 2120 B	Color (true)				5.52	
SM 2320 B-97	Total Alkalinity	99.6			0.172	
	Total Alkalinity	99.4			0.135	
SM 2540 C-97	TDS				0.583	
SM 4500 F-C-97	Fluoride	93.6	100 96.5			2.92
	Fluoride	94.7				0.516
SM 5310 B-00	Organic Carbon	95.6	94.2 95.8			1.42

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1968845, 1968846, 1968847, 1968848, 1968849
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1968845, 1968846, 1968847, 1968848, 1968849
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1968845, 1968846, 1968847, 1968848, 1968849
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1968850, 1968851, 1968852, 1968853, 1968854
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1968850, 1968851, 1968852, 1968853, 1968854
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1968850, 1968851, 1968852, 1968853, 1968854
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1968850, 1968851, 1968852, 1968853, 1968854

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1968855, 1968856, 1968857, 1968858, 1968859
SM 2120 B / E31780	True Color measured at 450 nm	1968845, 1968846, 1968847, 1968848, 1968849
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1968845, 1968846, 1968847, 1968848, 1968849
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1968845, 1968846, 1968847, 1968848, 1968849
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1968845, 1968846, 1968847, 1968848, 1968849
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1968845, 1968846, 1968847, 1968848, 1968849
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1968850, 1968851, 1968852, 1968853, 1968854

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	02/20/2018			02/20/2018 14:45	Tanya Welborn	1968845, 1968846, 1968847, 1968848, 1968849
EPA 300.0 Rev. 2.1	02/20/2018			02/23/2018	Julia Storbeck	1968845, 1968846, 1968847, 1968848, 1968849
EPA 350.1 Rev. 2.0	02/20/2018			03/01/2018	Ping Hua	1968850, 1968851, 1968852, 1968853, 1968854
EPA 351.2 Rev. 2.0	02/20/2018	02/22/2018	Adrian Shelby	02/23/2018	Joseph Suarez	1968850, 1968851, 1968852, 1968853
	02/20/2018	02/23/2018	Adrian Shelby	02/26/2018	Joseph Suarez	1968854
EPA 353.2 Rev. 2.0	02/20/2018			02/23/2018	Beverly Y. Sanders	1968851, 1968852, 1968853, 1968854
	02/20/2018			02/26/2018	Lauren Bottorf	1968850
EPA 365.1 Rev. 2.0	02/20/2018	02/23/2018	Sima Feizi	02/26/2018	Beverly Y. Sanders	1968854
	02/20/2018	02/23/2018	Sima Feizi	02/27/2018	Beverly Y. Sanders	1968850, 1968851, 1968852, 1968853
EPA 365.1 Rev. 2.0 dissolved	02/20/2018			02/20/2018 16:05	Megan Treadwell	1968859
	02/20/2018			02/20/2018 16:16	Megan Treadwell	1968855
	02/20/2018			02/20/2018 16:17	Megan Treadwell	1968856, 1968857
	02/20/2018			02/20/2018 16:18	Megan Treadwell	1968858
SM 2120 B	02/20/2018			02/20/2018 16:01	Tanya Welborn	1968845
	02/20/2018			02/20/2018 16:02	Tanya Welborn	1968846, 1968847
	02/20/2018			02/20/2018 16:03	Tanya Welborn	1968848
	02/20/2018			02/20/2018 16:04	Tanya Welborn	1968849
SM 2320 B-97	02/20/2018			02/27/2018	Dale L. Simmons	1968845, 1968846
	02/20/2018			02/28/2018	Dale L. Simmons	1968847, 1968848, 1968849
SM 2540 C-97	02/20/2018			02/21/2018	DeAsia Armster	1968845, 1968846, 1968847, 1968848, 1968849
SM 2540 D-97	02/20/2018			02/21/2018	DeAsia Armster	1968845, 1968846, 1968847, 1968848, 1968849
SM 4500 F-C-97	02/20/2018			02/27/2018	Dale L. Simmons	1968845, 1968846
	02/20/2018			02/28/2018	Dale L. Simmons	1968847, 1968848, 1968849
SM 5310 B-00	02/20/2018			02/24/2018	Megan Treadwell	1968850, 1968851, 1968852, 1968853, 1968854