Chemical Analysis Report

NW-DIST-2018-04-20-01

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

Event Description: **Dune Lake/Bayou Run**
Request ID: **RQ-2018-04-16-28**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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160 Government Center
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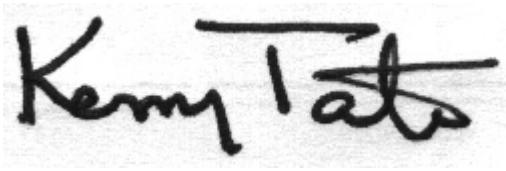
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 07-MAY-2018 14:41



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: FULLER LAKE (MIDDLE) **Collection Date/Time: 04/19/2018 10:30**

Field ID: G3NW0084 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1986232	EPA 180.1 Rev. 2.0	Turbidity	0.75		NTU	P343840	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P344451	
	SM 2540 D-97	TSS	3	I	mg/L	P344266	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P344455	
1986234	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P344180	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P343887	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.028		mg N/L	P343943	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P343921	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P344204	
1986236	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P343833	

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: LITTLE REDFISH LAKE **Collection Date/Time: 04/19/2018 11:35**

Field ID: G3NW0125 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1986233	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P343840	
	SM 2320 B-97	Total Alkalinity	54		mg CaCO3/L	P344174	RPD
	SM 2540 D-97	TSS	4	I	mg/L	P344267	
	SM 4500 F-C-97	Fluoride	0.52		mg F/L	P344178	
1986235	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P344166	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.50		mg N/L	P343884	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P344029	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P343958	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P343982	
1986237	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P343835	

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: Hogtown Bayou at Cessna Park **Collection Date/Time: 04/19/2018 13:00**

Field ID: G3NW0152 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1986226	EPA 180.1 Rev. 2.0	Turbidity	3.7	A	NTU	P343840	
	SM 2320 B-97	Total Alkalinity	63		mg CaCO3/L	P344174	RPD
	SM 2540 D-97	TSS	7	I	mg/L	P344267	
	SM 4500 F-C-97	Fluoride	0.55		mg F/L	P344178	
1986228	EPA 350.1 Rev. 2.0	Ammonia-N	0.031		mg N/L	P344166	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.38	I	mg N/L	P343884	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P344029	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P343919	
	SM 5310 B-00	Organic Carbon	5.4		mg C/L	P343982	
1986230	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P343835	

Field ID: G3NW0152 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes

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: Mack Bayou end of Bayou Rd. **Collection Date/Time: 04/19/2018 13:30**

Field ID: G3NW0144 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1986227	EPA 180.1 Rev. 2.0	Turbidity	1.6		NTU	P343840	
	SM 2320 B-97	Total Alkalinity	73		mg CaCO3/L	P344174	RPD
	SM 2540 D-97	TSS	4	IA	mg/L	P344267	
	SM 4500 F-C-97	Fluoride	0.65		mg F/L	P344178	
1986229	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P344166	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.30	I	mg N/L	P343884	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P344029	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P343919	
	SM 5310 B-00	Organic Carbon	3.8		mg C/L	P343982	
1986231	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P343835	

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: P343840

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344166

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344180

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343884

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343887

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343943

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344029

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343919

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343921

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343958

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343833

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343835

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

Reference Method: SM 2320 B-97
Batch ID: P344174

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

Reference Method: SM 2320 B-97
Batch ID: P344451

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

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P344266

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P344267

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P344178

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P344455

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P343982

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

Reference Method: SM 5310 B-00
Batch ID: P344204

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344166

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344180

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343884

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343884

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343887

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343943

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: P344029

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343919

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343921

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343958

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343833

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343835

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P344174

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

Reference Method: SM 2320 B-97
Batch ID: P344451

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

Reference Method: SM 4500 F-C-97
Batch ID: P344178

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.3		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P344455

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.2		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343982

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

Reference Method: SM 5310 B-00
Batch ID: P344204

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344166

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985154	Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986275	Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986260	Kjeldahl Nitrogen	103	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343887

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986213	Kjeldahl Nitrogen	104	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343943

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986171	NO2NO3-N	101		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344029

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986228	NO2NO3-N	96.3	97.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343919

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986043	Total-P	97.4	95.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343921

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986276	Total-P	99.3	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343958

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985898	Total-P	91.4	92.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343833

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986236	O-Phosphate-P	99.5	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343835

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986230	O-Phosphate-P	99.0	100	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P344178

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986386	Fluoride	94.7	96.2	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P344455

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986212	Fluoride	96.2	95.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343982

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985770	Organic Carbon	92.0	91.3	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P344204

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1986171	Organic Carbon	95.9	98.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343840

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986226	Turbidity	1.60	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344166

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985154	Ammonia-N	0.742	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P344180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986275	Ammonia-N	1.01	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986260	Kjeldahl Nitrogen	1.85	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343887

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986213	Kjeldahl Nitrogen	2.73	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343943

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986171	NO2NO3-N	0.343	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344029

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986228	NO2NO3-N	0.985	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986043	Total-P	1.90	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343921

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986276	Total-P	1.23	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343958

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985898	Total-P	0.920	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343833

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986236	O-Phosphate-P	0.706	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343835

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986230	O-Phosphate-P	1.50	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P344174

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986386	Total Alkalinity	1.95	Sample	F	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P344451

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986212	Total Alkalinity	0.229	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P344178

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986386	Fluoride	0.953	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P344455

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986212	Fluoride	0.476	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P343982

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985770	Organic Carbon	0.735	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P344204

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1986171	Organic Carbon	2.07	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: A83379
Included Lab Sample IDs: 1986230, 1986231, 1986236, 1986237

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.8	P/P	90 - 110
O-Phosphate-P	98.9	98.9	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83380
Included Lab Sample IDs: 1986226, 1986227, 1986232, 1986233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	97.5	99.5	P/P	95 - 105

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83417
Included Lab Sample IDs: 1986228, 1986229, 1986235

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83419
Included Lab Sample IDs: 1986234

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83423
Included Lab Sample IDs: 1986228, 1986229, 1986234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	99.2	P/P	90 - 110
Total-P	99.5	99.0	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A83430
Included Lab Sample IDs: 1986228, 1986229, 1986235

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	91.9	91.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83453
Included Lab Sample IDs: 1986228, 1986229, 1986235

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.0	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83473
Included Lab Sample IDs: 1986235

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83490
Included Lab Sample IDs: 1986234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	98.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83491
Included Lab Sample IDs: 1986228, 1986229, 1986235

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

Reference Method: SM 2320 B-97
Run ID: A83492
Included Lab Sample IDs: 1986226, 1986227, 1986233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	99.9	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83492
Included Lab Sample IDs: 1986226, 1986227, 1986233

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83494
Included Lab Sample IDs: 1986234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A83500
Included Lab Sample IDs: 1986234

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	98.0	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A83593
Included Lab Sample IDs: 1986232

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

Reference Method: SM 4500 F-C-97
Run ID: A83593
Included Lab Sample IDs: 1986232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	98.5	P/P	90 - 110

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					1.60	
EPA 350.1 Rev. 2.0	Ammonia-N	100	103	104			0.742
	Ammonia-N	101	103	104			1.01
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	103	106			1.85
	Kjeldahl Nitrogen	102	104	101			2.73
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101				0.343
	NO2NO3-N	97.5	96.3	97.3			0.985
EPA 365.1 Rev. 2.0	Total-P	105	97.4	95.1			1.90
	Total-P	101	99.3	101			1.23
	Total-P	99.9	91.4	92.3			0.920
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	99.5	98.8			0.706
	O-Phosphate-P	99.6	99.0	100			1.50
SM 2320 B-97	Total Alkalinity	101				1.95	
	Total Alkalinity	102				0.229	
SM 4500 F-C-97	Fluoride	95.3	94.7	96.2			0.953
	Fluoride	95.2	96.2	95.6			0.476
SM 5310 B-00	Organic Carbon	94.2	92.0	91.3			0.735
	Organic Carbon	95.8	95.9	98.0			2.07

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1986226, 1986227, 1986232, 1986233
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1986228, 1986229, 1986234, 1986235
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1986228, 1986229, 1986234, 1986235
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1986228, 1986229, 1986234, 1986235
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1986228, 1986229, 1986234, 1986235
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1986230, 1986231, 1986236, 1986237
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1986226, 1986227, 1986232, 1986233
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1986226, 1986227, 1986232, 1986233
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1986226, 1986227, 1986232, 1986233
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1986228, 1986229, 1986234, 1986235

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	04/20/2018			04/20/2018 16:58	Tanya Welborn	1986226, 1986227, 1986232, 1986233
EPA 350.1 Rev. 2.0	04/20/2018			04/24/2018 12:37	Ping Hua	1986228
	04/20/2018			04/24/2018 12:38	Ping Hua	1986229
	04/20/2018			04/24/2018 12:40	Ping Hua	1986235
	04/20/2018			04/25/2018 10:15	Ping Hua	1986234
EPA 351.2 Rev. 2.0	04/20/2018	04/23/2018 11:15	Adrian Shelby	04/24/2018 12:17	Joseph Suarez	1986228
	04/20/2018	04/23/2018 11:15	Adrian Shelby	04/24/2018 12:19	Joseph Suarez	1986229
	04/20/2018	04/23/2018 11:15	Adrian Shelby	04/24/2018 12:20	Joseph Suarez	1986235
	04/20/2018	04/23/2018 16:00	Adrian Shelby	04/25/2018 09:43	Joseph Suarez	1986234
EPA 353.2 Rev. 2.0	04/20/2018			04/24/2018 11:45	Lauren Bottorf	1986234
	04/20/2018			04/25/2018 11:32	Lauren Bottorf	1986228
	04/20/2018			04/25/2018 11:38	Lauren Bottorf	1986229
	04/20/2018			04/25/2018 11:39	Lauren Bottorf	1986235
EPA 365.1 Rev. 2.0	04/20/2018	04/23/2018 13:56	Sima Feizi	04/24/2018 13:53	Beverly Y. Sanders	1986228
	04/20/2018	04/23/2018 13:56	Sima Feizi	04/24/2018 13:54	Beverly Y. Sanders	1986229
	04/20/2018	04/23/2018 13:56	Sima Feizi	04/24/2018 14:09	Beverly Y. Sanders	1986234
	04/20/2018	04/24/2018 15:27	Sima Feizi	04/25/2018 12:32	Beverly Y. Sanders	1986235
EPA 365.1 Rev. 2.0 dissolved	04/20/2018			04/20/2018 15:02	Megan Treadwell	1986236
	04/20/2018			04/20/2018 15:15	Megan Treadwell	1986230
	04/20/2018			04/20/2018 15:18	Megan Treadwell	1986231, 1986237
SM 2320 B-97	04/20/2018			04/27/2018 00:42	Dale L. Simmons	1986226
	04/20/2018			04/27/2018 00:52	Dale L. Simmons	1986227
	04/20/2018			04/27/2018 01:03	Dale L. Simmons	1986233
	04/20/2018			05/01/2018 22:41	Dale L. Simmons	1986232
SM 2540 D-97	04/20/2018			04/24/2018 15:21	Yijie Li	1986226, 1986227, 1986232, 1986233
SM 4500 F-C-97	04/20/2018			04/26/2018 22:34	Dale L. Simmons	1986226
	04/20/2018			04/26/2018 22:37	Dale L. Simmons	1986227
	04/20/2018			04/26/2018 22:41	Dale L. Simmons	1986233
	04/20/2018			05/01/2018 22:41	Dale L. Simmons	1986232
SM 5310 B-00	04/20/2018			04/24/2018 12:31	Megan Treadwell	1986228
	04/20/2018			04/24/2018 12:47	Megan Treadwell	1986229
	04/20/2018			04/24/2018 13:07	Megan Treadwell	1986235
	04/20/2018			04/26/2018 01:48	Megan Treadwell	1986234