

Chemical Analysis Report

SO-DIST-2017-02-14-02

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

Event Description: **Highlands Canoe Lakes**

Request ID: **RQ-2017-02-13-37**

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
Attn: Ben Paswater

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

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 08-MAR-2017 11:38



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 RACHARD @ CENTER

Collection Date/Time: 02/13/2017 10:30

Field ID: 26010647*

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1872638	EPA 180.1 Rev. 2.0	Turbidity	3.7		NTU	P319840	
	EPA 300.0 Rev. 2.1	Chloride	6.8		mg Cl/L	P320748	
		Sulfate	16		mg SO4/L	P320749	
	SM 2120 B	Color (true)	7.7		PCU	P319845	
	SM 2320 B-97	Total Alkalinity	24		mg CaCO3/L	P320108	
	SM 2540 C-97	TDS	83		mg/L	P320456	
	SM 2540 D-97	TSS	3	I	mg/L	P320386	
	SM 4500 F-C-97	Fluoride	0.052	I	mg F/L	P320111	
1872644	EPA 350.1 Rev. 2.0	Ammonia-N	0.11		mg N/L	P320018	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.66		mg N/L	P319850	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P320174	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P319962	
	SM 5310 B-00	Organic Carbon	5.0		mg C/L	P319910	
1872650	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P319832	

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 LAKE @ CENTER

Collection Date/Time: 02/13/2017 11:20

Field ID: G4SD0157

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1872639	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P319840	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P320748	
		Sulfate	25		mg SO4/L	P320749	
	SM 2120 B	Color (true)	12	A	PCU	P319845	
	SM 2320 B-97	Total Alkalinity	20		mg CaCO3/L	P320108	
	SM 2540 C-97	TDS	103		mg/L	P320456	
	SM 2540 D-97	TSS	5	I	mg/L	P320386	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P320111	
1872645	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P320018	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P319850	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.096		mg N/L	P320174	
	EPA 365.1 Rev. 2.0	Total-P	0.020		mg P/L	P319964	
	SM 5310 B-00	Organic Carbon	7.4		mg C/L	P319910	
1872651	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P319832	

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: BUCK LAKE @ MIDDLE

Collection Date/Time: 02/13/2017 09:50

Field ID: G4SD0158

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1872640	EPA 180.1 Rev. 2.0	Turbidity	0.30		NTU	P319840	
	EPA 300.0 Rev. 2.1	Chloride	23		mg Cl/L	P320748	
		Sulfate	68		mg SO4/L	P320749	

Field ID: G4SD0158

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1872640	SM 2120 B	Color (true)	5.2	I	PCU	P319845	
	SM 2320 B-97	Total Alkalinity	14	A	mg CaCO3/L	P320108	
	SM 2540 C-97	TDS	238	A	mg/L	P320456	
	SM 2540 D-97	TSS	2	I	mg/L	P320386	
	SM 4500 F-C-97	Fluoride	0.073	I	mg F/L	P320111	
1872646	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P320018	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P320255	
	EPA 353.2 Rev. 2.0	NO2NO3-N	12		mg N/L	P320174	
	EPA 365.1 Rev. 2.0	Total-P	0.048		mg P/L	P320068	
	SM 5310 B-00	Organic Carbon	4.1		mg C/L	P320006	
1872652	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P319832	

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: FIELD BLANK

Collection Date/Time: 02/13/2017 11:40

Field ID: G4SD0159-B

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1872641	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P319840	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P320748	
		Sulfate	0.20	U	mg SO4/L	P320749	
	SM 2120 B	Color (true)	2.5	U	PCU	P319845	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P320108	
	SM 2540 C-97	TDS	15	U	mg/L	P320454	
	SM 2540 D-97	TSS	2	U	mg/L	P320384	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P320111	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P320018	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P319860	
1872647	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P320174	
	EPA 365.1 Rev. 2.0	Total-P	0.002	I	mg P/L	P319964	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P319910	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P319832	
	dissolved						

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: Total-P: The result was confirmed on 02/23/2017.

Sample Location: SILVER LAKE @ CENTER

Collection Date/Time: 02/13/2017 14:20

Field ID: G4SD0159

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1872642	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P319840	
	EPA 300.0 Rev. 2.1	Chloride	7.0		mg Cl/L	P320748	
		Sulfate	5.4		mg SO4/L	P320749	
	SM 2120 B	Color (true)	8.2		PCU	P319845	
	SM 2320 B-97	Total Alkalinity	1.2	I	mg CaCO3/L	P320108	
	SM 2540 C-97	TDS	43		mg/L	P320456	

Field ID: G4SD0159

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1872642	SM 2540 D-97	TSS	3	I	mg/L	P320386	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P320111	
1872648	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P320018	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.41		mg N/L	P319975	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.050		mg N/L	P320175	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P319964	
	SM 5310 B-00	Organic Carbon	6.3		mg C/L	P319910	
1872654	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P319832	

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: DUPLICATE SILVER LAKE

Collection Date/Time: 02/13/2017 14:30

Field ID: G4SD0159-D

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1872643	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P319840	
	EPA 300.0 Rev. 2.1	Chloride	7.0		mg Cl/L	P320748	
		Sulfate	5.4		mg SO4/L	P320749	
	SM 2120 B	Color (true)	9.0		PCU	P319845	
	SM 2320 B-97	Total Alkalinity	1.4	I	mg CaCO3/L	P320108	
	SM 2540 C-97	TDS	38		mg/L	P320456	
	SM 2540 D-97	TSS	3	I	mg/L	P320386	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P320111	
1872649	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P320018	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.42		mg N/L	P319975	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.051		mg N/L	P320175	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P319964	
	SM 5310 B-00	Organic Carbon	6.4		mg C/L	P319910	
1872655	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P319832	

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: P319840

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P320748

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report

Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P320749

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P320018

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P319850

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P319860

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P319975

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320255

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320174

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320175

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319962

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319964

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320068

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P319832

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

Reference Method: SM 2120 B
Batch ID: P319845

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P320108

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

Reference Method: SM 2540 C-97
Batch ID: P320454

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P320456

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P320384

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P320386

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P320111

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P319910

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

Reference Method: SM 5310 B-00
Batch ID: P320006

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: P320748

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P320749

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P320018

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P319850

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: P319860

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: P319975

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: P319975

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320255

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320174

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	107		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320175

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	95.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	93.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320068

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P319832

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

Reference Method: SM 2320 B-97
Batch ID: P320108

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P320111

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.4		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P319910

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.8		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P320006

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.8		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P320748

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872535	Chloride	102		P	90 - 110
1872536	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P320749

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872535	Sulfate	99.7		P	90 - 110
1872536	Sulfate	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P320018

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872546	Ammonia-N	92.4	97.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P319850

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872646	Kjeldahl Nitrogen	86.7	86.1	F/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P319860

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872502	Kjeldahl Nitrogen	107	105	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P319975

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872467	Kjeldahl Nitrogen	93.9	90.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320255

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1873901	Kjeldahl Nitrogen	102	97.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320174

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872545	NO2NO3-N	104	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320175

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872658	NO2NO3-N	106	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872644	Total-P	96.1	95.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872649	Total-P	96.6	94.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320068

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872947	Total-P	97.6	95.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P319832

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872650	O-Phosphate-P	99.5	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P320111

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872640	Fluoride	101	101	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P319910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872537	Organic Carbon	93.8	94.8	P/P	85 - 115

Reference Method: SM 5310 B-00
 Batch ID: P320006

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1872606	Organic Carbon	94.0	95.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P319840

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872610	Turbidity	5.57	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P320748

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872535	Chloride	0.0333	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P320749

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872535	Sulfate	0.0711	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P320018

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872546	Ammonia-N	3.95	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P319850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872646	Kjeldahl Nitrogen	0.467	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P319860

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: P319860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872502	Kjeldahl Nitrogen	1.38	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P319975

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872467	Kjeldahl Nitrogen	2.94	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P320255

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1873901	Kjeldahl Nitrogen	3.44	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320174

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872545	NO2NO3-N	0.800	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P320175

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872658	NO2NO3-N	0.871	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872644	Total-P	0.321	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P319964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872649	Total-P	2.11	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P320068

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872947	Total-P	2.02	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P319832

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872650	O-Phosphate-P	0.501	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P319845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872639	Color (true)	2.50	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P320108

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872640	Total Alkalinity	0.161	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P320454

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872368	TDS	4.91	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P320456

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872640	TDS	7.56	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P320111

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872640	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P319910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872537	Organic Carbon	0.557	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P320006

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1872606	Organic Carbon	1.95	Spike	P	0 - 20

Quality Assurance Report Precision

* 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: A74465

Included Lab Sample IDs: 1872650, 1872651, 1872652, 1872653, 1872654, 1872655

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	102	P/P	90 - 110
O-Phosphate-P	101	99.2	P/P	90 - 110
O-Phosphate-P	101	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A74468

Included Lab Sample IDs: 1872638, 1872639, 1872640, 1872641, 1872642, 1872643

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	97.0	97.5	P/P	95 - 105

Reference Method: SM 2120 B

Run ID: A74469

Included Lab Sample IDs: 1872638, 1872639, 1872640, 1872641, 1872642, 1872643

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

Reference Method: SM 5310 B-00

Run ID: A74499

Included Lab Sample IDs: 1872644, 1872645, 1872647, 1872648, 1872649

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.1	98.0	P/P	90 - 110
Organic Carbon	96.8	96.1	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A74535

Included Lab Sample IDs: 1872646

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.4	96.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A74538

Included Lab Sample IDs: 1872644, 1872645, 1872646, 1872647, 1872648, 1872649

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.8	97.4	P/P	90 - 110
Ammonia-N	97.4	97.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A74542

Included Lab Sample IDs: 1872647

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.8	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A74545

Included Lab Sample IDs: 1872644, 1872645

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.8	96.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A74554

Included Lab Sample IDs: 1872648, 1872649

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	98.4	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A74571

Included Lab Sample IDs: 1872638, 1872639, 1872640, 1872641, 1872642, 1872643

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	103	P/P	90 - 110
Total Alkalinity	103	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A74571

Included Lab Sample IDs: 1872638, 1872639, 1872640, 1872641, 1872642, 1872643

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	104	98.0	P/P	90 - 110
Fluoride	98.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A74582

Included Lab Sample IDs: 1872644, 1872645, 1872647, 1872648, 1872649

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.2	97.8	P/P	90 - 110
Total-P	99.0	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A74601

Included Lab Sample IDs: 1872644, 1872645, 1872646, 1872647, 1872648, 1872649

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A74613

Included Lab Sample IDs: 1872646

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A74673

Included Lab Sample IDs: 1872646

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.8	97.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A74765

Included Lab Sample IDs: 1872638, 1872639, 1872640, 1872641, 1872642, 1872643

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	104	107	P/P	90 - 110
Chloride	107	104	P/P	90 - 110
Sulfate	101	93.0	P/P	90 - 110
Sulfate	93.0	99.1	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					5.57	
EPA 300.0 Rev. 2.1	Chloride	104	102	101		0.0333	
	Sulfate	99.8	99.7	99.1		0.0711	
EPA 350.1 Rev. 2.0	Ammonia-N	99.8	92.4	97.3			3.95
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	86.7	86.1			0.467
	Kjeldahl Nitrogen	104	107	105			1.38
	Kjeldahl Nitrogen	99.6	93.9	90.1			2.94
	Kjeldahl Nitrogen	99.3	102	97.9			3.44
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	107	104	105			0.800
	NO ₂ NO ₃ -N	107	106	107			0.871
EPA 365.1 Rev. 2.0	Total-P	95.0	96.1	95.8			0.321
	Total-P	93.8	96.6	94.6			2.11
	Total-P	98.0	97.6	95.4			2.02
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	99.5	100			0.501
SM 2120 B	Color (true)					2.50	
SM 2320 B-97	Total Alkalinity	103				0.161	
SM 2540 C-97	TDS					4.91	
	TDS					7.56	
SM 4500 F-C-97	Fluoride	98.4	101	101			0.0
SM 5310 B-00	Organic Carbon	93.8	93.8	94.8			0.557
	Organic Carbon	94.8	94.0	95.8			1.95

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1872644, 1872645, 1872646, 1872647, 1872648, 1872649
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1872644, 1872645, 1872646, 1872647, 1872648, 1872649
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1872644, 1872645, 1872646, 1872647, 1872648, 1872649
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1872644, 1872645, 1872646, 1872647, 1872648, 1872649
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1872650, 1872651, 1872652, 1872653, 1872654, 1872655
SM 2120 B / E31780	True Color measured at 450 nm	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1872644, 1872645, 1872646, 1872647, 1872648, 1872649

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	02/14/2017			02/14/2017 15:27	Julie Michelle Frank	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
EPA 300.0 Rev. 2.1	02/14/2017			02/28/2017	Ping Hua	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
EPA 350.1 Rev. 2.0	02/14/2017			02/16/2017	Sofia Elnemr	1872644, 1872645, 1872646, 1872647, 1872648, 1872649
EPA 351.2 Rev. 2.0	02/14/2017	02/15/2017	Adrian Shelby	02/16/2017	Joseph Suarez	1872647
	02/14/2017	02/15/2017	Adrian Shelby	02/17/2017	Joseph Suarez	1872644, 1872645
	02/14/2017	02/16/2017	Adrian Shelby	02/17/2017	Joseph Suarez	1872648, 1872649
	02/14/2017	02/22/2017	Adrian Shelby	02/23/2017	Joseph Suarez	1872646
EPA 353.2 Rev. 2.0	02/14/2017			02/21/2017	Beverly Y. Sanders	1872644, 1872645, 1872646, 1872647, 1872648, 1872649
EPA 365.1 Rev. 2.0	02/14/2017	02/16/2017	Adrian Shelby	02/20/2017	Lipi Saha	1872644, 1872645, 1872647, 1872648, 1872649
EPA 365.1 Rev. 2.0 dissolved	02/14/2017	02/17/2017	Vijayalakshmi Reddy	02/21/2017	Lipi Saha	1872646
	02/14/2017			02/14/2017 14:40	Julia Storbeck	1872650
	02/14/2017			02/14/2017 15:10	Julia Storbeck	1872653, 1872654
	02/14/2017			02/14/2017 15:11	Julia Storbeck	1872655
	02/14/2017			02/14/2017 15:26	Julia Storbeck	1872651
	02/14/2017			02/14/2017 15:27	Julia Storbeck	1872652
SM 2120 B	02/14/2017			02/14/2017 16:51	Julie Michelle Frank	1872638
	02/14/2017			02/14/2017 16:53	Julie Michelle Frank	1872639
	02/14/2017			02/14/2017 16:54	Julie Michelle Frank	1872640, 1872641
	02/14/2017			02/14/2017 16:55	Julie Michelle Frank	1872642
	02/14/2017			02/14/2017 16:56	Julie Michelle Frank	1872643
SM 2320 B-97	02/14/2017			02/19/2017	Dale L. Simmons	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
SM 2540 C-97	02/14/2017			02/17/2017	Yijie Li	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
SM 2540 D-97	02/14/2017			02/17/2017	Yijie Li	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
SM 4500 F-C-97	02/14/2017			02/19/2017	Dale L. Simmons	1872638, 1872639, 1872640, 1872641, 1872642, 1872643
SM 5310 B-00	02/14/2017			02/15/2017	Julie Michelle Frank	1872644, 1872645, 1872647, 1872648, 1872649
	02/14/2017			02/16/2017	Julie Michelle Frank	1872646