Chemical Analysis Report

NE-DIST-2016-12-21-01

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

Event Description: **Suwannee springs**
Request ID: **RQ-2016-12-12-13**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
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8800 Baymeadows Way West
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 10-JAN-2017 11:08

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical group are included in this report: Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited 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: Suwannee R 2mi. upstream of CR 340 **Collection Date/Time: 12/20/2016 10:25**

Field ID: G1NE00858 12202016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1859453	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P317192	
	EPA 300.0 Rev. 2.1	Chloride	9.6		mg Cl/L	P317945	
		Sulfate	32		mg SO4/L	P317948	
	SM 2120 B	Color (true)	27		PCU	P317196	
	SM 2320 B-97	Total Alkalinity	139		mg CaCO3/L	P317327	
	SM 2540 C-97	TDS	218		mg/L	P317658	
	SM 2540 D-97	TSS	3	I	mg/L	P317636	
	SM 4500 F-C-97	Fluoride	0.20		mg F/L	P317328	
1859458	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P317680	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.29		mg N/L	P317199	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.1		mg N/L	P317373	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P317344	
	SM 5310 B-00	Organic Carbon	3.9		mg C/L	P317236	
1859463	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P317188	

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.
EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Suwannee River at CR 340 **Collection Date/Time: 12/20/2016 10:45**

Field ID: G1NE0356 12202016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1859454	EPA 180.1 Rev. 2.0	Turbidity	1.4	A	NTU	P317192	
	EPA 300.0 Rev. 2.1	Chloride	9.9		mg Cl/L	P317776	
		Sulfate	34		mg SO4/L	P317773	
	SM 2120 B	Color (true)	24		PCU	P317196	
	SM 2320 B-97	Total Alkalinity	141		mg CaCO3/L	P317327	
	SM 2540 C-97	TDS	218	A	mg/L	P317659	
	SM 2540 D-97	TSS	4	I	mg/L	P317637	
	SM 4500 F-C-97	Fluoride	0.20		mg F/L	P317328	
1859459	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P317680	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32		mg N/L	P317199	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.2		mg N/L	P317373	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P317344	
	SM 5310 B-00	Organic Carbon	3.6		mg C/L	P317236	
1859464	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.12		mg P/L	P317188	

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.
EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Trail Spring at Vent **Collection Date/Time: 12/20/2016 11:20**

Field ID: G1NE0815 12202016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1859455	EPA 180.1 Rev. 2.0	Turbidity	0.30		NTU	P317192	
	EPA 300.0 Rev. 2.1	Chloride	8.7		mg Cl/L	P317945	
		Sulfate	30		mg SO4/L	P317948	
	SM 2120 B	Color (true)	3.0	I	PCU	P317196	
	SM 2320 B-97	Total Alkalinity	158		mg CaCO3/L	P317327	
	SM 2540 C-97	TDS	249		mg/L	P317658	
	SM 2540 D-97	TSS	2	I	mg/L	P317637	
	SM 4500 F-C-97	Fluoride	0.069	I	mg F/L	P317328	
1859460	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P317680	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.22		mg N/L	P317199	
	EPA 353.2 Rev. 2.0	NO2NO3-N	7.3		mg N/L	P317373	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P317344	
	SM 5310 B-00	Organic Carbon	0.69	I	mg C/L	P317236	
1859465	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.046		mg P/L	P317188	

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.
EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Santa Fe below Elie Rays **Collection Date/Time: 12/20/2016 12:30**

Field ID: G1NE0855 12202016 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1859456	EPA 180.1 Rev. 2.0	Turbidity	0.70		NTU	P317192	
	EPA 300.0 Rev. 2.1	Chloride	10		mg Cl/L	P317947	
		Sulfate	27		mg SO4/L	P317950	
	SM 2120 B	Color (true)	11		PCU	P317196	
	SM 2320 B-97	Total Alkalinity	167		mg CaCO3/L	P317327	
	SM 2540 C-97	TDS	224		mg/L	P317659	
	SM 2540 D-97	TSS	3	I	mg/L	P317636	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P317328	
1859461	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P317680	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.27		mg N/L	P317199	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.98		mg N/L	P317373	
	EPA 365.1 Rev. 2.0	Total-P	0.068		mg P/L	P317344	
	SM 5310 B-00	Organic Carbon	1.8		mg C/L	P317236	
1859466	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.061		mg P/L	P317188	

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.
EPA 350.1 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Equipment Blank **Collection Date/Time: 12/20/2016 11:35**

Field ID: Equipment Blank Matrix: W-EQPMT-BK

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

Field ID: Equipment Blank Matrix: W-EQPMT-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1859457	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P317192	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P317947	
		Sulfate	0.20	U	mg SO4/L	P317950	
	SM 2120 B	Color (true)	2.5	U	PCU	P317196	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P317327	
	SM 2540 C-97	TDS	15	U	mg/L	P317656	
	SM 2540 D-97	TSS	2	U	mg/L	P317634	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P317328	
1859462	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P317681	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P317199	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P317373	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P317344	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P317236	
1859467	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P317188	

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.
SM 5310 B-00: 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: P317192

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317773

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317776

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317945

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317947

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: P317948

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317950

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317680

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317681

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317199

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P317373

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317344

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317188

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

Reference Method: SM 2120 B
Batch ID: P317196

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report
Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P317327

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

Reference Method: SM 2540 C-97
Batch ID: P317656

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P317658

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P317659

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P317634

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P317636

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P317637

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P317328

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P317236

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: P317773

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317776

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317945

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317947

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317948

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	94.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317950

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317680

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317681

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317199

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P317373

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317344

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317188

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

Reference Method: SM 2320 B-97
Batch ID: P317327

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.0		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P317328

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P317236

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317773

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859695	Sulfate	98.8		P	90 - 110
1859752	Sulfate	98.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317776

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859695	Chloride	101		P	90 - 110
1859752	Chloride	101		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317945

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859367	Chloride	98.9		P	90 - 110
1859368	Chloride	99.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317947

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860769	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317948

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859367	Sulfate	92.2		P	90 - 110
1859368	Sulfate	92.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317950

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1860769	Sulfate	96.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317681

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859635	Ammonia-N	98.4	91.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317199

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859419	Kjeldahl Nitrogen	97.0	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P317373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859636	NO2NO3-N	99.5	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317344

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859419	Total-P	98.0	97.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317188

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1859421	O-Phosphate-P	97.4	98.2	P/P	90 - 110

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P317192

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859454	Turbidity	2.14	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859752	Sulfate	0.425	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859752	Chloride	0.357	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317945

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859368	Chloride	0.111	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317947

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860769	Chloride	0.834	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317948

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859368	Sulfate	0.234	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P317950

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1860769	Sulfate	0.544	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317680

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859377	Ammonia-N	0.487	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P317681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859635	Ammonia-N	6.47	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P317199

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859419	Kjeldahl Nitrogen	2.79	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P317373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859636	NO2NO3-N	1.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P317344

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859419	Total-P	0.872	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P317188

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859421	O-Phosphate-P	0.769	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P317196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859415	Color (true)	1.63	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P317327

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859342	Total Alkalinity	0.299	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P317656

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859049	TDS	3.51	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P317658

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859415	TDS	6.74	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P317659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859454	TDS	4.59	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P317328

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859342	Fluoride	0.959	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P317236

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1859108	Organic Carbon	0.223	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: A73527
Included Lab Sample IDs: 1859463, 1859464, 1859465, 1859466, 1859467

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	100	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A73528
Included Lab Sample IDs: 1859453, 1859454, 1859455, 1859456, 1859457

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A73530
Included Lab Sample IDs: 1859453, 1859454, 1859455, 1859456, 1859457

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.8	99.9	P/P	85 - 115

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A73539
Included Lab Sample IDs: 1859458, 1859459, 1859460, 1859461, 1859462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.4	97.8	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A73565
Included Lab Sample IDs: 1859453, 1859454, 1859455, 1859456, 1859457

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.8	99.3	P/P	90 - 110
Total Alkalinity	99.6	97.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A73565
Included Lab Sample IDs: 1859453, 1859454, 1859455, 1859456, 1859457

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.0	P/P	90 - 110
Fluoride	99.5	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A73577
Included Lab Sample IDs: 1859458, 1859459, 1859460, 1859461, 1859462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A73580
Included Lab Sample IDs: 1859458, 1859459, 1859460, 1859461, 1859462

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A73608
Included Lab Sample IDs: 1859458, 1859459, 1859461

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A73615
Included Lab Sample IDs: 1859460, 1859462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.8	97.5	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A73714
Included Lab Sample IDs: 1859458, 1859459, 1859460, 1859461, 1859462

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.1	100	P/P	90 - 110
Ammonia-N	99.9	99.1	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A73754
Included Lab Sample IDs: 1859453, 1859454, 1859455, 1859456, 1859457

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	103	P/P	90 - 110
Chloride	102	104	P/P	90 - 110
Chloride	102	102	P/P	90 - 110
Sulfate	94.6	99.2	P/P	90 - 110
Sulfate	98.6	95.5	P/P	90 - 110
Sulfate	99.5	96.5	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					2.14	
EPA 300.0 Rev. 2.1	Chloride	101	101	101		0.357	
	Chloride	99.4	99.9	98.9		0.111	
	Chloride	101	100			0.834	
	Sulfate	98.4	98.5	98.8		0.425	
	Sulfate	94.6	92.6	92.2		0.234	
	Sulfate	96.2	96.1			0.544	
EPA 350.1 Rev. 2.0	Ammonia-N	98.9					0.487
	Ammonia-N	99.5	98.4	91.6			6.47
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	97.0	100			2.79
EPA 353.2 Rev. 2.0	NO2NO3-N	106	99.5	98.5			1.01
EPA 365.1 Rev. 2.0	Total-P	99.2	98.0	97.1			0.872
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	97.4	98.2			0.769
SM 2120 B	Color (true)					1.63	
SM 2320 B-97	Total Alkalinity	99.0				0.299	
SM 2540 C-97	TDS					3.51	
	TDS					6.74	
	TDS					4.59	
SM 4500 F-C-97	Fluoride	97.5					0.959
SM 5310 B-00	Organic Carbon	96.2					0.223

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1859453, 1859454, 1859455, 1859456, 1859457
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1859453, 1859454, 1859455, 1859456, 1859457
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1859453, 1859454, 1859455, 1859456, 1859457
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1859458, 1859459, 1859460, 1859461, 1859462
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1859458, 1859459, 1859460, 1859461, 1859462
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1859458, 1859459, 1859460, 1859461, 1859462
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1859458, 1859459, 1859460, 1859461, 1859462
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1859463, 1859464, 1859465, 1859466, 1859467
SM 2120 B / E31780	True Color measured at 450 nm	1859453, 1859454, 1859455, 1859456, 1859457
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1859453, 1859454, 1859455, 1859456, 1859457
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1859453, 1859454, 1859455, 1859456, 1859457
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1859453, 1859454, 1859455, 1859456, 1859457
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1859453, 1859454, 1859455, 1859456, 1859457
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1859458, 1859459, 1859460, 1859461, 1859462

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	12/21/2016			12/21/2016 14:24	Julie Michelle Frank	1859453, 1859454, 1859455, 1859456, 1859457
EPA 300.0 Rev. 2.1	12/21/2016			01/05/2017	Ping Hua	1859454
	12/21/2016			01/06/2017	Ping Hua	1859453, 1859455
	12/21/2016			01/07/2017	Ping Hua	1859456, 1859457
EPA 350.1 Rev. 2.0	12/21/2016			01/03/2017	Sofia Elnemr	1859458, 1859459, 1859460, 1859461, 1859462
EPA 351.2 Rev. 2.0	12/21/2016	12/22/2016	Adrian Shelby	12/23/2016	Joseph Suarez	1859458, 1859459, 1859460, 1859461, 1859462
EPA 353.2 Rev. 2.0	12/21/2016			12/23/2016	Beverly Y. Sanders	1859458, 1859459, 1859460, 1859461, 1859462
EPA 365.1 Rev. 2.0	12/21/2016	12/23/2016	Vijayalakshmi Reddy	12/27/2016	Lipi Saha	1859458, 1859459, 1859461
	12/21/2016	12/23/2016	Vijayalakshmi Reddy	12/28/2016	Lipi Saha	1859460, 1859462
EPA 365.1 Rev. 2.0 dissolved	12/21/2016			12/21/2016 15:17	Julia Storbeck	1859463, 1859467
	12/21/2016			12/21/2016 15:18	Julia Storbeck	1859464
	12/21/2016			12/21/2016 15:21	Julia Storbeck	1859465
	12/21/2016			12/21/2016 15:22	Julia Storbeck	1859466
SM 2120 B	12/21/2016			12/21/2016 16:45	Jared I. Manley	1859453, 1859454
	12/21/2016			12/21/2016 16:46	Jared I. Manley	1859455
	12/21/2016			12/21/2016 16:47	Jared I. Manley	1859456
	12/21/2016			12/21/2016 16:48	Jared I. Manley	1859457
SM 2320 B-97	12/21/2016			12/22/2016	Dale L. Simmons	1859453, 1859454, 1859455
	12/21/2016			12/23/2016	Dale L. Simmons	1859456, 1859457
SM 2540 C-97	12/21/2016			12/23/2016	Yijie Li	1859453, 1859454, 1859455, 1859456, 1859457
SM 2540 D-97	12/21/2016			12/23/2016	Yijie Li	1859453, 1859454, 1859455, 1859456, 1859457
SM 4500 F-C-97	12/21/2016			12/22/2016	Dale L. Simmons	1859453, 1859454, 1859455
	12/21/2016			12/23/2016	Dale L. Simmons	1859456, 1859457
SM 5310 B-00	12/21/2016			12/22/2016	Julie Michelle Frank	1859458, 1859459, 1859460, 1859461, 1859462