Chemical Analysis Report

NW-DIST-2018-05-04-01

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

Event Description: **South SR County Run**
Request ID: **RQ-2018-04-30-51**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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160 Government Center
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Pensacola, FL 32502-5794
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 17-MAY-2018 13:05

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: TOM KING CREEK **Collection Date/Time: 05/03/2018 11:00**

Field ID: G4NW0193 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990228	EPA 180.1 Rev. 2.0	Turbidity	5.7		NTU	P344727	
	EPA 300.0 Rev. 2.1	Chloride	24		mg Cl/L	P345098	
		Sulfate	9.1		mg SO4/L	P345101	
	SM 2120 B	Color (true)	49	A	PCU	P344721	
	SM 2320 B-97	Total Alkalinity	9.3		mg CaCO3/L	P345177	
	SM 2540 C-97	TDS	77		mg/L	P345315	
	SM 2540 D-97	TSS	3	I	mg/L	P345304	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345180	
1990232	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P345114	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.21		mg N/L	P344860	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.84		mg N/L	P345045	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P344894	
	SM 5310 B-00	Organic Carbon	3.7		mg C/L	P345195	
1990236	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P344714	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Dean Creek upstream of SR 87 **Collection Date/Time: 05/03/2018 11:30**

Field ID: G4NW0362 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990229	EPA 180.1 Rev. 2.0	Turbidity	0.60		NTU	P344727	
	EPA 300.0 Rev. 2.1	Chloride	4.1		mg Cl/L	P345098	
		Sulfate	1.3		mg SO4/L	P345101	
	SM 2120 B	Color (true)	16		PCU	P344721	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P345177	
	SM 2540 C-97	TDS	22	I	mg/L	P345315	
	SM 2540 D-97	TSS	2	U	mg/L	P345304	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345180	
1990233	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P345114	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P344860	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P345045	
	EPA 365.1 Rev. 2.0	Total-P	0.005		mg P/L	P344894	
	SM 5310 B-00	Organic Carbon	1.3		mg C/L	P345195	
1990237	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344714	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Boiling Creek at Boat Launch **Collection Date/Time: 05/03/2018 12:15**

Field ID: G4NW0385 Matrix: W-SURF-FRH

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

Field ID: G4NW0385 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990230	EPA 180.1 Rev. 2.0	Turbidity	1.0		NTU	P344727	
	EPA 300.0 Rev. 2.1	Chloride	3.0		mg Cl/L	P345098	
		Sulfate	0.50		mg SO4/L	P345101	
	SM 2120 B	Color (true)	11		PCU	P344721	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P345177	
	SM 2540 C-97	TDS	15	U	mg/L	P345315	
	SM 2540 D-97	TSS	2	I	mg/L	P345304	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345180	
1990234	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P345114	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P344860	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.086		mg N/L	P345046	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P344894	
	SM 5310 B-00	Organic Carbon	1.2		mg C/L	P345195	
1990238	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344714	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Sandy Point Creek above CR 191 **Collection Date/Time: 05/03/2018 12:55**

Field ID: G4NW0078 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990231	EPA 180.1 Rev. 2.0	Turbidity	3.9		NTU	P344727	
	EPA 300.0 Rev. 2.1	Chloride	17	A	mg Cl/L	P345209	
		Sulfate	1.8	A	mg SO4/L	P345212	
	SM 2120 B	Color (true)	460		PCU	P344721	
	SM 2320 B-97	Total Alkalinity	8.5		mg CaCO3/L	P345177	
	SM 2540 C-97	TDS	87		mg/L	P345316	
	SM 2540 D-97	TSS	3	I	mg/L	P345305	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345180	
1990235	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P345114	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P344860	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.018		mg N/L	P345046	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P344894	
	SM 5310 B-00	Organic Carbon	25		mg C/L	P345196	
1990239	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344714	

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: Jakes Bayou upstream of Robinson Point Rd **Collection Date/Time: 05/03/2018 13:20**

Field ID: G4NW0394 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990240	EPA 180.1 Rev. 2.0	Turbidity	4.6		NTU	P344727	
	SM 2320 B-97	Total Alkalinity	28		mg CaCO3/L	P345176	RPD

Field ID: G4NW0394 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990240	SM 2540 D-97	TSS	4	I	mg/L	P345307	
	SM 4500 F-C-97	Fluoride	0.20		mg F/L	P345179	
1990241	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P345111	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.17	I	mg N/L	P344859	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.026		mg N/L	P344803	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P344810	
	SM 5310 B-00	Organic Carbon	3.4		mg C/L	P345196	
1990242	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P344717	

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: P344727

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345098

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345101

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345209

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345212

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345111

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345114

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344859

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344860

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344803

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345045

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345046

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344810

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344894

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344714

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344717

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

Reference Method: SM 2120 B
Batch ID: P344721

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P345176

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

Reference Method: SM 2320 B-97
Batch ID: P345177

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

Reference Method: SM 2540 C-97
Batch ID: P345315

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P345316

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345304

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345305

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345307

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P345179

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P345180

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P345195

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

Reference Method: SM 5310 B-00
Batch ID: P345196

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: P345098

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345101

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345209

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345212

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345111

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345111

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345114

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: P344859

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.9		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344860

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344803

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345045

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345046

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344810

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344894

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344714

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344717

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

Reference Method: SM 2320 B-97
Batch ID: P345176

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

Reference Method: SM 2320 B-97
Batch ID: P345177

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

Reference Method: SM 4500 F-C-97
Batch ID: P345179

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

Reference Method: SM 4500 F-C-97
Batch ID: P345180

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.1		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345195

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P345196

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345098

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990183	Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345101

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990105	Sulfate	94.5		P	90 - 110
1990183	Sulfate	93.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345209

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990231	Chloride	97.3		P	90 - 110
1990422	Chloride	91.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990231	Sulfate	96.8		P	90 - 110
1990422	Sulfate	91.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345111

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989800	Ammonia-N	99.2	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345114

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990219	Ammonia-N	98.6	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344859

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990177	Kjeldahl Nitrogen	97.4	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344860

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990234	Kjeldahl Nitrogen	104	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344803

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990028	NO2NO3-N	104	106	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345045

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990184	NO2NO3-N	99.4	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990235	NO2NO3-N	96.4	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344810

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990173	Total-P	98.2	97.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344894

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990299	Total-P	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344714

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990222	O-Phosphate-P	101	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344717

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990242	O-Phosphate-P	92.6	94.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P345179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990462	Fluoride	96.6	96.0	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P345180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990422	Fluoride	95.9	96.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345195

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990109	Organic Carbon	97.1	98.0	P/P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P345196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990298	Organic Carbon	98.0	100	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P344727

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990216	Turbidity	8.09	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990105	Chloride	0.417	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345101

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990105	Sulfate	0.835	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345209

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990231	Chloride	0.919	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990231	Sulfate	0.456	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345111

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989800	Ammonia-N	1.70	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345114

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990219	Ammonia-N	0.151	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344859

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990177	Kjeldahl Nitrogen	3.95	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990234	Kjeldahl Nitrogen	0.553	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P344803

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990028	NO2NO3-N	1.43	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345045

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990184	NO2NO3-N	1.90	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990235	NO2NO3-N	0.476	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990173	Total-P	0.930	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344894

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990299	Total-P	0.440	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990222	O-Phosphate-P	2.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990242	O-Phosphate-P	1.44	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P344721

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990228	Color (true)	3.00	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P345176

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990462	Total Alkalinity	1.92	Sample	F	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P345177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990422	Total Alkalinity	0.141	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P345315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990183	TDS	1.98	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P345316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990297	TDS	7.77	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P345179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990462	Fluoride	0.473	Spike	P	0 - 3.5

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P345180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990422	Fluoride	0.473	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P345195

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990109	Organic Carbon	0.666	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P345196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990298	Organic Carbon	1.46	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: A83676
Included Lab Sample IDs: 1990236, 1990237, 1990238, 1990239, 1990242

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.6	P/P	90 - 110
O-Phosphate-P	99.6	99.9	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A83677
Included Lab Sample IDs: 1990228, 1990229, 1990230, 1990231

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	90 - 115
Color (true)	104	103	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83678
Included Lab Sample IDs: 1990228, 1990229, 1990230, 1990231, 1990240

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	102	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83710
Included Lab Sample IDs: 1990241

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83710
Included Lab Sample IDs: 1990241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83732
Included Lab Sample IDs: 1990228, 1990229, 1990230, 1990231

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	98.3	P/P	90 - 110
Chloride	102	101	P/P	90 - 110
Chloride	94.1	96.8	P/P	90 - 110
Sulfate	101	102	P/P	90 - 110
Sulfate	102	97.2	P/P	90 - 110
Sulfate	95.1	95.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83791
Included Lab Sample IDs: 1990241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.9	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83794
Included Lab Sample IDs: 1990232, 1990233, 1990234, 1990235

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	96.3	P/P	90 - 110
Kjeldahl Nitrogen	96.3	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83795
Included Lab Sample IDs: 1990241

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83806
Included Lab Sample IDs: 1990232, 1990233, 1990234, 1990235

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.5	96.5	P/P	90 - 110
NO2NO3-N	99.5	98.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83820
Included Lab Sample IDs: 1990232, 1990233, 1990234, 1990235, 1990241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	102	P/P	90 - 110
Ammonia-N	98.4	99.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A83837
Included Lab Sample IDs: 1990228, 1990229, 1990230, 1990231, 1990240

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	99.0	P/P	90 - 110
Total Alkalinity	99.0	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83837
Included Lab Sample IDs: 1990228, 1990229, 1990230, 1990231, 1990240

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.6	97.6	P/P	90 - 110
Fluoride	97.6	97.1	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A83843
Included Lab Sample IDs: 1990232, 1990233, 1990234, 1990235, 1990241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.2	97.4	P/P	90 - 110
Organic Carbon	97.4	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83863
Included Lab Sample IDs: 1990232, 1990233, 1990234, 1990235

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

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					8.09	
EPA 300.0 Rev. 2.1	Chloride	99.2	97.9			0.417	
	Chloride	96.2	97.3	91.2		0.919	
	Sulfate	96.8	94.5	93.6		0.835	
	Sulfate	95.9	96.8	91.0		0.456	
EPA 350.1 Rev. 2.0	Ammonia-N	99.7	99.2	101			1.70
	Ammonia-N	101	98.6	98.8			0.151
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.9	97.4	102			3.95
	Kjeldahl Nitrogen	101	104	104			0.553
EPA 353.2 Rev. 2.0	NO2NO3-N	104	104	106			1.43
	NO2NO3-N	100	99.4	102			1.90
	NO2NO3-N	101	96.4	96.0			0.476
EPA 365.1 Rev. 2.0	Total-P	103	98.2	97.3			0.930
	Total-P	99.0	103	102			0.440

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.2	101	99.1			2.00
	O-Phosphate-P	102	92.6	94.0			1.44
SM 2120 B	Color (true)					3.00	
SM 2320 B-97	Total Alkalinity	101				1.92	
	Total Alkalinity	101				0.141	
SM 2540 C-97	TDS					1.98	
	TDS					7.77	
SM 4500 F-C-97	Fluoride	94.7	96.6	96.0			0.473
	Fluoride	95.1	95.9	96.5			0.473
SM 5310 B-00	Organic Carbon	101	97.1	98.0			0.666
	Organic Carbon	100	98.0	100			1.46

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1990228, 1990229, 1990230, 1990231, 1990240
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1990228, 1990229, 1990230, 1990231
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1990228, 1990229, 1990230, 1990231
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1990232, 1990233, 1990234, 1990235, 1990241
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1990232, 1990233, 1990234, 1990235, 1990241
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1990232, 1990233, 1990234, 1990235, 1990241
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1990232, 1990233, 1990234, 1990235, 1990241
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1990236, 1990237, 1990238, 1990239, 1990242
SM 2120 B / E31780	True Color measured at 450 nm	1990228, 1990229, 1990230, 1990231
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1990228, 1990229, 1990230, 1990231, 1990240
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1990228, 1990229, 1990230, 1990231
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1990228, 1990229, 1990230, 1990231, 1990240
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1990228, 1990229, 1990230, 1990231, 1990240
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1990232, 1990233, 1990234, 1990235, 1990241

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	05/04/2018			05/04/2018 15:24	Tanya Welborn	1990228, 1990229, 1990230, 1990231, 1990240
EPA 300.0 Rev. 2.1	05/04/2018			05/09/2018 23:20	Lipi Saha	1990228
	05/04/2018			05/09/2018 23:56	Lipi Saha	1990229
	05/04/2018			05/10/2018 00:08	Lipi Saha	1990230
	05/04/2018			05/10/2018 14:47	Lipi Saha	1990231
EPA 350.1 Rev. 2.0	05/04/2018			05/10/2018 12:06	Ping Hua	1990241
	05/04/2018			05/10/2018 13:25	Ping Hua	1990232
	05/04/2018			05/10/2018 13:27	Ping Hua	1990233
	05/04/2018			05/10/2018 13:28	Ping Hua	1990234
	05/04/2018			05/10/2018 13:30	Ping Hua	1990235
EPA 351.2 Rev. 2.0	05/04/2018	05/08/2018 11:00	Adrian Shelby	05/10/2018 09:41	Joseph Suarez	1990241
	05/04/2018	05/08/2018 11:00	Adrian Shelby	05/10/2018 11:25	Joseph Suarez	1990232
	05/04/2018	05/08/2018 11:00	Adrian Shelby	05/10/2018 11:30	Joseph Suarez	1990233
	05/04/2018	05/08/2018 11:00	Adrian Shelby	05/10/2018 11:31	Joseph Suarez	1990234
	05/04/2018	05/08/2018 11:00	Adrian Shelby	05/10/2018 11:36	Joseph Suarez	1990235
EPA 353.2 Rev. 2.0	05/04/2018			05/07/2018 14:21	Lauren Bottorf	1990241
	05/04/2018			05/10/2018 12:16	Lauren Bottorf	1990235
	05/04/2018			05/10/2018 12:22	Lauren Bottorf	1990234
	05/04/2018			05/10/2018 14:22	Lauren Bottorf	1990232
	05/04/2018			05/10/2018 14:23	Lauren Bottorf	1990233
EPA 365.1 Rev. 2.0	05/04/2018	05/07/2018 13:25	Sima Feizi	05/09/2018 14:11	Beverly Y. Sanders	1990241
	05/04/2018	05/08/2018 12:00	Sima Feizi	05/14/2018 10:43	Beverly Y. Sanders	1990232
	05/04/2018	05/08/2018 12:00	Sima Feizi	05/14/2018 10:44	Beverly Y. Sanders	1990233
	05/04/2018	05/08/2018 12:00	Sima Feizi	05/14/2018 10:52	Beverly Y. Sanders	1990234
	05/04/2018	05/08/2018 12:00	Sima Feizi	05/14/2018 10:53	Beverly Y. Sanders	1990235
EPA 365.1 Rev. 2.0 dissolved	05/04/2018			05/04/2018 15:10	Megan Treadwell	1990236, 1990237
	05/04/2018			05/04/2018 15:11	Megan Treadwell	1990238
	05/04/2018			05/04/2018 15:12	Megan Treadwell	1990239
	05/04/2018			05/04/2018 15:26	Megan Treadwell	1990242
SM 2120 B	05/04/2018			05/04/2018 16:50	Tanya Welborn	1990228, 1990229
	05/04/2018			05/04/2018 16:51	Tanya Welborn	1990230
	05/04/2018			05/04/2018 17:16	Tanya Welborn	1990231
SM 2320 B-97	05/04/2018			05/12/2018 00:09	Dale L. Simmons	1990240
	05/04/2018			05/12/2018 02:08	Dale L. Simmons	1990228
	05/04/2018			05/12/2018 02:17	Dale L. Simmons	1990229
	05/04/2018			05/12/2018 02:28	Dale L. Simmons	1990230
	05/04/2018			05/12/2018 02:39	Dale L. Simmons	1990231
SM 2540 C-97	05/04/2018			05/09/2018 15:08	Yijie Li	1990228, 1990229, 1990230, 1990231

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2540 D-97	05/04/2018			05/09/2018 15:08	Yijie Li	1990228, 1990229, 1990230, 1990231, 1990240
SM 4500 F-C-97	05/04/2018			05/12/2018 00:09	Dale L. Simmons	1990240
	05/04/2018			05/12/2018 02:08	Dale L. Simmons	1990228
	05/04/2018			05/12/2018 02:17	Dale L. Simmons	1990229
	05/04/2018			05/12/2018 02:28	Dale L. Simmons	1990230
	05/04/2018			05/12/2018 02:39	Dale L. Simmons	1990231
SM 5310 B-00	05/04/2018			05/11/2018 19:54	Julia Storbeck	1990232
	05/04/2018			05/11/2018 20:06	Julia Storbeck	1990233
	05/04/2018			05/11/2018 20:18	Julia Storbeck	1990234
	05/04/2018			05/11/2018 22:10	Julia Storbeck	1990235
	05/04/2018			05/11/2018 22:23	Julia Storbeck	1990241