Chemical Analysis Report

CEN-DIST-2016-02-02-01

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

Event Description: **Kissimmee/Tiger**
Request ID: **RQ-2016-02-01-68**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

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

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 22-FEB-2016 15:14

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: KISSIMMEE RIVER **Collection Date/Time: 02/01/2016 12:50**

Field ID: G4CE0055 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1767970	EPA 180.1 Rev. 2.0	Turbidity	5.4		NTU	P297962	
	EPA 300.0 Rev. 2.1	Chloride	20	A	mg Cl/L	P298182	
		Sulfate	6.8	A	mg SO4/L	P298179	
	SM 2120 B	Color (true)	100		PCU	P297985	
	SM 2320 B-97	Total Alkalinity	30		mg CaCO3/L	P298263	
	SM 2540 C-97	TDS	99		mg/L	P298620	
	SM 2540 D-97	TSS	9	I	mg/L	P298549	
	SM 4500 F-C-97	Fluoride	0.073	I	mg F/L	P298258	
1767975	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P298496	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P298133	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.029		mg N/L	P298241	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P298160	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P298152	
1767980	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P297949	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: TIGER CREEK **Collection Date/Time: 02/01/2016 12:30**

Field ID: G4CE0070 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1767971	EPA 180.1 Rev. 2.0	Turbidity	3.7		NTU	P297962	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P298182	
		Sulfate	7.9		mg SO4/L	P298179	
	SM 2120 B	Color (true)	120		PCU	P297985	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P298263	
	SM 2540 C-97	TDS	76		mg/L	P298620	
	SM 2540 D-97	TSS	5	I	mg/L	P298549	
	SM 4500 F-C-97	Fluoride	0.066	I	mg F/L	P298258	
1767976	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P298496	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.89		mg N/L	P298134	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.012		mg N/L	P298241	
	EPA 365.1 Rev. 2.0	Total-P	0.092		mg P/L	P298160	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P298152	
1767981	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.045		mg P/L	P297949	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: TIGER CREEK **Collection Date/Time: 02/01/2016 12:20**

Field ID: G4CE0069 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1767972	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P297962	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P298182	
		Sulfate	8.0		mg SO4/L	P298179	

Field ID: G4CE0069 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1767972	SM 2120 B	Color (true)	120		PCU	P297985	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P298263	
	SM 2540 C-97	TDS	86		mg/L	P298620	
	SM 2540 D-97	TSS	4	I	mg/L	P298549	
	SM 4500 F-C-97	Fluoride	0.066	I	mg F/L	P298258	
1767977	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P298496	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.79		mg N/L	P298134	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.010		mg N/L	P298241	
	EPA 365.1 Rev. 2.0	Total-P	0.087		mg P/L	P298160	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P298152	
1767982	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.049		mg P/L	P297949	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: TIGER CREEK **Collection Date/Time: 02/01/2016 12:05**

Field ID: G4CE0068 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1767973	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P297962	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P298182	
		Sulfate	7.9		mg SO4/L	P298179	
	SM 2120 B	Color (true)	120	A	PCU	P297985	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P298263	
	SM 2540 C-97	TDS	85		mg/L	P298620	
	SM 2540 D-97	TSS	6	I	mg/L	P298549	
	SM 4500 F-C-97	Fluoride	0.066	I	mg F/L	P298258	
1767978	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P298496	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P298134	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P298242	
	EPA 365.1 Rev. 2.0	Total-P	0.087		mg P/L	P298161	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P298152	
1767983	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.040		mg P/L	P297949	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: TIGER CREEK **Collection Date/Time: 02/01/2016 11:55**

Field ID: G4CE0067 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1767974	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P297962	
	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P298182	
		Sulfate	7.9		mg SO4/L	P298179	
	SM 2120 B	Color (true)	120		PCU	P297985	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P298263	
	SM 2540 C-97	TDS	83		mg/L	P298620	
	SM 2540 D-97	TSS	6	I	mg/L	P298549	

Field ID: G4CE0067 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1767974	SM 4500 F-C-97	Fluoride	0.068	I	mg F/L	P298258	
1767979	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P298497	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.87		mg N/L	P298134	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P298242	
	EPA 365.1 Rev. 2.0	Total-P	0.089		mg P/L	P298161	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P298152	
1767984	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.040		mg P/L	P297949	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P297962

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298179

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298182

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298496

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298497

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298133

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298134

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298241

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298242

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298160

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298161

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297949

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

Reference Method: SM 2120 B
Batch ID: P297985

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P298263

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

Reference Method: SM 2540 C-97
Batch ID: P298620

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P298549

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P298258

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P298152

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: P298179

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298182

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298496

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298497

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: P298133

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298134

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298241

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298241

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: P298242

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298160

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298161

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297949

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

Reference Method: SM 2320 B-97
Batch ID: P298263

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

Reference Method: SM 4500 F-C-97
Batch ID: P298258

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.3		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P298152

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.5		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298179

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: P298179

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767970	Sulfate	101		P	90 - 110
1767987	Sulfate	99.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298182

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767970	Chloride	103		P	90 - 110
1767987	Chloride	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298496

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767976	Ammonia-N	99.8	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298497

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767996	Ammonia-N	101	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298133

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767907	Kjeldahl Nitrogen	102	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298134

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767976	Kjeldahl Nitrogen	96.0	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767950	NO2NO3-N	97.0	96.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298242

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767979	NO2NO3-N	98.5	96.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298160

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767909	Total-P	106	105	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298161

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767978	Total-P	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297949

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767471	O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P298258

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767986	Fluoride	97.1	98.3	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P298152

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1767873	Organic Carbon	97.1	96.3	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P297962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767947	Turbidity	2.12	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298179

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767970	Sulfate	0.352	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298182

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767970	Chloride	0.205	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298496

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767976	Ammonia-N	1.28	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P298497

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767996	Ammonia-N	0.130	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767907	Kjeldahl Nitrogen	1.99	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P298134

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767976	Kjeldahl Nitrogen	1.90	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767950	NO2NO3-N	0.276	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P298242

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767979	NO2NO3-N	2.05	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298160

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767909	Total-P	0.498	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P298161

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767978	Total-P	0.160	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767471	O-Phosphate-P	0.817	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2120 B
Batch ID: P297985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767973	Color (true)	1.10	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P298263

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767986	Total Alkalinity	2.46	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P298620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767985	TDS	4.24	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P298258

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767986	Fluoride	1.03	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P298152

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1767873	Organic Carbon	0.445	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: A67411
Included Lab Sample IDs: 1767980, 1767981, 1767982, 1767983, 1767984

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	99.3	P/P	90 - 110
O-Phosphate-P	99.3	98.3	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A67412
Included Lab Sample IDs: 1767970, 1767971, 1767972, 1767973, 1767974

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A67423
Included Lab Sample IDs: 1767970, 1767971, 1767972, 1767973, 1767974

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A67468
Included Lab Sample IDs: 1767970, 1767971, 1767972, 1767973, 1767974

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Chloride	102	102	P/P	90 - 110
Sulfate	95.4	99.0	P/P	90 - 110
Sulfate	99.0	95.8	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A67475
Included Lab Sample IDs: 1767975, 1767976, 1767977, 1767978, 1767979

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.1	99.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A67507
Included Lab Sample IDs: 1767975, 1767976, 1767977, 1767978, 1767979

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A67511
Included Lab Sample IDs: 1767975, 1767976, 1767977, 1767978, 1767979

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.0	92.9	P/P	90 - 110
Kjeldahl Nitrogen	92.8	92.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A67512
Included Lab Sample IDs: 1767976, 1767977, 1767978, 1767979

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	102	P/P	90 - 110
Total-P	105	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A67514
Included Lab Sample IDs: 1767970, 1767971, 1767972, 1767973, 1767974

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	98.6	P/P	90 - 110
Fluoride	99.1	99.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A67515
Included Lab Sample IDs: 1767970, 1767971, 1767972, 1767973, 1767974

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A67525
Included Lab Sample IDs: 1767975

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	96.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A67582
Included Lab Sample IDs: 1767975, 1767976, 1767977, 1767978, 1767979

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	102	P/P	90 - 110
Ammonia-N	102	102	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					2.12	
EPA 300.0 Rev. 2.1	Chloride	103	103	104		0.205	
	Sulfate	98.8	101	99.7		0.352	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	99.8	101			1.28
	Ammonia-N	99.8	101	101			0.130
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.8	102	98.4			1.99
	Kjeldahl Nitrogen	96.0	96.0	99.2			1.90
EPA 353.2 Rev. 2.0	NO2NO3-N	100	97.0	96.5			0.276
	NO2NO3-N	100	98.5	96.5			2.05
EPA 365.1 Rev. 2.0	Total-P	104	105	106			0.498
	Total-P	103	103	103			0.160
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	104	100	101			0.817
SM 2120 B	Color (true)					1.10	
SM 2320 B-97	Total Alkalinity	101				2.46	
SM 2540 C-97	TDS					4.24	
SM 4500 F-C-97	Fluoride	97.3	97.1	98.3			1.03
SM 5310 B-00	Organic Carbon	98.5	97.1	96.3			0.445

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1767970, 1767971, 1767972, 1767973, 1767974

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1767970, 1767971, 1767972, 1767973, 1767974
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1767970, 1767971, 1767972, 1767973, 1767974
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1767975, 1767976, 1767977, 1767978, 1767979
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1767975, 1767976, 1767977, 1767978, 1767979
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1767975, 1767976, 1767977, 1767978, 1767979
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1767975, 1767976, 1767977, 1767978, 1767979
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1767980, 1767981, 1767982, 1767983, 1767984
SM 2120 B / E31780	True Color measured at 450 nm	1767970, 1767971, 1767972, 1767973, 1767974
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1767970, 1767971, 1767972, 1767973, 1767974
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1767970, 1767971, 1767972, 1767973, 1767974
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1767970, 1767971, 1767972, 1767973, 1767974
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1767970, 1767971, 1767972, 1767973, 1767974
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1767975, 1767976, 1767977, 1767978, 1767979

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	02/02/2016			02/02/2016 17:04	Sima Feizi	1767970, 1767971, 1767972, 1767973, 1767974
EPA 300.0 Rev. 2.1	02/02/2016			02/05/2016	Ping Hua	1767970, 1767971, 1767972, 1767973, 1767974
EPA 350.1 Rev. 2.0	02/02/2016			02/11/2016	Diana M. Turner	1767975, 1767976, 1767977, 1767978, 1767979
EPA 351.2 Rev. 2.0	02/02/2016	02/05/2016	Sofia Elnemr	02/08/2016	Bryan A. Werth	1767975, 1767976, 1767977, 1767978, 1767979
EPA 353.2 Rev. 2.0	02/02/2016			02/08/2016	Diana M. Turner	1767975, 1767976, 1767977, 1767978, 1767979
EPA 365.1 Rev. 2.0	02/02/2016	02/05/2016	Lipi Saha	02/08/2016	Lipi Saha	1767975, 1767976, 1767977, 1767978, 1767979
EPA 365.1 Rev. 2.0 dissolved	02/02/2016			02/02/2016 15:08	Bryan A. Werth	1767980, 1767981
	02/02/2016			02/02/2016 15:09	Bryan A. Werth	1767982
	02/02/2016			02/02/2016 15:14	Bryan A. Werth	1767983
	02/02/2016			02/02/2016 15:15	Bryan A. Werth	1767984
SM 2120 B	02/02/2016			02/03/2016 09:44	Rochelle Y Jackson	1767970, 1767971
	02/02/2016			02/03/2016 09:45	Rochelle Y Jackson	1767972
	02/02/2016			02/03/2016 09:47	Rochelle Y Jackson	1767973, 1767974
SM 2320 B-97	02/02/2016			02/08/2016	Dale L. Simmons	1767970, 1767971
	02/02/2016			02/09/2016	Dale L. Simmons	1767972, 1767973, 1767974
SM 2540 C-97	02/02/2016			02/05/2016	Yijie Li	1767970, 1767971, 1767972, 1767973, 1767974
SM 2540 D-97	02/02/2016			02/05/2016	Yijie Li	1767970, 1767971, 1767972, 1767973, 1767974
SM 4500 F-C-97	02/02/2016			02/08/2016	Dale L. Simmons	1767970, 1767971, 1767972, 1767973, 1767974
SM 5310 B-00	02/02/2016			02/05/2016	Sofia Elnemr	1767975, 1767976, 1767977, 1767978, 1767979