Chemical Analysis Report

SO-DIST-2016-02-18-02

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

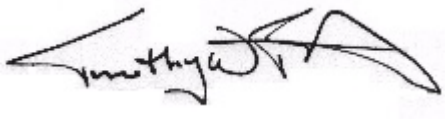
Event Description: **SMP: Highlands Lakes**
Request ID: **RQ-2016-02-15-65**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
Fort Myers, FL 33901
Attn: Ben Paswater

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

Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 09-MAR-2016 11:27



Case Narrative

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

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

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

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

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Henry WBID 1938 **Collection Date/Time: 02/17/2016 11:20**

Field ID: Lake Henry @ Middle Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1772676	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P298862	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P298970	
		Sulfate	20		mg SO4/L	P298971	
	SM 2120 B	Color (true)	23	A	PCU	P298867	
	SM 2320 B-97	Total Alkalinity	20		mg CaCO3/L	P299410	RPD
	SM 2540 C-97	TDS	90		mg/L	P299526	
	SM 2540 D-97	TSS	4	I	mg/L	P299448	
	SM 4500 F-C-97	Fluoride	0.058	I	mg F/L	P299322	
1772682	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P299316	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P299213	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P299443	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P299161	
	SM 5310 B-00	Organic Carbon	8.1		mg C/L	P299305	
1772688	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298851	

Ref. Method and Comment:
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 147 umhos/cm.
SM 5310 B-00: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Lake Henry WBID 1938 **Collection Date/Time: 02/17/2016 11:30**

Field ID: Lake Henry @ SE Corner Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1772677	EPA 180.1 Rev. 2.0	Turbidity	2.3		NTU	P298862	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P298970	
		Sulfate	20		mg SO4/L	P298971	
	SM 2120 B	Color (true)	24		PCU	P298867	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P299410	RPD
	SM 2540 C-97	TDS	85		mg/L	P299526	
	SM 2540 D-97	TSS	4	I	mg/L	P299448	
	SM 4500 F-C-97	Fluoride	0.057	I	mg F/L	P299322	
1772683	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P299316	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.70		mg N/L	P299213	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P299443	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P299161	
	SM 5310 B-00	Organic Carbon	8.2		mg C/L	P299305	
1772689	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298851	

Ref. Method and Comment:
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 146 umhos/cm.
SM 5310 B-00: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Lake Henry WBID 1938 **Collection Date/Time: 02/17/2016 11:43**

Field ID: Lake Henry @ East side Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1772678	EPA 180.1 Rev. 2.0	Turbidity	2.7		NTU	P298862	

Field ID: Lake Henry @ East side Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1772678	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P298970	
		Sulfate	20		mg SO4/L	P298971	
	SM 2120 B	Color (true)	23		PCU	P298867	
	SM 2320 B-97	Total Alkalinity	18		mg CaCO3/L	P299410	RPD
	SM 2540 C-97	TDS	79		mg/L	P299526	
	SM 2540 D-97	TSS	4	I	mg/L	P299448	
	SM 4500 F-C-97	Fluoride	0.057	I	mg F/L	P299322	
1772684	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P299316	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.71		mg N/L	P299213	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P299443	
	EPA 365.1 Rev. 2.0	Total-P	0.019		mg P/L	P299161	
	SM 5310 B-00	Organic Carbon	8.2		mg C/L	P299305	
1772690	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298851	

Ref. Method and Comment:
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 147 umhos/cm.
SM 5310 B-00: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Lake Henry WBID 1938 **Collection Date/Time: 02/17/2016 12:15**

Field ID: Lake Henry @ SW side Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1772679	EPA 180.1 Rev. 2.0	Turbidity	2.9		NTU	P298862	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P298970	
		Sulfate	20		mg SO4/L	P298971	
	SM 2120 B	Color (true)	23		PCU	P298867	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P299410	RPD
	SM 2540 C-97	TDS	82		mg/L	P299526	
	SM 2540 D-97	TSS	3	I	mg/L	P299448	
	SM 4500 F-C-97	Fluoride	0.057	I	mg F/L	P299322	
1772685	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P299316	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.67		mg N/L	P299213	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P299443	
	EPA 365.1 Rev. 2.0	Total-P	0.021		mg P/L	P299161	
	SM 5310 B-00	Organic Carbon	8.1		mg C/L	P299305	
1772691	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298851	

Ref. Method and Comment:
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 146 umhos/cm.
SM 5310 B-00: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Lake Henry WBID 1938 **Collection Date/Time: 02/17/2016 12:00**

Field ID: Lake Henry @ North side Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1772680	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P298862	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P298973	
		Sulfate	20		mg SO4/L	P298972	

Field ID: Lake Henry @ North side Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1772680	SM 2120 B	Color (true)	23		PCU	P298867	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P299410	RPD
	SM 2540 C-97	TDS	82	A	mg/L	P299527	
	SM 2540 D-97	TSS	3	I	mg/L	P299449	
	SM 4500 F-C-97	Fluoride	0.058	I	mg F/L	P299322	
1772686	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P299316	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.72		mg N/L	P299213	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P299443	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P299237	
	SM 5310 B-00	Organic Carbon	7.8		mg C/L	P299305	
1772692	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298851	

Ref. Method and Comment:
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 148 umhos/cm.
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
SM 5310 B-00: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: Lake Henry WBID 1938 e **Collection Date/Time: 02/17/2016 13:00**

Field ID: Persimman Lake Center Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1772681	EPA 180.1 Rev. 2.0	Turbidity	13		NTU	P298862	
	EPA 300.0 Rev. 2.1	Chloride	21		mg Cl/L	P298973	
		Sulfate	45		mg SO4/L	P298972	
	SM 2120 B	Color (true)	23		PCU	P298867	
	SM 2320 B-97	Total Alkalinity	30		mg CaCO3/L	P299410	RPD
	SM 2540 C-97	TDS	145	A	mg/L	P299526	
	SM 2540 D-97	TSS	11	A	mg/L	P299448	
	SM 4500 F-C-97	Fluoride	0.043	I	mg F/L	P299322	
1772687	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P299316	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P299213	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.5		mg N/L	P299443	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P299237	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P299305	
1772693	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P298852	

Ref. Method and Comment:
SM 2540 C-97: The reported result is consistent with the laboratory conductivity, 244 umhos/cm.
SM 5310 B-00: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298862

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298970

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298971

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298972

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298973

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P299316

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299213

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299443

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299161

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299237

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298851

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298852

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

Reference Method: SM 2120 B
Batch ID: P298867

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P299410

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

Reference Method: SM 2540 C-97
Batch ID: P299526

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P299527

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P299448

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P299449

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P299322

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P299305

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: P298970

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298971

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298972

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298973

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P299316

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299213

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.7		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299443

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: P299161

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299161

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299237

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298851

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298852

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

Reference Method: SM 2320 B-97
Batch ID: P299410

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P299322

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.6		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P299305

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298970

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772618	Chloride	103		P	90 - 110
1773346	Chloride	105	103	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298971

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772618	Sulfate	99.0		P	90 - 110
1773346	Sulfate	100	99.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298972

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772739	Sulfate	101		P	90 - 110
1772742	Sulfate	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298973

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772739	Chloride	104		P	90 - 110
1772742	Chloride	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P299316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772682	Ammonia-N	99.0	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299213

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772682	Kjeldahl Nitrogen	109	96.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299443

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772682	NO2NO3-N	97.5	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299161

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772649	Total-P	99.8	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299237

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772686	Total-P	104	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298851

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772691	O-Phosphate-P	102	104	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298852

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772693	O-Phosphate-P	102	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P299322

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1772627	Fluoride	96.6	98.3	P/P	94 - 107

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P298862

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772647	Turbidity	1.43	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298970

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1773346	Chloride	2.13	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298971

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1773346	Sulfate	0.786	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298972

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772739	Sulfate	0.969	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P298973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772739	Chloride	1.10	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P299316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P299316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772682	Ammonia-N	0.358	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299213

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772682	Kjeldahl Nitrogen	7.44	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772682	NO2NO3-N	1.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299161

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772649	Total-P	0.364	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299237

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772686	Total-P	2.94	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298851

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772691	O-Phosphate-P	1.65	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P298852

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772693	O-Phosphate-P	1.46	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P298867

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772676	Color (true)	1.55	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P299410

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772627	Total Alkalinity	8.88	Sample	F	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P299526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772681	TDS	4.14	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P299527

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772680	TDS	6.13	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P299448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772681	TSS	0.0	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P299322

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772627	Fluoride	0.940	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P299305

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1772743	Organic Carbon	0.412	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 300.0 Rev. 2.1
Run ID: A67638
Included Lab Sample IDs: 1772676, 1772677, 1772678, 1772679, 1772680, 1772681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Chloride	99.8	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A67638
Included Lab Sample IDs: 1772676, 1772677, 1772678, 1772679, 1772680, 1772681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	96.0	99.2	P/P	90 - 110
Sulfate	96.0	98.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A67674
Included Lab Sample IDs: 1772688, 1772689, 1772690, 1772691, 1772692, 1772693

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	99.4	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: A67676
Included Lab Sample IDs: 1772676, 1772677, 1772678, 1772679, 1772680, 1772681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A67678
Included Lab Sample IDs: 1772676, 1772677, 1772678, 1772679, 1772680, 1772681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	103	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A67829
Included Lab Sample IDs: 1772682, 1772683, 1772684, 1772685

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	98.8	P/P	90 - 110
Total-P	98.8	99.2	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A67848
Included Lab Sample IDs: 1772682, 1772683, 1772684, 1772685, 1772686, 1772687

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A67850
Included Lab Sample IDs: 1772682, 1772683, 1772684, 1772685, 1772686, 1772687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	102	P/P	90 - 110
Ammonia-N	102	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-97
Run ID: A67854
Included Lab Sample IDs: 1772676, 1772677, 1772678, 1772679, 1772680, 1772681

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A67866
Included Lab Sample IDs: 1772686, 1772687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A67889
Included Lab Sample IDs: 1772682, 1772683, 1772684, 1772685, 1772686, 1772687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110
NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A67892
Included Lab Sample IDs: 1772682, 1772683, 1772684, 1772685, 1772686, 1772687

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.6	97.6	P/P	90 - 110
Kjeldahl Nitrogen	95.4	94.6	P/P	90 - 110
Kjeldahl Nitrogen	97.6	96.3	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A67974
Included Lab Sample IDs: 1772676, 1772677, 1772678, 1772679, 1772680, 1772681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	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						1.43	
EPA 300.0 Rev. 2.1	Chloride	103	105	103	103			2.13
	Chloride	102	104	104			1.10	
	Sulfate	98.5	100	99.6	99.0			0.786
	Sulfate	99.9	101	102			0.969	
EPA 350.1 Rev. 2.0	Ammonia-N	100	99.0	98.6				0.358
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.7	109	96.7				7.44
EPA 353.2 Rev. 2.0	NO2NO3-N	101	97.5	98.5				1.02

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 365.1 Rev. 2.0	Total-P	99.1	99.8	99.4			0.364
	Total-P	101	104	101			2.94
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	102	104			1.65
	O-Phosphate-P	105	102	104			1.46
SM 2120 B	Color (true)					1.55	
SM 2320 B-97	Total Alkalinity	104				8.88	
SM 2540 C-97	TDS					4.14	
	TDS					6.13	
SM 2540 D-97	TSS					0.0	
SM 4500 F-C-97	Fluoride	97.6	96.6	98.3			0.940
SM 5310 B-00	Organic Carbon	101					0.412

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1772682, 1772683, 1772684, 1772685, 1772686, 1772687
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1772682, 1772683, 1772684, 1772685, 1772686, 1772687
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1772682, 1772683, 1772684, 1772685, 1772686, 1772687
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1772682, 1772683, 1772684, 1772685, 1772686, 1772687
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1772688, 1772689, 1772690, 1772691, 1772692, 1772693
SM 2120 B / E31780	True Color measured at 450 nm	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1772682, 1772683, 1772684, 1772685, 1772686, 1772687

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	02/18/2016			02/18/2016 15:08	Sima Feizi	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
EPA 300.0 Rev. 2.1	02/18/2016			02/19/2016	Ping Hua	1772676, 1772677, 1772678, 1772679
	02/18/2016			02/20/2016	Ping Hua	1772680, 1772681
EPA 350.1 Rev. 2.0	02/18/2016			02/25/2016	Diana M. Turner	1772682, 1772683, 1772684, 1772685, 1772686, 1772687
EPA 351.2 Rev. 2.0	02/18/2016	02/25/2016	Christopher Armour	02/26/2016	Rochelle Y Jackson	1772682, 1772683, 1772684, 1772685, 1772686, 1772687
EPA 353.2 Rev. 2.0	02/18/2016			02/26/2016	Diana M. Turner	1772682, 1772683, 1772684, 1772685, 1772686, 1772687
EPA 365.1 Rev. 2.0	02/18/2016	02/24/2016	Christopher Armour	02/25/2016	Lipi Saha	1772682, 1772683, 1772684, 1772685
	02/18/2016	02/25/2016	Christopher Armour	02/26/2016	Lipi Saha	1772686, 1772687
EPA 365.1 Rev. 2.0 dissolved	02/18/2016			02/18/2016 13:11	Bryan A. Werth	1772691
	02/18/2016			02/18/2016 13:16	Bryan A. Werth	1772693
	02/18/2016			02/18/2016 13:35	Bryan A. Werth	1772688
	02/18/2016			02/18/2016 13:36	Bryan A. Werth	1772689
	02/18/2016			02/18/2016 13:37	Bryan A. Werth	1772690
	02/18/2016			02/18/2016 13:38	Bryan A. Werth	1772692
SM 2120 B	02/18/2016			02/18/2016 16:02	Rochelle Y Jackson	1772676
	02/18/2016			02/18/2016 16:03	Rochelle Y Jackson	1772677, 1772678
	02/18/2016			02/18/2016 16:04	Rochelle Y Jackson	1772679
	02/18/2016			02/18/2016 16:05	Rochelle Y Jackson	1772680
	02/18/2016			02/18/2016 16:06	Rochelle Y Jackson	1772681
SM 2320 B-97	02/18/2016			02/28/2016	Dale L. Simmons	1772676
	02/18/2016			02/29/2016	Dale L. Simmons	1772677, 1772678, 1772679, 1772680, 1772681
SM 2540 C-97	02/18/2016			02/22/2016	Sima Feizi	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
SM 2540 D-97	02/18/2016			02/22/2016	Sima Feizi	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
SM 4500 F-C-97	02/18/2016			02/23/2016	Dale L. Simmons	1772676, 1772677, 1772678, 1772679, 1772680, 1772681
SM 5310 B-00	02/18/2016			02/25/2016	Sofia Elnemr	1772682, 1772683, 1772684, 1772685, 1772686, 1772687