Chemical Analysis Report

NW-DIST-2016-03-16-02

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

Event Description: **TMDL Bioassessment**
Request ID: **RQ-2016-02-01-57**
Customer: **NW-DIST**
Project ID: **SMP**

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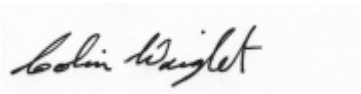
Certified by: Colin Wright, Environmental Administrator

Date Certified: 01-APR-2016 11:25



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: Gum Hwy 83 **Collection Date/Time: 03/15/2016 12:05**

Field ID: G4NW0322 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1780718	EPA 180.1 Rev. 2.0	Turbidity	4.0		NTU	P300521	
	EPA 300.0 Rev. 2.1	Chloride	3.6		mg Cl/L	P300753	
		Sulfate	0.20	U	mg SO4/L	P300755	
	SM 2120 B	Color (true)	230		PCU	P300505	
	SM 2320 B-97	Total Alkalinity	0.99	I	mg CaCO3/L	P300765	
	SM 2540 C-97	TDS	32		mg/L	P301169	
	SM 2540 D-97	TSS	15	A	mg/L	P300953	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P300767	
1780721	EPA 350.1 Rev. 2.0	Ammonia-N	0.043		mg N/L	P301193	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P301148	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P300805	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P301054	
	SM 5310 B-00	Organic Carbon	18		mg C/L	P300981	
1780724	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P300519	

Sample Location: Gum Creek abv Bartlett rd **Collection Date/Time: 03/15/2016 12:30**

Field ID: G4NW0323 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1780719	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P300521	
	EPA 300.0 Rev. 2.1	Chloride	3.6		mg Cl/L	P300753	
		Sulfate	0.20	U	mg SO4/L	P300755	
	SM 2120 B	Color (true)	240		PCU	P300505	
	SM 2320 B-97	Total Alkalinity	0.73	I	mg CaCO3/L	P300765	
	SM 2540 C-97	TDS	31		mg/L	P301169	
	SM 2540 D-97	TSS	7	I	mg/L	P300953	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P300767	
1780722	EPA 350.1 Rev. 2.0	Ammonia-N	0.042		mg N/L	P301193	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.96		mg N/L	P301148	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P300806	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P301054	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P300981	
1780725	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P300519	

Sample Location: Dead Fall creek abv Jackson rd **Collection Date/Time: 03/15/2016 15:50**

Field ID: G4NW0347 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1780720	EPA 180.1 Rev. 2.0	Turbidity	1.7		NTU	P300521	
	EPA 300.0 Rev. 2.1	Chloride	3.1		mg Cl/L	P300753	
		Sulfate	0.86		mg SO4/L	P300755	
	SM 2120 B	Color (true)	25		PCU	P300505	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P300765	

Field ID: G4NW0347 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1780720	SM 2540 C-97	TDS	15	U	mg/L	P301169	
	SM 2540 D-97	TSS	2	I	mg/L	P300953	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P300767	
1780723	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P301193	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.11	I	mg N/L	P301148	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.031		mg N/L	P300806	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P301054	
	SM 5310 B-00	Organic Carbon	2.3		mg C/L	P300981	
1780726	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P300519	

Sample Location: Bray Mill Creek North of Oil Plant Road **Collection Date/Time: 03/15/2016 11:30**

Field ID: G4NW0066 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1780779	EPA 180.1 Rev. 2.0	Turbidity	8.3		NTU	P300522	
	EPA 300.0 Rev. 2.1	Chloride	9.0		mg Cl/L	P300753	
		Sulfate	4.6		mg SO4/L	P300755	
	SM 2120 B	Color (true)	13		PCU	P300505	
	SM 2320 B-97	Total Alkalinity	2.9		mg CaCO3/L	P300765	
	SM 2540 C-97	TDS	46		mg/L	P301169	
	SM 2540 D-97	TSS	12		mg/L	P300953	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P300767	
1780780	EPA 350.1 Rev. 2.0	Ammonia-N	0.14		mg N/L	P301193	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32		mg N/L	P301149	
	EPA 353.2 Rev. 2.0	NO2NO3-N	3.8		mg N/L	P300806	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P301056	
	SM 5310 B-00	Organic Carbon	1.1		mg C/L	P300981	
1780781	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P300519	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P300521

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P300522

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300753

Component	Result	Code	Units

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300753

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300755

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301193

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301148

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301149

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300805

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300806

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301054

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301056

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: P300519

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

Reference Method: SM 2120 B
Batch ID: P300505

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P300765

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

Reference Method: SM 2540 C-97
Batch ID: P301169

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P300953

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P300767

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P300981

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: P300753

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300755

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300755

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301193

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301148

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301149

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300805

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300806

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: P301054

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301056

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300519

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P300765

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P300767

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.9		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P300981

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300753

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780694	Chloride	100		P	90 - 110
1781235	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300755

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780694	Sulfate	100		P	90 - 110
1781235	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301193

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780695	Ammonia-N	100	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301148

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780763	Kjeldahl Nitrogen	103	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301149

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780768	Kjeldahl Nitrogen	94.4	103	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300805

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780619	NO2NO3-N	97.0	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300806

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780722	NO2NO3-N	97.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301054

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780671	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301056

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780764	Total-P	104	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300519

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780726	O-Phosphate-P	106	105	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P300767

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1781236	Fluoride	99.2	98.6	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P300981

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1780764	Organic Carbon	97.3	98.2	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P300521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780668	Turbidity	2.63	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P300522

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780757	Turbidity	1.94	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300753

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780694	Chloride	0.0612	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P300755

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780694	Sulfate	0.359	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P301193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780695	Ammonia-N	0.245	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301148

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780763	Kjeldahl Nitrogen	0.580	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P301149

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780768	Kjeldahl Nitrogen	5.37	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780619	NO2NO3-N	5.03	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P300806

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780722	NO2NO3-N	1.29	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301054

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780671	Total-P	0.447	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P301056

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780764	Total-P	3.56	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P300519

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780726	O-Phosphate-P	0.475	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P300505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780757	Color (true)	5.71	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P300765

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1781236	Total Alkalinity	0.348	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P301169

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1781154	TDS	4.26	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P300953

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780718	TSS	5.41	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P300767

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1781236	Fluoride	0.500	Spike	P	0 - 3.7

Quality Assurance Report
Precision

Reference Method: SM 5310 B-00
Batch ID: P300981

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1780764	Organic Carbon	0.662	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: A68261
Included Lab Sample IDs: 1780718, 1780719, 1780720, 1780779

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

Reference Method: SM 2120 B
Run ID: A68264
Included Lab Sample IDs: 1780720, 1780779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.5	96.9	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A68269
Included Lab Sample IDs: 1780724, 1780725, 1780726, 1780781

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	97.5	P/P	90 - 110
O-Phosphate-P	98.9	98.7	P/P	90 - 110
O-Phosphate-P	99.2	98.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A68270
Included Lab Sample IDs: 1780718, 1780719, 1780720, 1780779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.0	P/P	95 - 105
Turbidity	99.0	99.0	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A68280
Included Lab Sample IDs: 1780718, 1780719

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.3	96.1	P/P	85 - 115

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A68354
Included Lab Sample IDs: 1780718, 1780719, 1780720, 1780779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A68354
Included Lab Sample IDs: 1780718, 1780719, 1780720, 1780779

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A68374
Included Lab Sample IDs: 1780721, 1780722, 1780723, 1780780

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110
NO2NO3-N	102	102	P/P	90 - 110
NO2NO3-N	99.5	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A68423
Included Lab Sample IDs: 1780721, 1780722, 1780723, 1780780

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.1	96.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A68500
Included Lab Sample IDs: 1780721, 1780722, 1780723, 1780780

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A68505
Included Lab Sample IDs: 1780721, 1780722, 1780723, 1780780

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A68514
Included Lab Sample IDs: 1780721, 1780722, 1780723, 1780780

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	99.2	P/P	90 - 110
Kjeldahl Nitrogen	99.2	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					2.63	
	Turbidity					1.94	
EPA 300.0 Rev. 2.1	Chloride	100	100	101		0.0612	
	Sulfate	101	100	100		0.359	
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	100	101			0.245
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	103	102			0.580
	Kjeldahl Nitrogen	103	94.4	103			5.37
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	97.0	102			5.03
	NO2NO3-N	100	97.0	99.0			1.29
EPA 365.1 Rev. 2.0	Total-P	105	102	103			0.447
	Total-P	99.8	104	100			3.56
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	106	105			0.475
SM 2120 B	Color (true)					5.71	
SM 2320 B-97	Total Alkalinity	103				0.348	
SM 2540 C-97	TDS					4.26	
SM 2540 D-97	TSS					5.41	
SM 4500 F-C-97	Fluoride	98.9	99.2	98.6			0.500
SM 5310 B-00	Organic Carbon	98.0	97.3	98.2			0.662

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1780718, 1780719, 1780720, 1780779
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1780718, 1780719, 1780720, 1780779
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1780718, 1780719, 1780720, 1780779
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1780721, 1780722, 1780723, 1780780
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1780721, 1780722, 1780723, 1780780
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1780721, 1780722, 1780723, 1780780
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1780721, 1780722, 1780723, 1780780
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1780724, 1780725, 1780726, 1780781
SM 2120 B / E31780	True Color measured at 450 nm	1780718, 1780719, 1780720, 1780779
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1780718, 1780719, 1780720, 1780779
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1780718, 1780719, 1780720, 1780779
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1780718, 1780719, 1780720, 1780779
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1780718, 1780719, 1780720, 1780779
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1780721, 1780722, 1780723, 1780780

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	03/16/2016			03/16/2016 16:50	Sima Feizi	1780718, 1780719, 1780720
EPA 300.0 Rev. 2.1	03/16/2016			03/19/2016	Ping Hua	1780718, 1780719, 1780720
EPA 350.1 Rev. 2.0	03/16/2016			03/28/2016	Diana M. Turner	1780780
EPA 351.2 Rev. 2.0	03/16/2016	03/28/2016	Sofia Elnemr	03/29/2016	Christopher Armour	1780780
EPA 353.2 Rev. 2.0	03/16/2016			03/22/2016	Peter D. Kaus	1780780
EPA 365.1 Rev. 2.0	03/16/2016	03/25/2016	Lipi Saha	03/28/2016	Lipi Saha	1780780
EPA 365.1 Rev. 2.0 dissolved	03/16/2016			03/16/2016 16:28	Julia Storbeck	1780726
	03/16/2016			03/16/2016 16:55	Julia Storbeck	1780724
	03/16/2016			03/16/2016 16:56	Julia Storbeck	1780725
	03/16/2016			03/16/2016 17:07	Julia Storbeck	1780781
SM 2120 B	03/16/2016			03/16/2016 16:17	Rochelle Y Jackson	1780720
	03/16/2016			03/16/2016 16:23	Rochelle Y Jackson	1780779
	03/16/2016			03/16/2016 17:11	Rochelle Y Jackson	1780718
	03/16/2016			03/16/2016 17:12	Rochelle Y Jackson	1780719
SM 2320 B-97	03/16/2016			03/22/2016	Dale L. Simmons	1780718, 1780719, 1780720
SM 2540 C-97	03/16/2016			03/21/2016	Yijie Li	1780779
SM 2540 D-97	03/16/2016			03/21/2016	Yijie Li	1780779
SM 4500 F-C-97	03/16/2016			03/22/2016	Dale L. Simmons	1780718, 1780719, 1780720
SM 5310 B-00	03/16/2016			03/23/2016	Diana M. Turner	1780780