

Chemical Analysis Report

NW-DIST-2016-11-23-01

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

Event Description: **Dune Lakes Run WBID 959G 881 959G 959B**

Request ID: **RQ-2016-11-14-22**

Customer: **NW-DIST**

Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 W Government St
Suite 208A
Pensacola, FL 32502-5794
Attn: Michael King

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

Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 19-DEC-2016 11:29



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: Fuller Lake Middle

Collection Date/Time: 11/22/2016 11:30

Field ID: G3NW0084

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852258	EPA 180.1 Rev. 2.0	Turbidity	2.1		NTU	P315715	
	EPA 300.0 Rev. 2.1	Chloride	20	A	mg Cl/L	P316119	
		Sulfate	5.0	A	mg SO4/L	P316115	
	SM 2120 B	Color (true)	180	A	PCU	P315706	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P315810	
	SM 2540 C-97	TDS	72		mg/L	P316228	
	SM 2540 D-97	TSS	3	I	mg/L	P316223	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P315813	
1852262	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P315898	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.58		mg N/L	P316291	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P316025	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P316085	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P315821	
1852266	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315702	

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: Stallworth Lake Center

Collection Date/Time: 11/22/2016 12:20

Field ID: G3NW0083

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852270	EPA 180.1 Rev. 2.0	Turbidity	0.55		NTU	P315715	
	SM 2320 B-97	Total Alkalinity	16		mg CaCO3/L	P315886	
	SM 2540 D-97	TSS	3	I	mg/L	P316223	
	SM 4500 F-C-97	Fluoride	0.093	I	mg F/L	P315988	
1852271	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P315963	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.54		mg N/L	P316364	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P316402	
	EPA 365.1 Rev. 2.0	Total-P	0.005	I	mg P/L	P316085	
	SM 5310 B-00	Organic Carbon	6.3		mg C/L	P315821	
1852272	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315702	

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: Allen Lake Middle

Collection Date/Time: 11/22/2016 12:50

Field ID: G3NW0085

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852259	EPA 180.1 Rev. 2.0	Turbidity	1.3		NTU	P315715	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P316119	
		Sulfate	3.8		mg SO4/L	P316115	
	SM 2120 B	Color (true)	210		PCU	P315706	
	SM 2320 B-97	Total Alkalinity	1.2	I	mg CaCO3/L	P315810	
	SM 2540 C-97	TDS	58		mg/L	P316228	
	SM 2540 D-97	TSS	2	I	mg/L	P316223	

Field ID: G3NW0085

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852259	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P315813	
1852263	EPA 350.1 Rev. 2.0	Ammonia-N	0.010		mg N/L	P316195	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.76		mg N/L	P316291	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.006	I	mg N/L	P316026	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P316250	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P315821	
1852267	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315702	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The result was confirmed on 11/29/2016.

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: The result was confirmed on 12/07/2016.

Sample Location: Allen Lake Middle

Collection Date/Time: 11/22/2016 12:55

Field ID: G3NW0085DUPLICATE

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852260	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P315715	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P316119	
		Sulfate	3.8		mg SO4/L	P316115	
	SM 2120 B	Color (true)	210		PCU	P315706	
	SM 2320 B-97	Total Alkalinity	1.1	I	mg CaCO3/L	P315810	
	SM 2540 C-97	TDS	61		mg/L	P316228	
	SM 2540 D-97	TSS	3	I	mg/L	P316223	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P315813	
1852264	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P316195	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P316291	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.007	I	mg N/L	P316026	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P316250	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P315821	
1852268	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315702	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: The sample was reanalyzed on 11/29/2016. The result was 1.2 Q NTU.

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

EPA 350.1 Rev. 2.0: The result was confirmed on 11/29/2016.

Sample Location: Allen Lake

Collection Date/Time: 11/22/2016 13:20

Field ID: FIELD BLANK

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852261	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P315715	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P316119	
		Sulfate	0.20	U	mg SO4/L	P316115	
	SM 2120 B	Color (true)	2.5	U	PCU	P315706	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P315810	
	SM 2540 C-97	TDS	15	U	mg/L	P316226	
	SM 2540 D-97	TSS	2	U	mg/L	P316221	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P315813	

Field ID: FIELD BLANK

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1852265	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P315898	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P316291	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P316025	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P316072	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P315821	
1852269	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P315702	

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: P315715

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P316115

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P316119

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P315898

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

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P315963

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

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P316195

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P316291

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316364

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316025

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316026

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316402

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316072

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316085

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316250

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315702

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

Reference Method: SM 2120 B
Batch ID: P315706

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P315810

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2320 B-97
Batch ID: P315886

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P316226

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P316228

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P316221

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P316223

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P315813

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P315988

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P315821

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: P316115

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316119

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315898

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315963

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316195

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316291

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316364

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316025

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316026

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	107		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316402

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316072

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	109		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316085

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: P316250

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: P315702

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

Reference Method: SM 2320 B-97
Batch ID: P315810

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 2320 B-97
Batch ID: P315886

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.4		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P315813

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.4		P	92 - 103

Reference Method: SM 4500 F-C-97
Batch ID: P315988

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.1		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P315821

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852258	Sulfate	97.7		P	90 - 110
1852259	Sulfate	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P316119

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852258	Chloride	101		P	90 - 110
1852259	Chloride	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315898

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1850644	Ammonia-N	99.6	99.1	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P315963

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852321	Ammonia-N	98.5	96.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P316195

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852263	Ammonia-N	94.5	97.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852192	Kjeldahl Nitrogen	95.5	110	P/F	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316364

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852271	Kjeldahl Nitrogen	103	98.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316025

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852095	NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316026

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852321	NO2NO3-N	102		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316402

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1855161	NO2NO3-N	94.2	95.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316072

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1851632	Total-P	102	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316085

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852041	Total-P	101	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316250

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852829	Total-P	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852272	O-Phosphate-P	98.1	99.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P315813

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852076	Fluoride	98.8	99.5	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P315988

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852673	Fluoride	94.8	95.3	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-00
 Batch ID: P315821

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1852056	Organic Carbon	97.3	96.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
 Batch ID: P315715

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852233	Turbidity	0.825	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P316115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852258	Sulfate	0.444	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P316119

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852258	Chloride	0.841	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P315898

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1850644	Ammonia-N	0.395	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P315963

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852321	Ammonia-N	1.49	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P316195

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852263	Ammonia-N	2.45	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852192	Kjeldahl Nitrogen	7.37	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P316364

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852271	Kjeldahl Nitrogen	3.19	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316025

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852095	NO2NO3-N	0.445	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852321	NO2NO3-N	1.05	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P316402

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1855161	NO2NO3-N	0.957	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316072

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851632	Total-P	2.34	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316085

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852041	Total-P	3.19	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P316250

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852829	Total-P	0.239	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P315702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852272	O-Phosphate-P	1.32	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P315706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852258	Color (true)	2.81	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P315810

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852076	Total Alkalinity	0.162	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P315886

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852235	Total Alkalinity	0.690	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P316226

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1851937	TDS	6.32	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P316228

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852050	TDS	2.84	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P315813

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852076	Fluoride	0.490	Spike	P	0 - 3.0

Reference Method: SM 4500 F-C-97
Batch ID: P315988

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852673	Fluoride	0.498	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P315821

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1852056	Organic Carbon	0.722	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: A72994
Included Lab Sample IDs: 1852266, 1852267, 1852268, 1852269, 1852272

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.5	97.8	P/P	90 - 110
O-Phosphate-P	97.8	97.4	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A72995
Included Lab Sample IDs: 1852258, 1852259, 1852260, 1852261

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	85 - 115
Color (true)	101	101	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A72997
Included Lab Sample IDs: 1852258, 1852259, 1852260, 1852261, 1852270

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

Reference Method: SM 2320 B-97
Run ID: A73035
Included Lab Sample IDs: 1852258, 1852259, 1852260, 1852261

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	103	P/P	90 - 110
Total Alkalinity	103	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A73035
Included Lab Sample IDs: 1852258, 1852259, 1852260, 1852261

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.0	98.5	P/P	90 - 110
Fluoride	98.5	97.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A73041

Included Lab Sample IDs: 1852262, 1852263, 1852264, 1852265, 1852271

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.4	96.8	P/P	90 - 110
Organic Carbon	96.8	97.0	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A73065

Included Lab Sample IDs: 1852270

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A73074

Included Lab Sample IDs: 1852262, 1852265

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A73098

Included Lab Sample IDs: 1852271

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.4	97.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A73103

Included Lab Sample IDs: 1852270

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A73117

Included Lab Sample IDs: 1852262, 1852263, 1852264, 1852265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110
NO2NO3-N	103	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A73131

Included Lab Sample IDs: 1852258, 1852259, 1852260, 1852261

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Chloride	101	101	P/P	90 - 110
Sulfate	97.7	99.1	P/P	90 - 110
Sulfate	98.5	97.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A73172

Included Lab Sample IDs: 1852263, 1852264

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A73187

Included Lab Sample IDs: 1852262, 1852271

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.8	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A73202

Included Lab Sample IDs: 1852265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A73226

Included Lab Sample IDs: 1852263, 1852264

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A73247

Included Lab Sample IDs: 1852271

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	96.5	95.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73260

Included Lab Sample IDs: 1852262, 1852263, 1852264, 1852265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	104	P/P	90 - 110
Kjeldahl Nitrogen	98.3	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A73267

Included Lab Sample IDs: 1852271

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	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	MS
EPA 180.1 Rev. 2.0	Turbidity				0.825	
EPA 300.0 Rev. 2.1	Chloride	101	101	102	0.841	
	Sulfate	97.7	97.7	102	0.444	
EPA 350.1 Rev. 2.0	Ammonia-N	105	99.6	99.1		0.395
	Ammonia-N	97.8	98.5	96.3		1.49
	Ammonia-N	106	94.5	97.4		2.45
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	95.5	110		7.37
	Kjeldahl Nitrogen	102	103	98.0		3.19
EPA 353.2 Rev. 2.0	NO2NO3-N	106	106	106		0.445
	NO2NO3-N	107	102			1.05
	NO2NO3-N	98.5	94.2	95.2		0.957
EPA 365.1 Rev. 2.0	Total-P	109	102	105		2.34
	Total-P	104	101	104		3.19
	Total-P	103	101	101		0.239
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	98.1	99.4		1.32
SM 2120 B	Color (true)				2.81	
SM 2320 B-97	Total Alkalinity	103			0.162	
	Total Alkalinity	98.4			0.690	
SM 2540 C-97	TDS				6.32	
	TDS				2.84	
SM 4500 F-C-97	Fluoride	96.4	98.8	99.5		0.490
	Fluoride	97.1	94.8	95.3		0.498
SM 5310 B-00	Organic Carbon	97.6	97.3	96.6		0.722

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1852258, 1852259, 1852260, 1852261, 1852270
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1852258, 1852259, 1852260, 1852261
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1852258, 1852259, 1852260, 1852261
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1852262, 1852263, 1852264, 1852265, 1852271
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1852262, 1852263, 1852264, 1852265, 1852271
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1852262, 1852263, 1852264, 1852265, 1852271
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1852262, 1852263, 1852264, 1852265, 1852271
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1852266, 1852267, 1852268, 1852269, 1852272
SM 2120 B / E31780	True Color measured at 450 nm	1852258, 1852259, 1852260, 1852261
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1852258, 1852259, 1852260, 1852261, 1852270
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1852258, 1852259, 1852260, 1852261
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1852258, 1852259, 1852260, 1852261, 1852270
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1852258, 1852259, 1852260, 1852261, 1852270
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1852262, 1852263, 1852264, 1852265, 1852271

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	11/23/2016			11/23/2016 14:00	Sima Feizi	1852258, 1852259, 1852260, 1852261, 1852270
EPA 300.0 Rev. 2.1	11/23/2016			12/02/2016	Ping Hua	1852258, 1852259
	11/23/2016			12/03/2016	Ping Hua	1852260, 1852261
EPA 350.1 Rev. 2.0	11/23/2016			11/29/2016	Sofia Elnemr	1852262, 1852265
	11/23/2016			11/30/2016	Sofia Elnemr	1852271
	11/23/2016			12/02/2016	Sofia Elnemr	1852263, 1852264
EPA 351.2 Rev. 2.0	11/23/2016	12/07/2016	Adrian Shelby	12/08/2016	Joseph Suarez	1852262, 1852263, 1852264, 1852265
	11/23/2016	12/08/2016	Adrian Shelby	12/09/2016	Joseph Suarez	1852271
EPA 353.2 Rev. 2.0	11/23/2016			12/01/2016	Beverly Y. Sanders	1852262, 1852263, 1852264, 1852265
	11/23/2016			12/08/2016	Beverly Y. Sanders	1852271
EPA 365.1 Rev. 2.0	11/23/2016	12/02/2016	Adrian Shelby	12/05/2016	Lipi Saha	1852262, 1852271
	11/23/2016	12/02/2016	Adrian Shelby	12/06/2016	Lipi Saha	1852265
	11/23/2016	12/06/2016	Vijayalakshmi Reddy	12/07/2016	Lipi Saha	1852263, 1852264
EPA 365.1 Rev. 2.0 dissolved	11/23/2016			11/23/2016 13:50	Julia Storbeck	1852272
	11/23/2016			11/23/2016 14:06	Julia Storbeck	1852267, 1852269
	11/23/2016			11/23/2016 14:07	Julia Storbeck	1852268
	11/23/2016			11/23/2016 14:09	Julia Storbeck	1852266
SM 2120 B	11/23/2016			11/23/2016 14:11	Jared I. Manley	1852261
	11/23/2016			11/23/2016 14:29	Jared I. Manley	1852258
	11/23/2016			11/23/2016 14:30	Jared I. Manley	1852259, 1852260
SM 2320 B-97	11/23/2016			11/29/2016	Dale L. Simmons	1852258, 1852259, 1852260, 1852261, 1852270
SM 2540 C-97	11/23/2016			11/26/2016	Yijie Li	1852258, 1852259, 1852260, 1852261
SM 2540 D-97	11/23/2016			11/26/2016	Yijie Li	1852258, 1852259, 1852260, 1852261, 1852270
SM 4500 F-C-97	11/23/2016			11/29/2016	Dale L. Simmons	1852258, 1852259, 1852260, 1852261
	11/23/2016			11/30/2016	Dale L. Simmons	1852270
SM 5310 B-00	11/23/2016			11/28/2016	Julie Michelle Frank	1852262, 1852263, 1852264, 1852265
	11/23/2016			11/29/2016	Julie Michelle Frank	1852271