Chemical Analysis Report

SW-DIST-2018-05-11-01

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

Event Description: **Lakes: Wire, Bonnet, Beluah**
Request ID: **RQ-2018-04-23-05**
Customer: **SW-DIST**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 21-JUN-2018 14:17

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 groups are included in this report: Metals and 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 Beulah NW **Collection Date/Time: 05/10/2018 10:10**

Field ID: G2SW0051 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992242	EPA 180.1 Rev. 2.0	Turbidity	2.8	A	NTU	P345147	
	EPA 300.0 Rev. 2.1	Chloride	3.6		mg Cl/L	P345289	
		Sulfate	2.3		mg SO4/L	P345290	
	SM 2120 B	Color (true)	13		PCU	P345136	
	SM 2320 B-97	Total Alkalinity	33		mg CaCO3/L	P345483	
	SM 2540 C-97	TDS	57		mg/L	P345719	
	SM 2540 D-97	TSS	2	I	mg/L	P345711	
	SM 4500 F-C-97	Fluoride	0.27		mg F/L	P345486	
1992250	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P345383	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.68		mg N/L	P345400	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345408	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P345337	
	SM 5310 B-00	Organic Carbon	6.8		mg C/L	P345544	
1992258	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P345150	
1992415	EPA 200.7 Rev. 4.4	Calcium	12.7		mg/L	P345280	
		Iron	30	U	ug/L	P345280	
		Magnesium	1.35		mg/L	P345280	
		Potassium	0.40	I	mg/L	P345280	
		Sodium	3.1		mg/L	P345280	
		Zinc	5.0	U	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	0.61		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.40	U	ug/L	P345280	
		Copper	0.36	I	ug/L	P345280	
		Lead	0.15	I	ug/L	P345280	
		Nickel	0.20	U	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	

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

Sample Location: Lake Beulah SW **Collection Date/Time: 05/10/2018 09:30**

Field ID: G2SW0052 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992243	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P345147	
	EPA 300.0 Rev. 2.1	Chloride	3.5		mg Cl/L	P345289	
		Sulfate	2.2		mg SO4/L	P345290	
	SM 2120 B	Color (true)	13		PCU	P345136	
	SM 2320 B-97	Total Alkalinity	34		mg CaCO3/L	P345483	
	SM 2540 C-97	TDS	51		mg/L	P345720	
	SM 2540 D-97	TSS	2	I	mg/L	P345712	
	SM 4500 F-C-97	Fluoride	0.26		mg F/L	P345486	
1992251	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P345383	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77		mg N/L	P345401	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345408	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P345337	
	SM 5310 B-00	Organic Carbon	6.9		mg C/L	P345544	
1992259	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P345150	
1992416	EPA 200.7 Rev. 4.4	Calcium	13.1		mg/L	P345280	
		Iron	30	U	ug/L	P345280	
		Magnesium	1.38		mg/L	P345280	
		Potassium	0.36	I	mg/L	P345280	
		Sodium	2.7		mg/L	P345280	
		Zinc	5.0	U	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	0.59		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.40	U	ug/L	P345280	
		Copper	0.30	I	ug/L	P345280	
		Lead	0.12	I	ug/L	P345280	
		Nickel	0.20	U	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	

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

Sample Location: Lake Beulah East **Collection Date/Time: 05/10/2018 09:50**

Field ID: G2SW0053 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992244	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P345147	
	EPA 300.0 Rev. 2.1	Chloride	3.6		mg Cl/L	P345289	
		Sulfate	2.3		mg SO4/L	P345290	
	SM 2120 B	Color (true)	12	A	PCU	P345137	
	SM 2320 B-97	Total Alkalinity	33		mg CaCO3/L	P345483	
	SM 2540 C-97	TDS	50		mg/L	P345720	
	SM 2540 D-97	TSS	2	I	mg/L	P345712	
	SM 4500 F-C-97	Fluoride	0.27		mg F/L	P345486	
1992252	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P345383	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.81		mg N/L	P345401	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345408	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P345337	
	SM 5310 B-00	Organic Carbon	6.8		mg C/L	P345544	
1992260	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P345151	
1992417	EPA 200.7 Rev. 4.4	Calcium	12.8		mg/L	P345280	
		Iron	30	U	ug/L	P345280	
		Magnesium	1.36		mg/L	P345280	
		Potassium	0.33	I	mg/L	P345280	
		Sodium	2.6		mg/L	P345280	
		Zinc	5.0	U	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	0.57		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	1.9		ug/L	P345280	
		Copper	0.30	I	ug/L	P345280	
		Lead	0.14	I	ug/L	P345280	
		Nickel	0.48	I	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	

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

Sample Location: Wire Lake East **Collection Date/Time: 05/10/2018 11:20**

Field ID: G2SW0055 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992245	EPA 180.1 Rev. 2.0	Turbidity	0.45		NTU	P345147	
	EPA 300.0 Rev. 2.1	Chloride	4.0		mg Cl/L	P345289	
		Sulfate	0.76		mg SO4/L	P345290	
	SM 2120 B	Color (true)	12		PCU	P345137	
	SM 2320 B-97	Total Alkalinity	33		mg CaCO3/L	P345483	
	SM 2540 C-97	TDS	49		mg/L	P345720	
	SM 2540 D-97	TSS	2	I	mg/L	P345712	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P345486	
1992253	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P345383	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P345401	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345408	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P345337	
	SM 5310 B-00	Organic Carbon	5.3		mg C/L	P345544	
1992261	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P345151	
1992418	EPA 200.7 Rev. 4.4	Calcium	13.2		mg/L	P345280	
		Iron	30	U	ug/L	P345280	
		Magnesium	1.04		mg/L	P345280	
		Potassium	0.30	U	mg/L	P345280	
		Sodium	2.2		mg/L	P345280	
		Zinc	5.0	U	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	1.44		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.40	U	ug/L	P345280	
		Copper	0.46	I	ug/L	P345280	
		Lead	1.14		ug/L	P345280	
		Nickel	0.20	U	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	

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

Sample Location: Wire Lake West **Collection Date/Time: 05/10/2018 11:00**

Field ID: G2SW0056 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992246	EPA 180.1 Rev. 2.0	Turbidity	0.60		NTU	P345147	
	EPA 300.0 Rev. 2.1	Chloride	4.1	A	mg Cl/L	P345433	
		Sulfate	0.75	A	mg SO4/L	P345435	
	SM 2120 B	Color (true)	12		PCU	P345137	
	SM 2320 B-97	Total Alkalinity	33		mg CaCO3/L	P345483	
	SM 2540 C-97	TDS	59		mg/L	P345720	
	SM 2540 D-97	TSS	2	I	mg/L	P345712	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P345486	
1992254	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P345384	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P345401	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345408	
	EPA 365.1 Rev. 2.0	Total-P	0.018		mg P/L	P345337	
	SM 5310 B-00	Organic Carbon	5.4		mg C/L	P345544	
1992262	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P345151	
1992419	EPA 200.7 Rev. 4.4	Calcium	13.4		mg/L	P345280	
		Iron	30	U	ug/L	P345280	
		Magnesium	1.10		mg/L	P345280	
		Potassium	0.30	U	mg/L	P345280	
		Sodium	2.2		mg/L	P345280	
		Zinc	5.0	U	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	1.46		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.40	U	ug/L	P345280	
		Copper	0.42	I	ug/L	P345280	
		Lead	1.07		ug/L	P345280	
		Nickel	0.20	U	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	

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: Lake Bonnet North **Collection Date/Time: 05/10/2018 12:45**

Field ID: G2SW0057 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992247	EPA 180.1 Rev. 2.0	Turbidity	34		NTU	P345147	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P345433	
		Sulfate	4.3		mg SO4/L	P345435	
	SM 2120 B	Color (true)	23		PCU	P345139	
	SM 2320 B-97	Total Alkalinity	45		mg CaCO3/L	P345483	
	SM 2540 C-97	TDS	120		mg/L	P345720	
	SM 2540 D-97	TSS	72	I	mg/L	P345712	
	SM 4500 F-C-97	Fluoride	0.22		mg F/L	P345486	
1992255	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P345384	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	6.1		mg N/L	P345819	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345408	
	EPA 365.1 Rev. 2.0	Total-P	0.42		mg P/L	P345441	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P345544	
1992263	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P345151	
1992420	EPA 200.7 Rev. 4.4	Calcium	16.7		mg/L	P345280	
		Iron	120		ug/L	P345280	
		Magnesium	2.54		mg/L	P345280	
		Potassium	2.6		mg/L	P345280	
		Sodium	10.5		mg/L	P345280	
		Zinc	5.0	U	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	0.64		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.47	I	ug/L	P345280	
		Copper	1.03		ug/L	P345280	
		Lead	2.54		ug/L	P345280	
		Nickel	0.33	I	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The PQL was elevated due to sample matrix interference.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 06/14/2018.

Sample Location: Lake Bonnet SE **Collection Date/Time: 05/10/2018 13:10**

Field ID: G2SW0059 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992248	EPA 180.1 Rev. 2.0	Turbidity	40		NTU	P345147	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P345433	
		Sulfate	4.4		mg SO4/L	P345435	
	SM 2120 B	Color (true)	22	A	PCU	P345139	
	SM 2320 B-97	Total Alkalinity	45		mg CaCO3/L	P345483	
	SM 2540 C-97	TDS	100		mg/L	P345720	
	SM 2540 D-97	TSS	92	I	mg/L	P345712	
	SM 4500 F-C-97	Fluoride	0.21		mg F/L	P345486	
1992256	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P345384	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	7.0		mg N/L	P345819	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345408	
	EPA 365.1 Rev. 2.0	Total-P	0.35		mg P/L	P345442	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P345544	
1992264	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P345151	
1992422	EPA 200.7 Rev. 4.4	Calcium	17.1		mg/L	P345280	
		Iron	120		ug/L	P345280	
		Magnesium	2.70		mg/L	P345280	
		Potassium	2.7		mg/L	P345280	
		Sodium	10.6		mg/L	P345280	
		Zinc	5.8	I	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	0.56		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	1.6	I	ug/L	P345280	
		Copper	1.11		ug/L	P345280	
		Lead	2.73		ug/L	P345280	
		Nickel	0.37	I	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The PQL was elevated due to sample matrix interference.
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 06/15/2018.

Sample Location: Lake Bonnet SW **Collection Date/Time: 05/10/2018 12:20**

Field ID: G2SW0058 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1992249	EPA 180.1 Rev. 2.0	Turbidity	35		NTU	P345147	
	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P345433	
		Sulfate	4.3		mg SO4/L	P345435	
	SM 2120 B	Color (true)	21		PCU	P345139	
	SM 2320 B-97	Total Alkalinity	45		mg CaCO3/L	P345483	
	SM 2540 C-97	TDS	96	I	mg/L	P345719	
	SM 2540 D-97	TSS	84	I	mg/L	P345711	
	SM 4500 F-C-97	Fluoride	0.21		mg F/L	P345486	
1992257	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P345384	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.2		mg N/L	P345401	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345408	
	EPA 365.1 Rev. 2.0	Total-P	0.36		mg P/L	P345442	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P345544	
1992265	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P345151	
1992421	EPA 200.7 Rev. 4.4	Calcium	16.7		mg/L	P345280	
		Iron	110	I	ug/L	P345280	
		Magnesium	2.59		mg/L	P345280	
		Potassium	2.6		mg/L	P345280	
		Sodium	10.5		mg/L	P345280	
		Zinc	5.0	U	ug/L	P345280	
	EPA 200.8 Rev. 5.4	Arsenic	0.57		ug/L	P345280	
		Cadmium	0.020	U	ug/L	P345280	
		Chromium	0.40	U	ug/L	P345280	
		Copper	0.98		ug/L	P345280	
		Lead	2.53		ug/L	P345280	
		Nickel	0.29	I	ug/L	P345280	
		Silver	0.010	U	ug/L	P345280	

Ref. Method and Comment:
SM 2540 C-97: The PQL was elevated due to sample matrix interference.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The PQL was elevated due to sample matrix interference.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 06/14/2018.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P345147

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345280

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345289

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345290

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345433

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345435

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345383

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345384

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345400

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345401

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345819

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345408

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345337

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345441

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345442

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: P345150

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345151

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

Reference Method: SM 2120 B
Batch ID: P345136

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P345137

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P345139

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P345483

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

Reference Method: SM 2540 C-97
Batch ID: P345719

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P345720

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345711

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P345712

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P345486

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P345544

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	99.8		P	85 - 115
Iron	104		P	85 - 115
Magnesium	106		P	85 - 115
Potassium	98.3		P	85 - 115
Sodium	97.5		P	85 - 115
Zinc	99.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	108		P	85 - 115
Copper	103		P	85 - 115
Lead	105		P	85 - 115
Nickel	102		P	85 - 115
Silver	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345289

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345290

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345433

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345435

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345383

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345384

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345400

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	94.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345819

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345408

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: P345337

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345441

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345442

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345150

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.4		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345151

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

Reference Method: SM 2320 B-97
Batch ID: P345483

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P345486

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.6		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345544

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.0		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992363	Calcium	100		P	80 - 120
1992363	Iron	103	103	P/P	80 - 120
1992363	Magnesium	103	104	P/P	80 - 120
1992363	Potassium	96.7	96.4	P/P	80 - 120
1992363	Sodium	99.1		P	80 - 120
1992363	Zinc	102	101	P/P	80 - 120
1992415	Calcium	101		P	80 - 120
1992415	Iron	104		P	80 - 120
1992415	Magnesium	106		P	80 - 120
1992415	Potassium	96.8		P	80 - 120
1992415	Sodium	92.2		P	80 - 120
1992415	Zinc	99.0		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992363	Arsenic	101	104	P/P	80 - 120
1992363	Cadmium	102	105	P/P	80 - 120
1992363	Chromium	107	111	P/P	80 - 120
1992363	Copper	99.8	105	P/P	80 - 120
1992363	Lead	104	107	P/P	80 - 120
1992363	Nickel	99.4	102	P/P	80 - 120
1992363	Silver	98.2	103	P/P	80 - 120
1992415	Arsenic	105		P	80 - 120
1992415	Cadmium	110		P	80 - 120
1992415	Chromium	101		P	80 - 120
1992415	Copper	105		P	80 - 120
1992415	Lead	106		P	80 - 120
1992415	Nickel	100		P	80 - 120
1992415	Silver	107		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345289

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992098	Chloride	92.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345290

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992098	Sulfate	90.3		P	90 - 110
1992222	Sulfate	94.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345433

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992246	Chloride	96.9		P	90 - 110
1992309	Chloride	98.5		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992246	Sulfate	93.8		P	90 - 110
1992309	Sulfate	96.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345383

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1991626	Ammonia-N	98.8	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345384

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992254	Ammonia-N	97.4	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992178	Kjeldahl Nitrogen	92.7	97.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345401

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992253	Kjeldahl Nitrogen	96.5	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345408

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992226	NO2NO3-N	99.6	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992250	Total-P	101	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345441

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992300	Total-P	100	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345442

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992342	Total-P	103	98.6	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345150

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992179	O-Phosphate-P	96.6	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345151

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992260	O-Phosphate-P	101	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P345486

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992225	Fluoride	94.9	93.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345544

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1992177	Organic Carbon	96.0	96.0	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P345147

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992242	Turbidity	2.50	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992363	Calcium	0.368	Spike	P	0 - 20
1992363	Iron	0.549	Spike	P	0 - 20
1992363	Magnesium	0.806	Spike	P	0 - 20
1992363	Potassium	0.183	Spike	P	0 - 20
1992363	Sodium	0.0954	Spike	P	0 - 20
1992363	Zinc	0.195	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P345280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992363	Arsenic	3.25	Spike	P	0 - 20
1992363	Cadmium	2.01	Spike	P	0 - 20
1992363	Chromium	4.06	Spike	P	0 - 20
1992363	Copper	5.14	Spike	P	0 - 20
1992363	Lead	3.04	Spike	P	0 - 20
1992363	Nickel	3.03	Spike	P	0 - 20
1992363	Silver	4.33	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345289

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992098	Chloride	0.544	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345290

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992098	Sulfate	0.377	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345433

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992246	Chloride	0.405	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992246	Sulfate	2.03	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345383

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1991626	Ammonia-N	1.58	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992254	Ammonia-N	1.24	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345400

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992178	Kjeldahl Nitrogen	3.88	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345401

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992253	Kjeldahl Nitrogen	1.84	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345819

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1993565	Kjeldahl Nitrogen	3.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992226	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992250	Total-P	0.972	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345441

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992300	Total-P	4.37	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P345442

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992342	Total-P	4.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345150

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992179	O-Phosphate-P	0.872	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P345151

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992260	O-Phosphate-P	0.396	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P345136

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992169	Color (true)	1.07	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P345137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992244	Color (true)	8.14	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P345139

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992248	Color (true)	0.582	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P345483

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992225	Total Alkalinity	0.607	Sample	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P345719

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992222	TDS	1.34	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P345720

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992225	TDS	0.678	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P345486

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992225	Fluoride	0.943	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P345544

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1992177	Organic Carbon	0.0	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: SM 2120 B
Run ID: A83828
Included Lab Sample IDs: 1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	97.9	99.4	P/P	90 - 115
Color (true)	99.2	97.9	P/P	90 - 115
Color (true)	99.3	99.8	P/P	90 - 115
Color (true)	99.8	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83829
Included Lab Sample IDs: 1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	102	P/P	95 - 105
Turbidity	101	100	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A83830
Included Lab Sample IDs: 1992258, 1992259, 1992260, 1992261, 1992262, 1992263, 1992264, 1992265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.5	99.5	P/P	90 - 110
O-Phosphate-P	99.5	99.4	P/P	90 - 110
O-Phosphate-P	99.7	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83885
Included Lab Sample IDs: 1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	101	P/P	90 - 110
Chloride	102	101	P/P	90 - 110
Sulfate	100	102	P/P	90 - 110
Sulfate	103	99.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83925
Included Lab Sample IDs: 1992250, 1992251, 1992252, 1992253, 1992254, 1992255, 1992256, 1992257

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83934
Included Lab Sample IDs: 1992250, 1992251, 1992252, 1992253, 1992254, 1992255, 1992256, 1992257

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A83969
Included Lab Sample IDs: 1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	99.5	P/P	90 - 110
Total Alkalinity	99.4	103	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83969
Included Lab Sample IDs: 1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	99.1	P/P	90 - 110
Fluoride	99.1	99.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83986
Included Lab Sample IDs: 1992415, 1992416, 1992417, 1992418, 1992419, 1992420, 1992421, 1992422

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	98.7	P/P	90 - 110
Calcium	98.9	100	P/P	90 - 110
Iron	100	100	P/P	90 - 110
Iron	99.8	100	P/P	90 - 110
Magnesium	100	100	P/P	90 - 110
Magnesium	99.9	100	P/P	90 - 110
Potassium	97.0	97.1	P/P	90 - 110
Potassium	98.8	97.0	P/P	90 - 110
Sodium	98.4	96.4	P/P	90 - 110
Sodium	99.2	98.4	P/P	90 - 110
Zinc	101	98.3	P/P	90 - 110
Zinc	99.0	101	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A83989
Included Lab Sample IDs: 1992250, 1992251, 1992252, 1992253, 1992254, 1992255, 1992256, 1992257

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.1	95.8	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83991
Included Lab Sample IDs: 1992415, 1992416, 1992417, 1992418, 1992419, 1992420, 1992421, 1992422

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.3	99.5	P/P	90 - 110
Arsenic	99.5	98.9	P/P	90 - 110
Cadmium	100	102	P/P	90 - 110
Cadmium	102	100	P/P	90 - 110
Chromium	104	105	P/P	90 - 110
Chromium	108	104	P/P	90 - 110
Lead	101	102	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Nickel	96.6	96.0	P/P	90 - 110
Nickel	97.6	96.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A84025
Included Lab Sample IDs: 1992250, 1992251, 1992252, 1992253, 1992254, 1992257

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.8	95.2	P/P	90 - 110
Kjeldahl Nitrogen	94.7	93.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A84046
Included Lab Sample IDs: 1992250, 1992251, 1992252, 1992253, 1992254

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A84065
Included Lab Sample IDs: 1992255, 1992256, 1992257

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	103	P/P	90 - 110
Total-P	103	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A84101
Included Lab Sample IDs: 1992415, 1992416, 1992417, 1992418, 1992419, 1992420, 1992421, 1992422

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	104	97.2	P/P	90 - 110
Copper	106	104	P/P	90 - 110
Silver	105	99.4	P/P	90 - 110
Silver	99.4	95.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A84135
Included Lab Sample IDs: 1992255, 1992256

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.5	94.0	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						2.50	
EPA 200.7 Rev. 4.4	Calcium	99.8	100	101				0.368
	Iron	104	103	103	104			0.549
	Magnesium	106	103	104	106			0.806
	Potassium	98.3	96.7	96.4	96.8			0.183
	Sodium	97.5	99.1	92.2				0.0954
	Zinc	99.5	102	101	99.0			0.195
EPA 200.8 Rev. 5.4	Arsenic	104	101	104	105			3.25
	Cadmium	102	102	105	110			2.01
	Chromium	108	107	111	101			4.06
	Copper	103	99.8	105	105			5.14
	Lead	105	104	107	106			3.04
	Nickel	102	99.4	102	100			3.03
	Silver	102	98.2	103	107			4.33
EPA 300.0 Rev. 2.1	Chloride	96.9	92.7				0.544	
	Chloride	98.5	96.9	98.5			0.405	
	Sulfate	96.4	90.3	94.6			0.377	
	Sulfate	95.7	93.8	96.8			2.03	
EPA 350.1 Rev. 2.0	Ammonia-N	102	98.8	101				1.58
	Ammonia-N	103	97.4	98.8				1.24
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	94.8	92.7	97.1				3.88
	Kjeldahl Nitrogen	95.7	96.5	99.0				1.84
	Kjeldahl Nitrogen	95.8						3.94
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	99.6	99.6				0.0
EPA 365.1 Rev. 2.0	Total-P	100	101	99.6				0.972
	Total-P	102	100	105				4.37
	Total-P	98.3	103	98.6				4.01
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.4	96.6	97.5				0.872
	O-Phosphate-P	100	101	101				0.396
SM 2120 B	Color (true)						1.07	
	Color (true)						8.14	
	Color (true)						0.582	
SM 2320 B-97	Total Alkalinity	102					0.607	
SM 2540 C-97	TDS						1.34	
	TDS						0.678	
SM 4500 F-C-97	Fluoride	95.6	94.9	93.8				0.943
SM 5310 B-00	Organic Carbon	95.0	96.0	96.0				0.0

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1992415, 1992416, 1992417, 1992418, 1992419, 1992420, 1992421, 1992422
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1992415, 1992416, 1992417, 1992418, 1992419, 1992420, 1992421, 1992422
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1992250, 1992251, 1992252, 1992253, 1992254, 1992255, 1992256, 1992257

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1992250, 1992251, 1992252, 1992253, 1992254, 1992255, 1992256, 1992257
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1992250, 1992251, 1992252, 1992253, 1992254, 1992255, 1992256, 1992257
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1992250, 1992251, 1992252, 1992253, 1992254, 1992255, 1992256, 1992257
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1992258, 1992259, 1992260, 1992261, 1992262, 1992263, 1992264, 1992265
SM 2120 B / E31780	True Color measured at 450 nm	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1992250, 1992251, 1992252, 1992253, 1992254, 1992255, 1992256, 1992257

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	05/11/2018			05/11/2018 14:35	Tanya Welborn	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
EPA 200.7 Rev. 4.4	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 20:30	Betina Topolski	1992415
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 20:50	Betina Topolski	1992416
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 20:57	Betina Topolski	1992417
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 21:05	Betina Topolski	1992418
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 21:12	Betina Topolski	1992419
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 21:43	Betina Topolski	1992420
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 21:51	Betina Topolski	1992421
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 21:58	Betina Topolski	1992422
EPA 200.8 Rev. 5.4	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 19:23	Robert K Palmer	1992415
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 19:43	Robert K Palmer	1992416
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 19:52	Robert K Palmer	1992417
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 20:02	Robert K Palmer	1992418
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 20:32	Robert K Palmer	1992419
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 20:42	Robert K Palmer	1992420
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 20:52	Robert K Palmer	1992421
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/17/2018 21:01	Robert K Palmer	1992422
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 11:50	Robert K Palmer	1992415
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 12:01	Robert K Palmer	1992416
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 12:07	Robert K Palmer	1992417
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 12:12	Robert K Palmer	1992418
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 12:18	Robert K Palmer	1992419
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 12:24	Robert K Palmer	1992420
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 12:29	Robert K Palmer	1992421
	05/11/2018	05/15/2018 16:00	Martin Acosta	05/22/2018 12:46	Robert K Palmer	1992422
EPA 300.0 Rev. 2.1	05/11/2018			05/14/2018 22:42	Lipi Saha	1992242
	05/11/2018			05/14/2018 22:54	Lipi Saha	1992243
	05/11/2018			05/14/2018 23:06	Lipi Saha	1992244
	05/11/2018			05/14/2018 23:18	Lipi Saha	1992245
	05/11/2018			05/15/2018 15:18	Lipi Saha	1992246
	05/11/2018			05/15/2018 16:05	Lipi Saha	1992247
	05/11/2018			05/15/2018 16:17	Lipi Saha	1992248
	05/11/2018			05/15/2018 16:29	Lipi Saha	1992249
EPA 350.1 Rev. 2.0	05/11/2018			05/15/2018 10:32	Ping Hua	1992250
	05/11/2018			05/15/2018 10:33	Ping Hua	1992251
	05/11/2018			05/15/2018 10:35	Ping Hua	1992252
	05/11/2018			05/15/2018 10:36	Ping Hua	1992253
	05/11/2018			05/15/2018 10:47	Ping Hua	1992254
	05/11/2018			05/15/2018 10:51	Ping Hua	1992255

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 350.1 Rev. 2.0	05/11/2018			05/15/2018 10:53	Ping Hua	1992256
	05/11/2018			05/15/2018 10:54	Ping Hua	1992257
EPA 351.2 Rev. 2.0	05/11/2018	05/16/2018 11:00	Adrian Shelby	05/18/2018 17:32	Joseph Suarez	1992250
	05/11/2018	05/16/2018 11:00	Adrian Shelby	05/18/2018 17:40	Joseph Suarez	1992251
	05/11/2018	05/16/2018 11:00	Adrian Shelby	05/18/2018 17:41	Joseph Suarez	1992252
	05/11/2018	05/16/2018 11:00	Adrian Shelby	05/18/2018 17:42	Joseph Suarez	1992253
	05/11/2018	05/16/2018 11:00	Adrian Shelby	05/18/2018 17:47	Joseph Suarez	1992254
	05/11/2018	05/16/2018 11:00	Adrian Shelby	05/18/2018 17:51	Joseph Suarez	1992257
	05/11/2018	05/23/2018 16:00	Adrian Shelby	05/24/2018 10:39	Joseph Suarez	1992255
	05/11/2018	05/23/2018 16:00	Adrian Shelby	05/24/2018 10:41	Joseph Suarez	1992256
EPA 353.2 Rev. 2.0	05/11/2018			05/16/2018 11:57	Lauren Bottorf	1992250
	05/11/2018			05/16/2018 11:59	Lauren Bottorf	1992251
	05/11/2018			05/16/2018 12:00	Lauren Bottorf	1992252
	05/11/2018			05/16/2018 12:01	Lauren Bottorf	1992253
	05/11/2018			05/16/2018 12:02	Lauren Bottorf	1992254
	05/11/2018			05/16/2018 12:03	Lauren Bottorf	1992255
	05/11/2018			05/16/2018 12:04	Lauren Bottorf	1992256
	05/11/2018			05/16/2018 12:06	Lauren Bottorf	1992257
EPA 365.1 Rev. 2.0	05/11/2018	05/15/2018 12:25	Sima Feizi	05/21/2018 10:53	Beverly Y. Sanders	1992250
	05/11/2018	05/15/2018 12:25	Sima Feizi	05/21/2018 10:54	Beverly Y. Sanders	1992251
	05/11/2018	05/15/2018 12:25	Sima Feizi	05/21/2018 10:55	Beverly Y. Sanders	1992252
	05/11/2018	05/15/2018 12:25	Sima Feizi	05/21/2018 10:56	Beverly Y. Sanders	1992253
	05/11/2018	05/15/2018 12:25	Sima Feizi	05/21/2018 10:57	Beverly Y. Sanders	1992254
	05/11/2018	05/16/2018 08:57	Sima Feizi	05/22/2018 10:07	Beverly Y. Sanders	1992255
	05/11/2018	05/16/2018 08:57	Sima Feizi	05/22/2018 10:16	Beverly Y. Sanders	1992256
	05/11/2018	05/16/2018 08:57	Sima Feizi	05/22/2018 10:17	Beverly Y. Sanders	1992257
EPA 365.1 Rev. 2.0 dissolved	05/11/2018			05/11/2018 14:14	Julia Storbeck	1992260
	05/11/2018			05/11/2018 15:04	Julia Storbeck	1992258
	05/11/2018			05/11/2018 15:05	Julia Storbeck	1992259, 1992261
	05/11/2018			05/11/2018 15:06	Julia Storbeck	1992262
	05/11/2018			05/11/2018 15:11	Julia Storbeck	1992263
	05/11/2018			05/11/2018 15:12	Julia Storbeck	1992264
	05/11/2018			05/11/2018 15:13	Julia Storbeck	1992265
SM 2120 B	05/11/2018			05/11/2018 14:37	Tanya Welborn	1992242
	05/11/2018			05/11/2018 14:38	Tanya Welborn	1992243
	05/11/2018			05/11/2018 14:42	Tanya Welborn	1992244, 1992245
	05/11/2018			05/11/2018 14:43	Tanya Welborn	1992246
	05/11/2018			05/11/2018 15:04	Tanya Welborn	1992248, 1992249
	05/11/2018			05/11/2018 15:12	Tanya Welborn	1992247
SM 2320 B-97	05/11/2018			05/16/2018 02:26	Dale L. Simmons	1992242

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2320 B-97	05/11/2018			05/16/2018 03:02	Dale L. Simmons	1992243
	05/11/2018			05/16/2018 03:12	Dale L. Simmons	1992244
	05/11/2018			05/16/2018 03:23	Dale L. Simmons	1992245
	05/11/2018			05/16/2018 03:34	Dale L. Simmons	1992246
	05/11/2018			05/16/2018 03:45	Dale L. Simmons	1992247
	05/11/2018			05/16/2018 03:56	Dale L. Simmons	1992248
	05/11/2018			05/16/2018 04:07	Dale L. Simmons	1992249
SM 2540 C-97	05/11/2018			05/16/2018 15:26	Yijie Li	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
SM 2540 D-97	05/11/2018			05/16/2018 15:26	Yijie Li	1992242, 1992243, 1992244, 1992245, 1992246, 1992247, 1992248, 1992249
SM 4500 F-C-97	05/11/2018			05/16/2018 02:26	Dale L. Simmons	1992242
	05/11/2018			05/16/2018 03:02	Dale L. Simmons	1992243
	05/11/2018			05/16/2018 03:12	Dale L. Simmons	1992244
	05/11/2018			05/16/2018 03:23	Dale L. Simmons	1992245
	05/11/2018			05/16/2018 03:34	Dale L. Simmons	1992246
	05/11/2018			05/16/2018 03:45	Dale L. Simmons	1992247
	05/11/2018			05/16/2018 03:56	Dale L. Simmons	1992248
	05/11/2018			05/16/2018 04:07	Dale L. Simmons	1992249
SM 5310 B-00	05/11/2018			05/16/2018 18:28	Megan Treadwell	1992250
	05/11/2018			05/16/2018 18:42	Megan Treadwell	1992251
	05/11/2018			05/16/2018 19:02	Megan Treadwell	1992252
	05/11/2018			05/16/2018 19:16	Megan Treadwell	1992253
	05/11/2018			05/16/2018 19:30	Megan Treadwell	1992254
	05/11/2018			05/16/2018 19:45	Megan Treadwell	1992255
	05/11/2018			05/16/2018 20:00	Megan Treadwell	1992256
	05/11/2018			05/16/2018 20:14	Megan Treadwell	1992257