

Chemical Analysis Report

CEN-DIST-2018-05-04-04

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

Event Description: **Dead River X4 + D&B**
Request ID: **RQ-2018-04-30-39**
Customer: **CEN-DIST**
Project ID: **SMP**

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

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 11-JUN-2018 15:39

A handwritten signature in black ink, appearing to read "Liang Lin", is written over a light gray, textured background.

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: DEAD RIVER @ 100M FROM LAKE HARRIS (2817C)

Collection Date/Time: 05/03/2018 11:28

Field ID: G1CE0099

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990420	EPA 180.1 Rev. 2.0	Turbidity	3.8		NTU	P344728	
	EPA 300.0 Rev. 2.1	Chloride	23		mg Cl/L	P345209	
		Sulfate	7.9		mg SO4/L	P345212	
	SM 2120 B	Color (true)	20		PCU	P344722	
	SM 2320 B-97	Total Alkalinity	99		mg CaCO3/L	P345177	
	SM 2540 C-97	TDS	175		mg/L	P345316	
	SM 2540 D-97	TSS	11	I	mg/L	P345305	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P345180	
1990424	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P345294	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P344943	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345047	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P344895	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P345196	
1990428	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344715	
1990442	EPA 200.7 Rev. 4.4	Calcium	36.1		mg/L	P344756	
		Iron	32	I	ug/L	P344756	
		Magnesium	7.37		mg/L	P344756	
		Potassium	4.1		mg/L	P344756	
		Sodium	12.1		mg/L	P344756	
		Zinc	5.0	U	ug/L	P344756	
	EPA 200.8 Rev. 5.4	Arsenic	1.31		ug/L	P344756	
		Cadmium	0.045	I	ug/L	P344756	
		Chromium	0.40	U	ug/L	P344756	
		Copper	0.42	I	ug/L	P344756	
		Lead	0.12	I	ug/L	P344756	
		Nickel	0.20	U	ug/L	P344756	
		Silver	0.010	U	ug/L	P344756	

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.

Sample Location: DEAD RIVER @ POWER LINES (2817C)

Collection Date/Time: 05/03/2018 11:42

Field ID: G1CE0056

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990421	EPA 180.1 Rev. 2.0	Turbidity	5.2		NTU	P344728	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P345209	
		Sulfate	11		mg SO4/L	P345212	
	SM 2120 B	Color (true)	21		PCU	P344722	
	SM 2320 B-97	Total Alkalinity	100		mg CaCO3/L	P345177	
	SM 2540 C-97	TDS	185		mg/L	P345316	
	SM 2540 D-97	TSS	10	I	mg/L	P345305	
	SM 4500 F-C-97	Fluoride	0.14		mg F/L	P345180	
1990425	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P345294	

Field ID: G1CE0056

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990425	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P345328	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345047	
	EPA 365.1 Rev. 2.0	Total-P	0.029		mg P/L	P344895	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P345196	
1990429	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344715	
1990443	EPA 200.7 Rev. 4.4	Calcium	36.6		mg/L	P344756	
		Iron	30	U	ug/L	P344756	
		Magnesium	8.11		mg/L	P344756	
		Potassium	4.6		mg/L	P344756	
		Sodium	12.8		mg/L	P344756	
		Zinc	5.0	U	ug/L	P344756	
	EPA 200.8 Rev. 5.4	Arsenic	1.42		ug/L	P344756	
		Cadmium	0.020	U	ug/L	P344756	
		Chromium	0.40	U	ug/L	P344756	
		Copper	0.20	U	ug/L	P344756	
		Lead	0.14	I	ug/L	P344756	
		Nickel	0.20	U	ug/L	P344756	
		Silver	0.010	U	ug/L	P344756	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: DEAD RIVER @ 50m S OF US441 (2817C)

Collection Date/Time: 05/03/2018 11:55

Field ID: G1CE0100

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990422	EPA 180.1 Rev. 2.0	Turbidity	6.2	A	NTU	P344729	
	EPA 300.0 Rev. 2.1	Chloride	29		mg Cl/L	P345209	
		Sulfate	17		mg SO4/L	P345212	
	SM 2120 B	Color (true)	22	A	PCU	P344724	
	SM 2320 B-97	Total Alkalinity	103	A	mg CaCO3/L	P345177	
	SM 2540 C-97	TDS	215		mg/L	P345317	
	SM 2540 D-97	TSS	8	I	mg/L	P345306	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P345180	
1990426	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P345294	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P345328	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345047	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P344895	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P345196	
1990430	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344715	
1990444	EPA 200.7 Rev. 4.4	Calcium	36.6		mg/L	P344756	
		Iron	30	U	ug/L	P344756	
		Magnesium	9.51		mg/L	P344756	
		Potassium	6.1		mg/L	P344756	
		Sodium	14.6		mg/L	P344756	

Field ID: G1CE0100

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990444	EPA 200.7 Rev. 4.4	Zinc	5.0	U	ug/L	P344756	
	EPA 200.8 Rev. 5.4	Arsenic	1.68		ug/L	P344756	
		Cadmium	0.020	U	ug/L	P344756	
		Chromium	0.40	U	ug/L	P344756	
		Copper	0.20	U	ug/L	P344756	
		Lead	0.15	I	ug/L	P344756	
		Nickel	0.20	U	ug/L	P344756	
		Silver	0.010	U	ug/L	P344756	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

**Sample Location: DEAD RIVER @ 150M FROM LAKE EUSTIS
(2817C)**

Collection Date/Time: 05/03/2018 12:05

Field ID: G1CE0101

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990423	EPA 180.1 Rev. 2.0	Turbidity	7.0		NTU	P344729	
	EPA 300.0 Rev. 2.1	Chloride	29		mg Cl/L	P345209	
		Sulfate	18		mg SO4/L	P345212	
	SM 2120 B	Color (true)	22		PCU	P344724	
	SM 2320 B-97	Total Alkalinity	104		mg CaCO3/L	P345177	
	SM 2540 C-97	TDS	225		mg/L	P345317	
	SM 2540 D-97	TSS	10	I	mg/L	P345306	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P345180	
1990427	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P345294	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P345328	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P345047	
	EPA 365.1 Rev. 2.0	Total-P	0.033		mg P/L	P344895	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P345196	
1990431	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344715	
1990445	EPA 200.7 Rev. 4.4	Calcium	38.1		mg/L	P344929	
		Iron	30	U	ug/L	P344929	
		Magnesium	9.64		mg/L	P344929	
		Potassium	6.4		mg/L	P344929	
		Sodium	15.2		mg/L	P344929	
		Zinc	8.3	I	ug/L	P344929	
	EPA 200.8 Rev. 5.4	Arsenic	1.80		ug/L	P344929	
		Cadmium	0.020	U	ug/L	P344929	
		Chromium	0.40	U	ug/L	P344929	
		Copper	0.38	I	ug/L	P344929	
		Lead	0.20		ug/L	P344929	
		Nickel	0.21	I	ug/L	P344929	
		Silver	0.010	U	ug/L	P344929	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: DEAD RIVER @ POWER LINES

Collection Date/Time: 05/03/2018 11:45

Field ID: G1CE0056-DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990432	EPA 180.1 Rev. 2.0	Turbidity	4.9		NTU	P344729	
	EPA 300.0 Rev. 2.1	Chloride	24		mg Cl/L	P345209	
		Sulfate	10		mg SO4/L	P345212	
	SM 2120 B	Color (true)	21		PCU	P344724	
	SM 2320 B-97	Total Alkalinity	101		mg CaCO3/L	P345177	
	SM 2540 C-97	TDS	192		mg/L	P345317	
	SM 2540 D-97	TSS	11	I	mg/L	P345306	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P345180	
1990434	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P345294	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P345328	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345047	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P344895	
	SM 5310 B-00	Organic Carbon	15		mg C/L	P345196	
1990436	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344716	
1990446	EPA 200.7 Rev. 4.4	Calcium	37.0		mg/L	P344929	
		Iron	30	U	ug/L	P344929	
		Magnesium	8.14		mg/L	P344929	
		Potassium	4.7		mg/L	P344929	
		Sodium	13.1		mg/L	P344929	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P344929	
		Arsenic	1.48		ug/L	P344929	
		Cadmium	0.020	U	ug/L	P344929	
		Chromium	0.40	U	ug/L	P344929	
		Copper	0.20	U	ug/L	P344929	
		Lead	0.17	I	ug/L	P344929	
		Nickel	0.20	U	ug/L	P344929	
		Silver	0.010	U	ug/L	P344929	

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.

Sample Location: DI SOURCE WASHROOM

Collection Date/Time: 05/03/2018 12:17

Field ID: blank_05032018

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990433	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P344729	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P345209	
		Sulfate	0.20	U	mg SO4/L	P345212	
	SM 2120 B	Color (true)	2.5	U	PCU	P344724	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P345177	
	SM 2540 C-97	TDS	15	U	mg/L	P345313	
	SM 2540 D-97	TSS	2	U	mg/L	P345302	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P345180	
1990435	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P345295	

Field ID: blank_05032018

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1990435	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P345328	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P345047	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P344895	
	SM 5310 B-00	Organic Carbon	0.50	U	mg C/L	P345196	
1990437	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P344716	
1990447	EPA 200.7 Rev. 4.4	Calcium	0.075	U	mg/L	P345282	
		Iron	30	U	ug/L	P344929	
		Magnesium	0.040	U	mg/L	P344929	
		Potassium	0.30	U	mg/L	P344929	
		Sodium	0.50	U	mg/L	P344929	
		Zinc	5.0	U	ug/L	P344929	
	EPA 200.8 Rev. 5.4	Arsenic	0.050	U	ug/L	P344929	
		Cadmium	0.020	U	ug/L	P344929	
		Chromium	0.40	U	ug/L	P344929	
		Copper	0.70	I	ug/L	P344929	
		Lead	0.050	U	ug/L	P344929	
		Nickel	0.20	U	ug/L	P344929	
		Silver	0.010	U	ug/L	P344929	

Ref. Method and Comment:

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

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 copper result was confirmed in the undigested sample on 05/11/2018.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P344728

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P344729

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P344756

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P344929

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 200.7 Rev. 4.4
Batch ID: P345282

Component	Result	Code	Units
Calcium	0.075	U	mg/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344756

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	1.6		ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.74	I	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344929

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: P345209

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345212

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: P345294

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345295

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344943

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345328

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345047

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344895

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344715

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344716

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

Reference Method: SM 2120 B
Batch ID: P344722

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
Batch ID: P344724

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P345177

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

Reference Method: SM 2540 C-97
Batch ID: P345313

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P345316

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P345317

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345302

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345305

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P345306

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P345180

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P345196

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: P344756

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	105		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	99.9		P	85 - 115
Sodium	103		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P344929

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	94.0		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	100		P	85 - 115
Sodium	99.5		P	85 - 115
Zinc	90.0		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345282

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344756

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	96.8		P	85 - 115
Cadmium	95.4		P	85 - 115
Chromium	94.9		P	85 - 115
Copper	96.3		P	85 - 115
Lead	92.4		P	85 - 115
Nickel	97.5		P	85 - 115
Silver	97.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344929

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	80 - 120
Cadmium	99.2		P	80 - 120

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344929

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	101		P	80 - 120
Copper	96.9		P	80 - 120
Lead	97.5		P	80 - 120
Nickel	99.6		P	80 - 120
Silver	100		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345209

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	96.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345212

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345294

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345295

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344943

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345328

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345047

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO ₂ NO ₃ -N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344895

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344895

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344715

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344716

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

Reference Method: SM 2320 B-97
Batch ID: P345177

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P345180

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.1		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345196

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	100		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P344756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989441	Calcium	101		P	80 - 120
1989441	Iron	103	103	P/P	80 - 120
1989441	Magnesium	101		P	80 - 120
1989441	Potassium	100	99.8	P/P	80 - 120
1989441	Sodium	101	101	P/P	80 - 120
1989441	Zinc	99.4	99.3	P/P	80 - 120
1990383	Calcium	101		P	80 - 120
1990383	Iron	103		P	80 - 120
1990383	Magnesium	104		P	80 - 120
1990383	Potassium	97.6		P	80 - 120
1990383	Sodium	97.7		P	80 - 120
1990383	Zinc	101		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P344929

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990446	Calcium	105		P	80 - 120
1990446	Iron	99.4	101	P/P	80 - 120
1990446	Magnesium	105		P	80 - 120
1990446	Potassium	104		P	80 - 120
1990446	Sodium	104		P	80 - 120
1990446	Zinc	93.4	97.4	P/P	80 - 120
1990487	Calcium	107		P	80 - 120
1990487	Iron	108		P	80 - 120
1990487	Magnesium	112		P	80 - 120
1990487	Potassium	105		P	80 - 120
1990487	Sodium	104		P	80 - 120
1990487	Zinc	102		P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345282

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990972	Calcium	100		P	80 - 120
1992511	Calcium	98.3		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1989441	Arsenic	97.6	99.1	P/P	80 - 120
1989441	Cadmium	96.3	100	P/P	80 - 120
1989441	Chromium	98.4	98.2	P/P	80 - 120
1989441	Copper	96.4	96.1	P/P	80 - 120
1989441	Lead	93.9	96.2	P/P	80 - 120
1989441	Nickel	98.9	98.9	P/P	80 - 120
1989441	Silver	98.9	101	P/P	80 - 120
1990383	Arsenic	99.9		P	80 - 120
1990383	Cadmium	99.6		P	80 - 120
1990383	Chromium	101		P	80 - 120
1990383	Copper	102		P	80 - 120
1990383	Lead	97.8		P	80 - 120
1990383	Nickel	103		P	80 - 120
1990383	Silver	100		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344929

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990446	Arsenic	102	90.7	P/P	80 - 120
1990446	Cadmium	101	88.9	P/P	80 - 120
1990446	Chromium	101	89.3	P/P	80 - 120
1990446	Copper	97.1	85.9	P/P	80 - 120
1990446	Lead	100	87.8	P/P	80 - 120
1990446	Nickel	99.8	88.6	P/P	80 - 120
1990446	Silver	101	91.0	P/P	80 - 120
1990487	Arsenic	104		P	80 - 120
1990487	Cadmium	102		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344929

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990487	Chromium	102		P	80 - 120
1990487	Copper	97.5		P	80 - 120
1990487	Lead	102		P	80 - 120
1990487	Nickel	100		P	80 - 120
1990487	Silver	101		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345209

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990231	Chloride	97.3		P	90 - 110
1990422	Chloride	91.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345212

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990231	Sulfate	96.8		P	90 - 110
1990422	Sulfate	91.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345294

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990358	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345295

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990465	Ammonia-N	102	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344943

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990367	Kjeldahl Nitrogen	97.1	97.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345047

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990424	NO2NO3-N	99.0	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344895

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990367	Total-P	99.2	94.2	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344715

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990306	O-Phosphate-P	94.2	91.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344716

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990436	O-Phosphate-P	92.4	93.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P345180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990422	Fluoride	95.9	96.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P345196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990298	Organic Carbon	98.0	100	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P344728

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990296	Turbidity	2.93	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P344729

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990422	Turbidity	5.14	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P344756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989441	Calcium	0.751	Spike	P	0 - 20
1989441	Iron	0.0636	Spike	P	0 - 20
1989441	Magnesium	0.0807	Spike	P	0 - 20
1989441	Potassium	0.377	Spike	P	0 - 20
1989441	Sodium	0.225	Spike	P	0 - 20
1989441	Zinc	0.0369	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P344929

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990446	Calcium	1.83	Spike	P	0 - 20
1990446	Iron	1.26	Spike	P	0 - 20
1990446	Magnesium	0.712	Spike	P	0 - 20
1990446	Potassium	2.26	Spike	P	0 - 20
1990446	Sodium	1.71	Spike	P	0 - 20
1990446	Zinc	4.12	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P345282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990972	Calcium	0.228	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1989441	Arsenic	1.51	Spike	P	0 - 20
1989441	Cadmium	3.80	Spike	P	0 - 20
1989441	Chromium	0.251	Spike	P	0 - 20
1989441	Copper	0.261	Spike	P	0 - 20
1989441	Lead	2.42	Spike	P	0 - 20
1989441	Nickel	0.0564	Spike	P	0 - 20
1989441	Silver	2.40	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344929

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990446	Arsenic	11.2	Spike	P	0 - 20
1990446	Cadmium	12.8	Spike	P	0 - 20
1990446	Chromium	12.5	Spike	P	0 - 20
1990446	Copper	12.1	Spike	P	0 - 20
1990446	Lead	13.1	Spike	P	0 - 20
1990446	Nickel	11.9	Spike	P	0 - 20
1990446	Silver	10.8	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345209

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990231	Chloride	0.919	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P345212

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990231	Sulfate	0.456	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345294

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990358	Ammonia-N	0.661	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P345295

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990465	Ammonia-N	2.90	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P344943

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990367	Kjeldahl Nitrogen	0.0828	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P345328

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990426	Kjeldahl Nitrogen	2.26	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P345047

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990424	NO2NO3-N	0.504	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P344895

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990367	Total-P	4.75	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344715

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990306	O-Phosphate-P	2.09	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P344716

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990436	O-Phosphate-P	1.29	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P344722

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990285	Color (true)	9.06	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P344724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990422	Color (true)	0.619	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P345177

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990422	Total Alkalinity	0.141	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P345313

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990069	TDS	2.42	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P345316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990297	TDS	7.77	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P345317

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990454	TDS	1.38	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P345180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990422	Fluoride	0.473	Spike	P	0 - 3.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P345196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990298	Organic Carbon	1.46	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: A83676

Included Lab Sample IDs: 1990428, 1990429, 1990430, 1990431, 1990436, 1990437

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	100	P/P	90 - 110
O-Phosphate-P	99.9	98.8	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A83677

Included Lab Sample IDs: 1990420, 1990421, 1990422, 1990423, 1990432, 1990433

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83678

Included Lab Sample IDs: 1990420, 1990421, 1990422, 1990423, 1990432, 1990433

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83732

Included Lab Sample IDs: 1990420, 1990421, 1990422, 1990423, 1990432, 1990433

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	94.1	96.8	P/P	90 - 110
Chloride	96.8	98.7	P/P	90 - 110
Sulfate	95.1	95.9	P/P	90 - 110
Sulfate	95.9	99.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83752

Included Lab Sample IDs: 1990442, 1990443, 1990444

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.6	98.4	P/P	90 - 110
Iron	98.8	98.8	P/P	90 - 110
Magnesium	99.8	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A83752

Included Lab Sample IDs: 1990442, 1990443, 1990444

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Potassium	97.3	96.6	P/P	90 - 110
Sodium	96.3	95.6	P/P	90 - 110
Zinc	98.6	98.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A83755

Included Lab Sample IDs: 1990442, 1990443, 1990444

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.4	97.8	P/P	90 - 110
Cadmium	98.3	97.9	P/P	90 - 110
Lead	97.8	97.8	P/P	90 - 110
Silver	100	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A83783

Included Lab Sample IDs: 1990442, 1990443, 1990444

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	100	100	P/P	90 - 110
Copper	102	103	P/P	90 - 110
Nickel	100	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A83806

Included Lab Sample IDs: 1990424, 1990425, 1990426, 1990427, 1990434, 1990435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	98.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A83813

Included Lab Sample IDs: 1990445, 1990446, 1990447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	100	101	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Iron	102	102	P/P	95 - 105
Magnesium	103	104	P/P	90 - 110
Magnesium	103	103	P/P	95 - 105
Potassium	99.8	99.9	P/P	95 - 105
Potassium	99.9	101	P/P	90 - 110
Sodium	99.1	101	P/P	90 - 110
Sodium	99.4	99.1	P/P	95 - 105
Zinc	99.5	103	P/P	90 - 110
Zinc	99.5	99.5	P/P	95 - 105

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A83824

Included Lab Sample IDs: 1990424

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.5	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A83836

Included Lab Sample IDs: 1990445, 1990446, 1990447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	99.9	P/P	90 - 110
Arsenic	98.8	101	P/P	90 - 110
Cadmium	99.1	99.5	P/P	90 - 110
Cadmium	99.5	99.8	P/P	90 - 110
Chromium	101	103	P/P	90 - 110
Chromium	103	105	P/P	90 - 110
Lead	98.5	99.3	P/P	90 - 110
Lead	99.3	99.4	P/P	90 - 110
Nickel	98.4	99.7	P/P	90 - 110
Nickel	99.7	99.6	P/P	90 - 110
Silver	100	101	P/P	90 - 110
Silver	101	101	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A83837

Included Lab Sample IDs: 1990420, 1990421, 1990422, 1990423, 1990432, 1990433

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	99.0	P/P	90 - 110
Total Alkalinity	99.0	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A83837

Included Lab Sample IDs: 1990420, 1990421, 1990422, 1990423, 1990432, 1990433

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.6	97.6	P/P	90 - 110
Fluoride	97.6	97.1	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A83843

Included Lab Sample IDs: 1990424, 1990425, 1990426, 1990427, 1990434, 1990435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	97.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A83863

Included Lab Sample IDs: 1990424, 1990425, 1990426, 1990427, 1990434, 1990435

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A83870

Included Lab Sample IDs: 1990445, 1990446, 1990447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	97.9	98.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A83889

Included Lab Sample IDs: 1990424, 1990425, 1990426, 1990427, 1990434, 1990435

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A83975

Included Lab Sample IDs: 1990425, 1990426, 1990427, 1990434, 1990435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	95.6	P/P	90 - 110
Kjeldahl Nitrogen	93.6	100	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A83986

Included Lab Sample IDs: 1990447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	103	P/P	95 - 105

* 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		LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						2.93	
	Turbidity						5.14	
EPA 200.7 Rev. 4.4	Calcium	102		101	101			0.751
	Calcium	102		105	107			1.83
	Calcium	103		100	98.3			0.228
	Iron	105		103	103	103		0.0636
	Iron	94.0		99.4	101	108		1.26
	Magnesium	102		101	104			0.0807
	Magnesium	103		105	112			0.712
	Potassium	99.9		100	99.8	97.6		0.377
	Potassium	100		104	105			2.26
	Sodium	103		101	101	97.7		0.225
	Sodium	99.5		104	104			1.71
	Zinc	101		99.4	99.3	101		0.0369
	Zinc	90.0		93.4	97.4	102		4.12
EPA 200.8 Rev. 5.4	Arsenic	96.8		97.6	99.1	99.9		1.51

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision	MS
			LCS	SMP	MS		
EPA 200.8 Rev. 5.4	Arsenic	100	102	90.7	104		11.2
	Cadmium	95.4	96.3	100	99.6		3.80
	Cadmium	99.2	101	88.9	102		12.8
	Chromium	94.9	98.4	98.2	101		0.251
	Chromium	101	101	89.3	102		12.5
	Copper	96.3	96.4	96.1	102		0.261
	Copper	96.9	97.1	85.9	97.5		12.1
	Lead	92.4	93.9	96.2	97.8		2.42
	Lead	97.5	100	87.8	102		13.1
	Nickel	97.5	98.9	98.9	103		0.0564
	Nickel	99.6	99.8	88.6	100		11.9
	Silver	97.8	98.9	101	100		2.40
	Silver	100	101	91.0	101		10.8
EPA 300.0 Rev. 2.1	Chloride	96.2	97.3	91.2		0.919	
	Sulfate	95.9	96.8	91.0		0.456	
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	102			0.661
	Ammonia-N	101	102	98.9			2.90
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	97.1	97.0			0.0828
	Kjeldahl Nitrogen	105					2.26
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	99.0	99.5			0.504
EPA 365.1 Rev. 2.0	Total-P	100	99.2	94.2			4.75
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	94.2	91.7			2.09
	O-Phosphate-P	97.4	92.4	93.6			1.29
SM 2120 B	Color (true)					9.06	
	Color (true)					0.619	
SM 2320 B-97	Total Alkalinity	101				0.141	
SM 2540 C-97	TDS					2.42	
	TDS					7.77	
	TDS					1.38	
SM 4500 F-C-97	Fluoride	95.1	95.9	96.5			0.473
SM 5310 B-00	Organic Carbon	100	98.0	100			1.46

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1990442, 1990443, 1990444, 1990445, 1990446, 1990447
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1990442, 1990443, 1990444, 1990445, 1990446, 1990447
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1990424, 1990425, 1990426, 1990427, 1990434, 1990435
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1990424, 1990425, 1990426, 1990427, 1990434, 1990435
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1990424, 1990425, 1990426, 1990427, 1990434, 1990435
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1990424, 1990425, 1990426, 1990427, 1990434, 1990435
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1990428, 1990429, 1990430, 1990431, 1990436, 1990437

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 2120 B / E31780	True Color measured at 450 nm	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1990424, 1990425, 1990426, 1990427, 1990434, 1990435

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	05/04/2018			05/04/2018 15:24	Tanya Welborn	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
EPA 200.7 Rev. 4.4	05/04/2018	05/07/2018 13:19	Allison Taylor	05/08/2018 15:02	Betina Topolski	1990442
	05/04/2018	05/07/2018 13:19	Allison Taylor	05/08/2018 15:10	Betina Topolski	1990443
	05/04/2018	05/07/2018 13:19	Allison Taylor	05/08/2018 15:17	Betina Topolski	1990444
	05/04/2018	05/09/2018 12:06	Allison Taylor	05/10/2018 12:05	Betina Topolski	1990447
	05/04/2018	05/09/2018 12:06	Allison Taylor	05/10/2018 13:42	Betina Topolski	1990445
	05/04/2018	05/09/2018 12:06	Allison Taylor	05/10/2018 13:49	Betina Topolski	1990446
	05/04/2018	05/15/2018 12:30	Allison Taylor	05/17/2018 11:20	Betina Topolski	1990447
EPA 200.8 Rev. 5.4	05/04/2018	05/07/2018 13:19	Allison Taylor	05/08/2018 20:34	Robert K Palmer	1990442
	05/04/2018	05/07/2018 13:19	Allison Taylor	05/08/2018 20:43	Robert K Palmer	1990443
	05/04/2018	05/07/2018 13:19	Allison Taylor	05/08/2018 20:52	Robert K Palmer	1990444
	05/04/2018	05/07/2018 13:19	Allison Taylor	05/09/2018 18:48	Robert K Palmer	1990442
	05/04/2018	05/07/2018 13:19	Allison Taylor	05/09/2018 18:54	Robert K Palmer	1990443
	05/04/2018	05/07/2018 13:19	Allison Taylor	05/09/2018 19:00	Robert K Palmer	1990444
	05/04/2018	05/09/2018 12:06	Allison Taylor	05/11/2018 18:33	Nadine Brooks	1990447
	05/04/2018	05/09/2018 12:06	Allison Taylor	05/11/2018 21:17	Nadine Brooks	1990445
	05/04/2018	05/09/2018 12:06	Allison Taylor	05/11/2018 21:26	Nadine Brooks	1990446
	05/04/2018	05/09/2018 12:06	Allison Taylor	05/14/2018 14:42	Nadine Brooks	1990447
	05/04/2018	05/09/2018 12:06	Allison Taylor	05/14/2018 14:56	Nadine Brooks	1990445
	05/04/2018	05/09/2018 12:06	Allison Taylor	05/14/2018 15:04	Nadine Brooks	1990446
EPA 300.0 Rev. 2.1	05/04/2018			05/10/2018 15:10	Lipi Saha	1990422
	05/04/2018			05/10/2018 17:22	Lipi Saha	1990420
	05/04/2018			05/10/2018 17:34	Lipi Saha	1990421
	05/04/2018			05/10/2018 17:46	Lipi Saha	1990423
	05/04/2018			05/10/2018 17:58	Lipi Saha	1990432
	05/04/2018			05/10/2018 18:10	Lipi Saha	1990433
EPA 350.1 Rev. 2.0	05/04/2018			05/11/2018 10:32	Ping Hua	1990424
	05/04/2018			05/11/2018 10:34	Ping Hua	1990425
	05/04/2018			05/11/2018 10:35	Ping Hua	1990426
	05/04/2018			05/11/2018 10:37	Ping Hua	1990427
	05/04/2018			05/11/2018 10:38	Ping Hua	1990434
	05/04/2018			05/11/2018 11:01	Ping Hua	1990435
EPA 351.2 Rev. 2.0	05/04/2018	05/09/2018 11:30	Adrian Shelby	05/11/2018 11:36	Joseph Suarez	1990424
	05/04/2018	05/15/2018 11:30	Adrian Shelby	05/17/2018 09:20	Joseph Suarez	1990425
	05/04/2018	05/15/2018 11:30	Adrian Shelby	05/17/2018 09:22	Joseph Suarez	1990426
	05/04/2018	05/15/2018 11:30	Adrian Shelby	05/17/2018 09:26	Joseph Suarez	1990427
	05/04/2018	05/15/2018 11:30	Adrian Shelby	05/17/2018 09:28	Joseph Suarez	1990434
	05/04/2018	05/15/2018 11:30	Adrian Shelby	05/17/2018 09:32	Joseph Suarez	1990435
EPA 353.2 Rev. 2.0	05/04/2018			05/10/2018 12:39	Lauren Bottorf	1990424

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 353.2 Rev. 2.0	05/04/2018			05/10/2018 12:45	Lauren Bottorf	1990435
	05/04/2018			05/10/2018 12:47	Lauren Bottorf	1990425
	05/04/2018			05/10/2018 12:48	Lauren Bottorf	1990426
	05/04/2018			05/10/2018 12:49	Lauren Bottorf	1990427
	05/04/2018			05/10/2018 12:51	Lauren Bottorf	1990434
EPA 365.1 Rev. 2.0	05/04/2018	05/08/2018 12:00	Sima Feizi	05/14/2018 10:58	Beverly Y. Sanders	1990424
	05/04/2018	05/08/2018 12:00	Sima Feizi	05/14/2018 10:59	Beverly Y. Sanders	1990425
	05/04/2018	05/08/2018 12:00	Sima Feizi	05/14/2018 11:00	Beverly Y. Sanders	1990426
	05/04/2018	05/08/2018 12:00	Sima Feizi	05/14/2018 11:01	Beverly Y. Sanders	1990427
	05/04/2018	05/08/2018 12:00	Sima Feizi	05/14/2018 11:08	Beverly Y. Sanders	1990434
EPA 365.1 Rev. 2.0 dissolved	05/04/2018	05/08/2018 12:00	Sima Feizi	05/14/2018 11:09	Beverly Y. Sanders	1990435
	05/04/2018			05/04/2018 14:57	Megan Treadwell	1990436
	05/04/2018			05/04/2018 15:33	Megan Treadwell	1990428, 1990429
	05/04/2018			05/04/2018 15:34	Megan Treadwell	1990430
	05/04/2018			05/04/2018 15:35	Megan Treadwell	1990431
SM 2120 B	05/04/2018			05/04/2018 15:36	Megan Treadwell	1990437
	05/04/2018			05/04/2018 17:06	Tanya Welborn	1990420
	05/04/2018			05/04/2018 17:07	Tanya Welborn	1990421
	05/04/2018			05/04/2018 17:20	Tanya Welborn	1990422
	05/04/2018			05/04/2018 17:21	Tanya Welborn	1990423
SM 2320 B-97	05/04/2018			05/04/2018 17:22	Tanya Welborn	1990432, 1990433
	05/04/2018			05/12/2018 01:22	Dale L. Simmons	1990422
	05/04/2018			05/12/2018 03:50	Dale L. Simmons	1990420
	05/04/2018			05/12/2018 04:00	Dale L. Simmons	1990421
	05/04/2018			05/12/2018 04:10	Dale L. Simmons	1990423
SM 2540 C-97	05/04/2018			05/12/2018 04:19	Dale L. Simmons	1990432
	05/04/2018			05/12/2018 04:31	Dale L. Simmons	1990433
	05/04/2018			05/09/2018 15:08	Yijie Li	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
	05/04/2018			05/09/2018 15:08	Yijie Li	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
	05/04/2018			05/09/2018 15:08	Yijie Li	1990420, 1990421, 1990422, 1990423, 1990432, 1990433
SM 4500 F-C-97	05/04/2018			05/12/2018 01:14	Dale L. Simmons	1990422
	05/04/2018			05/12/2018 03:50	Dale L. Simmons	1990420
	05/04/2018			05/12/2018 04:00	Dale L. Simmons	1990421
	05/04/2018			05/12/2018 04:10	Dale L. Simmons	1990423
	05/04/2018			05/12/2018 04:19	Dale L. Simmons	1990432
SM 5310 B-00	05/04/2018			05/12/2018 04:31	Dale L. Simmons	1990433
	05/04/2018			05/12/2018 00:41	Julia Storbeck	1990424
	05/04/2018			05/12/2018 00:54	Julia Storbeck	1990425
	05/04/2018			05/12/2018 01:06	Julia Storbeck	1990426
	05/04/2018			05/12/2018 01:06	Julia Storbeck	1990426

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 5310 B-00	05/04/2018			05/12/2018 01:18	Julia Storbeck	1990427
	05/04/2018			05/12/2018 01:32	Julia Storbeck	1990434
	05/04/2018			05/12/2018 01:44	Julia Storbeck	1990435