Chemical Analysis Report

CEN-DIST-2018-04-17-01

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

Event Description: **SJR bw Harney X2 + HA**
Request ID: **RQ-2018-04-16-38**
Customer: **CEN-DIST**
Project ID: **SMP**

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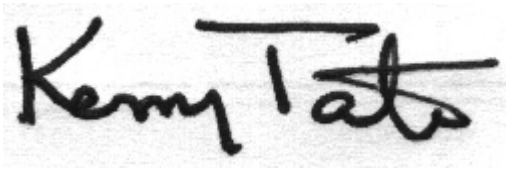
Date Certified: 23-MAY-2018 13:33



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: SJR @ 700m DS of Lake Harney (2964) **Collection Date/Time: 04/16/2018 10:15**

Field ID: G2CE0188 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1984741	EPA 180.1 Rev. 2.0	Turbidity	4.8		NTU	P343607	
	EPA 300.0 Rev. 2.1	Chloride	410		mg Cl/L	P343704	
		Sulfate	110		mg SO4/L	P343706	
	SM 2120 B	Color (true)	100		PCU	P343582	
	SM 2320 B-97	Total Alkalinity	68		mg CaCO3/L	P344008	
	SM 2540 C-97	TDS	992	J	mg/L	P343895	
	SM 2540 D-97	TSS	3	I	mg/L	P343878	
	SM 4500 F-C-97	Fluoride	0.17		mg F/L	P344010	
1984743	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P343774	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P343640	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.013		mg N/L	P343658	
	EPA 365.1 Rev. 2.0	Total-P	0.064		mg P/L	P343712	
	SM 5310 B-00	Organic Carbon	20		mg C/L	P343739	
1984745	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.023		mg P/L	P343578	
1984751	EPA 200.7 Rev. 4.4	Calcium	63.7		mg/L	P343702	
		Iron	310		ug/L	P343702	
		Magnesium	29.8		mg/L	P343702	
		Potassium	8.9		mg/L	P343702	
		Sodium	221		mg/L	P343702	
		Zinc	5.0	U	ug/L	P343702	
	EPA 200.8 Rev. 5.4	Arsenic	0.62		ug/L	P343702	
		Cadmium	0.020	U	ug/L	P343702	
		Chromium	0.40	U	ug/L	P343702	
		Copper	0.61	I	ug/L	P343702	
		Lead	0.28		ug/L	P343702	
		Nickel	0.39	I	ug/L	P343702	
		Silver	0.010	U	ug/L	P343702	

Ref. Method and Comment:
SM 2540 C-97: A constant dry weight was not attained.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and potassium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: SJR North of Lake Harney @ Old Osceola Fish Camp (2964) **Collection Date/Time: 04/16/2018 10:33**

Field ID: G2CE0166 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1984742	EPA 180.1 Rev. 2.0	Turbidity	4.7	A	NTU	P343608	
	EPA 300.0 Rev. 2.1	Chloride	360		mg Cl/L	P343704	
		Sulfate	97		mg SO4/L	P343706	
	SM 2120 B	Color (true)	120		PCU	P343584	
	SM 2320 B-97	Total Alkalinity	64		mg CaCO3/L	P344070	
	SM 2540 C-97	TDS	839		mg/L	P343895	
	SM 2540 D-97	TSS	3	I	mg/L	P343878	

Field ID: G2CE0166 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1984742	SM 4500 F-C-97	Fluoride	0.15		mg F/L	P344072	
1984744	EPA 350.1 Rev. 2.0	Ammonia-N	0.023		mg N/L	P343775	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P343640	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P343659	
	EPA 365.1 Rev. 2.0	Total-P	0.064		mg P/L	P343712	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P343740	
1984746	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.024		mg P/L	P343578	
1984752	EPA 200.7 Rev. 4.4	Calcium	58.2		mg/L	P343702	
		Iron	330		ug/L	P343702	
		Magnesium	25.6		mg/L	P343702	
		Potassium	7.8		mg/L	P343702	
		Sodium	187		mg/L	P343702	
		Zinc	5.0	U	ug/L	P343702	
	EPA 200.8 Rev. 5.4	Arsenic	0.61		ug/L	P343702	
		Cadmium	0.020	U	ug/L	P343702	
		Chromium	0.40	U	ug/L	P343702	
		Copper	0.61	I	ug/L	P343702	
		Lead	0.28		ug/L	P343702	
		Nickel	0.39	I	ug/L	P343702	
		Silver	0.010	U	ug/L	P343702	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and potassium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343607

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343608

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343702

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 200.8 Rev. 5.4
Batch ID: P343702

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: P343704

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343706

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343774

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343775

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343640

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343658

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343659

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343712

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343578

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

Reference Method: SM 2120 B
Batch ID: P343582

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P343584

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P344008

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

Reference Method: SM 2320 B-97
Batch ID: P344070

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

Reference Method: SM 2540 C-97
Batch ID: P343895

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P343878

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P344010

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P344072

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P343739

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

Reference Method: SM 5310 B-00
Batch ID: P343740

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: P343702

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343702

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	104		P	85 - 115
Cadmium	99.2		P	85 - 115
Chromium	94.1		P	85 - 115
Copper	99.2		P	85 - 115
Lead	95.1		P	85 - 115
Nickel	105		P	85 - 115
Silver	95.2		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343704

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	95.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343706

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.6		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343774

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343775

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343640

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: P343658

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343659

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343712

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343578

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

Reference Method: SM 2320 B-97
Batch ID: P344008

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

Reference Method: SM 2320 B-97
Batch ID: P344070

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P344010

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

Reference Method: SM 4500 F-C-97
Batch ID: P344072

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.4		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343739

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P343740

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.2		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984901	Iron	99.4	101	P/P	80 - 120
1984901	Magnesium	103		P	80 - 120
1984901	Sodium	99.6		P	80 - 120
1984901	Zinc	94.2	97.0	P/P	80 - 120
1985012	Calcium	102		P	80 - 120
1985012	Iron	97.5		P	80 - 120
1985012	Magnesium	103		P	80 - 120
1985012	Potassium	91.4		P	80 - 120
1985012	Sodium	99.8		P	80 - 120
1985012	Zinc	97.2		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984901	Arsenic	104	104	P/P	80 - 120
1984901	Cadmium	101	100	P/P	80 - 120
1984901	Chromium	90.8	89.4	P/P	80 - 120
1984901	Copper	93.6	94.8	P/P	80 - 120
1984901	Lead	96.1	95.7	P/P	80 - 120
1984901	Nickel	96.4	94.8	P/P	80 - 120
1984901	Silver	95.8	93.1	P/P	80 - 120
1985012	Arsenic	106		P	80 - 120
1985012	Cadmium	102		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343702

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985012	Chromium	91.5		P	80 - 120
1985012	Copper	95.3		P	80 - 120
1985012	Lead	97.2		P	80 - 120
1985012	Nickel	96.9		P	80 - 120
1985012	Silver	93.9		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343704

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984758	Chloride	96.7		P	90 - 110
1985022	Chloride	93.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343706

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984758	Sulfate	94.3		P	90 - 110
1985022	Sulfate	94.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343774

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984692	Ammonia-N	100	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984744	Ammonia-N	99.8	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343640

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984760	Kjeldahl Nitrogen	109	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343658

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984692	NO2NO3-N	93.6	94.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343659

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984744	NO2NO3-N	99.8	98.8	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343712

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984761	Total-P	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343578

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984745	O-Phosphate-P	97.0	97.5	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P344010

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984638	Fluoride	94.3	94.8	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P344072

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1985016	Fluoride	95.3	97.2	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343739

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984640	Organic Carbon	99.2	97.6	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P343740

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1984744	Organic Carbon	103		P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343607

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984633	Turbidity	1.59	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P343608

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984742	Turbidity	2.55	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P343702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984901	Calcium	2.31	Spike	P	0 - 20
1984901	Iron	1.50	Spike	P	0 - 20
1984901	Magnesium	2.86	Spike	P	0 - 20
1984901	Potassium	1.53	Spike	P	0 - 20
1984901	Sodium	1.85	Spike	P	0 - 20
1984901	Zinc	2.85	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343702

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984901	Arsenic	0.319	Spike	P	0 - 20
1984901	Cadmium	0.657	Spike	P	0 - 20
1984901	Chromium	1.56	Spike	P	0 - 20
1984901	Copper	1.22	Spike	P	0 - 20
1984901	Lead	0.427	Spike	P	0 - 20
1984901	Nickel	1.58	Spike	P	0 - 20
1984901	Silver	2.93	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343704

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984758	Chloride	0.207	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P343706

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984758	Sulfate	1.19	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343774

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984692	Ammonia-N	0.777	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984744	Ammonia-N	0.902	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P343640

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984760	Kjeldahl Nitrogen	2.68	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343658

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984692	NO2NO3-N	0.469	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P343659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984744	NO2NO3-N	0.930	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P343712

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984761	Total-P	1.60	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P343578

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984745	O-Phosphate-P	0.416	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P343582

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984634	Color (true)	2.24	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P343584

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984758	Color (true)	0.528	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P344008

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984638	Total Alkalinity	0.316	Sample	P	0 - 1.6

Quality Assurance Report
Precision

Reference Method: SM 2320 B-97
Batch ID: P344070

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985016	Total Alkalinity	1.46	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P343895

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984684	TDS	9.12	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P344010

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984638	Fluoride	0.479	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P344072

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1985016	Fluoride	1.46	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P343739

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984640	Organic Carbon	1.05	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P343740

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1984744	Organic Carbon	0.758	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83267
Included Lab Sample IDs: 1984741, 1984742

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	98.6	P/P	90 - 110
Sulfate	101	98.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A83289
Included Lab Sample IDs: 1984745, 1984746

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	100	P/P	90 - 110
O-Phosphate-P	99.9	99.7	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A83291
Included Lab Sample IDs: 1984741, 1984742

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	90 - 115
Color (true)	98.5	100	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A83304
Included Lab Sample IDs: 1984741, 1984742

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	98.5	P/P	95 - 105
Turbidity	98.5	99.0	P/P	95 - 105

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A83321
Included Lab Sample IDs: 1984743, 1984744

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A83339
Included Lab Sample IDs: 1984743, 1984744

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

Reference Method: SM 5310 B-00
Run ID: A83342
Included Lab Sample IDs: 1984743, 1984744

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.0	98.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A83354
Included Lab Sample IDs: 1984743, 1984744

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A83387
Included Lab Sample IDs: 1984751, 1984752

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	103	P/P	95 - 105
Calcium	103	103	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Iron	102	102	P/P	95 - 105
Magnesium	102	103	P/P	90 - 110
Magnesium	102	102	P/P	95 - 105
Potassium	100	99.6	P/P	90 - 110
Potassium	99.9	100	P/P	95 - 105
Sodium	100	99.9	P/P	90 - 110
Sodium	101	100	P/P	95 - 105
Zinc	103	102	P/P	90 - 110
Zinc	103	103	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A83391
Included Lab Sample IDs: 1984743, 1984744

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	107	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83408
Included Lab Sample IDs: 1984751, 1984752

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	100	98.7	P/P	90 - 110
Cadmium	95.6	99.2	P/P	90 - 110
Chromium	93.7	93.4	P/P	90 - 110
Lead	97.4	97.1	P/P	90 - 110
Nickel	101	97.4	P/P	90 - 110
Silver	93.4	95.6	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A83439
Included Lab Sample IDs: 1984741

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	98.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83439
Included Lab Sample IDs: 1984741

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

Reference Method: SM 2320 B-97
Run ID: A83462
Included Lab Sample IDs: 1984742

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A83462
Included Lab Sample IDs: 1984742

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.4	104	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A83462
Included Lab Sample IDs: 1984742

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	97.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83480
Included Lab Sample IDs: 1984751, 1984752

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

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						1.59	
	Turbidity						2.55	
EPA 200.7 Rev. 4.4	Calcium	105	102					2.31
	Iron	101	99.4	101	97.5			1.50
	Magnesium	105	103	103				2.86
	Potassium	101	91.4					1.53
	Sodium	101	99.6	99.8				1.85
	Zinc	102	94.2	97.0	97.2			2.85
EPA 200.8 Rev. 5.4	Arsenic	104	104	104	106			0.319
	Cadmium	99.2	101	100	102			0.657
	Chromium	94.1	90.8	89.4	91.5			1.56
	Copper	99.2	93.6	94.8	95.3			1.22
	Lead	95.1	96.1	95.7	97.2			0.427
	Nickel	105	96.4	94.8	96.9			1.58
	Silver	95.2	95.8	93.1	93.9			2.93
EPA 300.0 Rev. 2.1	Chloride	95.3	96.7	93.7			0.207	
	Sulfate	95.6	94.3	94.0			1.19	
EPA 350.1 Rev. 2.0	Ammonia-N	100	100	101				0.777
	Ammonia-N	98.8	99.8	98.5				0.902
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	109	105				2.68
EPA 353.2 Rev. 2.0	NO2NO3-N	102	93.6	94.0				0.469
	NO2NO3-N	102	99.8	98.8				0.930
EPA 365.1 Rev. 2.0	Total-P	102	104	102				1.60
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.0	97.5				0.416
SM 2120 B	Color (true)						2.24	

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
SM 2120 B	Color (true)					0.528	
SM 2320 B-97	Total Alkalinity	101				0.316	
	Total Alkalinity	101				1.46	
SM 2540 C-97	TDS					9.12	
SM 4500 F-C-97	Fluoride	95.1	94.3	94.8			0.479
	Fluoride	94.4	95.3	97.2			1.46
SM 5310 B-00	Organic Carbon	95.4	99.2	97.6			1.05
	Organic Carbon	95.2	103				0.758

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1984741, 1984742
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1984751, 1984752
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1984751, 1984752
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1984741, 1984742
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1984741, 1984742
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1984743, 1984744
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1984743, 1984744
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1984743, 1984744
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1984743, 1984744
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1984745, 1984746
SM 2120 B / E31780	True Color measured at 450 nm	1984741, 1984742
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1984741, 1984742
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1984741, 1984742
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1984741, 1984742
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1984741, 1984742
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1984743, 1984744

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	04/17/2018			04/17/2018 17:41	William L. Brown IV	1984741, 1984742
EPA 200.7 Rev. 4.4	04/17/2018	04/19/2018 11:01	Allison Taylor	04/20/2018 11:53	Betina Topolski	1984751
	04/17/2018	04/19/2018 11:01	Allison Taylor	04/20/2018 12:01	Betina Topolski	1984751
	04/17/2018	04/19/2018 11:01	Allison Taylor	04/20/2018 12:33	Betina Topolski	1984752
EPA 200.8 Rev. 5.4	04/17/2018	04/19/2018 11:01	Allison Taylor	04/23/2018 18:44	Robert K Palmer	1984751
	04/17/2018	04/19/2018 11:01	Allison Taylor	04/23/2018 18:54	Robert K Palmer	1984752
	04/17/2018	04/19/2018 11:01	Allison Taylor	04/26/2018 12:02	Robert K Palmer	1984751
	04/17/2018	04/19/2018 11:01	Allison Taylor	04/26/2018 12:07	Robert K Palmer	1984752
EPA 300.0 Rev. 2.1	04/17/2018			04/18/2018 15:24	Lipi Saha	1984741
	04/17/2018			04/18/2018 15:36	Lipi Saha	1984742
EPA 350.1 Rev. 2.0	04/17/2018			04/18/2018 12:17	Ping Hua	1984743
	04/17/2018			04/18/2018 12:23	Ping Hua	1984744
EPA 351.2 Rev. 2.0	04/17/2018	04/18/2018 11:00	Adrian Shelby	04/19/2018 12:40	Joseph Suarez	1984743
	04/17/2018	04/18/2018 11:00	Adrian Shelby	04/19/2018 12:42	Joseph Suarez	1984744
EPA 353.2 Rev. 2.0	04/17/2018			04/18/2018 14:15	Lauren Bottorf	1984743
	04/17/2018			04/18/2018 14:22	Lauren Bottorf	1984744
EPA 365.1 Rev. 2.0	04/17/2018	04/18/2018 14:25	Sima Feizi	04/23/2018 08:17	Beverly Y. Sanders	1984743
	04/17/2018	04/18/2018 14:25	Sima Feizi	04/23/2018 08:18	Beverly Y. Sanders	1984744
EPA 365.1 Rev. 2.0 dissolved	04/17/2018			04/17/2018 14:51	Megan Treadwell	1984745
	04/17/2018			04/17/2018 15:23	Megan Treadwell	1984746
SM 2120 B	04/17/2018			04/17/2018 15:56	Tanya Welborn	1984741
	04/17/2018			04/17/2018 16:09	Tanya Welborn	1984742
SM 2320 B-97	04/17/2018			04/24/2018 22:07	Dale L. Simmons	1984741
	04/17/2018			04/25/2018 20:45	Dale L. Simmons	1984742
SM 2540 C-97	04/17/2018			04/18/2018 16:03	Yijie Li	1984741, 1984742
SM 2540 D-97	04/17/2018			04/18/2018 16:03	Yijie Li	1984741, 1984742
SM 4500 F-C-97	04/17/2018			04/24/2018 22:07	Dale L. Simmons	1984741
	04/17/2018			04/25/2018 20:45	Dale L. Simmons	1984742
SM 5310 B-00	04/17/2018			04/19/2018 05:26	Megan Treadwell	1984743
	04/17/2018			04/19/2018 06:14	Megan Treadwell	1984744