

Chemical Analysis Report

NE-DIST-2018-03-23-01

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

Event Description: **2340 Yellow, 2249BMccoy**

Request ID: **RQ-2018-03-19-75**

Customer: **NE-DIST**

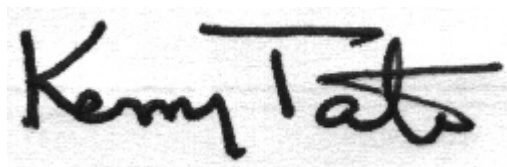
Project ID: **SMP**

Send Reports to:
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8800 Baymeadows Way West
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Attn: Jeremy Parrish

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 30-APR-2018 14:14

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line extending from the end of the name.

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: MCGIRTS CREEK AT OLD PLANK ROAD

Collection Date/Time: 03/22/2018 12:55

Field ID: 20030346

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977217	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P342126	
	EPA 300.0 Rev. 2.1	Chloride	20		mg Cl/L	P342414	
		Sulfate	11		mg SO4/L	P342418	
	SM 2120 B	Color (true)	120		PCU	P342122	
	SM 2320 B-97	Total Alkalinity	26		mg CaCO3/L	P342530	
	SM 2540 C-97	TDS	121		mg/L	P342575	
	SM 2540 D-97	TSS	2	U	mg/L	P342630	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P342534	
1977219	EPA 350.1 Rev. 2.0	Ammonia-N	0.033		mg N/L	P342591	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P342172	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.021		mg N/L	P342257	
	EPA 365.1 Rev. 2.0	Total-P	0.030		mg P/L	P342251	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P342873	
1977221	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P342103	
1977231	EPA 200.7 Rev. 4.4	Calcium	15.2		mg/L	P342274	
		Iron	790		ug/L	P342274	
		Magnesium	1.48		mg/L	P342274	
		Potassium	1.1	I	mg/L	P342274	
		Sodium	10.9		mg/L	P342274	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P342274	
		Arsenic	0.34		ug/L	P342274	
		Cadmium	0.020	U	ug/L	P342274	
		Chromium	0.57	I	ug/L	P343020	
		Copper	0.84		ug/L	P342274	
		Lead	1.70		ug/L	P342274	
		Nickel	0.59	I	ug/L	P343020	
		Silver	0.010	U	ug/L	P342274	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 04/04/2018.

Sample Location: YELLOW WATER CREEK AT STATE FOREST

Collection Date/Time: 03/22/2018 13:35

Field ID: G2NE1163

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977218	EPA 180.1 Rev. 2.0	Turbidity	9.4		NTU	P342126	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P342414	
		Sulfate	7.0		mg SO4/L	P342418	
	SM 2120 B	Color (true)	130		PCU	P342122	
	SM 2320 B-97	Total Alkalinity	29		mg CaCO3/L	P342531	RPD
	SM 2540 C-97	TDS	92		mg/L	P342575	
	SM 2540 D-97	TSS	4	I	mg/L	P342630	
	SM 4500 F-C-97	Fluoride	0.048	I	mg F/L	P342536	
1977220	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P342591	

Field ID: G2NE1163

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1977220	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.40		mg N/L	P342172	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.040		mg N/L	P342257	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P342251	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P342873	
1977222	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P342103	
1977232	EPA 200.7 Rev. 4.4	Calcium	13.3		mg/L	P342274	
		Iron	930		ug/L	P342274	
		Magnesium	2.17		mg/L	P342274	
		Potassium	0.81	I	mg/L	P342274	
		Sodium	7.1		mg/L	P342274	
		Zinc	5.0	U	ug/L	P342274	
	EPA 200.8 Rev. 5.4	Arsenic	0.43		ug/L	P342274	
		Cadmium	0.029	I	ug/L	P342274	
		Chromium	0.69	I	ug/L	P342274	
		Copper	0.75	I	ug/L	P342274	
		Lead	0.78		ug/L	P342274	
		Nickel	0.77	I	ug/L	P342274	
		Silver	0.010	U	ug/L	P342274	

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P342126

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P342274

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: P342274

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342274

Component	Result	Code	Units
Silver	0.010	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343020

Component	Result	Code	Units
Chromium	0.40	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342414

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342418

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342591

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342172

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342257

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342251

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342103

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

Quality Assurance Report Method Blank Results

Reference Method: SM 2120 B
Batch ID: P342122

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P342530

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

Reference Method: SM 2320 B-97
Batch ID: P342531

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

Reference Method: SM 2540 C-97
Batch ID: P342575

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P342630

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P342534

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P342873

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: P342274

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342274

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	106		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	102		P	85 - 115
Sodium	101		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342274

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	101		P	85 - 115
Copper	102		P	85 - 115
Lead	102		P	85 - 115
Nickel	101		P	85 - 115
Silver	99.7		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343020

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	107		P	85 - 115
Nickel	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342414

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342418

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342591

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342172

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342257

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342251

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	108		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342103

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

Reference Method: SM 2320 B-97
Batch ID: P342530

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.4		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P342531

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P342534

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.2		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P342536

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

Reference Method: SM 5310 B-00
Batch ID: P342873

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.9		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342274

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342274

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977262	Calcium	101		P	80 - 120
1977262	Iron	108	106	P/P	80 - 120
1977262	Magnesium	102		P	80 - 120
1977262	Potassium	104	101	P/P	80 - 120
1977262	Sodium	102		P	80 - 120
1977262	Zinc	98.1	96.6	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342274

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977262	Arsenic	98.2	98.7	P/P	80 - 120
1977262	Cadmium	103	106	P/P	80 - 120
1977262	Chromium	101	102	P/P	80 - 120
1977262	Copper	96.1	96.1	P/P	80 - 120
1977262	Lead	102	102	P/P	80 - 120
1977262	Nickel	94.0	94.3	P/P	80 - 120
1977262	Silver	98.9	99.8	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343020

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1975197	Chromium	102		P	80 - 120
1975197	Nickel	102		P	80 - 120
1977231	Chromium	104	104	P/P	80 - 120
1977231	Nickel	102	102	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1976686	Chloride	97.4		P	90 - 110
1977257	Chloride	93.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1976686	Sulfate	98.3		P	90 - 110
1977257	Sulfate	94.6		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342591

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977159	Ammonia-N	97.8	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977242	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342257

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977156	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342251

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977220	Total-P	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342103

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977191	O-Phosphate-P	99.5	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P342534

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977257	Fluoride	97.3	98.5	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977936	Fluoride	97.3	97.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P342873

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1977219	Organic Carbon	100	99.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P342126

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977184	Turbidity	0.233	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342274

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977262	Calcium	2.32	Spike	P	0 - 20
1977262	Iron	1.77	Spike	P	0 - 20
1977262	Magnesium	2.53	Spike	P	0 - 20
1977262	Potassium	1.87	Spike	P	0 - 20
1977262	Sodium	2.12	Spike	P	0 - 20
1977262	Zinc	1.44	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342274

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977262	Arsenic	0.495	Spike	P	0 - 20
1977262	Cadmium	2.27	Spike	P	0 - 20
1977262	Chromium	1.11	Spike	P	0 - 20
1977262	Copper	0.0705	Spike	P	0 - 20
1977262	Lead	0.407	Spike	P	0 - 20
1977262	Nickel	0.374	Spike	P	0 - 20
1977262	Silver	0.941	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P343020

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977231	Chromium	0.299	Spike	P	0 - 20
1977231	Nickel	0.567	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342414

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1976686	Chloride	0.596	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1976686	Sulfate	1.35	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P342591

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977159	Ammonia-N	2.44	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977242	Kjeldahl Nitrogen	0.192	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342257

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977156	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342251

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977220	Total-P	1.28	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342103

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977191	O-Phosphate-P	1.40	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P342122

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977184	Color (true)	3.79	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P342530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977257	Total Alkalinity	0.330	Sample	P	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P342531

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977936	Total Alkalinity	4.10	Sample	F	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P342575

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977923	TDS	3.82	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P342534

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977257	Fluoride	0.934	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P342536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977936	Fluoride	0.479	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P342873

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1977219	Organic Carbon	0.592	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: A82810
Included Lab Sample IDs: 1977221, 1977222

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

Reference Method: SM 2120 B
Run ID: A82815
Included Lab Sample IDs: 1977217, 1977218

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	99.6	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A82817
Included Lab Sample IDs: 1977217, 1977218

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A82873
Included Lab Sample IDs: 1977219, 1977220

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A82892
Included Lab Sample IDs: 1977217, 1977218

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.8	100	P/P	90 - 110
Sulfate	101	99.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A82913
Included Lab Sample IDs: 1977231, 1977232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.2	100	P/P	90 - 110
Iron	102	102	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	100	99.9	P/P	90 - 110
Sodium	99.8	100	P/P	90 - 110
Zinc	102	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A82932
Included Lab Sample IDs: 1977219, 1977220

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.5	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A82948
Included Lab Sample IDs: 1977219, 1977220

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.8	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A82967
Included Lab Sample IDs: 1977217, 1977218

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	97.4	P/P	90 - 110
Total Alkalinity	97.4	100	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A82967
Included Lab Sample IDs: 1977217, 1977218

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.2	98.1	P/P	90 - 110
Fluoride	98.1	98.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A82995
Included Lab Sample IDs: 1977231, 1977232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	96.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A82995
Included Lab Sample IDs: 1977231, 1977232

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	96.7	96.0	P/P	90 - 110
Cadmium	97.7	98.9	P/P	90 - 110
Cadmium	98.9	99.0	P/P	90 - 110
Chromium	98.9	99.0	P/P	90 - 110
Copper	101	96.5	P/P	90 - 110
Copper	96.5	96.2	P/P	90 - 110
Lead	99.6	99.3	P/P	90 - 110
Lead	99.6	99.6	P/P	90 - 110
Nickel	96.2	95.7	P/P	90 - 110
Silver	102	102	P/P	90 - 110
Silver	102	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A82997
Included Lab Sample IDs: 1977219, 1977220

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

Reference Method: SM 5310 B-00
Run ID: A83069
Included Lab Sample IDs: 1977219, 1977220

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.3	95.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A83172
Included Lab Sample IDs: 1977231

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	98.5	99.2	P/P	90 - 110
Nickel	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	LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity				0.233	
EPA 200.7 Rev. 4.4	Calcium	102	101			2.32
	Iron	106	108	106		1.77
	Magnesium	103	102			2.53
	Potassium	102	104	101		1.87
	Sodium	101	102			2.12
	Zinc	101	98.1	96.6		1.44

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision	MS
						SMP	
EPA 200.8 Rev. 5.4	Arsenic	102	98.2	98.7			0.495
	Cadmium	102	103	106			2.27
	Chromium	101	101	102			1.11
	Chromium	107	102	104	104		0.299
	Copper	102	96.1	96.1			0.0705
	Lead	102	102	102			0.407
	Nickel	101	94.0	94.3			0.374
	Nickel	107	102	102	102		0.567
	Silver	99.7	98.9	99.8			0.941
EPA 300.0 Rev. 2.1	Chloride	98.2	97.4	93.3		0.596	
	Sulfate	98.0	98.3	94.6		1.35	
EPA 350.1 Rev. 2.0	Ammonia-N	96.0	97.8	100			2.44
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	103	104			0.192
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	103	104	104			0.0
EPA 365.1 Rev. 2.0	Total-P	108	101	103			1.28
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	99.5	101			1.40
SM 2120 B	Color (true)					3.79	
SM 2320 B-97	Total Alkalinity	99.4				0.330	
	Total Alkalinity	100				4.10	
SM 2540 C-97	TDS					3.82	
SM 4500 F-C-97	Fluoride	94.2	97.3	98.5			0.934
	Fluoride	95.6	97.3	97.8			0.479
SM 5310 B-00	Organic Carbon	96.9	100	99.4			0.592

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1977217, 1977218
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1977231, 1977232
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1977231, 1977232
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1977217, 1977218
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1977217, 1977218
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1977219, 1977220
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1977219, 1977220
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1977219, 1977220
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1977219, 1977220
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1977221, 1977222
SM 2120 B / E31780	True Color measured at 450 nm	1977217, 1977218
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1977217, 1977218
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1977217, 1977218
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1977217, 1977218
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1977217, 1977218
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1977219, 1977220

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	03/23/2018			03/23/2018 14:40	Tanya Welborn	1977217, 1977218
EPA 200.7 Rev. 4.4	03/23/2018	03/27/2018 17:20	Elliott D. Healy	03/28/2018 16:28	Betina Topolski	1977231
	03/23/2018	03/27/2018 17:20	Elliott D. Healy	03/28/2018 16:35	Betina Topolski	1977232
EPA 200.8 Rev. 5.4	03/23/2018	03/27/2018 17:20	Elliott D. Healy	04/02/2018 16:39	Nadine Brooks	1977231
	03/23/2018	03/27/2018 17:20	Elliott D. Healy	04/02/2018 17:18	Nadine Brooks	1977232
	03/23/2018	04/09/2018 13:15	Elliott D. Healy	04/12/2018 00:15	Nadine Brooks	1977231
EPA 300.0 Rev. 2.1	03/23/2018			03/28/2018 17:03	Lipi Saha	1977217
	03/23/2018			03/28/2018 17:15	Lipi Saha	1977218
EPA 350.1 Rev. 2.0	03/23/2018			04/02/2018 12:52	Ping Hua	1977219
	03/23/2018			04/02/2018 12:54	Ping Hua	1977220
EPA 351.2 Rev. 2.0	03/23/2018	03/26/2018 11:30	Adrian Shelby	03/29/2018 13:16	Joseph Suarez	1977219
	03/23/2018	03/26/2018 11:30	Adrian Shelby	03/29/2018 13:18	Joseph Suarez	1977220
EPA 353.2 Rev. 2.0	03/23/2018			03/27/2018 12:37	Lauren Bottorf	1977219
	03/23/2018			03/27/2018 12:38	Lauren Bottorf	1977220
EPA 365.1 Rev. 2.0	03/23/2018	03/27/2018 13:10	Sima Feizi	03/29/2018 13:12	Beverly Y. Sanders	1977220
	03/23/2018	03/27/2018 13:10	Sima Feizi	03/29/2018 13:13	Beverly Y. Sanders	1977219
EPA 365.1 Rev. 2.0 dissolved	03/23/2018			03/23/2018 14:18	Megan Treadwell	1977221
	03/23/2018			03/23/2018 14:19	Megan Treadwell	1977222
SM 2120 B	03/23/2018			03/23/2018 15:34	Tanya Welborn	1977217
	03/23/2018			03/23/2018 15:35	Tanya Welborn	1977218
SM 2320 B-97	03/23/2018			03/30/2018 21:58	Lauren Bottorf	1977217
	03/23/2018			03/31/2018 00:59	Lauren Bottorf	1977218
SM 2540 C-97	03/23/2018			03/28/2018 15:49	Yijie Li	1977217, 1977218
SM 2540 D-97	03/23/2018			03/28/2018 15:49	Yijie Li	1977217, 1977218
SM 4500 F-C-97	03/23/2018			03/30/2018 21:58	Lauren Bottorf	1977217
	03/23/2018			03/31/2018 00:59	Lauren Bottorf	1977218
SM 5310 B-00	03/23/2018			04/04/2018 18:14	Julia Storbeck	1977219
	03/23/2018			04/04/2018 19:45	Julia Storbeck	1977220