

Chemical Analysis Report

SE-DIST-2018-03-30-01

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

Event Description: **SMP- Martin**
Request ID: **RQ-2018-02-05-82**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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2199 South Rock Road
Fort Pierce, FL 34945
Attn: Matthew Sewell

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

Date Certified: 17-MAY-2018 12:11

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: C-23 UPSTREAM OF S97

Collection Date/Time: 03/29/2018 12:30

Field ID: G2SE0032

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1979572	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P342516	
	EPA 300.0 Rev. 2.1	Chloride	190		mg Cl/L	P342688	
		Sulfate	53		mg SO4/L	P342689	
	SM 2120 B	Color (true)	87		PCU	P342519	
	SM 2320 B-97	Total Alkalinity	182		mg CaCO3/L	P343027	RPD
	SM 2540 C-97	TDS	609		mg/L	P343012	
	SM 2540 D-97	TSS	4	I	mg/L	P342959	
	SM 4500 F-C-97	Fluoride	0.28		mg F/L	P343648	
1979573	EPA 350.1 Rev. 2.0	Ammonia-N	0.053		mg N/L	P343147	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P342669	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.014		mg N/L	P342850	
	EPA 365.1 Rev. 2.0	Total-P	0.088		mg P/L	P342652	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P343083	
1979574	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.068		mg P/L	P342541	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

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

Sample Location: WARNER @ 24TH

Collection Date/Time: 03/29/2018 13:50

Field ID: G2SE0038

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1979575	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P342516	
	EPA 300.0 Rev. 2.1	Chloride	59		mg Cl/L	P342688	
		Sulfate	13		mg SO4/L	P342689	
	SM 2120 B	Color (true)	110		PCU	P342520	
	SM 2320 B-97	Total Alkalinity	101		mg CaCO3/L	P343367	RPD
	SM 2540 C-97	TDS	267		mg/L	P343012	
	SM 2540 D-97	TSS	3	I	mg/L	P342959	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P343180	
1979578	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P343147	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P342670	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.019		mg N/L	P342851	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P342652	
	SM 5310 B-00	Organic Carbon	22		mg C/L	P343083	
1979581	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P342541	
1979609	EPA 200.7 Rev. 4.4	Calcium	44.1		mg/L	P342580	
		Iron	140		ug/L	P342580	
		Magnesium	2.49		mg/L	P342580	
		Potassium	2.0		mg/L	P342580	
		Sodium	35.1		mg/L	P342580	
		Zinc	5.0	U	ug/L	P342580	
	EPA 200.8 Rev. 5.4	Arsenic	0.72		ug/L	P342580	
		Cadmium	0.020	U	ug/L	P342580	

Field ID: G2SE0038

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1979609	EPA 200.8 Rev. 5.4	Chromium	1.3	I	ug/L	P342580	
		Copper	0.83		ug/L	P342580	
		Lead	0.22		ug/L	P342580	
		Nickel	0.38	I	ug/L	P342580	
		Silver	0.010	U	ug/L	P342580	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

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

Sample Location: WARNER CREEK @ TROPICALIA

Collection Date/Time: 03/29/2018 14:00

Field ID: G2SE0037

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1979576	EPA 180.1 Rev. 2.0	Turbidity	1.4		NTU	P342517	
	EPA 300.0 Rev. 2.1	Chloride	52		mg Cl/L	P342688	
		Sulfate	12		mg SO4/L	P342689	
	SM 2120 B	Color (true)	97		PCU	P342520	
	SM 2320 B-97	Total Alkalinity	98		mg CaCO3/L	P343367	RPD
	SM 2540 C-97	TDS	235		mg/L	P343012	
	SM 2540 D-97	TSS	3	I	mg/L	P342959	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P343180	
1979579	EPA 350.1 Rev. 2.0	Ammonia-N	0.048		mg N/L	P343147	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.69		mg N/L	P342670	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P342851	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P342653	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P343083	
1979582	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P342541	
1979610	EPA 200.7 Rev. 4.4	Calcium	47.7		mg/L	P342580	
		Iron	66	I	ug/L	P342580	
		Magnesium	2.31		mg/L	P342580	
		Potassium	2.0		mg/L	P342580	
		Sodium	32.6		mg/L	P342580	
		Zinc	5.0	U	ug/L	P342580	
	EPA 200.8 Rev. 5.4	Arsenic	0.58		ug/L	P342580	
		Cadmium	0.020	U	ug/L	P342580	
		Chromium	1.2	I	ug/L	P342580	
		Copper	0.90		ug/L	P342580	
		Lead	0.14	I	ug/L	P342580	
		Nickel	0.29	I	ug/L	P342580	
		Silver	0.010	U	ug/L	P342580	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

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

Sample Location: WARNER CREEK @ DIXIE

Collection Date/Time: 03/29/2018 14:30

Field ID: G2SE0031

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1979577	EPA 180.1 Rev. 2.0	Turbidity	3.2	A	NTU	P342517	
	EPA 300.0 Rev. 2.1	Chloride	8.2E+03		mg Cl/L	P342688	
		Sulfate	1.1E+03		mg SO4/L	P342689	
	SM 2120 B	Color (true)	60	A	PCU	P342520	
	SM 2320 B-97	Total Alkalinity	116		mg CaCO3/L	P343367	RPD
	SM 2540 C-97	TDS	1.99E+04		mg/L	P343016	
	SM 2540 D-97	TSS	5	I	mg/L	P342965	
	SM 4500 F-C-97	Fluoride	0.46		mg F/L	P343372	
1979580	EPA 350.1 Rev. 2.0	Ammonia-N	0.038		mg N/L	P343146	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.80		mg N/L	P342701	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P342751	
	EPA 365.1 Rev. 2.0	Total-P	0.064		mg P/L	P342649	
	SM 5310 B-00	Organic Carbon	12		mg C/L	P343001	
1979583	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.033		mg P/L	P342542	
1979611	EPA 200.7 Rev. 4.4	Calcium	234		mg/L	P342663	
		Iron	150	I	ug/L	P342663	
		Magnesium	565		mg/L	P342663	
		Potassium	180		mg/L	P342663	
		Sodium	4.65E+03		mg/L	P342663	
		Zinc	20	U	ug/L	P342663	
	EPA 200.8 Rev. 5.4	Arsenic	1.50		ug/L	P344841	
		Cadmium	0.080	U	ug/L	P342663	
		Chromium	1.6	U	ug/L	P344841	
		Copper	0.87	I	ug/L	P342663	
		Lead	0.25	I	ug/L	P342663	
		Nickel	0.80	U	ug/L	P344841	
		Silver	0.040	U	ug/L	P342663	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium, potassium, and sodium are unavailable 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: P342516

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P342517

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342580

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: P342663

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: P342580

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 200.8 Rev. 5.4
Batch ID: P342663

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344841

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Chromium	0.40	U	ug/L
Nickel	0.20	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342688

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342689

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343146

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343147

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342669

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342670

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342701

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342751

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342850

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342851

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: P342649

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342652

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342653

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342541

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342542

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

Reference Method: SM 2120 B
Batch ID: P342519

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P342520

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P343027

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

Reference Method: SM 2320 B-97
Batch ID: P343367

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

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P343012

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P343016

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P342959

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P342965

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P343180

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P343372

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 4500 F-C-97
Batch ID: P343648

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P343001

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

Reference Method: SM 5310 B-00
Batch ID: P343083

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: P342580

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	102		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	98.0		P	85 - 115
Sodium	99.0		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342663

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	98.6		P	85 - 115
Iron	100		P	85 - 115
Magnesium	98.3		P	85 - 115
Potassium	94.9		P	85 - 115
Sodium	95.7		P	85 - 115
Zinc	96.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342580

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	105		P	85 - 115
Chromium	99.4		P	85 - 115
Copper	104		P	85 - 115
Lead	102		P	85 - 115
Nickel	102		P	85 - 115
Silver	98.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342663

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	105		P	85 - 115
Copper	97.6		P	85 - 115
Lead	101		P	85 - 115
Silver	97.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344841

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	96.5		P	85 - 115
Chromium	100		P	85 - 115
Nickel	92.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342688

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342689

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	96.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343146

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343147

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342669

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342670

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342701

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342751

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342850

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342851

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342649

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342652

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342653

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342541

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342542

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

Reference Method: SM 2320 B-97
Batch ID: P343027

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.6		P	98 - 107

Reference Method: SM 2320 B-97
Batch ID: P343367

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

Reference Method: SM 4500 F-C-97
Batch ID: P343180

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	92.3		P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P343372

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.1		P	91 - 105

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P343648

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.1		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343001

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

Reference Method: SM 5310 B-00
Batch ID: P343083

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.9		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342580

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979610	Calcium	101		P	80 - 120
1979610	Iron	105	105	P/P	80 - 120
1979610	Magnesium	104	105	P/P	80 - 120
1979610	Potassium	96.7	98.2	P/P	80 - 120
1979610	Sodium	99.7		P	80 - 120
1979610	Zinc	102	104	P/P	80 - 120

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342663

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979815	Iron	95.9	97.3	P/P	80 - 120
1979815	Zinc	98.0	94.4	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342580

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979610	Arsenic	102	102	P/P	80 - 120
1979610	Cadmium	107	108	P/P	80 - 120
1979610	Chromium	98.4	98.7	P/P	80 - 120
1979610	Copper	99.9	100	P/P	80 - 120
1979610	Lead	104	104	P/P	80 - 120
1979610	Nickel	98.7	97.8	P/P	80 - 120
1979610	Silver	97.3	97.2	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342663

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342663

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979815	Cadmium	101	99.2	P/P	80 - 120
1979815	Copper	96.4	97.3	P/P	80 - 120
1979815	Lead	110	111	P/P	80 - 120
1979815	Silver	90.3	91.6	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344841

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1990561	Arsenic	109	106	P/P	70 - 130
1990561	Chromium	95.6	92.9	P/P	70 - 130
1990561	Nickel	97.8	91.9	P/P	70 - 130

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342689

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979517	Sulfate	97.4		P	90 - 110
1979575	Sulfate	93.0		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343146

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979443	Ammonia-N	97.5	98.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343147

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979578	Ammonia-N	96.7	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979573	Kjeldahl Nitrogen	98.7	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342670

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979670	Kjeldahl Nitrogen	98.0	93.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342701

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1978935	Kjeldahl Nitrogen	99.5	103	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342751

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979078	NO2NO3-N	107	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342850

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979520	NO2NO3-N	107	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342851

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979578	NO2NO3-N	105	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342649

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979440	Total-P	95.6	96.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342652

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979518	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342653

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979670	Total-P	98.8	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342541

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979522	O-Phosphate-P	98.4	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342542

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979583	O-Phosphate-P	96.6	97.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P343180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979576	Fluoride	102	103	P/P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P343372

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979759	Fluoride	97.5	98.1	P/P	91 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P343648

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979516	Fluoride	97.2	97.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P343001

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979078	Organic Carbon	92.1	92.0	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P343083

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1979380	Organic Carbon	95.0	96.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P342516

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979418	Turbidity	7.97	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P342517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979577	Turbidity	1.86	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342580

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979610	Calcium	1.67	Spike	P	0 - 20
1979610	Iron	0.312	Spike	P	0 - 20
1979610	Magnesium	0.290	Spike	P	0 - 20
1979610	Potassium	1.02	Spike	P	0 - 20
1979610	Sodium	1.39	Spike	P	0 - 20
1979610	Zinc	1.26	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P342663

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979815	Calcium	1.55	Spike	P	0 - 20
1979815	Iron	1.24	Spike	P	0 - 20
1979815	Magnesium	1.48	Spike	P	0 - 20
1979815	Potassium	1.32	Spike	P	0 - 20
1979815	Sodium	0.350	Spike	P	0 - 20
1979815	Zinc	3.74	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342580

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979610	Arsenic	0.0313	Spike	P	0 - 20
1979610	Cadmium	1.36	Spike	P	0 - 20
1979610	Chromium	0.337	Spike	P	0 - 20
1979610	Copper	0.116	Spike	P	0 - 20
1979610	Lead	0.265	Spike	P	0 - 20
1979610	Nickel	0.937	Spike	P	0 - 20
1979610	Silver	0.0359	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P342663

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979815	Cadmium	1.39	Spike	P	0 - 20
1979815	Copper	0.926	Spike	P	0 - 20
1979815	Lead	0.908	Spike	P	0 - 20
1979815	Silver	1.48	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P344841

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1990561	Arsenic	3.02	Spike	P	0 - 20
1990561	Chromium	2.78	Spike	P	0 - 20
1990561	Nickel	6.17	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342688

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979517	Chloride	0.433	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P342689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979517	Sulfate	0.338	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343146

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979443	Ammonia-N	0.769	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P343147

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979578	Ammonia-N	2.89	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979573	Kjeldahl Nitrogen	0.399	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342670

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979670	Kjeldahl Nitrogen	4.04	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P342701

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1978935	Kjeldahl Nitrogen	3.34	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342751

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979078	NO2NO3-N	0.844	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979520	NO2NO3-N	0.930	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P342851

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979578	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342649

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979440	Total-P	0.540	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342652

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979518	Total-P	0.440	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P342653

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979670	Total-P	0.201	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342541

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979522	O-Phosphate-P	1.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P342542

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979583	O-Phosphate-P	0.766	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P342519

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979379	Color (true)	0.439	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P342520

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979577	Color (true)	1.51	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P343027

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979516	Total Alkalinity	4.27	Sample	F	0 - 1.6

Reference Method: SM 2320 B-97
Batch ID: P343367

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979759	Total Alkalinity	1.86	Sample	F	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P343012

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979397	TDS	7.52	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P343016

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979559	TDS	4.62	Sample	P	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P342965

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979744	TSS	5.71	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P343180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979576	Fluoride	0.467	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P343372

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979759	Fluoride	0.487	Spike	P	0 - 3.5

Reference Method: SM 4500 F-C-97
Batch ID: P343648

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979516	Fluoride	0.477	Spike	P	0 - 3.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P343001

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979078	Organic Carbon	0.0906	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P343083

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1979380	Organic Carbon	1.05	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 180.1 Rev. 2.0
Run ID: A82962
Included Lab Sample IDs: 1979572, 1979575, 1979576, 1979577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105
Turbidity	99.5	100	P/P	95 - 105

Reference Method: SM 2120 B
Run ID: A82963
Included Lab Sample IDs: 1979572, 1979575, 1979576, 1979577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.8	101	P/P	85 - 115
Color (true)	99.6	96.8	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A82970
Included Lab Sample IDs: 1979574, 1979581, 1979582, 1979583

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A83001
Included Lab Sample IDs: 1979572, 1979575, 1979576, 1979577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.1	98.5	P/P	90 - 110
Chloride	98.4	97.1	P/P	90 - 110
Sulfate	97.1	97.5	P/P	90 - 110
Sulfate	97.5	97.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A83016

Included Lab Sample IDs: 1979609, 1979610

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.8	103	P/P	90 - 110
Iron	97.3	101	P/P	90 - 110
Magnesium	97.7	101	P/P	90 - 110
Potassium	95.0	98.6	P/P	90 - 110
Sodium	97.1	102	P/P	90 - 110
Zinc	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A83020

Included Lab Sample IDs: 1979573

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A83030

Included Lab Sample IDs: 1979580

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A83035

Included Lab Sample IDs: 1979580

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A83043

Included Lab Sample IDs: 1979573, 1979578, 1979579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	103	P/P	90 - 110
Kjeldahl Nitrogen	103	97.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A83044

Included Lab Sample IDs: 1979611

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	95.1	94.2	P/P	90 - 110
Iron	96.4	94.5	P/P	90 - 110
Magnesium	97.1	95.0	P/P	90 - 110
Potassium	94.4	93.4	P/P	90 - 110
Sodium	94.2	93.0	P/P	90 - 110
Zinc	97.5	95.3	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A83048

Included Lab Sample IDs: 1979580

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A83052

Included Lab Sample IDs: 1979578, 1979579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A83062

Included Lab Sample IDs: 1979573, 1979578, 1979579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	106	P/P	90 - 110
NO2NO3-N	106	106	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A83104

Included Lab Sample IDs: 1979580

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.0	93.6	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A83116

Included Lab Sample IDs: 1979572

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	98.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A83129

Included Lab Sample IDs: 1979609, 1979610

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	97.1	95.3	P/P	90 - 110
Cadmium	99.7	101	P/P	90 - 110
Chromium	95.1	95.7	P/P	90 - 110
Copper	97.4	95.4	P/P	90 - 110
Lead	97.7	97.6	P/P	90 - 110
Nickel	97.1	94.6	P/P	90 - 110
Silver	99.5	100	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A83136

Included Lab Sample IDs: 1979573, 1979578, 1979579

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.1	96.7	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A83153

Included Lab Sample IDs: 1979573, 1979578, 1979579, 1979580

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

Reference Method: SM 4500 F-C-97

Run ID: A83159

Included Lab Sample IDs: 1979575, 1979576

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	96.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A83200

Included Lab Sample IDs: 1979611

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	99.4	99.3	P/P	90 - 110
Copper	96.2	95.9	P/P	90 - 110
Lead	97.6	98.0	P/P	90 - 110
Silver	100	99.7	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A83225

Included Lab Sample IDs: 1979575, 1979576, 1979577

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	98.5	P/P	90 - 110
Total Alkalinity	98.4	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A83225

Included Lab Sample IDs: 1979577

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

Reference Method: SM 4500 F-C-97

Run ID: A83315

Included Lab Sample IDs: 1979572

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A83834

Included Lab Sample IDs: 1979611

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	94.0	92.8	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A83835

Included Lab Sample IDs: 1979611

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.8	99.5	P/P	90 - 110
Chromium	95.6	97.7	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				7.97	
	Turbidity				1.86	
EPA 200.7 Rev. 4.4	Calcium	103	101			1.67
	Calcium	98.6				1.55
	Iron	102	105 105			0.312
	Iron	100	95.9 97.3			1.24
	Magnesium	105	104 105			0.290
	Magnesium	98.3				1.48
	Potassium	98.0	96.7 98.2			1.02
	Potassium	94.9				1.32
	Sodium	99.0	99.7			1.39
	Sodium	95.7				0.350
	Zinc	101	102 104			1.26
	Zinc	96.6	98.0 94.4			3.74
EPA 200.8 Rev. 5.4	Arsenic	102	102 102			0.0313
	Arsenic	96.5	109 106			3.02
	Cadmium	105	107 108			1.36
	Cadmium	105	101 99.2			1.39
	Chromium	99.4	98.4 98.7			0.337
	Chromium	100	95.6 92.9			2.78
	Copper	104	99.9 100			0.116
	Copper	97.6	96.4 97.3			0.926
	Lead	102	104 104			0.265
	Lead	101	110 111			0.908
	Nickel	102	98.7 97.8			0.937
	Nickel	92.3	97.8 91.9			6.17
	Silver	98.6	97.3 97.2			0.0359
	Silver	97.6	90.3 91.6			1.48
EPA 300.0 Rev. 2.1	Chloride	97.5			0.433	
	Sulfate	96.5	97.4 93.0		0.338	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	97.5 98.8			0.769
	Ammonia-N	97.1	96.7 101			2.89
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.7	98.7 98.0			0.399
	Kjeldahl Nitrogen	101	98.0 93.1			4.04
	Kjeldahl Nitrogen	107	99.5 103			3.34
EPA 353.2 Rev. 2.0	NO2NO3-N	103	107 108			0.844
	NO2NO3-N	107	107 108			0.930
	NO2NO3-N	106	105 105			0.0

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
EPA 365.1 Rev. 2.0	Total-P	100	95.6	96.2		0.540
	Total-P	98.8	102	102		0.440
	Total-P	98.8	98.8	99.1		0.201
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	98.4	99.4		1.01
	O-Phosphate-P	98.4	96.6	97.6		0.766
SM 2120 B	Color (true)				0.439	
	Color (true)				1.51	
SM 2320 B-97	Total Alkalinity	98.6			4.27	
	Total Alkalinity	100			1.86	
SM 2540 C-97	TDS				7.52	
	TDS				4.62	
SM 2540 D-97	TSS				5.71	
SM 4500 F-C-97	Fluoride	92.3	102	103		0.467
	Fluoride	94.1	97.5	98.1		0.487
	Fluoride	98.1	97.2	97.8		0.477
SM 5310 B-00	Organic Carbon	96.0	92.1	92.0		0.0906
	Organic Carbon	95.9	95.0	96.4		1.05

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1979572, 1979575, 1979576, 1979577
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1979609, 1979610, 1979611
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1979609, 1979610, 1979611
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1979572, 1979575, 1979576, 1979577
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1979572, 1979575, 1979576, 1979577
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1979573, 1979578, 1979579, 1979580
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1979573, 1979578, 1979579, 1979580
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1979573, 1979578, 1979579, 1979580
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1979573, 1979578, 1979579, 1979580
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1979574, 1979581, 1979582, 1979583
SM 2120 B / E31780	True Color measured at 450 nm	1979572, 1979575, 1979576, 1979577
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1979572, 1979575, 1979576, 1979577
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1979572, 1979575, 1979576, 1979577
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1979572, 1979575, 1979576, 1979577
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1979572, 1979575, 1979576, 1979577
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1979573, 1979578, 1979579, 1979580

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	03/30/2018			03/30/2018 15:46	Tanya Welborn	1979572, 1979575, 1979576, 1979577
EPA 200.7 Rev. 4.4	03/30/2018	04/02/2018 16:50	Elliott D. Healy	04/03/2018 14:05	Betina Topolski	1979609
	03/30/2018	04/02/2018 16:50	Elliott D. Healy	04/03/2018 14:11	Betina Topolski	1979610
	03/30/2018	04/03/2018 16:50	Elliott D. Healy	04/04/2018 17:40	Betina Topolski	1979611
	03/30/2018	04/03/2018 16:50	Elliott D. Healy	04/04/2018 17:51	Betina Topolski	1979611
EPA 200.8 Rev. 5.4	03/30/2018	04/02/2018 16:50	Elliott D. Healy	04/09/2018 20:27	Nadine Brooks	1979609
	03/30/2018	04/02/2018 16:50	Elliott D. Healy	04/09/2018 20:37	Nadine Brooks	1979610
	03/30/2018	04/03/2018 16:50	Elliott D. Healy	04/12/2018 22:32	Nadine Brooks	1979611
	03/30/2018	04/03/2018 16:50	Elliott D. Healy	05/11/2018 12:58	Robert K Palmer	1979611
	03/30/2018	05/08/2018 11:30	Allison Taylor	05/10/2018 13:55	Robert K Palmer	1979611
	03/30/2018	05/08/2018 11:30	Allison Taylor	05/11/2018 12:58	Robert K Palmer	1979611
EPA 300.0 Rev. 2.1	03/30/2018			04/03/2018 17:43	Lipi Saha	1979575
	03/30/2018			04/03/2018 20:18	Lipi Saha	1979572
	03/30/2018			04/03/2018 20:30	Lipi Saha	1979576
	03/30/2018			04/03/2018 20:42	Lipi Saha	1979577
EPA 350.1 Rev. 2.0	03/30/2018			04/10/2018 10:55	Ping Hua	1979580
	03/30/2018			04/10/2018 11:24	Ping Hua	1979578
	03/30/2018			04/10/2018 11:42	Ping Hua	1979573
	03/30/2018			04/10/2018 11:43	Ping Hua	1979579
EPA 351.2 Rev. 2.0	03/30/2018	04/03/2018 09:50	Adrian Shelby	04/04/2018 15:16	Joseph Suarez	1979573
	03/30/2018	04/03/2018 09:50	Adrian Shelby	04/04/2018 15:27	Joseph Suarez	1979578
	03/30/2018	04/03/2018 09:50	Adrian Shelby	04/04/2018 15:29	Joseph Suarez	1979579
	03/30/2018	04/04/2018 10:15	Adrian Shelby	04/05/2018 10:33	Joseph Suarez	1979580
EPA 353.2 Rev. 2.0	03/30/2018			04/04/2018 12:41	Lauren Bottorf	1979580
	03/30/2018			04/05/2018 14:22	Lauren Bottorf	1979573
	03/30/2018			04/05/2018 14:29	Lauren Bottorf	1979578
	03/30/2018			04/05/2018 14:35	Lauren Bottorf	1979579
EPA 365.1 Rev. 2.0	03/30/2018	04/03/2018 13:07	Sima Feizi	04/04/2018 09:49	Beverly Y. Sanders	1979573
	03/30/2018	04/03/2018 13:07	Sima Feizi	04/04/2018 11:30	Beverly Y. Sanders	1979580
	03/30/2018	04/03/2018 13:07	Sima Feizi	04/04/2018 13:35	Beverly Y. Sanders	1979578
	03/30/2018	04/03/2018 13:07	Sima Feizi	04/04/2018 13:37	Beverly Y. Sanders	1979579
EPA 365.1 Rev. 2.0 dissolved	03/30/2018			03/30/2018 16:04	Megan Treadwell	1979583
	03/30/2018			03/30/2018 16:47	Megan Treadwell	1979574, 1979581
	03/30/2018			03/30/2018 16:48	Megan Treadwell	1979582
SM 2120 B	03/30/2018			03/30/2018 15:01	Tanya Welborn	1979572
	03/30/2018			03/30/2018 15:04	Tanya Welborn	1979575
	03/30/2018			03/30/2018 15:05	Tanya Welborn	1979576
	03/30/2018			03/30/2018 15:06	Tanya Welborn	1979577
SM 2320 B-97	03/30/2018			04/07/2018 06:19	Dale L. Simmons	1979572
	03/30/2018			04/12/2018 12:49	Dale L. Simmons	1979575

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2320 B-97	03/30/2018			04/12/2018 13:03	Dale L. Simmons	1979576
	03/30/2018			04/12/2018 13:55	Dale L. Simmons	1979577
SM 2540 C-97	03/30/2018			04/04/2018 15:34	Yijie Li	1979572, 1979575, 1979576, 1979577
SM 2540 D-97	03/30/2018			04/04/2018 15:34	Yijie Li	1979572, 1979575, 1979576, 1979577
SM 4500 F-C-97	03/30/2018			04/11/2018 00:53	Dale L. Simmons	1979576
	03/30/2018			04/11/2018 01:29	Dale L. Simmons	1979575
	03/30/2018			04/12/2018 13:55	Dale L. Simmons	1979577
	03/30/2018			04/17/2018 18:57	Dale L. Simmons	1979572
SM 5310 B-00	03/30/2018			04/07/2018 04:00	Julia Storbeck	1979573
	03/30/2018			04/07/2018 04:12	Julia Storbeck	1979578
	03/30/2018			04/07/2018 04:24	Julia Storbeck	1979579
	03/30/2018			04/07/2018 14:15	Megan Treadwell	1979580