

Chemical Analysis Report

WQAP-2016-02-23-03

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

Event Description: **Tanyard Branch, Megginnis Arm Run, Quincy Creek and Little River**

Request ID: **RQ-2016-02-22-66**

Customer: **WQAP**

Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
MS #3560
Tallahassee, FL 32399-2400
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Date Certified: 16-MAR-2016 14:02



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: TANYARD BRANCH 100 METERS UPSTREAM OF RALPH STROMS RD

Collection Date/Time: 02/23/2016 09:15

Field ID: G1WA0005

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1774012	EPA 180.1 Rev. 2.0	Turbidity	2.8		NTU	P299185	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P299333	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.003	I	mg N/L	P299164	
	SM 2120 B	Color (true)	23		PCU	P299166	
	SM 2320 B-97	Total Alkalinity	50		mg CaCO3/L	P299822	
	SM 2540 C-97	TDS	92		mg/L	P299757	
	SM 2540 D-97	TSS	3	I	mg/L	P299680	
	SM 4500 F-C-97	Fluoride	0.16		mg F/L	P299391	
1774015	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P299978	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25		mg N/L	P299572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P299499	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P299566	
	SM 5310 B-00	Organic Carbon	4.6		mg C/L	P299378	
1774018	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.021		mg P/L	P299114	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 353.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: QUINCY CREEK 100 METERS UPSTREAM OF RALPH STROMS RD

Collection Date/Time: 02/23/2016 08:40

Field ID: G1WA0018

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1774006	EPA 180.1 Rev. 2.0	Turbidity	10	A	NTU	P299185	
	EPA 300.0 Rev. 2.1	Chloride	5.8		mg Cl/L	P299333	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.004	I	mg N/L	P299164	
	SM 2120 B	Color (true)	47	A	PCU	P299166	
	SM 2320 B-97	Total Alkalinity	24		mg CaCO3/L	P299822	
	SM 2540 C-97	TDS	56		mg/L	P299757	
	SM 2540 D-97	TSS	10	I	mg/L	P299680	
	SM 4500 F-C-97	Fluoride	0.085	I	mg F/L	P299391	
1774008	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P299978	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.31		mg N/L	P299572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P299499	
	EPA 365.1 Rev. 2.0	Total-P	0.088		mg P/L	P299566	
	SM 5310 B-00	Organic Carbon	4.0		mg C/L	P299378	
1774010	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P299114	
1774035	EPA 200.7 Rev. 4.4	Calcium	7.08		mg/L	P299426	
		Iron	1.36E+03		ug/L	P299426	
		Magnesium	2.39		mg/L	P299426	
		Potassium	0.47	I	mg/L	P299426	
		Sodium	3.4		mg/L	P299426	
		Zinc	5.0	U	ug/L	P299426	
	EPA 200.8 Rev. 5.4	Arsenic	0.53		ug/L	P299426	

Field ID: G1WA0018

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1774035	EPA 200.8 Rev. 5.4	Cadmium	0.020	U	ug/L	P299426	
		Chromium	0.88		ug/L	P299426	
		Copper	0.35	I	ug/L	P299426	
		Lead	0.47		ug/L	P299426	
		Nickel	0.26		ug/L	P299426	
		Silver	0.0050	U	ug/L	P299426	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 353.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: QUINCY CREEK UPSTREAM OF SR 12

Collection Date/Time: 02/23/2016 11:30

Field ID: G1WA0019

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1774007	EPA 180.1 Rev. 2.0	Turbidity	8.0		NTU	P299185	
	EPA 300.0 Rev. 2.1	Chloride	5.6		mg Cl/L	P299333	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.003	I	mg N/L	P299164	
	SM 2120 B	Color (true)	42		PCU	P299166	
	SM 2320 B-97	Total Alkalinity	24		mg CaCO3/L	P299822	
	SM 2540 C-97	TDS	41		mg/L	P299757	
	SM 2540 D-97	TSS	6	I	mg/L	P299680	
	SM 4500 F-C-97	Fluoride	0.083	I	mg F/L	P299391	
1774009	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P299978	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33		mg N/L	P299572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P299499	
	EPA 365.1 Rev. 2.0	Total-P	0.072		mg P/L	P299566	
	SM 5310 B-00	Organic Carbon	3.7		mg C/L	P299378	
1774011	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.018		mg P/L	P299114	
1774036	EPA 200.7 Rev. 4.4	Calcium	6.96		mg/L	P299426	
		Iron	1.12E+03		ug/L	P299426	
		Magnesium	2.37		mg/L	P299426	
		Potassium	0.47	I	mg/L	P299426	
		Sodium	3.3		mg/L	P299426	
		Zinc	5.0	U	ug/L	P299426	
	EPA 200.8 Rev. 5.4	Arsenic	0.47		ug/L	P299426	
		Cadmium	0.020	U	ug/L	P299426	
		Chromium	0.67		ug/L	P299426	
		Copper	0.31	I	ug/L	P299426	
		Lead	0.34		ug/L	P299426	
		Nickel	0.19	I	ug/L	P299426	
		Silver	0.0050	U	ug/L	P299426	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 353.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: LITTLE RIVER 100 METERS UPSTREAM OF SR

Collection Date/Time: 02/23/2016 12:05

Field ID: G1WA0020

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1774013	EPA 180.1 Rev. 2.0	Turbidity	15		NTU	P299185	
	EPA 300.0 Rev. 2.1	Chloride	7.0		mg Cl/L	P299333	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.035		mg N/L	P299164	
	SM 2120 B	Color (true)	82		PCU	P299166	
	SM 2320 B-97	Total Alkalinity	15		mg CaCO3/L	P299822	
	SM 2540 C-97	TDS	68		mg/L	P299757	
	SM 2540 D-97	TSS	8	I	mg/L	P299680	
	SM 4500 F-C-97	Fluoride	0.088	I	mg F/L	P299391	
1774016	EPA 350.1 Rev. 2.0	Ammonia-N	0.10		mg N/L	P299978	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P299572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	2.3		mg N/L	P299500	
	EPA 365.1 Rev. 2.0	Total-P	0.085		mg P/L	P299566	
	SM 5310 B-00	Organic Carbon	6.3		mg C/L	P299378	
1774019	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.022		mg P/L	P299114	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Sample Location: MEGGINNS ARM RUN AR MERIDIAN WOODS DRIVEWAY **Collection Date/Time: 02/23/2016 13:30**

Field ID: G1WA0009

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1774014	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P299185	
	EPA 300.0 Rev. 2.1	Chloride	9.3		mg Cl/L	P299333	
	EPA 353.2 Rev. 2.0	Nitrite-N	0.002	U	mg N/L	P299168	
	SM 2120 B	Color (true)	4.8	I	PCU	P299166	
	SM 2320 B-97	Total Alkalinity	43		mg CaCO3/L	P299822	
	SM 2540 C-97	TDS	65		mg/L	P299757	
	SM 2540 D-97	TSS	2	U	mg/L	P299680	
	SM 4500 F-C-97	Fluoride	0.096	I	mg F/L	P299391	
1774017	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P299978	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.11	I	mg N/L	P299572	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.41		mg N/L	P299500	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P299566	
	SM 5310 B-00	Organic Carbon	1.2		mg C/L	P299378	
1774020	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P299114	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P299185

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: P299426

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: P299426

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P299333

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P299978

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299572

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299164

Component	Result	Code	Units
Nitrite-N	0.003	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299168

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299499

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299500

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299566

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P299114

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

Reference Method: SM 2120 B
Batch ID: P299166

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P299822

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

Reference Method: SM 2540 C-97
Batch ID: P299757

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P299680

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P299391

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Method Blank Results

Reference Method: SM 5310 B-00
Batch ID: P299378

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: P299426

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	104		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	104		P	85 - 115
Sodium	105		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P299426

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	96.2		P	85 - 115
Cadmium	95.9		P	85 - 115
Chromium	99.7		P	85 - 115
Copper	95.9		P	85 - 115
Lead	92.8		P	85 - 115
Nickel	97.1		P	85 - 115
Silver	96.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P299333

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P299978

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299572

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299164

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299168

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Nitrite-N	91.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299499

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: P299500

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: P299566

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P299114

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

Reference Method: SM 2320 B-97
Batch ID: P299822

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P299391

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.8		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P299378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	101		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P299426

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: P299426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1774309	Calcium	101		P	80 - 120
1774309	Iron	101	104	P/P	80 - 120
1774309	Magnesium	103		P	80 - 120
1774309	Potassium	101	103	P/P	80 - 120
1774309	Sodium	104		P	80 - 120
1774309	Zinc	99.0	101	P/P	80 - 120
1774761	Calcium	104		P	80 - 120
1774761	Iron	101		P	80 - 120
1774761	Magnesium	104		P	80 - 120
1774761	Potassium	103		P	80 - 120
1774761	Sodium	101		P	80 - 120
1774761	Zinc	98.2		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P299426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1774309	Arsenic	97.3	98.4	P/P	80 - 120
1774309	Cadmium	97.4	100	P/P	80 - 120
1774309	Chromium	96.3	97.0	P/P	80 - 120
1774309	Copper	92.0	93.3	P/P	80 - 120
1774309	Lead	92.3	94.7	P/P	80 - 120
1774309	Nickel	92.7	94.4	P/P	80 - 120
1774309	Silver	94.4	95.7	P/P	80 - 120
1774761	Arsenic	95.4		P	80 - 120
1774761	Cadmium	96.0		P	80 - 120
1774761	Chromium	95.2		P	80 - 120
1774761	Copper	87.9		P	80 - 120
1774761	Lead	91.1		P	80 - 120
1774761	Nickel	90.8		P	80 - 120
1774761	Silver	94.6		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P299333

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1774103	Chloride	103		P	90 - 110
1774104	Chloride	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P299978

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1774015	Ammonia-N	96.8	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P299572

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1773989	Kjeldahl Nitrogen	95.6	92.4	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299164

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1774006	Nitrite-N	95.8	93.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299168

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1774014	Nitrite-N	95.7	94.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299500

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1774106	NO2NO3-N	107	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299566

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1773837	Total-P	98.6	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P299114

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1774010	O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P299391

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1774012	Fluoride	96.0	96.7	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P299378

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1773697	Organic Carbon	102	102	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P299185

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774006	Turbidity	0.976	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P299426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774309	Calcium	2.48	Spike	P	0 - 20
1774309	Iron	2.43	Spike	P	0 - 20
1774309	Magnesium	4.19	Spike	P	0 - 20
1774309	Potassium	0.945	Spike	P	0 - 20
1774309	Sodium	0.509	Spike	P	0 - 20
1774309	Zinc	2.10	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P299426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774309	Arsenic	1.12	Spike	P	0 - 20
1774309	Cadmium	2.80	Spike	P	0 - 20
1774309	Chromium	0.652	Spike	P	0 - 20
1774309	Copper	1.33	Spike	P	0 - 20
1774309	Lead	2.46	Spike	P	0 - 20
1774309	Nickel	1.82	Spike	P	0 - 20
1774309	Silver	1.35	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P299333

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774103	Chloride	0.107	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P299978

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774015	Ammonia-N	0.528	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P299572

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1773989	Kjeldahl Nitrogen	3.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299164

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774006	Nitrite-N	1.98	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299168

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774014	Nitrite-N	1.05	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299499

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1773837	NO2NO3-N	0.665	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P299500

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774106	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P299566

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1773837	Total-P	2.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P299114

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774010	O-Phosphate-P	1.17	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P299166

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774006	Color (true)	1.55	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P299822

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1773721	Total Alkalinity	1.14	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P299757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774104	TDS	3.51	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P299391

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1774012	Fluoride	0.473	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P299378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1773697	Organic Carbon	0.175	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: A67740
Included Lab Sample IDs: 1774006, 1774007, 1774012, 1774013, 1774014

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A67769
Included Lab Sample IDs: 1774010, 1774011, 1774018, 1774019, 1774020

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	98.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A67784
Included Lab Sample IDs: 1774006, 1774007, 1774012, 1774013

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

Reference Method: SM 2120 B
Run ID: A67787
Included Lab Sample IDs: 1774006, 1774007, 1774012, 1774013, 1774014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.2	99.7	P/P	85 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A67788
Included Lab Sample IDs: 1774014

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A67802

Included Lab Sample IDs: 1774006, 1774007, 1774012, 1774013, 1774014

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

Reference Method: SM 5310 B-00

Run ID: A67869

Included Lab Sample IDs: 1774008, 1774009, 1774015, 1774016, 1774017

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.6	99.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A67872

Included Lab Sample IDs: 1774006, 1774007, 1774012, 1774013, 1774014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.6	99.5	P/P	90 - 110
Fluoride	99.5	99.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A67914

Included Lab Sample IDs: 1774008, 1774009, 1774015, 1774016, 1774017

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A67966

Included Lab Sample IDs: 1774035, 1774036

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	100	P/P	90 - 110
Iron	99.7	101	P/P	90 - 110
Magnesium	101	102	P/P	90 - 110
Potassium	101	102	P/P	90 - 110
Sodium	104	102	P/P	90 - 110
Zinc	100	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A67996

Included Lab Sample IDs: 1774008, 1774009, 1774016

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A67998

Included Lab Sample IDs: 1774035, 1774036

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
 Run ID: A67998
 Included Lab Sample IDs: 1774035, 1774036

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	101	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	103	104	P/P	90 - 110
Copper	102	101	P/P	90 - 110
Lead	99.3	101	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Silver	98.2	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Run ID: A68000
 Included Lab Sample IDs: 1774008, 1774009, 1774015, 1774016, 1774017

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	98.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Run ID: A68003
 Included Lab Sample IDs: 1774015, 1774017

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

Reference Method: SM 2320 B-97
 Run ID: A68022
 Included Lab Sample IDs: 1774006, 1774007, 1774012, 1774013, 1774014

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

Reference Method: EPA 350.1 Rev. 2.0
 Run ID: A68091
 Included Lab Sample IDs: 1774008, 1774009, 1774015, 1774016, 1774017

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.7	99.5	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					0.976	
EPA 200.7 Rev. 4.4	Calcium	102	101	104			2.48
	Iron	104	101	104	101		2.43
	Magnesium	103	103	104			4.19
	Potassium	104	101	103	103		0.945

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision	MS
			LCS	SMP	MS		
EPA 200.7 Rev. 4.4	Sodium	105	104	101			0.509
	Zinc	101	99.0	101	98.2		2.10
EPA 200.8 Rev. 5.4	Arsenic	96.2	97.3	98.4	95.4		1.12
	Cadmium	95.9	97.4	100	96.0		2.80
	Chromium	99.7	96.3	97.0	95.2		0.652
	Copper	95.9	92.0	93.3	87.9		1.33
	Lead	92.8	92.3	94.7	91.1		2.46
	Nickel	97.1	92.7	94.4	90.8		1.82
	Silver	96.7	94.4	95.7	94.6		1.35
EPA 300.0 Rev. 2.1	Chloride	103	103	104		0.107	
EPA 350.1 Rev. 2.0	Ammonia-N	96.4	96.8	97.5			0.528
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.6	95.6	92.4			3.35
EPA 353.2 Rev. 2.0	Nitrite-N	101	95.8	93.8			1.98
	Nitrite-N	91.2	95.7	94.7			1.05
	NO2NO3-N	102					0.665
	NO2NO3-N	102	107	107			0.0
EPA 365.1 Rev. 2.0	Total-P	99.6	98.6	101			2.01
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	101	102			1.17
SM 2120 B	Color (true)					1.55	
SM 2320 B-97	Total Alkalinity	101				1.14	
SM 2540 C-97	TDS					3.51	
SM 4500 F-C-97	Fluoride	96.8	96.0	96.7			0.473
SM 5310 B-00	Organic Carbon	101	102	102			0.175

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1774006, 1774007, 1774012, 1774013, 1774014
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1774035, 1774036
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1774035, 1774036
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1774006, 1774007, 1774012, 1774013, 1774014
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1774008, 1774009, 1774015, 1774016, 1774017
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1774008, 1774009, 1774015, 1774016, 1774017
EPA 353.2 Rev. 2.0 / E31780	Nitrite in aqueous matrices as mg N/L	1774006, 1774007, 1774012, 1774013, 1774014
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1774008, 1774009, 1774015, 1774016, 1774017
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1774008, 1774009, 1774015, 1774016, 1774017
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1774010, 1774011, 1774018, 1774019, 1774020
SM 2120 B / E31780	True Color measured at 450 nm	1774006, 1774007, 1774012, 1774013, 1774014
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1774006, 1774007, 1774012, 1774013, 1774014
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1774006, 1774007, 1774012, 1774013, 1774014
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1774006, 1774007, 1774012, 1774013, 1774014

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1774006, 1774007, 1774012, 1774013, 1774014
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1774008, 1774009, 1774015, 1774016, 1774017

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	02/23/2016			02/24/2016 15:24	Sima Feizi	1774006, 1774007, 1774012, 1774013, 1774014
EPA 200.7 Rev. 4.4	02/23/2016	02/29/2016	Elliott D. Healy	03/02/2016	Joshua Ayres	1774035, 1774036
EPA 200.8 Rev. 5.4	02/23/2016	02/29/2016	Elliott D. Healy	03/03/2016	Charles J. Peterson	1774035, 1774036
EPA 300.0 Rev. 2.1	02/23/2016			02/25/2016	Ping Hua	1774006, 1774007, 1774012, 1774013, 1774014
EPA 350.1 Rev. 2.0	02/23/2016			03/08/2016	Diana M. Turner	1774008, 1774009, 1774015, 1774016, 1774017
EPA 351.2 Rev. 2.0	02/23/2016	03/02/2016	Christopher Armour	03/04/2016	Rochelle Y Jackson	1774008, 1774009, 1774015, 1774016, 1774017
EPA 353.2 Rev. 2.0	02/23/2016			02/24/2016 10:43	Virginia P. Brown	1774006
	02/23/2016			02/24/2016 10:47	Virginia P. Brown	1774007
	02/23/2016			02/24/2016 10:48	Virginia P. Brown	1774012
	02/23/2016			02/24/2016 10:49	Virginia P. Brown	1774013
	02/23/2016			02/24/2016 12:18	Virginia P. Brown	1774014
	02/23/2016			03/01/2016	Peter D. Kaus	1774008, 1774009, 1774015, 1774016, 1774017
EPA 365.1 Rev. 2.0	02/23/2016	03/02/2016	Christopher Armour	03/03/2016	Lipi Saha	1774015, 1774017
	02/23/2016	03/02/2016	Christopher Armour	03/04/2016	Lipi Saha	1774008, 1774009, 1774016
EPA 365.1 Rev. 2.0 dissolved	02/23/2016			02/23/2016 16:15	Bryan A. Werth	1774010
	02/23/2016			02/23/2016 16:18	Bryan A. Werth	1774011
	02/23/2016			02/23/2016 16:19	Bryan A. Werth	1774018, 1774019
	02/23/2016			02/23/2016 16:20	Bryan A. Werth	1774020
SM 2120 B	02/23/2016			02/24/2016 11:48	Blanca Fach	1774006
	02/23/2016			02/24/2016 11:50	Blanca Fach	1774007, 1774012
	02/23/2016			02/24/2016 11:51	Blanca Fach	1774013
	02/23/2016			02/24/2016 11:52	Blanca Fach	1774014
SM 2320 B-97	02/23/2016			03/04/2016	Dale L. Simmons	1774006, 1774007, 1774012, 1774013, 1774014
SM 2540 C-97	02/23/2016			02/26/2016	Yijie Li	1774006, 1774007, 1774012, 1774013, 1774014
SM 2540 D-97	02/23/2016			02/26/2016	Yijie Li	1774006, 1774007, 1774012, 1774013, 1774014
SM 4500 F-C-97	02/23/2016			02/26/2016	Dale L. Simmons	1774006, 1774007, 1774012, 1774013, 1774014
SM 5310 B-00	02/23/2016			02/26/2016	Sofia Elnemr	1774008, 1774009, 1774015, 1774016, 1774017