

Chemical Analysis Report

WQAP-2016-06-29-02

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

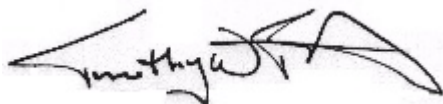
Event Description: **Tanyard Branch, Little River, Quincy Creek and Megginnis Arm Run**
Request ID: **RQ-2016-06-27-12**
Customer: **WQAP**
Project ID: **SMP**

Send Reports to:
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Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 22-JUL-2016 09:33

A handwritten signature in black ink, appearing to read "Timothy W. Fitzpatrick", with a stylized flourish at the end.

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: Quincy Creek 100 meters upstream of Ralph Strong Rd

Collection Date/Time: 06/29/2016 08:45

Field ID: G1WA0018

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1812255	EPA 180.1 Rev. 2.0	Turbidity	17		NTU	P307124	
	EPA 300.0 Rev. 2.1	Chloride	5.6		mg Cl/L	P308021	
	SM 2120 B	Color (true)	33		PCU	P307369	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P307616	
	SM 2540 C-97	TDS	35		mg/L	P307695	
	SM 2540 D-97	TSS	18		mg/L	P307687	
	SM 4500 F-C-97	Fluoride	0.086	I	mg F/L	P307620	
1812257	EPA 350.1 Rev. 2.0	Ammonia-N	0.036		mg N/L	P307418	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39		mg N/L	P307262	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P307254	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P307260	
	SM 5310 B-00	Organic Carbon	4.4		mg C/L	P307476	
1812259	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.046		mg P/L	P307099	
1812275	EPA 200.7 Rev. 4.4	Calcium	5.96		mg/L	P307149	
		Iron	2.28E+03		ug/L	P307149	
		Magnesium	2.12		mg/L	P307149	
		Potassium	0.72	I	mg/L	P307149	
		Sodium	3.4		mg/L	P307149	
		Zinc	5.0	U	ug/L	P307149	
	EPA 200.8 Rev. 5.4	Arsenic	1.09		ug/L	P307149	
		Cadmium	0.020	U	ug/L	P307149	
		Chromium	1.27		ug/L	P307149	
		Copper	0.41		ug/L	P307149	
		Lead	0.82		ug/L	P308038	
		Nickel	0.35		ug/L	P307149	
		Silver	0.0050	U	ug/L	P307149	

Ref. Method and Comment:

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

EPA 200.8 Rev. 5.4: The lead result was confirmed on 07/08/2016.

Sample Location: Quincy Creek upstream of SR 12

Collection Date/Time: 06/29/2016 09:50

Field ID: G1WA0019

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1812256	EPA 180.1 Rev. 2.0	Turbidity	12		NTU	P307124	
	EPA 300.0 Rev. 2.1	Chloride	5.4		mg Cl/L	P308025	
	SM 2120 B	Color (true)	57	A	PCU	P307368	
	SM 2320 B-97	Total Alkalinity	16		mg CaCO3/L	P307616	
	SM 2540 C-97	TDS	41		mg/L	P307695	
	SM 2540 D-97	TSS	12		mg/L	P307687	
	SM 4500 F-C-97	Fluoride	0.082	I	mg F/L	P307620	
1812258	EPA 350.1 Rev. 2.0	Ammonia-N	0.033		mg N/L	P307419	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.33		mg N/L	P307262	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.16		mg N/L	P307254	

Field ID: G1WA0019

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1812258	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P307260	
	SM 5310 B-00	Organic Carbon	4.2		mg C/L	P307805	
1812260	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.040		mg P/L	P307099	
1812276	EPA 200.7 Rev. 4.4	Calcium	5.64		mg/L	P307149	
		Iron	1.82E+03		ug/L	P307149	
		Magnesium	2.00		mg/L	P307149	
		Potassium	0.65	I	mg/L	P307149	
		Sodium	3.2		mg/L	P307149	
		Zinc	5.0	U	ug/L	P307149	
	EPA 200.8 Rev. 5.4	Arsenic	0.90		ug/L	P307149	
		Cadmium	0.020	U	ug/L	P307149	
		Chromium	0.82		ug/L	P307149	
		Copper	0.50		ug/L	P307149	
		Lead	0.51		ug/L	P307149	
		Nickel	0.27		ug/L	P307149	
		Silver	0.0050	U	ug/L	P307149	

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: Tanyard Branch 100 meters upstream of Ralph Strong Rd **Collection Date/Time: 06/29/2016 09:15**

Field ID: G1WA0005

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1812261	EPA 180.1 Rev. 2.0	Turbidity	13		NTU	P307124	
	EPA 300.0 Rev. 2.1	Chloride	19		mg Cl/L	P308021	
	SM 2120 B	Color (true)	71		PCU	P307368	
	SM 2320 B-97	Total Alkalinity	53		mg CaCO3/L	P307616	
	SM 2540 C-97	TDS	116	A	mg/L	P307695	
	SM 2540 D-97	TSS	5	I	mg/L	P307687	
	SM 4500 F-C-97	Fluoride	0.19		mg F/L	P307620	
1812264	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P307419	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.43		mg N/L	P307262	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.29		mg N/L	P307254	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P307260	
	SM 5310 B-00	Organic Carbon	5.8		mg C/L	P307805	
1812267	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.076		mg P/L	P307099	

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: Little River 100 meters upstream of SR 12 **Collection Date/Time: 06/29/2016 10:40**

Field ID: G1WA0020

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1812262	EPA 180.1 Rev. 2.0	Turbidity	19		NTU	P307124	
	EPA 300.0 Rev. 2.1	Chloride	5.4		mg Cl/L	P308025	

Field ID: G1WA0020

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1812262	SM 2120 B	Color (true)	46		PCU	P307369	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P307616	
	SM 2540 C-97	TDS	51		mg/L	P307695	
	SM 2540 D-97	TSS	10		mg/L	P307687	
	SM 4500 F-C-97	Fluoride	0.093	I	mg F/L	P307620	
1812265	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P307419	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P307262	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.55		mg N/L	P307254	
	EPA 365.1 Rev. 2.0	Total-P	0.099		mg P/L	P307260	
	SM 5310 B-00	Organic Carbon	6.3		mg C/L	P307805	
1812268	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.041		mg P/L	P307099	

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: Megginnis Arm Run Downstream of Shores

Collection Date/Time: 06/29/2016 12:00

Field ID: G1WA0033

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1812263	EPA 180.1 Rev. 2.0	Turbidity	2.6		NTU	P307124	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P308025	
	SM 2120 B	Color (true)	23		PCU	P307368	
	SM 2320 B-97	Total Alkalinity	73	A	mg CaCO3/L	P307616	
	SM 2540 C-97	TDS	107	A	mg/L	P307696	
	SM 2540 D-97	TSS	3	I	mg/L	P307687	
	SM 4500 F-C-97	Fluoride	0.12		mg F/L	P307620	
1812266	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P307419	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P307262	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.15		mg N/L	P307256	
	EPA 365.1 Rev. 2.0	Total-P	0.092		mg P/L	P307260	
	SM 5310 B-00	Organic Carbon	4.9		mg C/L	P307805	
1812269	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.057		mg P/L	P307099	

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: P307124

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P307149

Component	Result	Code	Units
Calcium	0.075	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P307149

Component	Result	Code	Units
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: P307149

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 200.8 Rev. 5.4
Batch ID: P308038

Component	Result	Code	Units
Lead	0.050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308021

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308025

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307418

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307419

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307262

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307262

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307254

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307256

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307260

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307099

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

Reference Method: SM 2120 B
Batch ID: P307368

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P307369

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P307616

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

Reference Method: SM 2540 C-97
Batch ID: P307695

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P307696

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P307687

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P307620

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P307476

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

Reference Method: SM 5310 B-00
Batch ID: P307805

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: P307149

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	103		P	85 - 115
Iron	109		P	85 - 115
Magnesium	112		P	85 - 115
Potassium	101		P	85 - 115
Sodium	98.8		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P307149

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	100		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	99.2		P	85 - 115
Copper	97.8		P	85 - 115
Lead	98.0		P	85 - 115
Nickel	99.6		P	85 - 115
Silver	96.6		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308038

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Lead	96.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.4		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308025

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307418

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307419

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307262

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307254

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: P307256

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307260

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307099

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

Reference Method: SM 2320 B-97
Batch ID: P307616

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P307620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P307476

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

Reference Method: SM 5310 B-00
Batch ID: P307805

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P307149

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812091	Calcium	106		P	80 - 120
1812091	Iron	107	113	P/P	80 - 120
1812091	Magnesium	108	115	P/P	80 - 120
1812091	Potassium	95.7	100	P/P	80 - 120
1812091	Sodium	101		P	80 - 120
1812091	Zinc	104	106	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P307149

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812091	Arsenic	103	102	P/P	80 - 120
1812091	Cadmium	102	99.3	P/P	80 - 120
1812091	Chromium	102	100	P/P	80 - 120
1812091	Copper	99.9	100	P/P	80 - 120
1812091	Lead	100	99.5	P/P	80 - 120
1812091	Nickel	100	98.4	P/P	80 - 120
1812091	Silver	98.2	97.7	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308038

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1815457	Lead	94.9	96.6	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812319	Chloride	101		P	90 - 110
1812354	Chloride	99.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308025

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812263	Chloride	99.2		P	90 - 110
1812688	Chloride	99.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307418

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812074	Ammonia-N	98.5	99.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307419

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812265	Ammonia-N	98.1	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812184	Kjeldahl Nitrogen	81.1	89.2	F/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307254

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812257	NO2NO3-N	99.5	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307256

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812266	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307260

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812323	Total-P	101	96.6	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307099

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812260	O-Phosphate-P	96.9	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P307620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812263	Fluoride	99.2	98.6	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P307476

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812049	Organic Carbon	100	102	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P307805

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1812258	Organic Carbon	98.4	99.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P307124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812183	Turbidity	2.23	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P307149

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812091	Calcium	4.32	Spike	P	0 - 20
1812091	Iron	4.38	Spike	P	0 - 20
1812091	Magnesium	3.87	Spike	P	0 - 20
1812091	Potassium	3.09	Spike	P	0 - 20
1812091	Sodium	4.01	Spike	P	0 - 20
1812091	Zinc	2.63	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P307149

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812091	Arsenic	1.28	Spike	P	0 - 20
1812091	Cadmium	2.98	Spike	P	0 - 20
1812091	Chromium	1.51	Spike	P	0 - 20
1812091	Copper	0.212	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P307149

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812091	Lead	0.686	Spike	P	0 - 20
1812091	Nickel	1.89	Spike	P	0 - 20
1812091	Silver	0.509	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P308038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1815457	Lead	1.75	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812319	Chloride	0.136	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308025

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812688	Chloride	0.287	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307418

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812074	Ammonia-N	1.08	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307419

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812265	Ammonia-N	1.01	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307262

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812184	Kjeldahl Nitrogen	7.62	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307254

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307254

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812257	NO2NO3-N	1.43	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307256

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812266	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307260

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812323	Total-P	4.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307099

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812260	O-Phosphate-P	0.802	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P307368

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812256	Color (true)	0.0372	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P307369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811966	Color (true)	3.48	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P307616

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812263	Total Alkalinity	0.0901	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P307695

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812261	TDS	0.858	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P307696

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812263	TDS	5.61	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P307620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812263	Fluoride	0.466	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P307476

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812049	Organic Carbon	0.788	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P307805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1812258	Organic Carbon	1.17	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: A70308
Included Lab Sample IDs: 1812259, 1812260, 1812267, 1812268, 1812269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	100	P/P	90 - 110
O-Phosphate-P	100	97.7	P/P	90 - 110
O-Phosphate-P	101	99.2	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A70310
Included Lab Sample IDs: 1812255, 1812256, 1812261, 1812262, 1812263

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	96.7	95.6	P/P	85 - 115
Color (true)	97.1	96.7	P/P	85 - 115

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A70317

Included Lab Sample IDs: 1812255, 1812256, 1812261, 1812262, 1812263

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A70364

Included Lab Sample IDs: 1812257, 1812258, 1812264, 1812265, 1812266

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A70396

Included Lab Sample IDs: 1812275, 1812276

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	101	101	P/P	90 - 110
Iron	103	105	P/P	90 - 110
Magnesium	101	103	P/P	90 - 110
Potassium	98.5	98.9	P/P	90 - 110
Sodium	98.1	97.8	P/P	90 - 110
Zinc	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A70418

Included Lab Sample IDs: 1812257, 1812258, 1812264, 1812265, 1812266

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.6	P/P	90 - 110
Total-P	99.6	99.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A70419

Included Lab Sample IDs: 1812257, 1812258, 1812264, 1812265, 1812266

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.9	P/P	90 - 110
Ammonia-N	99.6	101	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A70435

Included Lab Sample IDs: 1812257

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A70469

Included Lab Sample IDs: 1812257, 1812258, 1812264, 1812265, 1812266

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.9	92.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A70474

Included Lab Sample IDs: 1812255, 1812256, 1812261, 1812262, 1812263

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

Reference Method: SM 4500 F-C-97

Run ID: A70474

Included Lab Sample IDs: 1812255, 1812256, 1812261, 1812262, 1812263

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A70477

Included Lab Sample IDs: 1812275, 1812276

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	98.9	98.9	P/P	90 - 110
Cadmium	97.9	97.2	P/P	90 - 110
Chromium	99.3	98.8	P/P	90 - 110
Copper	98.0	98.6	P/P	90 - 110
Lead	95.1	93.9	P/P	90 - 110
Nickel	98.4	98.4	P/P	90 - 110
Silver	96.2	95.0	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A70521

Included Lab Sample IDs: 1812258, 1812264, 1812265, 1812266

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	99.6	100	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A70540

Included Lab Sample IDs: 1812255, 1812256, 1812261, 1812262, 1812263

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.6	99.1	P/P	90 - 110
Chloride	98.8	99.4	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A70553

Included Lab Sample IDs: 1812276

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	96.7	96.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A70615

Included Lab Sample IDs: 1812275

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	95.7	95.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

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

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					2.23	
EPA 200.7 Rev. 4.4	Calcium	103	106				4.32
	Iron	109	107	113			4.38
	Magnesium	112	108	115			3.87
	Potassium	101	95.7	100			3.09
	Sodium	98.8	101				4.01
	Zinc	101	104	106			2.63
EPA 200.8 Rev. 5.4	Arsenic	100	103	102			1.28
	Cadmium	98.9	102	99.3			2.98
	Chromium	99.2	102	100			1.51
	Copper	97.8	99.9	100			0.212
	Lead	98.0	100	99.5			0.686
	Lead	96.4	94.9	96.6			1.75
	Nickel	99.6	100	98.4			1.89
	Silver	96.6	98.2	97.7			0.509
EPA 300.0 Rev. 2.1	Chloride	99.4	101	99.6		0.136	
	Chloride	99.1	99.2	99.2		0.287	
EPA 350.1 Rev. 2.0	Ammonia-N	98.9	98.5	99.8			1.08
	Ammonia-N	97.6	98.1	99.5			1.01
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	81.1	89.2			7.62
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.5	102			1.43
	NO2NO3-N	104	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	98.2	101	96.6			4.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	96.9	98.0			0.802
SM 2120 B	Color (true)					0.0372	
	Color (true)					3.48	
SM 2320 B-97	Total Alkalinity	103				0.0901	
SM 2540 C-97	TDS					0.858	
	TDS					5.61	
SM 4500 F-C-97	Fluoride	98.9	99.2	98.6			0.466
SM 5310 B-00	Organic Carbon	99.2	100	102			0.788
	Organic Carbon	98.4	98.4	99.8			1.17

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1812255, 1812256, 1812261, 1812262, 1812263
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1812275, 1812276
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1812275, 1812276
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1812255, 1812256, 1812261, 1812262, 1812263
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1812257, 1812258, 1812264, 1812265, 1812266

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1812257, 1812258, 1812264, 1812265, 1812266
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1812257, 1812258, 1812264, 1812265, 1812266
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1812257, 1812258, 1812264, 1812265, 1812266
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1812259, 1812260, 1812267, 1812268, 1812269
SM 2120 B / E31780	True Color measured at 450 nm	1812255, 1812256, 1812261, 1812262, 1812263
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1812255, 1812256, 1812261, 1812262, 1812263
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1812255, 1812256, 1812261, 1812262, 1812263
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1812255, 1812256, 1812261, 1812262, 1812263
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1812255, 1812256, 1812261, 1812262, 1812263
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1812257, 1812258, 1812264, 1812265, 1812266

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	06/29/2016			06/29/2016 15:59	Sima Feizi	1812255, 1812256, 1812261, 1812262, 1812263
EPA 200.7 Rev. 4.4	06/29/2016	06/30/2016	Elliott D. Healy	07/05/2016	Joshua Ayres	1812275, 1812276
EPA 200.8 Rev. 5.4	06/29/2016	06/30/2016	Elliott D. Healy	07/08/2016	Charles J. Peterson	1812275, 1812276
	06/29/2016	06/30/2016	Elliott D. Healy	07/13/2016	Charles J. Peterson	1812276
	06/29/2016	07/15/2016	Elliott D. Healy	07/18/2016	Charles J. Peterson	1812275
EPA 300.0 Rev. 2.1	06/29/2016			07/13/2016	Ping Hua	1812255, 1812261
	06/29/2016			07/14/2016	Ping Hua	1812256, 1812262, 1812263
EPA 350.1 Rev. 2.0	06/29/2016			07/06/2016	Diana M. Turner	1812257, 1812258, 1812264, 1812265, 1812266
EPA 351.2 Rev. 2.0	06/29/2016	07/05/2016	Sofia Elnemr	07/07/2016	Christopher Armour	1812257, 1812258, 1812264, 1812265, 1812266
EPA 353.2 Rev. 2.0	06/29/2016			07/01/2016	Beverly Y. Sanders	1812257, 1812258, 1812264, 1812265, 1812266
EPA 365.1 Rev. 2.0	06/29/2016	07/05/2016	Vijayalakshmi Reddy	07/06/2016	Lipi Saha	1812257, 1812258, 1812264, 1812265, 1812266
EPA 365.1 Rev. 2.0 dissolved	06/29/2016			06/29/2016 15:08	Julia Storbeck	1812260
	06/29/2016			06/29/2016 15:59	Julia Storbeck	1812259, 1812267
	06/29/2016			06/29/2016 16:00	Julia Storbeck	1812268
	06/29/2016			06/29/2016 16:05	Julia Storbeck	1812269
SM 2120 B	06/29/2016			06/29/2016 16:45	Rochelle Y Jackson	1812256
	06/29/2016			06/29/2016 16:46	Rochelle Y Jackson	1812261
	06/29/2016			06/29/2016 16:47	Rochelle Y Jackson	1812263
	06/29/2016			06/29/2016 16:55	Rochelle Y Jackson	1812255
	06/29/2016			06/29/2016 16:56	Rochelle Y Jackson	1812262
SM 2320 B-97	06/29/2016			07/08/2016	Dale L. Simmons	1812255, 1812256, 1812261, 1812262, 1812263
SM 2540 C-97	06/29/2016			07/01/2016	Yijie Li	1812255, 1812256, 1812261, 1812262, 1812263
SM 2540 D-97	06/29/2016			07/01/2016	Yijie Li	1812255, 1812256, 1812261, 1812262, 1812263
SM 4500 F-C-97	06/29/2016			07/08/2016	Dale L. Simmons	1812255, 1812256, 1812261, 1812262, 1812263
SM 5310 B-00	06/29/2016			07/07/2016	Sofia Elnemr	1812257
	06/29/2016			07/11/2016	Sofia Elnemr	1812258, 1812264, 1812265, 1812266