

Chemical Analysis Report

WQAP-2016-07-06-04

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

Event Description: **Ochlockonee River**
Request ID: **RQ-2016-07-04-30**
Customer: **WQAP**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
MS #3560
Tallahassee, FL 32399-2400
Attn: Katrina Sanders

For additional information please contact
Timothy W. Fitzpatrick
Liang-Tsair Lin, Ph.D.
Colin Wright, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 27-JUL-2016 14:44

A handwritten signature in black ink, appearing to read "Liang Lin", is written on a light-colored, textured background.

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: Ocklockonee River Downstream of Whitehead Lake Campground **Collection Date/Time: 07/06/2016 09:45**

Field ID: G1WA0029

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1813873	EPA 180.1 Rev. 2.0	Turbidity	6.2	A	NTU	P307530	
	EPA 300.0 Rev. 2.1	Chloride	4.4		mg Cl/L	P308026	
	SM 2120 B	Color (true)	240		PCU	P307504	
	SM 2320 B-97	Total Alkalinity	12		mg CaCO3/L	P307629	
	SM 2540 C-97	TDS	51		mg/L	P308086	
	SM 2540 D-97	TSS	8	I	mg/L	P308074	
	SM 4500 F-C-97	Fluoride	0.060	I	mg F/L	P307633	
1813877	EPA 350.1 Rev. 2.0	Ammonia-N	0.055		mg N/L	P307668	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.73		mg N/L	P307701	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.12		mg N/L	P307649	
	EPA 365.1 Rev. 2.0	Total-P	0.069		mg P/L	P307658	
	SM 5310 B-00	Organic Carbon	19		mg C/L	P308047	
1813881	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.028		mg P/L	P307497	
1813889	EPA 200.7 Rev. 4.4	Calcium	6.38		mg/L	P307730	
		Iron	1.12E+03		ug/L	P307730	
		Magnesium	1.59		mg/L	P307730	
		Potassium	1.1	I	mg/L	P307730	
		Sodium	3.2		mg/L	P307730	
		Zinc	5.0	U	ug/L	P307730	
	EPA 200.8 Rev. 5.4	Arsenic	0.92		ug/L	P307730	
		Cadmium	0.020	U	ug/L	P307730	
		Chromium	0.57		ug/L	P307730	
		Copper	0.44		ug/L	P307730	
		Lead	0.42		ug/L	P307730	
		Nickel	0.31		ug/L	P307730	
		Silver	0.0050	U	ug/L	P307730	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: The potassium matrix spike recovery data for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

Sample Location: Ocklockonee River Upstream of Telogia Creek **Collection Date/Time: 07/06/2016 11:05**

Field ID: G1WA0030

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1813874	EPA 180.1 Rev. 2.0	Turbidity	3.6		NTU	P307530	
	EPA 300.0 Rev. 2.1	Chloride	5.5		mg Cl/L	P308026	
	SM 2120 B	Color (true)	150		PCU	P307504	
	SM 2320 B-97	Total Alkalinity	22		mg CaCO3/L	P307629	
	SM 2540 C-97	TDS	52		mg/L	P308086	
	SM 2540 D-97	TSS	6	I	mg/L	P308074	
	SM 4500 F-C-97	Fluoride	0.086	I	mg F/L	P307633	
1813878	EPA 350.1 Rev. 2.0	Ammonia-N	0.16		mg N/L	P307668	

Field ID: G1WA0030

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1813878	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.80		mg N/L	P307701	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P307648	
	EPA 365.1 Rev. 2.0	Total-P	0.073		mg P/L	P307658	
	SM 5310 B-00	Organic Carbon	14		mg C/L	P308047	
1813882	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.032		mg P/L	P307497	
1813890	EPA 200.7 Rev. 4.4	Calcium	7.70		mg/L	P307730	
		Iron	1.24E+03		ug/L	P307730	
		Magnesium	2.27		mg/L	P307730	
		Potassium	1.4		mg/L	P307730	
		Sodium	3.9		mg/L	P307730	
		Zinc	5.0	U	ug/L	P307730	
	EPA 200.8 Rev. 5.4	Arsenic	1.24		ug/L	P307730	
		Cadmium	0.020	U	ug/L	P307730	
		Chromium	0.33		ug/L	P307730	
		Copper	0.43		ug/L	P307730	
		Lead	0.17	I	ug/L	P307730	
		Nickel	0.21		ug/L	P307730	
		Silver	0.0050	U	ug/L	P307730	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: The potassium matrix spike recovery data for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

Sample Location: Ocklockonee River Upstream of SR 12

Collection Date/Time: 07/06/2016 13:50

Field ID: G1WA0038

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1813875	EPA 180.1 Rev. 2.0	Turbidity	15		NTU	P307530	
	EPA 300.0 Rev. 2.1	Chloride	8.5		mg Cl/L	P308026	
	SM 2120 B	Color (true)	87		PCU	P307508	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P307629	
	SM 2540 C-97	TDS	71		mg/L	P308086	
	SM 2540 D-97	TSS	12		mg/L	P308074	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P307633	
1813879	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P307668	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.63		mg N/L	P307701	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.30		mg N/L	P307649	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P307658	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P308047	
1813883	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.069		mg P/L	P307497	
1813891	EPA 200.7 Rev. 4.4	Calcium	6.44		mg/L	P307730	
		Iron	1.55E+03		ug/L	P307730	
		Magnesium	3.20		mg/L	P307730	
		Potassium	2.6		mg/L	P307730	
		Sodium	6.1		mg/L	P307730	

Field ID: G1WA0038

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1813891	EPA 200.7 Rev. 4.4	Zinc	5.0	U	ug/L	P307730	
	EPA 200.8 Rev. 5.4	Arsenic	1.51		ug/L	P307730	
		Cadmium	0.020	U	ug/L	P307730	
		Chromium	1.07		ug/L	P307730	
		Copper	0.99		ug/L	P307730	
		Lead	0.75		ug/L	P307730	
		Nickel	0.54		ug/L	P307730	
		Silver	0.0050	U	ug/L	P307730	

Ref. Method and Comment:

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

EPA 350.1 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: The potassium matrix spike recovery data for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 07/25/2016.

Sample Location: Ocklockonee River 300m Upstream of SR 12 Collection Date/Time: 07/06/2016 14:05

Field ID: G1WA0042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1813876	EPA 180.1 Rev. 2.0	Turbidity	15		NTU	P307530	
	EPA 300.0 Rev. 2.1	Chloride	8.5		mg Cl/L	P308026	
	SM 2120 B	Color (true)	88		PCU	P307508	
	SM 2320 B-97	Total Alkalinity	17		mg CaCO3/L	P307629	
	SM 2540 C-97	TDS	64		mg/L	P308086	
	SM 2540 D-97	TSS	11		mg/L	P308074	
	SM 4500 F-C-97	Fluoride	0.13		mg F/L	P307633	
1813880	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P307669	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.64		mg N/L	P307701	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.30		mg N/L	P307649	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P307658	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P308047	
1813884	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.069		mg P/L	P307497	
1813892	EPA 200.7 Rev. 4.4	Calcium	6.56		mg/L	P307730	
		Iron	1.57E+03		ug/L	P307730	
		Magnesium	3.19		mg/L	P307730	
		Potassium	2.6		mg/L	P307730	
		Sodium	6.2		mg/L	P307730	
		Zinc	5.0	U	ug/L	P307730	
	EPA 200.8 Rev. 5.4	Arsenic	1.48		ug/L	P307730	
		Cadmium	0.020	U	ug/L	P307730	
		Chromium	1.09		ug/L	P307730	
		Copper	1.03		ug/L	P307730	
		Lead	0.77		ug/L	P307730	
		Nickel	0.48		ug/L	P307730	
		Silver	0.0050	U	ug/L	P307730	

Field ID: G1WA0042

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
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Ref. Method and Comment:

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

EPA 200.7 Rev. 4.4: The potassium matrix spike recovery data for one of two spiked samples are unavailable because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 07/25/2016.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P307530

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P307730

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: P307730

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: P308026

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P307668

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P307669

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307701

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307648

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307649

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307658

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307497

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

Reference Method: SM 2120 B
Batch ID: P307504

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P307508

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P307629

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

Reference Method: SM 2540 C-97
Batch ID: P308086

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 D-97
Batch ID: P308074

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P307633

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P308047

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: P307730

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	105		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	103		P	85 - 115
Sodium	102		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P307730

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	97.1		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	95.5		P	85 - 115
Copper	94.0		P	85 - 115
Lead	96.4		P	85 - 115
Nickel	96.1		P	85 - 115
Silver	97.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308026

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307668

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307669

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307701

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.2		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307648

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307649

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307658

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	94.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307497

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

Reference Method: SM 2320 B-97
Batch ID: P307629

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P307633

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P308047

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P307730

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1814019	Calcium	102		P	80 - 120
1814019	Iron	102	102	P/P	80 - 120
1814019	Magnesium	101		P	80 - 120
1814019	Sodium	101		P	80 - 120
1814019	Zinc	101	100	P/P	80 - 120
1814768	Calcium	103		P	80 - 120
1814768	Iron	103		P	80 - 120
1814768	Magnesium	104		P	80 - 120
1814768	Potassium	96.2		P	80 - 120
1814768	Sodium	102		P	80 - 120
1814768	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P307730

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1814019	Arsenic	100	101	P/P	80 - 120
1814019	Cadmium	99.7	99.3	P/P	80 - 120
1814019	Chromium	94.1	94.9	P/P	80 - 120
1814019	Copper	90.8	91.8	P/P	80 - 120
1814019	Lead	95.9	97.0	P/P	80 - 120
1814019	Nickel	92.8	95.1	P/P	80 - 120
1814019	Silver	95.6	95.8	P/P	80 - 120
1814768	Arsenic	100		P	80 - 120
1814768	Cadmium	102		P	80 - 120
1814768	Chromium	97.5		P	80 - 120
1814768	Copper	91.2		P	80 - 120
1814768	Lead	97.5		P	80 - 120
1814768	Nickel	92.2		P	80 - 120
1814768	Silver	96.5		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308026

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1813608	Chloride	98.7		P	90 - 110
1813649	Chloride	98.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307669

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1813990	Ammonia-N	97.2	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307701

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1813879	Kjeldahl Nitrogen	93.9	92.7	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307648

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1813878	NO2NO3-N	104	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307649

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1813900	NO2NO3-N	102	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307658

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1813880	Total-P	101	95.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307497

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1813881	O-Phosphate-P	96.6	97.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P307633

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1814095	Fluoride	97.3	97.8	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P308047

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1813650	Organic Carbon	96.4	97.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P307530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813873	Turbidity	2.43	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P307730

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1814019	Calcium	0.543	Spike	P	0 - 20
1814019	Iron	0.545	Spike	P	0 - 20
1814019	Magnesium	0.131	Spike	P	0 - 20
1814019	Potassium	0.244	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P307730

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1814019	Sodium	0.358	Spike	P	0 - 20
1814019	Zinc	0.948	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P307730

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1814019	Arsenic	0.264	Spike	P	0 - 20
1814019	Cadmium	0.382	Spike	P	0 - 20
1814019	Chromium	0.848	Spike	P	0 - 20
1814019	Copper	1.00	Spike	P	0 - 20
1814019	Lead	1.13	Spike	P	0 - 20
1814019	Nickel	2.44	Spike	P	0 - 20
1814019	Silver	0.219	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P308026

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813649	Chloride	0.169	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307668

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813753	Ammonia-N	0.0841	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P307669

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813990	Ammonia-N	0.167	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P307701

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813879	Kjeldahl Nitrogen	0.875	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307648

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813878	NO2NO3-N	1.61	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307649

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813900	NO2NO3-N	2.14	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P307658

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813880	Total-P	4.19	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P307497

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813881	O-Phosphate-P	0.961	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P307504

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813987	Color (true)	0.232	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P307508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813989	Color (true)	0.643	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P307629

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1814095	Total Alkalinity	1.90	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P308086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813612	TDS	4.47	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P307633

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1814095	Fluoride	0.477	Spike	P	0 - 3.0

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P308047

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1813650	Organic Carbon	1.16	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: A70438
Included Lab Sample IDs: 1813881, 1813882, 1813883, 1813884

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	99.1	P/P	90 - 110
O-Phosphate-P	99.4	99.8	P/P	90 - 110

Reference Method: SM 2120 B
Run ID: A70439
Included Lab Sample IDs: 1813873, 1813874, 1813875, 1813876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	94.2	94.2	P/P	90 - 115
Color (true)	96.2	91.8	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A70445
Included Lab Sample IDs: 1813873, 1813874, 1813875, 1813876

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

Reference Method: SM 2320 B-97
Run ID: A70476
Included Lab Sample IDs: 1813873, 1813874, 1813875, 1813876

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: A70476
Included Lab Sample IDs: 1813873, 1813874, 1813875, 1813876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A70479
Included Lab Sample IDs: 1813877, 1813878, 1813879, 1813880

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A70479

Included Lab Sample IDs: 1813877, 1813878, 1813879, 1813880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A70485

Included Lab Sample IDs: 1813877, 1813878, 1813879, 1813880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.2	99.5	P/P	90 - 110
Ammonia-N	99.5	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A70494

Included Lab Sample IDs: 1813877, 1813878, 1813879, 1813880

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A70537

Included Lab Sample IDs: 1813877, 1813878, 1813879, 1813880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.4	97.4	P/P	90 - 110
Kjeldahl Nitrogen	97.4	99.8	P/P	90 - 110
Kjeldahl Nitrogen	99.8	99.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A70538

Included Lab Sample IDs: 1813889, 1813890, 1813891, 1813892

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	99.5	102	P/P	90 - 110
Iron	99.8	100	P/P	90 - 110
Magnesium	101	102	P/P	90 - 110
Potassium	99.2	101	P/P	90 - 110
Sodium	99.7	101	P/P	90 - 110
Zinc	99.1	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A70540

Included Lab Sample IDs: 1813873, 1813874, 1813875, 1813876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.9	99.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A70553

Included Lab Sample IDs: 1813889, 1813890, 1813891, 1813892

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: A70553

Included Lab Sample IDs: 1813889, 1813890, 1813891, 1813892

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	98.3	98.9	P/P	90 - 110
Lead	95.9	95.3	P/P	90 - 110
Silver	96.7	96.5	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A70583

Included Lab Sample IDs: 1813877, 1813878, 1813879, 1813880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.9	98.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A70599

Included Lab Sample IDs: 1813889, 1813890, 1813891, 1813892

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	96.2	94.5	P/P	90 - 110
Chromium	94.6	95.2	P/P	90 - 110
Copper	95.4	94.4	P/P	90 - 110
Nickel	95.8	94.5	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			LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						2.43	
EPA 200.7 Rev. 4.4	Calcium	102	102	103				0.543
	Iron	105	102	102	103			0.545
	Magnesium	104	101	104				0.131
	Potassium	103	96.2					0.244
	Sodium	102	101	102				0.358
	Zinc	100	101	100	101			0.948
EPA 200.8 Rev. 5.4	Arsenic	97.1	100	101	100			0.264
	Cadmium	100	99.7	99.3	102			0.382
	Chromium	95.5	94.1	94.9	97.5			0.848
	Copper	94.0	90.8	91.8	91.2			1.00
	Lead	96.4	95.9	97.0	97.5			1.13
	Nickel	96.1	92.8	95.1	92.2			2.44
	Silver	97.9	95.6	95.8	96.5			0.219
EPA 300.0 Rev. 2.1	Chloride	99.5	98.3	98.7			0.169	
EPA 350.1 Rev. 2.0	Ammonia-N	97.5						0.0841
	Ammonia-N	98.5	97.2	97.0				0.167
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.2	93.9	92.7				0.875
EPA 353.2 Rev. 2.0	NO2NO3-N	104	104	106				1.61
	NO2NO3-N	106	102	105				2.14

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision	
					LCS	MS
EPA 365.1 Rev. 2.0	Total-P	94.8	101	95.0		4.19
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	96.6	97.8		0.961
SM 2120 B	Color (true)				0.232	
	Color (true)				0.643	
SM 2320 B-97	Total Alkalinity	104			1.90	
SM 2540 C-97	TDS				4.47	
SM 4500 F-C-97	Fluoride	99.0	97.3	97.8		0.477
SM 5310 B-00	Organic Carbon	100	96.4	97.6		1.16

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1813873, 1813874, 1813875, 1813876
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1813889, 1813890, 1813891, 1813892
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1813889, 1813890, 1813891, 1813892
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1813873, 1813874, 1813875, 1813876
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1813877, 1813878, 1813879, 1813880
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1813877, 1813878, 1813879, 1813880
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1813877, 1813878, 1813879, 1813880
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1813877, 1813878, 1813879, 1813880
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1813881, 1813882, 1813883, 1813884
SM 2120 B / E31780	True Color measured at 450 nm	1813873, 1813874, 1813875, 1813876
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1813873, 1813874, 1813875, 1813876
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1813873, 1813874, 1813875, 1813876
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1813873, 1813874, 1813875, 1813876
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1813873, 1813874, 1813875, 1813876
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1813877, 1813878, 1813879, 1813880

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	07/06/2016			07/07/2016 15:16	Sima Feizi	1813873, 1813874, 1813875, 1813876
EPA 200.7 Rev. 4.4	07/06/2016	07/12/2016	Elliott D. Healy	07/13/2016	Joshua Ayres	1813889, 1813890, 1813891, 1813892
EPA 200.8 Rev. 5.4	07/06/2016	07/12/2016	Elliott D. Healy	07/13/2016	Charles J. Peterson	1813889, 1813890, 1813891, 1813892
	07/06/2016	07/12/2016	Elliott D. Healy	07/15/2016	Charles J. Peterson	1813889, 1813890, 1813891, 1813892
EPA 300.0 Rev. 2.1	07/06/2016			07/15/2016	Ping Hua	1813873, 1813874, 1813875, 1813876
EPA 350.1 Rev. 2.0	07/06/2016			07/11/2016	Diana M. Turner	1813877, 1813878, 1813879, 1813880
EPA 351.2 Rev. 2.0	07/06/2016	07/12/2016	Sofia Elnemr	07/13/2016	Christopher Armour	1813877, 1813878, 1813879, 1813880
EPA 353.2 Rev. 2.0	07/06/2016			07/11/2016	Beverly Y. Sanders	1813877, 1813878, 1813879, 1813880
EPA 365.1 Rev. 2.0	07/06/2016	07/11/2016	Vijayalakshmi Reddy	07/12/2016	Lipi Saha	1813877, 1813878, 1813879, 1813880
EPA 365.1 Rev. 2.0 dissolved	07/06/2016			07/07/2016 14:28	Julia Storbeck	1813881
	07/06/2016			07/07/2016 15:45	Julia Storbeck	1813882
	07/06/2016			07/07/2016 15:46	Julia Storbeck	1813883
	07/06/2016			07/07/2016 15:47	Julia Storbeck	1813884
SM 2120 B	07/06/2016			07/07/2016 17:04	Rochelle Y Jackson	1813874
	07/06/2016			07/07/2016 17:46	Rochelle Y Jackson	1813875
	07/06/2016			07/07/2016 17:47	Rochelle Y Jackson	1813876
	07/06/2016			07/07/2016 17:49	Rochelle Y Jackson	1813873
SM 2320 B-97	07/06/2016			07/09/2016	Dale L. Simmons	1813873, 1813874, 1813875, 1813876
SM 2540 C-97	07/06/2016			07/08/2016	Yijie Li	1813873, 1813874, 1813875, 1813876
SM 2540 D-97	07/06/2016			07/08/2016	Yijie Li	1813873, 1813874, 1813875, 1813876
SM 4500 F-C-97	07/06/2016			07/09/2016	Dale L. Simmons	1813873, 1813874, 1813875, 1813876
SM 5310 B-00	07/06/2016			07/14/2016	Sofia Elnemr	1813877, 1813878, 1813879, 1813880