Chemical Analysis Report

NW-DIST-2017-07-12-01

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

Event Description: **Upper Esc River WBID 10A,B,C**
Request ID: **RQ-2017-07-10-34**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator Date Certified: 02-AUG-2017 13:36

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: Escambia River (BLW Cotton Lake) **Collection Date/Time: 07/11/2017 11:15**

Field ID: G4NW0403 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1912797	EPA 180.1 Rev. 2.0	Turbidity	18		NTU	P328387	
	EPA 300.0 Rev. 2.1	Chloride	4.4		mg Cl/L	P328503	
		Sulfate	5.0		mg SO4/L	P328505	
	SM 2120 B	Color (true)	45		PCU	P328369	
	SM 2320 B-97	Total Alkalinity	27		mg CaCO3/L	P328661	
	SM 2540 C-97	TDS	61		mg/L	P328642	
	SM 2540 D-97	TSS	19		mg/L	P328733	
	SM 4500 F-C-97	Fluoride	0.041	I	mg F/L	P328819	
1912799	EPA 350.1 Rev. 2.0	Ammonia-N	0.032		mg N/L	P328589	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.42		mg N/L	P328615	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P328673	
	EPA 365.1 Rev. 2.0	Total-P	0.045		mg P/L	P328697	
	SM 5310 B-00	Organic Carbon	6.9		mg C/L	P328860	
1912801	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.012		mg P/L	P328385	
1912822	EPA 200.7 Rev. 4.4	Calcium	10.1		mg/L	P328583	
		Iron	2.45E+03		ug/L	P328583	
		Magnesium	1.24		mg/L	P328583	
		Potassium	0.98	I	mg/L	P328583	
		Sodium	4.5		mg/L	P328583	
		Zinc	5.0	U	ug/L	P328583	
	EPA 200.8 Rev. 5.4	Arsenic	1.24		ug/L	P328583	
		Cadmium	0.020	U	ug/L	P328583	
		Chromium	1.5	I	ug/L	P328583	
		Copper	0.67	I	ug/L	P328583	
		Lead	0.64		ug/L	P328583	
		Nickel	1.15		ug/L	P328583	
		Silver	0.010	U	ug/L	P328583	

Ref. Method and Comment:
SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Escambia River (ABV Mitchell Ck) **Collection Date/Time: 07/11/2017 12:15**

Field ID: G4NW0404 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1912798	EPA 180.1 Rev. 2.0	Turbidity	19		NTU	P328387	
	EPA 300.0 Rev. 2.1	Chloride	4.3		mg Cl/L	P328503	
		Sulfate	5.2		mg SO4/L	P328505	
	SM 2120 B	Color (true)	44		PCU	P328369	
	SM 2320 B-97	Total Alkalinity	27		mg CaCO3/L	P328661	
	SM 2540 C-97	TDS	78		mg/L	P328643	RPD
	SM 2540 D-97	TSS	20		mg/L	P328734	
	SM 4500 F-C-97	Fluoride	0.041	I	mg F/L	P328819	
1912800	EPA 350.1 Rev. 2.0	Ammonia-N	0.046		mg N/L	P328719	

Field ID: G4NW0404 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1912800	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P328714	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P328765	
	EPA 365.1 Rev. 2.0	Total-P	0.046		mg P/L	P328697	
	SM 5310 B-00	Organic Carbon	6.7		mg C/L	P328860	
1912802	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.011		mg P/L	P328385	
1912823	EPA 200.7 Rev. 4.4	Calcium	10.1		mg/L	P328583	
		Iron	2.43E+03		ug/L	P328583	
		Magnesium	1.23		mg/L	P328583	
		Potassium	0.93	I	mg/L	P328583	
		Sodium	4.8		mg/L	P328583	
		Zinc	5.0	U	ug/L	P328583	
	EPA 200.8 Rev. 5.4	Arsenic	1.23		ug/L	P328583	
		Cadmium	0.020	U	ug/L	P328583	
		Chromium	1.5	I	ug/L	P328583	
		Copper	0.65	I	ug/L	P328583	
		Lead	0.64		ug/L	P328583	
		Nickel	1.20		ug/L	P328583	
		Silver	0.010	U	ug/L	P328583	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 5310 B-00: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P328387

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P328583

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: P328583

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P328583

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P328503

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P328505

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P328589

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P328719

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P328615

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P328714

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P328673

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P328765

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P328697

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P328385

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

Reference Method: SM 2120 B
Batch ID: P328369

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P328661

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

Reference Method: SM 2540 C-97
Batch ID: P328642

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 C-97
Batch ID: P328643

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P328733

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P328734

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P328819

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: P328860

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: P328583

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	104		P	85 - 115
Magnesium	102		P	85 - 115
Potassium	96.0		P	85 - 115
Sodium	99.9		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P328583

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	102		P	85 - 115
Cadmium	101		P	85 - 115
Chromium	98.4		P	85 - 115
Copper	98.5		P	85 - 115
Lead	95.9		P	85 - 115
Nickel	101		P	85 - 115
Silver	96.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P328503

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P328505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P328589

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P328719

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P328615

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P328714

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P328673

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P328765

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: P328697

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	94.6		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P328385

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.0		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P328661

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P328819

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

Reference Method: SM 5310 B-00
Batch ID: P328860

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P328583

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1913134	Calcium	96.3		P	80 - 120
1913134	Iron	103		P	80 - 120
1913134	Magnesium	97.5		P	80 - 120
1913134	Potassium	96.0		P	80 - 120
1913134	Sodium	98.3		P	80 - 120
1913134	Zinc	98.2		P	80 - 120
1913470	Calcium	98.7		P	80 - 120
1913470	Iron	106	106	P/P	80 - 120
1913470	Magnesium	100		P	80 - 120
1913470	Potassium	95.2	96.4	P/P	80 - 120
1913470	Sodium	99.8		P	80 - 120
1913470	Zinc	97.4	97.6	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P328583

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1913134	Arsenic	103		P	80 - 120
1913134	Cadmium	103		P	80 - 120
1913134	Chromium	97.9		P	80 - 120
1913134	Copper	96.6		P	80 - 120
1913134	Lead	96.6		P	80 - 120
1913134	Nickel	99.8		P	80 - 120
1913134	Silver	97.2		P	80 - 120
1913470	Arsenic	102	102	P/P	80 - 120
1913470	Cadmium	105	105	P/P	80 - 120
1913470	Chromium	96.0	96.4	P/P	80 - 120
1913470	Copper	96.2	96.2	P/P	80 - 120
1913470	Lead	95.0	95.2	P/P	80 - 120
1913470	Nickel	96.9	98.0	P/P	80 - 120
1913470	Silver	96.6	96.7	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P328503

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1912707	Chloride	100		P	90 - 110
1912715	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P328505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1912707	Sulfate	97.0		P	90 - 110
1912715	Sulfate	98.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P328589

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1912767	Ammonia-N	105	102	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P328719

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1912745	Ammonia-N	97.9	94.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P328615

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1912799	Kjeldahl Nitrogen	98.3	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P328714

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1913479	Kjeldahl Nitrogen	99.4	111	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P328673

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1912746	NO2NO3-N	99.9	99.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P328765

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1912683	NO2NO3-N	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P328697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1912800	Total-P	97.5	96.3	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P328819

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1912682	Fluoride	104	99.1	P/P	91 - 105

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P328387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912760	Turbidity	3.37	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P328583

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1913470	Calcium	0.246	Spike	P	0 - 20
1913470	Iron	0.500	Spike	P	0 - 20
1913470	Magnesium	0.376	Spike	P	0 - 20
1913470	Potassium	0.947	Spike	P	0 - 20
1913470	Sodium	0.185	Spike	P	0 - 20
1913470	Zinc	0.218	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P328583

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1913470	Arsenic	0.366	Spike	P	0 - 20
1913470	Cadmium	0.229	Spike	P	0 - 20
1913470	Chromium	0.403	Spike	P	0 - 20
1913470	Copper	0.0572	Spike	P	0 - 20
1913470	Lead	0.224	Spike	P	0 - 20
1913470	Nickel	1.13	Spike	P	0 - 20
1913470	Silver	0.101	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P328503

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912707	Chloride	2.53	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P328505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912707	Sulfate	3.25	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P328589

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912767	Ammonia-N	1.88	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P328719

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912745	Ammonia-N	2.45	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P328615

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912799	Kjeldahl Nitrogen	0.380	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P328714

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1913479	Kjeldahl Nitrogen	6.09	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P328673

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912746	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P328765

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912683	NO2NO3-N	0.484	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P328697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912800	Total-P	1.07	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P328385

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912717	O-Phosphate-P	0.325	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P328369

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912850	Color (true)	3.38	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P328661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912682	Total Alkalinity	0.253	Sample	P	0 - 4.8

Quality Assurance Report
Precision

Reference Method: SM 2540 C-97
Batch ID: P328642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912701	TDS	1.85	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P328643

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912890	TDS	10.2	Sample	F	0 - 10

Reference Method: SM 2540 D-97
Batch ID: P328733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912701	TSS	8.89	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P328819

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912682	Fluoride	2.98	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P328860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1912638	Organic Carbon	0.416	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: SM 2120 B
Run ID: A77661
Included Lab Sample IDs: 1912797, 1912798

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	106	103	P/P	85 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A77667
Included Lab Sample IDs: 1912801, 1912802

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	97.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A77668
Included Lab Sample IDs: 1912797, 1912798

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A77695
Included Lab Sample IDs: 1912797, 1912798

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	105	105	P/P	90 - 110
Sulfate	105	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A77748
Included Lab Sample IDs: 1912799

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

Reference Method: SM 2320 B-97
Run ID: A77776
Included Lab Sample IDs: 1912797, 1912798

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A77778
Included Lab Sample IDs: 1912799

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

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A77792
Included Lab Sample IDs: 1912822, 1912823

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.3	98.8	P/P	95 - 105
Calcium	98.8	97.5	P/P	90 - 110
Iron	101	102	P/P	90 - 110
Iron	101	101	P/P	95 - 105
Magnesium	101	101	P/P	90 - 110
Magnesium	101	101	P/P	95 - 105
Potassium	96.7	96.5	P/P	90 - 110
Potassium	98.5	96.7	P/P	95 - 105
Sodium	97.9	99.4	P/P	95 - 105
Sodium	99.4	98.3	P/P	90 - 110
Zinc	99.2	101	P/P	90 - 110
Zinc	99.2	99.2	P/P	95 - 105

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A77794
Included Lab Sample IDs: 1912800

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A77801
Included Lab Sample IDs: 1912799

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.9	95.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A77806
Included Lab Sample IDs: 1912800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	98.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A77824
Included Lab Sample IDs: 1912822, 1912823

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	102	102	P/P	90 - 110
Arsenic	103	102	P/P	90 - 110
Cadmium	101	99.5	P/P	90 - 110
Cadmium	99.5	99.6	P/P	90 - 110
Chromium	100	99.6	P/P	90 - 110
Chromium	99.6	99.4	P/P	90 - 110
Copper	100	101	P/P	90 - 110
Copper	101	100	P/P	90 - 110
Lead	93.6	95.1	P/P	90 - 110
Lead	94.6	93.6	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Nickel	102	101	P/P	90 - 110
Silver	94.9	95.0	P/P	90 - 110
Silver	95.4	94.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A77827
Included Lab Sample IDs: 1912799, 1912800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	102	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A77832
Included Lab Sample IDs: 1912797, 1912798

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

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A77848
Included Lab Sample IDs: 1912799, 1912800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.9	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A77857
Included Lab Sample IDs: 1912800

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.0	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			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						3.37	
EPA 200.7 Rev. 4.4	Calcium	102	96.3	98.7				0.246
	Iron	104	103	106	106			0.500
	Magnesium	102	97.5	100				0.376
	Potassium	96.0	96.0	95.2	96.4			0.947
	Sodium	99.9	98.3	99.8				0.185
	Zinc	102	98.2	97.4	97.6			0.218
EPA 200.8 Rev. 5.4	Arsenic	102	103	102	102			0.366
	Cadmium	101	103	105	105			0.229
	Chromium	98.4	97.9	96.0	96.4			0.403
	Copper	98.5	96.6	96.2	96.2			0.0572
	Lead	95.9	96.6	95.0	95.2			0.224
	Nickel	101	99.8	96.9	98.0			1.13
	Silver	96.7	97.2	96.6	96.7			0.101
EPA 300.0 Rev. 2.1	Chloride	96.5	100	100			2.53	
	Sulfate	95.3	97.0	98.5			3.25	
EPA 350.1 Rev. 2.0	Ammonia-N	102	105	102				1.88
	Ammonia-N	97.2	97.9	94.5				2.45
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	98.3	98.8				0.380
	Kjeldahl Nitrogen	99.0	99.4	111				6.09
EPA 353.2 Rev. 2.0	NO2NO3-N	101	99.9	99.9				0.0
	NO2NO3-N	102	104	103				0.484
EPA 365.1 Rev. 2.0	Total-P	94.6	97.5	96.3				1.07
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.0						0.325
SM 2120 B	Color (true)						3.38	
SM 2320 B-97	Total Alkalinity	102					0.253	
SM 2540 C-97	TDS						1.85	
	TDS						10.2	
SM 2540 D-97	TSS						8.89	
SM 4500 F-C-97	Fluoride	98.9	104	99.1				2.98
SM 5310 B-00	Organic Carbon	95.4						0.416

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1912797, 1912798
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1912822, 1912823
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1912822, 1912823
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1912797, 1912798
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1912797, 1912798
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1912799, 1912800
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1912799, 1912800
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1912799, 1912800
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1912799, 1912800
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1912801, 1912802
SM 2120 B / E31780	True Color measured at 450 nm	1912797, 1912798
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1912797, 1912798
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1912797, 1912798
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1912797, 1912798
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1912797, 1912798
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1912799, 1912800

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	07/12/2017			07/12/2017 17:13	DeAsia Armster	1912797, 1912798
EPA 200.7 Rev. 4.4	07/12/2017	07/17/2017	Elliott D. Healy	07/18/2017	Betina Topolski	1912822, 1912823
EPA 200.8 Rev. 5.4	07/12/2017	07/17/2017	Elliott D. Healy	07/19/2017	Nadine Brooks	1912822, 1912823
EPA 300.0 Rev. 2.1	07/12/2017			07/13/2017	Julia Storbeck	1912797, 1912798
EPA 350.1 Rev. 2.0	07/12/2017			07/14/2017	Sofia Elnemr	1912799
	07/12/2017			07/18/2017	Sofia Elnemr	1912800
EPA 351.2 Rev. 2.0	07/12/2017	07/18/2017	Adrian Shelby	07/19/2017	Joseph Suarez	1912799
	07/12/2017	07/19/2017	Adrian Shelby	07/21/2017	Joseph Suarez	1912800
EPA 353.2 Rev. 2.0	07/12/2017			07/18/2017	Beverly Y. Sanders	1912799
	07/12/2017			07/19/2017	Beverly Y. Sanders	1912800
EPA 365.1 Rev. 2.0	07/12/2017	07/18/2017	Vijayalakshmi Reddy	07/20/2017	Lipi Saha	1912799, 1912800
EPA 365.1 Rev. 2.0 dissolved	07/12/2017			07/12/2017 17:26	Lipi Saha	1912801
	07/12/2017			07/12/2017 17:27	Lipi Saha	1912802
SM 2120 B	07/12/2017			07/12/2017 15:32	Tanya Welborn	1912797
	07/12/2017			07/12/2017 15:33	Tanya Welborn	1912798
SM 2320 B-97	07/12/2017			07/15/2017	Dale L. Simmons	1912797, 1912798
SM 2540 C-97	07/12/2017			07/13/2017	Yijie Li	1912797, 1912798
SM 2540 D-97	07/12/2017			07/13/2017	Yijie Li	1912797, 1912798
SM 4500 F-C-97	07/12/2017			07/20/2017	Dale L. Simmons	1912797, 1912798
SM 5310 B-00	07/12/2017			07/20/2017	Sofia Elnemr	1912799, 1912800