Chemical Analysis Report

NW-DIST-2019-11-26-02

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

Event Description: **Choctawhatchee North Run**
Request ID: **RQ-2019-11-18-33**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

For additional information please contact
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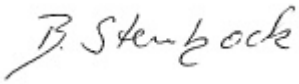
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 13-DEC-2019 16:00



NON-CONFORMANCE REPORT INCLUDED

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 by the Florida Department of Health Environmental Laboratory Certification Program 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: Choctawhatchee River South of Carlisle Lake **Collection Date/Time: 11/25/2019 12:30**

Field ID: G3NW0130 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2139446	EPA 180.1 Rev. 2.0	Turbidity	7.0		NTU	P375070	
	EPA 300.0 Rev. 2.1	Chloride	6.6		mg Cl/L	P375405	
		Sulfate	5.8	Y	mg SO4/L	P375409	
	SM 2120 B	Color (true)	23		PCU	P374893	
	SM 2320 B-97	Total Alkalinity	47	Y	mg CaCO3/L	P375172	
	SM 2540 C-97	TDS	65	Y	mg/L	P375511	
	SM 2540 D-97	TSS	10	I Y	mg/L	P375496	
	SM 4500 F-C-97	Fluoride	0.045	I	mg F/L	P375180	
2139447	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P375578	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.21		mg N/L	P375138	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.61		mg N/L	P374951	
	EPA 365.1 Rev. 2.0	Total-P	0.056		mg P/L	P375271	
	SM 5310 B-00	Organic Carbon	2.5		mg C/L	P375085	
2139448	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.034		mg P/L	P374910	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples and batch relative percent difference are unavailable because of high analyte concentration in the QC sample.
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample. Sample was left out at room temperature overnight, should be stored below 6 degC.
SM 2320 B-97: Sample was left out at room temperature overnight, should be stored below 6 degC.
SM 2540 C-97: Sample was left out at room temperature overnight, should be stored below 6 degC.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample was left out at room temperature overnight, should be stored below 6 degC.

Sample Location: Choctawhatchee River upstream of Holmes Creek **Collection Date/Time: 11/25/2019 14:15**

Field ID: G3NW0129 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2139443	EPA 180.1 Rev. 2.0	Turbidity	6.5		NTU	P375070	
	EPA 300.0 Rev. 2.1	Chloride	6.0		mg Cl/L	P375405	
		Sulfate	5.2	Y	mg SO4/L	P375409	
	SM 2120 B	Color (true)	29		PCU	P374893	
	SM 2320 B-97	Total Alkalinity	32	Y	mg CaCO3/L	P375172	
	SM 2540 C-97	TDS	53	Y	mg/L	P375511	
	SM 2540 D-97	TSS	4	I Y	mg/L	P375496	
	SM 4500 F-C-97	Fluoride	0.036	I	mg F/L	P375180	
2139444	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P375098	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.19	I	mg N/L	P375138	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.37		mg N/L	P374951	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P375271	
	SM 5310 B-00	Organic Carbon	2.6		mg C/L	P375085	
2139445	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P374910	
2139453	EPA 200.7 Rev. 4.4	Barium	19.2		ug/L	P375027	
		Calcium	11.2		mg/L	P375027	
		Iron	620		ug/L	P375027	
		Magnesium	2.11		mg/L	P375027	
		Potassium	1.1	I	mg/L	P375027	
		Sodium	4.3		mg/L	P375027	
		Zinc	5.0	U	ug/L	P375027	
	EPA 200.8 Rev. 5.4	Aluminum	153		ug/L	P375027	
		Antimony	0.050	U	ug/L	P375027	
		Arsenic	0.39		ug/L	P375027	
		Boron**	12.7		ug/L	P375027	
		Cadmium	0.020	U	ug/L	P375027	
		Chromium	0.46	I	ug/L	P375027	
		Copper	0.40	U	ug/L	P375027	
		Lead	0.20	U	ug/L	P375027	
		Nickel	0.50	U	ug/L	P375027	
		Selenium	0.20	U	ug/L	P375027	
		Silver	0.010	U	ug/L	P375027	
		Thallium	0.10	U	ug/L	P375027	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Chloride: Batch matrix spike recoveries for one of two spiked samples and batch relative percent difference are unavailable because of high analyte concentration in the QC sample.
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples are unavailable because of high analyte concentration in the QC sample. Sample was left out at room temperature overnight, should be stored below 6 degC.
SM 2320 B-97: Sample was left out at room temperature overnight, should be stored below 6 degC.
SM 2540 C-97: Sample was left out at room temperature overnight, should be stored below 6 degC.
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. Sample was left out at room temperature overnight, should be stored below 6 degC.

Non-Conformance Report

NCR ID: 8043

Event(s)	Job(s)	Sample(s)	Test(s)
NW-DIST-2019-11-26-02	TLH-2019-11-26-75	2139443	
NW-DIST-2019-11-26-02	TLH-2019-11-26-75	2139446	

NCR Type: SHIPPING/RECEIVING **NCR Category: Preservation Not Intact**

Observation: Samples left out at room temperature overnight on 11/26/2019.

Resolution: Samples analyzed after 11/26/2019, were Y qualified for incorrect preservation.

Authorized by/Date: Peter D. Kaus 12/11/2019

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P375070

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P375027

Component	Result	Code	Units
Barium	1.0	U	ug/L
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: P375027

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375405

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375409

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375098

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375578

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375138

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374951

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375271

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374910

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

Reference Method: SM 2120 B
Batch ID: P374893

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P375172

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

Reference Method: SM 2540 C-97
Batch ID: P375511

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P375496

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P375180

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P375085

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: P375027

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P375027

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	100		P	85 - 115
Antimony	101		P	85 - 115
Arsenic	104		P	85 - 115
Boron	105		P	85 - 115
Cadmium	98.9		P	85 - 115
Chromium	104		P	85 - 115
Copper	109		P	85 - 115
Lead	104		P	85 - 115
Nickel	105		P	85 - 115
Selenium	102		P	85 - 115
Silver	106		P	85 - 115
Thallium	109		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375405

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375409

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375098

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375578

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375138

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374951

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375271

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374910

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

Reference Method: SM 2120 B
Batch ID: P374893

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P375172

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P375180

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P375085

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P375027

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139437	Barium	101	106	P/P	80 - 120
2139437	Calcium	100	106	P/P	80 - 120
2139437	Iron	100	103	P/P	80 - 120
2139437	Magnesium	101	104	P/P	80 - 120
2139437	Potassium	96.1	101	P/P	80 - 120
2139437	Sodium	96.1	104	P/P	80 - 120
2139437	Zinc	103	108	P/P	80 - 120
2139462	Barium	102		P	80 - 120
2139462	Calcium	101		P	80 - 120
2139462	Iron	101		P	80 - 120
2139462	Magnesium	100		P	80 - 120
2139462	Potassium	96.9		P	80 - 120
2139462	Sodium	99.1		P	80 - 120
2139462	Zinc	104		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P375027

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139437	Aluminum	97.2	96.3	P/P	80 - 120
2139437	Antimony	99.3	98.4	P/P	80 - 120
2139437	Arsenic	102	100	P/P	80 - 120
2139437	Boron	103	102	P/P	80 - 120
2139437	Cadmium	97.2	96.7	P/P	80 - 120
2139437	Chromium	104	102	P/P	80 - 120
2139437	Copper	101	102	P/P	80 - 120
2139437	Lead	102	101	P/P	80 - 120
2139437	Nickel	101	101	P/P	80 - 120
2139437	Selenium	96.9	95.1	P/P	80 - 120
2139437	Silver	104	105	P/P	80 - 120
2139437	Thallium	106	106	P/P	80 - 120
2139462	Aluminum	98.0		P	80 - 120
2139462	Antimony	102		P	80 - 120
2139462	Arsenic	104		P	80 - 120
2139462	Boron	104		P	80 - 120
2139462	Cadmium	97.6		P	80 - 120
2139462	Chromium	105		P	80 - 120
2139462	Copper	102		P	80 - 120
2139462	Lead	103		P	80 - 120
2139462	Nickel	101		P	80 - 120
2139462	Selenium	95.9		P	80 - 120
2139462	Silver	103		P	80 - 120
2139462	Thallium	109		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375405

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139553	Chloride	99.2		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375409

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139384	Sulfate	98.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375098

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139358	Ammonia-N	102	100	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375578

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139425	Ammonia-N	105	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375138

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139555	Kjeldahl Nitrogen	104	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374951

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139415	NO2NO3-N	98.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375271

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139416	Total-P	98.3	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374910

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139445	O-Phosphate-P	98.6	98.6	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P375180

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139456	Fluoride	97.8	99.0	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P375085

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2139444	Organic Carbon	99.6	100	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P375070

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139379	Turbidity	4.99	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P375027

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139437	Barium	4.65	Spike	P	0 - 20
2139437	Calcium	3.75	Spike	P	0 - 20
2139437	Iron	2.19	Spike	P	0 - 20
2139437	Magnesium	2.01	Spike	P	0 - 20
2139437	Potassium	3.72	Spike	P	0 - 20
2139437	Sodium	5.10	Spike	P	0 - 20
2139437	Zinc	4.83	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P375027

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139437	Aluminum	0.864	Spike	P	0 - 20
2139437	Antimony	0.938	Spike	P	0 - 20
2139437	Arsenic	1.76	Spike	P	0 - 20
2139437	Boron	0.466	Spike	P	0 - 20
2139437	Cadmium	0.489	Spike	P	0 - 20
2139437	Chromium	1.72	Spike	P	0 - 20
2139437	Copper	0.752	Spike	P	0 - 20
2139437	Lead	0.785	Spike	P	0 - 20
2139437	Nickel	0.316	Spike	P	0 - 20
2139437	Selenium	1.89	Spike	P	0 - 20
2139437	Silver	0.674	Spike	P	0 - 20
2139437	Thallium	0.138	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P375409

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139384	Sulfate	0.450	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375098

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139358	Ammonia-N	1.68	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375578

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139425	Ammonia-N	0.114	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375138

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139555	Kjeldahl Nitrogen	2.87	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374951

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139415	NO2NO3-N	0.509	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375271

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139416	Total-P	1.22	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374910

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139445	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P374893

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139412	Color (true)	0.776	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P375172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139456	Total Alkalinity	0.380	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P375511

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139456	TDS	1.60	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P375180

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139456	Fluoride	0.974	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P375085

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2139444	Organic Carbon	0.355	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: SM 2120 B
Run ID: A95976
Included Lab Sample IDs: 2139443, 2139446

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	103	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A95979
Included Lab Sample IDs: 2139445, 2139448

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	91.6	92.5	P/P	90 - 110
O-Phosphate-P	92.8	92.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A96002
Included Lab Sample IDs: 2139444, 2139447

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A96050
Included Lab Sample IDs: 2139443, 2139446

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	101	P/P	95 - 105

Reference Method: SM 5310 B-00
Run ID: A96056
Included Lab Sample IDs: 2139444, 2139447

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A96065
Included Lab Sample IDs: 2139444

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A96081
Included Lab Sample IDs: 2139453

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	99.4	99.9	P/P	90 - 110
Calcium	100	99.8	P/P	90 - 110
Iron	98.4	99.0	P/P	90 - 110
Magnesium	99.1	99.8	P/P	90 - 110
Potassium	97.7	98.6	P/P	90 - 110
Sodium	98.9	99.0	P/P	90 - 110
Zinc	102	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 2320 B-97
Run ID: A96084
Included Lab Sample IDs: 2139443, 2139446

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	102	105	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A96084
Included Lab Sample IDs: 2139443, 2139446

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A96087
Included Lab Sample IDs: 2139443, 2139446

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A96111
Included Lab Sample IDs: 2139444, 2139447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	103	P/P	90 - 110
Kjeldahl Nitrogen	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A96168
Included Lab Sample IDs: 2139447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A96171
Included Lab Sample IDs: 2139444

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A96173
Included Lab Sample IDs: 2139453

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.0	97.4	P/P	90 - 110
Antimony	96.9	97.6	P/P	90 - 110
Boron	104	104	P/P	90 - 110
Cadmium	97.3	98.0	P/P	90 - 110
Chromium	106	106	P/P	90 - 110
Copper	102	102	P/P	90 - 110
Lead	100	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A96173
Included Lab Sample IDs: 2139453

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Nickel	103	103	P/P	90 - 110
Selenium	101	99.5	P/P	90 - 110
Silver	105	106	P/P	90 - 110
Thallium	96.8	97.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A96211
Included Lab Sample IDs: 2139453

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	103	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A96246
Included Lab Sample IDs: 2139447

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	102	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						4.99	
EPA 200.7 Rev. 4.4	Barium	104	101	106	102			4.65
	Calcium	104	100	106	101			3.75
	Iron	103	100	103	101			2.19
	Magnesium	105	101	104	100			2.01
	Potassium	100	96.1	101	96.9			3.72
	Sodium	105	96.1	104	99.1			5.10
	Zinc	105	103	108	104			4.83
EPA 200.8 Rev. 5.4	Aluminum	100	97.2	96.3	98.0			0.864
	Antimony	101	99.3	98.4	102			0.938
	Arsenic	104	102	100	104			1.76
	Boron	105	103	102	104			0.466
	Cadmium	98.9	97.2	96.7	97.6			0.489
	Chromium	104	104	102	105			1.72
	Copper	109	101	102	102			0.752
	Lead	104	102	101	103			0.785
	Nickel	105	101	101	101			0.316
	Selenium	102	96.9	95.1	95.9			1.89
	Silver	106	104	105	103			0.674
	Thallium	109	106	106	109			0.138
EPA 300.0 Rev. 2.1	Chloride	102	99.2					
	Sulfate	101	98.8				0.450	
EPA 350.1 Rev. 2.0	Ammonia-N	101	102	100				1.68
	Ammonia-N	102	105	105				0.114
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	104	108				2.87
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	98.5	98.0				0.509
EPA 365.1 Rev. 2.0	Total-P	99.6	98.3	99.6				1.22
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	98.6	98.6				0.0
SM 2120 B	Color (true)	102					0.776	
SM 2320 B-97	Total Alkalinity	103					0.380	
SM 2540 C-97	TDS						1.60	
SM 4500 F-C-97	Fluoride	96.2	97.8	99.0				0.974
SM 5310 B-00	Organic Carbon	101	99.6	100				0.355

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2139443, 2139446
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2139453
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2139453
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2139443, 2139446
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2139443, 2139446
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2139444, 2139447
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2139444, 2139447
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2139444, 2139447
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2139444, 2139447

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2139445, 2139448
SM 2120 B / E31780	True Color measured at 450 nm	2139443, 2139446
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2139443, 2139446
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2139443, 2139446
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2139443, 2139446
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2139443, 2139446
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2139444, 2139447

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	11/26/2019			11/26/2019 18:00	Yen Ta	2139443, 2139446
EPA 200.7 Rev. 4.4	11/26/2019	12/02/2019 13:30	Elliott D. Healy	12/03/2019 15:20	Betina Topolski	2139453
EPA 200.8 Rev. 5.4	11/26/2019	12/02/2019 13:30	Elliott D. Healy	12/07/2019 06:32	Alexander Thompson	2139453
	11/26/2019	12/02/2019 13:30	Elliott D. Healy	12/10/2019 05:26	Alexander Thompson	2139453
EPA 300.0 Rev. 2.1	11/26/2019			12/07/2019 01:20	Jhamieka S. Greenwood	2139443
	11/26/2019			12/07/2019 01:32	Jhamieka S. Greenwood	2139446
EPA 350.1 Rev. 2.0	11/26/2019			12/02/2019 14:03	Ping Hua	2139444
	11/26/2019			12/10/2019 11:04	Ping Hua	2139447
EPA 351.2 Rev. 2.0	11/26/2019	12/03/2019 12:55	Sima Feizi	12/04/2019 15:39	Jhamieka S. Greenwood	2139444
	11/26/2019	12/03/2019 12:55	Sima Feizi	12/04/2019 15:44	Jhamieka S. Greenwood	2139447
EPA 353.2 Rev. 2.0	11/26/2019			11/27/2019 11:36	Beverly Y. Sanders	2139444
	11/26/2019			11/27/2019 11:37	Beverly Y. Sanders	2139447
EPA 365.1 Rev. 2.0	11/26/2019	12/05/2019 17:50	Lipi Saha	12/06/2019 16:09	Julia Storbeck	2139447
	11/26/2019	12/05/2019 17:50	Lipi Saha	12/06/2019 20:42	Julia Storbeck	2139444
EPA 365.1 Rev. 2.0 dissolved	11/26/2019			11/26/2019 15:54	Virginia P. Brown	2139445
	11/26/2019			11/26/2019 16:35	Virginia P. Brown	2139448
SM 2120 B	11/26/2019			11/26/2019 16:40	Julia Storbeck	2139443
	11/26/2019			11/26/2019 16:41	Julia Storbeck	2139446
SM 2320 B-97	11/26/2019			12/03/2019 07:59	Dale L. Simmons	2139443
	11/26/2019			12/03/2019 08:11	Dale L. Simmons	2139446
SM 2540 C-97	11/26/2019			11/27/2019 15:32	Yijie Li	2139443, 2139446
SM 2540 D-97	11/26/2019			11/27/2019 15:32	Yijie Li	2139443, 2139446
SM 4500 F-C-97	11/26/2019			12/03/2019 07:59	Dale L. Simmons	2139443
	11/26/2019			12/03/2019 08:11	Dale L. Simmons	2139446
SM 5310 B-00	11/26/2019			12/02/2019 15:09	Lauren Lees	2139444
	11/26/2019			12/02/2019 18:38	Lauren Lees	2139447