Chemical Analysis Report

NW-DIST-2020-02-11-01

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

Event Description: **Escambia River Run**
Request ID: **RQ-2020-02-10-35**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
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160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

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Certified by: Colin Wright, Program Administrator

Date Certified: 04-MAR-2020 10:40

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: Escambia River upstream Gulf Power Discharge

Collection Date/Time: 02/10/2020 11:50

Field ID: G4NW0264

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2156426	EPA 180.1 Rev. 2.0	Turbidity	23	A	NTU	P378690	
	EPA 300.0 Rev. 2.1	Chloride	5.2		mg Cl/L	P379492	
		Sulfate	5.2		mg SO4/L	P379495	
	SM 2120 B-2011	Color (true)	47		PCU	P378705	
	SM 2320 B-2011	Total Alkalinity	11		mg CaCO3/L	P379405	
	SM 2540 C-2011	TDS	59		mg/L	P379103	
	SM 2540 D-2011	TSS	10		mg/L	P378962	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P379408	
2156427	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P379067	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.37		mg N/L	P378930	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P379428	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P379358	
	SM 5310 B-2011	Organic Carbon	6.9		mg C/L	P378968	
2156428	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.013		mg P/L	P378695	
2156433	EPA 200.7 Rev. 4.4	Barium	24.6		ug/L	P378788	
		Calcium	5.90		mg/L	P378788	
		Iron	1.56E+03		ug/L	P378788	
		Magnesium	1.04		mg/L	P378788	
		Potassium	0.89	I	mg/L	P378788	
		Sodium	4.9		mg/L	P378788	
		Zinc	5.0	U	ug/L	P378788	
	EPA 200.8 Rev. 5.4	Aluminum	791		ug/L	P378788	
		Antimony	0.050	U	ug/L	P378788	
		Arsenic	0.73		ug/L	P378788	
		Boron**	10.8		ug/L	P378788	
		Cadmium	0.020	U	ug/L	P378788	
		Chromium	1.7		ug/L	P378788	
		Copper	0.81		ug/L	P378788	
		Lead	0.68		ug/L	P378788	
		Nickel	1.3	I	ug/L	P378788	
		Selenium	0.20	U	ug/L	P378788	
		Silver	0.010	U	ug/L	P378788	
		Thallium	0.10	U	ug/L	P378788	

Ref. Method and Comment:
SM 2120 B-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: The iron result was confirmed in the undigested sample on 02/17/2020.
EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 02/27/2020.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P378690

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P378788

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: P378788

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: P379492

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379495

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379067

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: P378930

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379428

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379358

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378695

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

Reference Method: SM 2120 B-2011
Batch ID: P378705

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P379405

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

Reference Method: SM 2540 C-2011
Batch ID: P379103

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P378962

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P379408

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P378968

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: P378788

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	105		P	85 - 115
Iron	103		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	100		P	85 - 115
Sodium	104		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P378788

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	93.4		P	85 - 115
Antimony	106		P	85 - 115
Arsenic	102		P	85 - 115
Boron	90.0		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	102		P	85 - 115
Copper	97.0		P	85 - 115
Lead	96.3		P	85 - 115
Nickel	95.8		P	85 - 115
Selenium	102		P	85 - 115
Silver	102		P	85 - 115
Thallium	91.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379492

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379495

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379067

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P378930

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379428

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: P379358

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378695

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

Reference Method: SM 2120 B-2011
Batch ID: P378705

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.0		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P379405

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P379408

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.9		P	92 - 103

Reference Method: SM 5310 B-2011
Batch ID: P378968

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

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P378788

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2156465	Barium	104	105	P/P	80 - 120
2156465	Calcium	104		P	80 - 120
2156465	Iron	103	104	P/P	80 - 120
2156465	Magnesium	103		P	80 - 120
2156465	Potassium	101	103	P/P	80 - 120
2156465	Sodium	103		P	80 - 120
2156465	Zinc	103	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P378788

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2156465	Aluminum	94.9	91.9	P/P	80 - 120
2156465	Antimony	111	108	P/P	80 - 120
2156465	Arsenic	107	105	P/P	80 - 120
2156465	Boron	94.3	89.5	P/P	80 - 120
2156465	Cadmium	108	105	P/P	80 - 120
2156465	Chromium	109	105	P/P	80 - 120
2156465	Copper	99.2	96.6	P/P	80 - 120
2156465	Lead	98.5	96.8	P/P	80 - 120
2156465	Nickel	98.6	96.0	P/P	80 - 120
2156465	Selenium	106	103	P/P	80 - 120
2156465	Silver	106	103	P/P	80 - 120
2156465	Thallium	97.0	93.2	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379492

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2156270	Chloride	102		P	90 - 110
2156381	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379495

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2156270	Sulfate	101		P	90 - 110
2156381	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379067

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2156509	Ammonia-N	99.8	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P378930

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2156427	Kjeldahl Nitrogen	101	100	P/P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2156361	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379358

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2156406	Total-P	106	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378695

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2156455	O-Phosphate-P	95.6	96.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P379408

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157223	Fluoride	98.1	99.9	P/P	89 - 106

Reference Method: SM 5310 B-2011
Batch ID: P378968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2156427	Organic Carbon	96.4	97.8	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P378690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156426	Turbidity	0.443	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P378788

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156465	Barium	0.759	Spike	P	0 - 20
2156465	Calcium	0.102	Spike	P	0 - 20
2156465	Iron	1.07	Spike	P	0 - 20
2156465	Magnesium	1.26	Spike	P	0 - 20
2156465	Potassium	1.48	Spike	P	0 - 20
2156465	Sodium	0.796	Spike	P	0 - 20
2156465	Zinc	0.424	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P378788

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156465	Aluminum	3.07	Spike	P	0 - 20
2156465	Antimony	2.83	Spike	P	0 - 20
2156465	Arsenic	2.24	Spike	P	0 - 20
2156465	Boron	4.63	Spike	P	0 - 20
2156465	Cadmium	3.09	Spike	P	0 - 20
2156465	Chromium	3.19	Spike	P	0 - 20
2156465	Copper	2.70	Spike	P	0 - 20
2156465	Lead	1.77	Spike	P	0 - 20
2156465	Nickel	2.75	Spike	P	0 - 20
2156465	Selenium	3.10	Spike	P	0 - 20
2156465	Silver	3.19	Spike	P	0 - 20
2156465	Thallium	4.00	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379492

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156381	Chloride	0.612	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379495

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156381	Sulfate	0.306	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156509	Ammonia-N	0.360	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P378930

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156427	Kjeldahl Nitrogen	0.425	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156361	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379358

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156406	Total-P	0.393	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378695

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156455	O-Phosphate-P	0.881	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P379405

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157223	Total Alkalinity	0.373	Sample	P	0 - 2.8

Reference Method: SM 2540 C-2011
Batch ID: P379103

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156336	TDS	2.08	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P379408

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157223	Fluoride	1.48	Spike	P	0 - 2.5

Quality Assurance Report
Precision

Reference Method: SM 5310 B-2011
Batch ID: P378968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2156427	Organic Carbon	1.06	Spike	P	0 - 20

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A97441
Included Lab Sample IDs: 2156426

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A97443
Included Lab Sample IDs: 2156428

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	97.8	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A97448
Included Lab Sample IDs: 2156426

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	100	P/P	90 - 115

Reference Method: SM 5310 B-2011
Run ID: A97553
Included Lab Sample IDs: 2156427

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	102	98.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A97558
Included Lab Sample IDs: 2156433

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	105	104	P/P	90 - 110
Calcium	102	102	P/P	90 - 110
Iron	102	103	P/P	90 - 110
Magnesium	102	102	P/P	90 - 110
Potassium	100	101	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Zinc	105	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A97580
Included Lab Sample IDs: 2156427

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	94.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A97588
Included Lab Sample IDs: 2156427

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A97638
Included Lab Sample IDs: 2156426

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	97.9	98.2	P/P	90 - 110
Sulfate	98.6	99.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A97713
Included Lab Sample IDs: 2156433

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	93.3	91.3	P/P	90 - 110
Antimony	105	103	P/P	90 - 110
Arsenic	100	100	P/P	90 - 110
Boron	93.8	90.9	P/P	90 - 110
Cadmium	99.6	98.6	P/P	90 - 110
Chromium	100	98.5	P/P	90 - 110
Copper	94.7	93.8	P/P	90 - 110
Lead	94.1	92.7	P/P	90 - 110
Nickel	94.2	94.2	P/P	90 - 110
Selenium	100	99.8	P/P	90 - 110
Silver	100	97.9	P/P	90 - 110
Thallium	95.6	92.6	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A97738
Included Lab Sample IDs: 2156426

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

Reference Method: SM 4500 F-C-2011
Run ID: A97738
Included Lab Sample IDs: 2156426

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A97741
Included Lab Sample IDs: 2156427

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A97846
Included Lab Sample IDs: 2156427

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.8	99.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

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

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					0.443	
EPA 200.7 Rev. 4.4	Barium	102	104	105			0.759
	Calcium	105	104				0.102
	Iron	103	103	104			1.07
	Magnesium	105	103				1.26
	Potassium	100	101	103			1.48
	Sodium	104	103				0.796
	Zinc	101	103	103			0.424
EPA 200.8 Rev. 5.4	Aluminum	93.4	94.9	91.9			3.07
	Antimony	106	111	108			2.83
	Arsenic	102	107	105			2.24
	Boron	90.0	94.3	89.5			4.63
	Cadmium	104	108	105			3.09
	Chromium	102	109	105			3.19
	Copper	97.0	99.2	96.6			2.70
	Lead	96.3	98.5	96.8			1.77
	Nickel	95.8	98.6	96.0			2.75
	Selenium	102	106	103			3.10
	Silver	102	106	103			3.19
	Thallium	91.7	97.0	93.2			4.00
EPA 300.0 Rev. 2.1	Chloride	101	100	102		0.612	
	Sulfate	102	101	101		0.306	
EPA 350.1 Rev. 2.0	Ammonia-N	103	99.8	100			0.360
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.5	101	100			0.425
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	106	106	107			0.393
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	95.6	96.5			0.881
SM 2120 B-2011	Color (true)	99.0					
SM 2320 B-2011	Total Alkalinity	104				0.373	
SM 2540 C-2011	TDS					2.08	
SM 4500 F-C-2011	Fluoride	97.9	98.1	99.9			1.48
SM 5310 B-2011	Organic Carbon	99.6	96.4	97.8			1.06

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2156426
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2156433
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2156433
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2156426
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2156426
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2156427
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2156427
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2156427
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2156427
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2156428
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2156426
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2156426
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2156426
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2156426

Reference Method Descriptions

Method	Description	Associated Samples
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2156426
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2156427

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	02/11/2020			02/11/2020 14:57	Yen Ta	2156426
EPA 200.7 Rev. 4.4	02/11/2020	02/12/2020 16:00	Elliott D. Healy	02/14/2020 15:19	Betina Topolski	2156433
EPA 200.8 Rev. 5.4	02/11/2020	02/12/2020 16:00	Elliott D. Healy	02/20/2020 22:40	Justin Cutchin	2156433
EPA 300.0 Rev. 2.1	02/11/2020			02/21/2020 07:27	Elliott Rodriguez	2156426
EPA 350.1 Rev. 2.0	02/11/2020			02/17/2020 09:38	Ping Hua	2156427
EPA 351.2 Rev. 2.0	02/11/2020	02/14/2020 09:30	Elliott Rodriguez	02/17/2020 12:26	Jhamieka S. Greenwood	2156427
EPA 353.2 Rev. 2.0	02/11/2020			02/20/2020 11:22	Beverly Y. Sanders	2156427
EPA 365.1 Rev. 2.0	02/11/2020	02/21/2020 14:16	Yen Ta	02/26/2020 14:52	Benjamin T. Nordmann	2156427
EPA 365.1 Rev. 2.0 dissolved	02/11/2020			02/11/2020 15:14	Carlos Miranda	2156428
SM 2120 B-2011	02/11/2020			02/11/2020 16:35	Madeline Funaro	2156426
SM 2320 B-2011	02/11/2020			02/21/2020 00:30	Dale L. Simmons	2156426
SM 2540 C-2011	02/11/2020			02/12/2020 17:00	Blanca Fach	2156426
SM 2540 D-2011	02/11/2020			02/12/2020 17:00	Blanca Fach	2156426
SM 4500 F-C-2011	02/11/2020			02/21/2020 00:30	Dale L. Simmons	2156426
SM 5310 B-2011	02/11/2020			02/13/2020 22:26	Lauren Lees	2156427