

Chemical Analysis Report

CEN-DIST-2020-08-18-01

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

Event Description: **Mills/Dead River/Florence**
Request ID: **RQ-2020-08-17-60**
Customer: **CEN-DIST**
Project ID: **SMP**

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Date Certified: 09-SEP-2020 17:59



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: Mills Creek @ Park

Collection Date/Time: 08/17/2020 10:16

Field ID: G2CE0233

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2190933	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P386192	
	EPA 300.0 Rev. 2.1	Chloride	72		mg Cl/L	P386377	
		Sulfate	13		mg SO4/L	P386380	
		Color (true)	74		PCU	P386200	
	SM 2120 B-2011	Total Alkalinity	123	A	mg CaCO3/L	P386325	
	SM 2540 C-2011	TDS	288		mg/L	P386505	
	SM 2540 D-2011	TSS	2	I	mg/L	P386392	
	SM 4500 F-C-2011	Fluoride	0.34		mg F/L	P386329	
2190934	EPA 350.1 Rev. 2.0	Ammonia-N	0.034		mg N/L	P386430	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P386371	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P386304	
	EPA 365.1 Rev. 2.0	Total-P	0.31		mg P/L	P386253	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P386333	
2190935	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.25		mg P/L	P386204	
2190938	EPA 200.7 Rev. 4.4	Barium	24.4		ug/L	P386268	
		Calcium	50.5		mg/L	P386268	
		Iron	710		ug/L	P386268	
		Magnesium	7.16		mg/L	P386268	
		Potassium	3.9		mg/L	P386268	
		Sodium	44.1		mg/L	P386268	
		Zinc	5.0	U	ug/L	P386268	
	EPA 200.8 Rev. 5.4	Aluminum	51		ug/L	P386268	
		Antimony	0.30		ug/L	P386268	
		Arsenic	2.88		ug/L	P386268	
		Beryllium	0.012	I	ug/L	P386268	
		Boron**	65.0		ug/L	P386268	
		Cadmium	0.020	U	ug/L	P386268	
		Chromium	0.71	I	ug/L	P386268	
		Copper	1.90		ug/L	P386268	
		Lead	0.29	I	ug/L	P386268	
		Nickel	0.99	I	ug/L	P386268	
		Selenium	0.21	I	ug/L	P386268	
		Silver	0.010	U	ug/L	P386268	
		Thallium	0.10	U	ug/L	P386268	
		Hardness	156		mg/L	P386268	

Ref. Method and Comment:

SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386192

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386268

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: P386268

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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: P386377

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386380

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386430

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: P386371

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386304

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386253

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386204

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

Reference Method: SM 2120 B-2011
Batch ID: P386200

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P386325

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

Reference Method: SM 2540 C-2011
Batch ID: P386505

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P386392

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P386329

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: P386333

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: P386268

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

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386268

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	102		P	85 - 115
Antimony	97.9		P	85 - 115
Arsenic	98.0		P	85 - 115
Beryllium	99.7		P	85 - 115
Boron	101		P	85 - 115
Cadmium	97.3		P	85 - 115
Chromium	99.6		P	85 - 115
Copper	98.7		P	85 - 115
Lead	103		P	85 - 115
Nickel	99.2		P	85 - 115
Selenium	98.1		P	85 - 115
Silver	101		P	85 - 115
Thallium	110		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386377

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386380

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386430

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386371

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.0		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386304

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: P386253

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386204

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

Reference Method: SM 2120 B-2011
Batch ID: P386200

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.3		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P386325

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.3		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P386329

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	102		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P386333

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386268

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190926	Barium	103	104	P/P	80 - 120
2190926	Calcium	103		P	80 - 120
2190926	Iron	105	105	P/P	80 - 120
2190926	Magnesium	103	103	P/P	80 - 120
2190926	Potassium	101	101	P/P	80 - 120
2190926	Sodium	103		P	80 - 120
2190926	Zinc	106	107	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386268

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190926	Aluminum	100	102	P/P	80 - 120
2190926	Antimony	99.8	99.9	P/P	80 - 120
2190926	Arsenic	98.7	100	P/P	80 - 120
2190926	Beryllium	94.9	97.1	P/P	80 - 120
2190926	Boron	102	102	P/P	80 - 120
2190926	Cadmium	98.6	101	P/P	80 - 120
2190926	Chromium	101	101	P/P	80 - 120
2190926	Copper	99.5	98.8	P/P	80 - 120
2190926	Lead	104	105	P/P	80 - 120
2190926	Nickel	96.8	97.7	P/P	80 - 120
2190926	Selenium	96.6	97.8	P/P	80 - 120
2190926	Silver	100	100	P/P	80 - 120
2190926	Thallium	115	115	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386377

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190820	Chloride	99.0		P	90 - 110
2190962	Chloride	97.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386380

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190820	Sulfate	99.7		P	90 - 110
2190962	Sulfate	98.4		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190965	Ammonia-N	99.4	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386371

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190965	Kjeldahl Nitrogen	94.9	97.8	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190900	NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190920	Total-P	105	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386204

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190932	O-Phosphate-P	97.8	99.1	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P386329

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190933	Fluoride	102	104	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P386333

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2190822	Organic Carbon	95.9	97.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P386192

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190978	Turbidity	2.11	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P386268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190926	Barium	1.07	Spike	P	0 - 20
2190926	Calcium	0.844	Spike	P	0 - 20
2190926	Iron	0.299	Spike	P	0 - 20
2190926	Magnesium	0.105	Spike	P	0 - 20
2190926	Potassium	0.00426	Spike	P	0 - 20
2190926	Sodium	0.0792	Spike	P	0 - 20
2190926	Zinc	0.862	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P386268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190926	Aluminum	0.973	Spike	P	0 - 20
2190926	Antimony	0.0694	Spike	P	0 - 20
2190926	Arsenic	1.25	Spike	P	0 - 20
2190926	Beryllium	2.14	Spike	P	0 - 20
2190926	Boron	0.127	Spike	P	0 - 20
2190926	Cadmium	1.94	Spike	P	0 - 20
2190926	Chromium	0.354	Spike	P	0 - 20
2190926	Copper	0.665	Spike	P	0 - 20
2190926	Lead	0.453	Spike	P	0 - 20
2190926	Nickel	0.879	Spike	P	0 - 20
2190926	Selenium	1.19	Spike	P	0 - 20
2190926	Silver	0.373	Spike	P	0 - 20
2190926	Thallium	0.113	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190820	Chloride	1.76	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P386380

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190820	Sulfate	0.620	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190965	Ammonia-N	0.719	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386371

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190965	Kjeldahl Nitrogen	1.81	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190900	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190920	Total-P	1.94	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386204

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190932	O-Phosphate-P	1.05	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P386200

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190897	Color (true)	3.01	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P386325

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190933	Total Alkalinity	3.11	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P386505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190919	TDS	7.02	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P386329

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190933	Fluoride	0.909	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P386333

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2190822	Organic Carbon	1.71	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: A100517

Included Lab Sample IDs: 2190933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A100519

Included Lab Sample IDs: 2190933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.7	101	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100520

Included Lab Sample IDs: 2190935

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	99.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A100543

Included Lab Sample IDs: 2190933

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100558

Included Lab Sample IDs: 2190934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A100560

Included Lab Sample IDs: 2190933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.6	98.1	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A100560

Included Lab Sample IDs: 2190933

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	104	105	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A100563

Included Lab Sample IDs: 2190934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.1	95.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100566

Included Lab Sample IDs: 2190934

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A100573

Included Lab Sample IDs: 2190938

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	104	P/P	90 - 110
Calcium	99.5	100	P/P	90 - 110
Iron	101	102	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	100	100	P/P	90 - 110
Zinc	101	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100597

Included Lab Sample IDs: 2190934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	99.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100612

Included Lab Sample IDs: 2190934

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.8	93.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100647

Included Lab Sample IDs: 2190938

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	102	101	P/P	90 - 110
Arsenic	99.1	98.8	P/P	90 - 110
Beryllium	105	93.1	P/P	90 - 110
Boron	102	106	P/P	90 - 110
Cadmium	98.4	99.3	P/P	90 - 110
Chromium	98.3	97.8	P/P	90 - 110
Copper	99.5	96.6	P/P	90 - 110
Lead	101	101	P/P	90 - 110
Nickel	99.6	96.9	P/P	90 - 110
Selenium	98.1	99.9	P/P	90 - 110
Silver	101	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100692

Included Lab Sample IDs: 2190938

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: A100692

Included Lab Sample IDs: 2190938

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A100693

Included Lab Sample IDs: 2190938

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Thallium	105	106	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 SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					2.11	
EPA 200.7 Rev. 4.4	Barium	103		103	104		1.07
	Calcium	105		103			0.844
	Iron	104		105	105		0.299
	Magnesium	105		103	103		0.105
	Potassium	103		101	101		0.0042
	Sodium	104		103			0.0792
	Zinc	103		106	107		0.862
EPA 200.8 Rev. 5.4	Aluminum	102		100	102		0.973
	Antimony	97.9		99.8	99.9		0.0694
	Arsenic	98.0		98.7	100		1.25
	Beryllium	99.7		94.9	97.1		2.14
	Boron	101		102	102		0.127
	Cadmium	97.3		98.6	101		1.94
	Chromium	99.6		101	101		0.354
	Copper	98.7		99.5	98.8		0.665
	Lead	103		104	105		0.453
	Nickel	99.2		96.8	97.7		0.879
	Selenium	98.1		96.6	97.8		1.19
	Silver	101		100	100		0.373
	Thallium	110		115	115		0.113
EPA 300.0 Rev. 2.1	Chloride	98.7		99.0	97.9	1.76	
	Sulfate	99.5		99.7	98.4	0.620	
EPA 350.1 Rev. 2.0	Ammonia-N	99.4		99.4	100		0.719
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.0		94.9	97.8		1.81
EPA 353.2 Rev. 2.0	NO2NO3-N	102		97.5			0.0
EPA 365.1 Rev. 2.0	Total-P	101		105	103		1.94
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.6		97.8	99.1		1.05
SM 2120 B-2011	Color (true)	99.3				3.01	
SM 2320 B-2011	Total Alkalinity	98.3				3.11	
SM 2540 C-2011	TDS					7.02	
SM 4500 F-C-2011	Fluoride	102		102	104		0.909
SM 5310 B-2011	Organic Carbon	96.6		95.9	97.9		1.71

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2190933
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2190938
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2190938
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2190933
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2190933
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2190934
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2190934
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2190934
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2190934
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2190935
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2190933
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2190933
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2190938

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2190933
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2190933
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2190933
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2190934

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	08/18/2020			08/18/2020 15:27	Yen Ta	2190933
EPA 200.7 Rev. 4.4	08/18/2020	08/19/2020 15:40	Elliott D. Healy	08/20/2020 16:14	Betina Topolski	2190938
EPA 200.8 Rev. 5.4	08/18/2020	08/19/2020 15:40	Elliott D. Healy	08/25/2020 15:32	Alexander Thompson	2190938
	08/18/2020	08/19/2020 15:40	Elliott D. Healy	08/27/2020 13:42	Alexander Thompson	2190938
	08/18/2020	08/19/2020 15:40	Elliott D. Healy	08/27/2020 19:27	Alexander Thompson	2190938
EPA 300.0 Rev. 2.1	08/18/2020			08/21/2020 00:55	Julia Storbeck	2190933
EPA 350.1 Rev. 2.0	08/18/2020			08/22/2020 14:22	Ping Hua	2190934
EPA 351.2 Rev. 2.0	08/18/2020	08/21/2020 09:05	David Boose	08/24/2020 09:59	Virginia P. Brown	2190934
EPA 353.2 Rev. 2.0	08/18/2020			08/20/2020 09:56	Beverly Y. Sanders	2190934
EPA 365.1 Rev. 2.0	08/18/2020	08/19/2020 13:04	Yen Ta	08/20/2020 14:44	Benjamin T. Nordmann	2190934
EPA 365.1 Rev. 2.0 dissolved	08/18/2020			08/18/2020 16:49	Samantha Davila	2190935
SM 2120 B-2011	08/18/2020			08/18/2020 16:17	Benjamin T. Nordmann	2190933
SM 2320 B-2011	08/18/2020			08/20/2020 01:19	Dale L. Simmons	2190933
SM 2340B	08/18/2020			08/20/2020 16:14	Betina Topolski	2190938
SM 2540 C-2011	08/18/2020			08/19/2020 15:39	Yijie Li	2190933
SM 2540 D-2011	08/18/2020			08/19/2020 15:39	Yijie Li	2190933
SM 4500 F-C-2011	08/18/2020			08/20/2020 01:08	Dale L. Simmons	2190933
SM 5310 B-2011	08/18/2020			08/20/2020 04:56	David Boose	2190934