Chemical Analysis Report

SO-DIST-2020-06-26-02

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

Event Description: **2020 SMP : Canals**
Request ID: **RQ-2020-06-29-17**
Customer: **SO-DIST**
Project ID: **SMP**

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FLDEP South District Office
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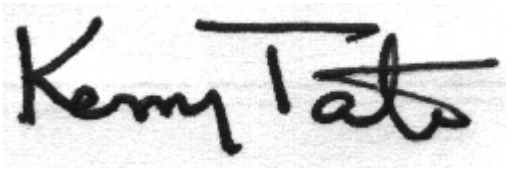
Date Certified: 16-JUL-2020 13:06



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: Nine Mile Canal @ SR 80 **Collection Date/Time: 06/25/2020 12:20**

Field ID: G3SD0088 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2178949	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P383752	
	EPA 300.0 Rev. 2.1	Chloride	59		mg Cl/L	P384002	
		Sulfate	41		mg SO4/L	P384004	
	SM 2120 B-2011	Color (true)	120		PCU	P383760	
	SM 2320 B-2011	Total Alkalinity	185		mg CaCO3/L	P383848	
	SM 2540 C-2011	TDS	410		mg/L	P384362	
	SM 2540 D-2011	TSS	5	I	mg/L	P384353	
	SM 4500 F-C-2011	Fluoride	0.29		mg F/L	P383854	
2178950	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P383772	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P383886	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P383913	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P383864	
	SM 5310 B-2011	Organic Carbon	23		mg C/L	P383904	
2178951	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.063		mg P/L	P383777	
2178954	EPA 200.7 Rev. 4.4	Barium	32.7		ug/L	P383802	
		Calcium	79.1		mg/L	P383802	
		Iron	110	I	ug/L	P383802	
		Magnesium	10.4		mg/L	P383802	
		Potassium	10.3		mg/L	P383802	
		Sodium	32.9		mg/L	P383802	
		Zinc	5.0	U	ug/L	P383802	
	EPA 200.8 Rev. 5.4	Aluminum	25		ug/L	P383802	
		Antimony	0.23		ug/L	P383802	
		Arsenic	2.03		ug/L	P383802	
		Boron**	74.0		ug/L	P383802	
		Cadmium	0.020	U	ug/L	P383802	
		Chromium	0.40	U	ug/L	P383802	
		Copper	0.62	I	ug/L	P383802	
		Lead	0.20	U	ug/L	P383802	
		Nickel	0.64	I	ug/L	P383802	
		Selenium	0.20	I	ug/L	P383802	
		Silver	0.010	U	ug/L	P383802	
		Thallium	0.10	U	ug/L	P383802	
	SM 2340B	Hardness	240		mg/L	P383802	

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: P383752

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P383802

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: P383802

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: P384002

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384004

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383772

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: P383886

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383913

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383864

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383777

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

Reference Method: SM 2120 B-2011
Batch ID: P383760

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P383848

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

Reference Method: SM 2540 C-2011
Batch ID: P384362

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P384353

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P383854

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: P383904

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: P383802

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	100		P	85 - 115
Iron	104		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	98.3		P	85 - 115
Sodium	97.2		P	85 - 115
Zinc	105		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383802

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	101		P	85 - 115
Antimony	99.5		P	85 - 115
Arsenic	103		P	85 - 115
Boron	102		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	102		P	85 - 115
Copper	104		P	85 - 115
Lead	102		P	85 - 115
Nickel	101		P	85 - 115
Selenium	100		P	85 - 115
Silver	102		P	85 - 115
Thallium	104		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384002

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.6		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384004

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383772

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383886

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383913

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383864

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383777

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.6		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P383760

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	98.7		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P383848

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.6		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P383854

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.8		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P383904

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	107		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P383802

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178510	Barium	104	104	P/P	80 - 120
2178510	Calcium	104		P	80 - 120
2178510	Iron	103	103	P/P	80 - 120
2178510	Magnesium	103	104	P/P	80 - 120
2178510	Potassium	97.0	97.0	P/P	80 - 120
2178510	Sodium	99.5		P	80 - 120
2178510	Zinc	108	108	P/P	80 - 120
2178946	Barium	104		P	80 - 120
2178946	Calcium	106		P	80 - 120
2178946	Iron	104		P	80 - 120
2178946	Magnesium	103		P	80 - 120
2178946	Potassium	96.1		P	80 - 120
2178946	Sodium	102		P	80 - 120
2178946	Zinc	108		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383802

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178510	Aluminum	100	101	P/P	80 - 120
2178510	Antimony	100	100	P/P	80 - 120
2178510	Arsenic	103	103	P/P	80 - 120
2178510	Boron	94.7	101	P/P	80 - 120
2178510	Cadmium	99.5	98.6	P/P	80 - 120
2178510	Chromium	101	104	P/P	80 - 120
2178510	Copper	102	103	P/P	80 - 120
2178510	Lead	101	103	P/P	80 - 120
2178510	Nickel	98.3	98.8	P/P	80 - 120
2178510	Selenium	100	101	P/P	80 - 120
2178510	Silver	101	103	P/P	80 - 120
2178510	Thallium	107	108	P/P	80 - 120
2178946	Aluminum	99.7		P	80 - 120
2178946	Antimony	101		P	80 - 120
2178946	Arsenic	104		P	80 - 120
2178946	Boron	98.5		P	80 - 120
2178946	Cadmium	102		P	80 - 120
2178946	Chromium	104		P	80 - 120
2178946	Copper	101		P	80 - 120
2178946	Lead	102		P	80 - 120
2178946	Nickel	100		P	80 - 120
2178946	Selenium	99.0		P	80 - 120
2178946	Silver	102		P	80 - 120
2178946	Thallium	107		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384002

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178770	Chloride	95.8		P	90 - 110
2178922	Chloride	97.7		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384004

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178770	Sulfate	94.8		P	90 - 110
2178922	Sulfate	95.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383772

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178943	Ammonia-N	98.8	98.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383886

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178923	Kjeldahl Nitrogen	104	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383913

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178923	NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178909	Total-P	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383777

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178681	O-Phosphate-P	98.3	98.9	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P383854

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178942	Fluoride	97.9	96.2	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P383904

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2178964	Organic Carbon	108	111	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P383752

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178907	Turbidity	1.60	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P383802

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178510	Barium	0.631	Spike	P	0 - 20
2178510	Calcium	1.41	Spike	P	0 - 20
2178510	Iron	0.0302	Spike	P	0 - 20
2178510	Magnesium	0.422	Spike	P	0 - 20
2178510	Potassium	0.0619	Spike	P	0 - 20
2178510	Sodium	1.25	Spike	P	0 - 20
2178510	Zinc	0.185	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P383802

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178510	Aluminum	0.820	Spike	P	0 - 20
2178510	Antimony	0.193	Spike	P	0 - 20
2178510	Arsenic	0.543	Spike	P	0 - 20
2178510	Boron	5.25	Spike	P	0 - 20
2178510	Cadmium	0.901	Spike	P	0 - 20
2178510	Chromium	2.62	Spike	P	0 - 20
2178510	Copper	1.33	Spike	P	0 - 20
2178510	Lead	1.99	Spike	P	0 - 20
2178510	Nickel	0.549	Spike	P	0 - 20
2178510	Selenium	0.256	Spike	P	0 - 20
2178510	Silver	1.38	Spike	P	0 - 20
2178510	Thallium	1.32	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384002

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178922	Chloride	1.23	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384004

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178922	Sulfate	1.21	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P383772

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178943	Ammonia-N	0.485	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P383886

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178923	Kjeldahl Nitrogen	1.13	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P383913

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178923	NO2NO3-N	0.504	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P383864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178909	Total-P	1.54	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P383777

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178681	O-Phosphate-P	0.609	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P383760

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178922	Color (true)	1.91	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P383848

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178942	Total Alkalinity	2.42	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P384362

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178942	TDS	5.65	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P383854

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178942	Fluoride	1.39	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P383904

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2178964	Organic Carbon	1.72	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: A99552
Included Lab Sample IDs: 2178949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	102	P/P	95 - 105

Reference Method: SM 2120 B-2011
Run ID: A99555
Included Lab Sample IDs: 2178949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.1	99.8	P/P	90 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A99557
Included Lab Sample IDs: 2178950

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A99558
Included Lab Sample IDs: 2178951

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.2	96.9	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A99591
Included Lab Sample IDs: 2178949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.6	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A99591
Included Lab Sample IDs: 2178949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	91.9	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A99614
Included Lab Sample IDs: 2178954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	101	P/P	90 - 110
Calcium	103	102	P/P	90 - 110
Iron	103	103	P/P	90 - 110
Magnesium	103	102	P/P	90 - 110
Potassium	98.4	98.2	P/P	90 - 110
Sodium	99.7	100	P/P	90 - 110
Zinc	103	103	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-2011
Run ID: A99616
Included Lab Sample IDs: 2178950

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A99621
Included Lab Sample IDs: 2178950

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A99625
Included Lab Sample IDs: 2178950

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.2	93.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A99628
Included Lab Sample IDs: 2178950

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	106	105	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A99659
Included Lab Sample IDs: 2178949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.8	100	P/P	90 - 110
Sulfate	99.2	99.7	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A99728
Included Lab Sample IDs: 2178954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	101	100	P/P	90 - 110
Arsenic	104	103	P/P	90 - 110
Cadmium	104	103	P/P	90 - 110
Chromium	101	100	P/P	90 - 110
Lead	104	103	P/P	90 - 110
Nickel	100	99.7	P/P	90 - 110
Selenium	104	104	P/P	90 - 110
Silver	103	101	P/P	90 - 110
Thallium	102	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A99751
Included Lab Sample IDs: 2178954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A99751
Included Lab Sample IDs: 2178954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Boron	105	106	P/P	90 - 110
Copper	98.4	99.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A99778
Included Lab Sample IDs: 2178954

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.6	99.9	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						1.60	
EPA 200.7 Rev. 4.4	Barium	104	104	104	104			0.631
	Calcium	100	104	106				1.41
	Iron	104	103	103	104			0.0302
	Magnesium	105	103	104	103			0.422
	Potassium	98.3	97.0	97.0	96.1			0.0619
	Sodium	97.2	99.5	102				1.25
	Zinc	105	108	108	108			0.185
EPA 200.8 Rev. 5.4	Aluminum	101	100	101	99.7			0.820
	Antimony	99.5	100	100	101			0.193
	Arsenic	103	103	103	104			0.543
	Boron	102	94.7	101	98.5			5.25
	Cadmium	102	99.5	98.6	102			0.901
	Chromium	102	101	104	104			2.62
	Copper	104	102	103	101			1.33
	Lead	102	101	103	102			1.99
	Nickel	101	98.3	98.8	100			0.549
	Selenium	100	100	101	99.0			0.256
	Silver	102	101	103	102			1.38
	Thallium	104	107	108	107			1.32
EPA 300.0 Rev. 2.1	Chloride	98.6	97.7	95.8			1.23	
	Sulfate	97.8	95.5	94.8			1.21	
EPA 350.1 Rev. 2.0	Ammonia-N	100	98.8	98.3				0.485
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	104	106				1.13
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.5	99.0				0.504
EPA 365.1 Rev. 2.0	Total-P	103	103	105				1.54
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.6	98.3	98.9				0.609
SM 2120 B-2011	Color (true)	98.7					1.91	
SM 2320 B-2011	Total Alkalinity	99.6					2.42	
SM 2540 C-2011	TDS						5.65	
SM 4500 F-C-2011	Fluoride	96.8	97.9	96.2				1.39
SM 5310 B-2011	Organic Carbon	107	108	111				1.72

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2178949
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2178954
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2178954
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2178949
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2178949
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2178950
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2178950
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2178950
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2178950
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2178951
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2178949
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2178949
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2178954
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2178949

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2178949
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2178949
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2178950

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	06/26/2020			06/26/2020 16:13	Yen Ta	2178949
EPA 200.7 Rev. 4.4	06/26/2020	06/29/2020 14:30	Elliott D. Healy	06/30/2020 19:59	Betina Topolski	2178954
EPA 200.8 Rev. 5.4	06/26/2020	06/29/2020 14:30	Elliott D. Healy	07/07/2020 17:10	Alexander Thompson	2178954
	06/26/2020	06/29/2020 14:30	Elliott D. Healy	07/08/2020 16:20	Alexander Thompson	2178954
	06/26/2020	06/29/2020 14:30	Elliott D. Healy	07/09/2020 10:52	Alexander Thompson	2178954
EPA 300.0 Rev. 2.1	06/26/2020			07/02/2020 03:25	Elliott Rodriguez	2178949
EPA 350.1 Rev. 2.0	06/26/2020			06/28/2020 13:28	Ping Hua	2178950
EPA 351.2 Rev. 2.0	06/26/2020	06/30/2020 14:30	Jhamieka S. Greenwood	07/01/2020 12:22	Jhamieka S. Greenwood	2178950
EPA 353.2 Rev. 2.0	06/26/2020			07/01/2020 08:56	Beverly Y. Sanders	2178950
EPA 365.1 Rev. 2.0	06/26/2020	06/30/2020 11:51	Yen Ta	07/01/2020 13:19	Benjamin T. Nordmann	2178950
EPA 365.1 Rev. 2.0 dissolved	06/26/2020			06/26/2020 17:03	Jhamieka S. Greenwood	2178951
SM 2120 B-2011	06/26/2020			06/26/2020 17:27	Benjamin T. Nordmann	2178949
SM 2320 B-2011	06/26/2020			06/29/2020 19:58	Dale L. Simmons	2178949
SM 2340B	06/26/2020			06/30/2020 19:59	Betina Topolski	2178954
SM 2540 C-2011	06/26/2020			07/01/2020 13:59	Yijie Li	2178949
SM 2540 D-2011	06/26/2020			07/01/2020 13:59	Yijie Li	2178949
SM 4500 F-C-2011	06/26/2020			06/29/2020 19:58	Dale L. Simmons	2178949
SM 5310 B-2011	06/26/2020			07/01/2020 00:00	David Boose	2178950