

Chemical Analysis Report

CEN-DIST-2021-08-11-03

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

Event Description: **Cow Creek/B-19 Canal**
Request ID: **RQ-2021-07-05-20**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 02-SEP-2021 09:55

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Cow Creek at OsteenMaytown Road (2952)

Collection Date/Time: 08/10/2021 13:00

Field ID: G2CE0086

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2268501	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P402345	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P402551	
		Sulfate	0.20	U	mg SO4/L	P402553	
	SM 2120 B-2011	Color (true)	780		PCU	P402348	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P402593	
	SM 2540 C-2011	TDS	154		mg/L	P402859	
	SM 2540 D-2011	TSS	2	I	mg/L	P402750	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P402596	
2268502	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P402460	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P403154	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P402440	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P402464	MS
	SM 5310 B-2011	Organic Carbon	59		mg C/L	P402919	
2268503	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P402313	
2268514	EPA 200.7 Rev. 4.4	Barium	10.3		ug/L	P402516	
		Calcium	4.66		mg/L	P402516	
		Iron	1.74E+03		ug/L	P402516	
		Magnesium	1.20		mg/L	P402516	
		Manganese	11.1		ug/L	P402516	
		Potassium	0.30	U	mg/L	P402516	
		Sodium	7.5		mg/L	P402516	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P402516	
		Aluminum	399		ug/L	P402516	
		Antimony	0.050	U	ug/L	P402516	
		Arsenic	0.56		ug/L	P402516	
		Beryllium	0.017	I	ug/L	P402516	
		Boron**	25.7		ug/L	P402516	
		Cadmium	0.020	U	ug/L	P402516	
		Chromium	0.48	I	ug/L	P402516	
		Copper	0.40	U	ug/L	P402516	
		Lead	0.56		ug/L	P402516	
		Nickel	1.5	I	ug/L	P402516	
		Selenium	0.20	U	ug/L	P402516	
		Silver	0.010	U	ug/L	P402516	
		Thallium	0.10	U	ug/L	P402516	
		Hardness	16.6		mg/L	P402516	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 08/19/2021.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P402345

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P402516

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
Manganese	1.0	U	ug/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: P402516

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: P402551

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402553

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402460

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: P403154

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402440

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402464

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402313

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

Reference Method: SM 2120 B-2011
Batch ID: P402348

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P402593

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-2011
Batch ID: P402859

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P402750

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P402596

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: P402919

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: P402516

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	110		P	85 - 115
Calcium	107		P	85 - 115
Iron	112		P	85 - 115
Magnesium	111		P	85 - 115
Manganese	105		P	85 - 115
Potassium	107		P	85 - 115
Sodium	104		P	85 - 115
Zinc	106		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P402516

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	102		P	85 - 115
Arsenic	104		P	85 - 115
Beryllium	95.9		P	85 - 115
Boron	103		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	102		P	85 - 115
Copper	105		P	85 - 115
Lead	106		P	85 - 115
Nickel	105		P	85 - 115
Selenium	105		P	85 - 115
Silver	111		P	85 - 115
Thallium	106		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P402551

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P402553

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P402460

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: P403154

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402440

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402464

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	109		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402313

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

Reference Method: SM 2120 B-2011
Batch ID: P402348

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P402593

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P402596

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.0		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P402919

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P402516

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2267978	Barium	108	112	P/P	80 - 120
2267978	Calcium	106		P	80 - 120
2267978	Iron	108	118	P/P	80 - 120
2267978	Magnesium	108	115	P/P	80 - 120
2267978	Manganese	103	109	P/P	80 - 120
2267978	Potassium	104	109	P/P	80 - 120
2267978	Sodium	103		P	80 - 120
2267978	Zinc	106	110	P/P	80 - 120
2268448	Barium	108		P	80 - 120
2268448	Calcium	108		P	80 - 120
2268448	Iron	110		P	80 - 120
2268448	Magnesium	109		P	80 - 120
2268448	Manganese	104		P	80 - 120
2268448	Potassium	111		P	80 - 120
2268448	Sodium	106		P	80 - 120
2268448	Zinc	103		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P402516

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2267978	Aluminum	98.2	102	P/P	80 - 120
2267978	Antimony	97.2	99.4	P/P	80 - 120
2267978	Arsenic	98.0	100	P/P	80 - 120
2267978	Beryllium	98.4	100	P/P	80 - 120
2267978	Boron	99.9	104	P/P	80 - 120
2267978	Cadmium	96.5	100	P/P	80 - 120
2267978	Chromium	97.0	98.3	P/P	80 - 120
2267978	Copper	95.8	99.4	P/P	80 - 120
2267978	Lead	103	106	P/P	80 - 120
2267978	Nickel	97.5	98.8	P/P	80 - 120
2267978	Selenium	98.3	99.8	P/P	80 - 120
2267978	Silver	107	108	P/P	80 - 120
2267978	Thallium	104	106	P/P	80 - 120
2268448	Aluminum	99.8		P	80 - 120
2268448	Antimony	98.5		P	80 - 120
2268448	Arsenic	99.8		P	80 - 120
2268448	Beryllium	96.7		P	80 - 120
2268448	Boron	98.7		P	80 - 120
2268448	Cadmium	99.5		P	80 - 120
2268448	Chromium	99.5		P	80 - 120
2268448	Copper	101		P	80 - 120
2268448	Lead	105		P	80 - 120
2268448	Nickel	101		P	80 - 120
2268448	Selenium	99.8		P	80 - 120
2268448	Silver	108		P	80 - 120
2268448	Thallium	106		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P402551

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402551

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268465	Chloride	101		P	90 - 110
2268944	Chloride	99.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P402553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268465	Sulfate	101		P	90 - 110
2268944	Sulfate	98.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402460

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268523	Ammonia-N	101	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402440

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268495	NO2NO3-N	98.8	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402464

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268624	Total-P	113	106	F/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402313

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268525	O-Phosphate-P	102	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P402596

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268419	Fluoride	103	103	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P402919

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2268467	Organic Carbon	98.6	96.6	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P402345

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268510	Turbidity	4.78	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P402516

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2267978	Barium	4.27	Spike	P	0 - 20
2267978	Calcium	5.55	Spike	P	0 - 20
2267978	Iron	7.99	Spike	P	0 - 20
2267978	Magnesium	5.41	Spike	P	0 - 20
2267978	Manganese	5.14	Spike	P	0 - 20
2267978	Potassium	4.43	Spike	P	0 - 20
2267978	Sodium	5.49	Spike	P	0 - 20
2267978	Zinc	4.42	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P402516

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2267978	Aluminum	2.64	Spike	P	0 - 20
2267978	Antimony	2.29	Spike	P	0 - 20
2267978	Arsenic	2.24	Spike	P	0 - 20
2267978	Beryllium	2.11	Spike	P	0 - 20
2267978	Boron	3.22	Spike	P	0 - 20
2267978	Cadmium	3.63	Spike	P	0 - 20
2267978	Chromium	1.33	Spike	P	0 - 20
2267978	Copper	3.63	Spike	P	0 - 20
2267978	Lead	3.11	Spike	P	0 - 20
2267978	Nickel	1.32	Spike	P	0 - 20
2267978	Selenium	1.50	Spike	P	0 - 20
2267978	Silver	1.22	Spike	P	0 - 20
2267978	Thallium	1.79	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P402551

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268944	Chloride	1.97	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P402553

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268944	Sulfate	1.98	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402460

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268523	Ammonia-N	0.787	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403154

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2270409	Kjeldahl Nitrogen	11.6	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P402440

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268495	NO2NO3-N	0.935	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402464

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268624	Total-P	5.15	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P402313

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268525	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P402348

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268510	Color (true)	0.841	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P402593

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268419	Total Alkalinity	0.923	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P402859

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268626	TDS	2.87	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P402596

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268419	Fluoride	0.457	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P402919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2268467	Organic Carbon	1.46	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A107178

Included Lab Sample IDs: 2268503

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	98.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A107187

Included Lab Sample IDs: 2268501

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

Reference Method: SM 2120 B-2011

Run ID: A107189

Included Lab Sample IDs: 2268501

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A107236

Included Lab Sample IDs: 2268502

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A107243

Included Lab Sample IDs: 2268502

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	98.7	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A107288

Included Lab Sample IDs: 2268501

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	99.5	P/P	90 - 110
Sulfate	100	99.6	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A107300

Included Lab Sample IDs: 2268501

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.5	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A107300

Included Lab Sample IDs: 2268501

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107304

Included Lab Sample IDs: 2268514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	102	104	P/P	90 - 110
Iron	101	104	P/P	90 - 110
Magnesium	100	102	P/P	90 - 110
Manganese	102	102	P/P	90 - 110
Potassium	101	102	P/P	90 - 110
Sodium	99.6	101	P/P	90 - 110
Zinc	97.9	95.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A107317

Included Lab Sample IDs: 2268502

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A107337

Included Lab Sample IDs: 2268514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	99.4	99.8	P/P	90 - 110
Antimony	98.5	98.5	P/P	90 - 110
Arsenic	97.9	98.4	P/P	90 - 110
Beryllium	94.9	94.9	P/P	90 - 110
Boron	98.0	99.3	P/P	90 - 110
Cadmium	98.8	98.7	P/P	90 - 110
Chromium	96.9	97.9	P/P	90 - 110
Copper	94.8	95.2	P/P	90 - 110
Lead	102	102	P/P	90 - 110
Nickel	96.7	97.4	P/P	90 - 110
Selenium	96.6	98.0	P/P	90 - 110
Silver	102	103	P/P	90 - 110
Thallium	102	102	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A107416

Included Lab Sample IDs: 2268514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.1	101	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A107443

Included Lab Sample IDs: 2268502

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.0	96.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A107583

Included Lab Sample IDs: 2268502

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	98.9	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					4.78	
EPA 200.7 Rev. 4.4	Barium	110	108	112	108		4.27
	Calcium	107	106	108			5.55
	Iron	112	108	118	110		7.99
	Magnesium	111	108	115	109		5.41
	Manganese	105	103	109	104		5.14
	Potassium	107	104	109	111		4.43
	Sodium	104	103	106			5.49
	Zinc	106	106	110	103		4.42
EPA 200.8 Rev. 5.4	Aluminum	103	98.2	102	99.8		2.64
	Antimony	102	97.2	99.4	98.5		2.29
	Arsenic	104	98.0	100	99.8		2.24
	Beryllium	95.9	98.4	100	96.7		2.11
	Boron	103	99.9	104	98.7		3.22
	Cadmium	102	96.5	100	99.5		3.63
	Chromium	102	97.0	98.3	99.5		1.33
	Copper	105	95.8	99.4	101		3.63
	Lead	106	103	106	105		3.11
	Nickel	105	97.5	98.8	101		1.32
	Selenium	105	98.3	99.8	99.8		1.50
	Silver	111	107	108	108		1.22
	Thallium	106	104	106	106		1.79
EPA 300.0 Rev. 2.1	Chloride	99.1	99.8	101		1.97	
	Sulfate	101	98.9	101		1.98	
EPA 350.1 Rev. 2.0	Ammonia-N	99.4	101	102			0.787
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104					11.6
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.5	98.8	99.8			0.935
EPA 365.1 Rev. 2.0	Total-P	109	113	106			5.15
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	102	102			0.0
SM 2120 B-2011	Color (true)	101				0.841	
SM 2320 B-2011	Total Alkalinity	102				0.923	
SM 2540 C-2011	TDS					2.87	
SM 4500 F-C-2011	Fluoride	99.0	103	103			0.457
SM 5310 B-2011	Organic Carbon	95.5	98.6	96.6			1.46

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2268501
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2268514
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2268514
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2268501
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2268501
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2268502
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2268502
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2268502
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2268502
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2268503
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2268501
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2268501

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2268514
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2268501
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2268501
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2268501
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2268502

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	08/11/2021			08/11/2021 15:39	Sarah A Nixon	2268501
EPA 200.7 Rev. 4.4	08/11/2021	08/16/2021 16:10	Elliott D. Healy	08/17/2021 21:35	Josef B Mick	2268514
	08/11/2021	08/16/2021 16:10	Elliott D. Healy	08/24/2021 04:46	Josef B Mick	2268514
EPA 200.8 Rev. 5.4	08/11/2021	08/16/2021 16:10	Elliott D. Healy	08/18/2021 22:42	McKinley C Carter	2268514
EPA 300.0 Rev. 2.1	08/11/2021			08/17/2021 07:23	Lipi Saha	2268501
EPA 350.1 Rev. 2.0	08/11/2021			08/13/2021 13:38	Ping Hua	2268502
EPA 351.2 Rev. 2.0	08/11/2021	08/30/2021 13:42	Benjamin T. Nordmann	08/31/2021 14:17	Alexandra J Mattheus	2268502
EPA 353.2 Rev. 2.0	08/11/2021			08/13/2021 10:30	Beverly Y. Sanders	2268502
EPA 365.1 Rev. 2.0	08/11/2021	08/13/2021 15:00	Simonne.V. Calhoun	08/16/2021 11:36	Shengyu Ding	2268502
EPA 365.1 Rev. 2.0 dissolved	08/11/2021			08/11/2021 11:20	Patrick M. Roche	2268503
SM 2120 B-2011	08/11/2021			08/11/2021 16:35	Sarah A Nixon	2268501
SM 2320 B-2011	08/11/2021			08/12/2021 19:08	Dale L. Simmons	2268501
SM 2340B	08/11/2021			08/17/2021 21:35	Josef B Mick	2268514
SM 2540 C-2011	08/11/2021			08/16/2021 15:36	Yijie Li	2268501
SM 2540 D-2011	08/11/2021			08/16/2021 15:36	Yijie Li	2268501
SM 4500 F-C-2011	08/11/2021			08/12/2021 19:08	Dale L. Simmons	2268501
SM 5310 B-2011	08/11/2021			08/23/2021 17:47	Madeline Gruver	2268502