

Chemical Analysis Report

NE-DIST-2021-05-11-01

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

Event Description: **Bmap 2 2021 SMP**
Request ID: **RQ-2021-05-10-17**
Customer: **NE-DIST**
Project ID: **SMP**

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 27-MAY-2021 10:18

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: TRIB TO OPEN CR @ WINDSOR PARK DR N

Collection Date/Time: 05/10/2021 11:50

Field ID: 20030858

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2246567	EPA 200.7 Rev. 4.4	Barium	34.7		ug/L	P398360	
		Calcium	32.6		mg/L	P398360	
		Iron	420		ug/L	P398360	
		Magnesium	7.13		mg/L	P398360	
		Manganese	38.1		ug/L	P398360	
		Potassium	3.4		mg/L	P398360	
		Sodium	20.3		mg/L	P398360	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P398360	
		Aluminum	73		ug/L	P398360	
		Antimony	0.050	U	ug/L	P398360	
		Arsenic	0.98		ug/L	P398360	
		Beryllium	0.028	I	ug/L	P398360	
		Boron**	25.6		ug/L	P398360	
		Cadmium	0.020	U	ug/L	P398360	
		Chromium	0.40	U	ug/L	P398360	
		Copper	1.27		ug/L	P398360	
		Lead	0.20	U	ug/L	P398360	
		Nickel	0.50	U	ug/L	P398360	
		Selenium	0.20	U	ug/L	P398360	
		Silver	0.010	U	ug/L	P398360	
		Thallium	0.10	U	ug/L	P398360	
	SM 2340B	Hardness	111		mg/L	P398360	

Sample Location: OPEN CREEK AT POWERLINES EAST OF DANFORTH RD

Collection Date/Time: 05/10/2021 12:15

Field ID: 20030950

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2246555	EPA 180.1 Rev. 2.0	Turbidity	3.0		NTU	P398005	
	EPA 300.0 Rev. 2.1	Chloride	38		mg Cl/L	P398646	
		Sulfate	62		mg SO4/L	P398649	
	SM 2120 B-2011	Color (true)	34		PCU	P398011	
	SM 2320 B-2011	Total Alkalinity	76		mg CaCO3/L	P398477	
	SM 2540 C-2011	TDS	258		mg/L	P398440	
	SM 2540 D-2011	TSS	2	I	mg/L	P398333	
	SM 4500 F-C-2011	Fluoride	0.071	I	mg F/L	P398697	
2246556	EPA 350.1 Rev. 2.0	Ammonia-N	0.086		mg N/L	P398306	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.55		mg N/L	P398245	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.28		mg N/L	P398124	
	EPA 365.1 Rev. 2.0	Total-P	0.066		mg P/L	P398447	
	SM 5310 B-2011	Organic Carbon	11		mg C/L	P398166	
2246557	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.030		mg P/L	P398025	
2246566	EPA 200.7 Rev. 4.4	Barium	38.4		ug/L	P398360	
		Calcium	51.5		mg/L	P398360	
		Iron	390		ug/L	P398360	
		Magnesium	9.04		mg/L	P398360	
		Manganese	29.2		ug/L	P398360	
		Potassium	4.1		mg/L	P398360	
		Sodium	22.7		mg/L	P398360	
	EPA 200.8 Rev. 5.4	Zinc	5.0	U	ug/L	P398360	
		Aluminum	155		ug/L	P398360	
		Antimony	0.070	I	ug/L	P398360	
		Arsenic	1.03		ug/L	P398360	
		Beryllium	0.050		ug/L	P398360	
		Boron**	30.8		ug/L	P398360	
		Cadmium	0.020	U	ug/L	P398360	
		Chromium	0.40	U	ug/L	P398360	
		Copper	3.95		ug/L	P398360	
		Lead	0.20	U	ug/L	P398360	
		Nickel	0.50	U	ug/L	P398360	
		Selenium	0.20	U	ug/L	P398360	
		Silver	0.010	U	ug/L	P398360	
		Thallium	0.10	U	ug/L	P398360	
	SM 2340B	Hardness	166		mg/L	P398360	

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.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P398005

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P398360

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: P398360

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: P398646

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398649

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398306

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: P398245

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398124

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398447

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398025

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

Reference Method: SM 2120 B-2011
Batch ID: P398011

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P398477

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

Reference Method: SM 2540 C-2011
Batch ID: P398440

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P398333

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P398697

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: P398166

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: P398360

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.5		P	85 - 115
Calcium	108		P	85 - 115
Iron	106		P	85 - 115
Magnesium	105		P	85 - 115
Manganese	104		P	85 - 115
Potassium	99.6		P	85 - 115
Sodium	99.6		P	85 - 115
Zinc	94.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P398360

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	92.7		P	85 - 115
Antimony	95.9		P	85 - 115
Arsenic	102		P	85 - 115
Beryllium	93.8		P	85 - 115
Boron	94.5		P	85 - 115
Cadmium	99.3		P	85 - 115
Chromium	95.7		P	85 - 115
Copper	99.2		P	85 - 115
Lead	90.5		P	85 - 115
Nickel	100		P	85 - 115
Selenium	93.8		P	85 - 115
Silver	98.7		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398646

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398649

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398306

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398245

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.3		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398124

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: P398447

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: P398025

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

Reference Method: SM 2120 B-2011
Batch ID: P398011

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

Reference Method: SM 2320 B-2011
Batch ID: P398477

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.9		P	94 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P398697

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.0		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P398166

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P398360

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246566	Barium	97.0		P	80 - 120
2246566	Calcium	99.5		P	80 - 120
2246566	Iron	108		P	80 - 120
2246566	Magnesium	97.2		P	80 - 120
2246566	Manganese	102		P	80 - 120
2246566	Potassium	94.4		P	80 - 120
2246566	Sodium	99.1		P	80 - 120
2246566	Zinc	95.6		P	80 - 120
2246664	Barium	91.8	88.1	P/P	80 - 120
2246664	Calcium	101	94.4	P/P	80 - 120
2246664	Iron	99.9	95.4	P/P	80 - 120
2246664	Magnesium	98.2	93.8	P/P	80 - 120
2246664	Manganese	95.4	91.4	P/P	80 - 120
2246664	Potassium	97.4	92.5	P/P	80 - 120
2246664	Sodium	94.4	85.2	P/P	80 - 120
2246664	Zinc	85.9	83.1	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P398360

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246566	Aluminum	91.5		P	80 - 120
2246566	Antimony	96.9		P	80 - 120
2246566	Arsenic	100		P	80 - 120
2246566	Beryllium	93.8		P	80 - 120
2246566	Boron	94.5		P	80 - 120
2246566	Cadmium	99.2		P	80 - 120
2246566	Chromium	97.4		P	80 - 120
2246566	Copper	101		P	80 - 120
2246566	Lead	92.3		P	80 - 120
2246566	Nickel	98.9		P	80 - 120
2246566	Selenium	94.6		P	80 - 120
2246566	Silver	98.6		P	80 - 120
2246566	Thallium	108		P	80 - 120
2246664	Aluminum	92.9	92.8	P/P	80 - 120
2246664	Antimony	95.9	96.8	P/P	80 - 120
2246664	Arsenic	100	101	P/P	80 - 120
2246664	Beryllium	91.3	93.0	P/P	80 - 120
2246664	Boron	92.7	94.2	P/P	80 - 120
2246664	Cadmium	97.7	102	P/P	80 - 120
2246664	Chromium	95.7	96.9	P/P	80 - 120
2246664	Copper	99.1	98.6	P/P	80 - 120
2246664	Lead	91.4	92.1	P/P	80 - 120
2246664	Nickel	98.1	98.9	P/P	80 - 120
2246664	Selenium	91.3	93.4	P/P	80 - 120
2246664	Silver	99.3	100	P/P	80 - 120
2246664	Thallium	104	106	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P398646

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: P398646

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246525	Chloride	102		P	90 - 110
2246890	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P398649

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246525	Sulfate	101		P	90 - 110
2246890	Sulfate	107		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398306

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246485	Ammonia-N	92.2	93.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246526	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398447

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246556	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398025

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246655	O-Phosphate-P	102	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P398697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246889	Fluoride	98.2	98.8	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P398166

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2246354	Organic Carbon	97.0	97.8	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P398005

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246484	Turbidity	3.05	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P398360

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246664	Barium	4.01	Spike	P	0 - 20
2246664	Calcium	5.54	Spike	P	0 - 20
2246664	Iron	4.17	Spike	P	0 - 20
2246664	Magnesium	4.11	Spike	P	0 - 20
2246664	Manganese	3.99	Spike	P	0 - 20
2246664	Potassium	5.22	Spike	P	0 - 20
2246664	Sodium	7.03	Spike	P	0 - 20
2246664	Zinc	3.35	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P398360

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246664	Aluminum	0.0861	Spike	P	0 - 20
2246664	Antimony	0.975	Spike	P	0 - 20
2246664	Arsenic	0.752	Spike	P	0 - 20
2246664	Beryllium	1.72	Spike	P	0 - 20
2246664	Boron	1.58	Spike	P	0 - 20
2246664	Cadmium	4.73	Spike	P	0 - 20
2246664	Chromium	1.27	Spike	P	0 - 20
2246664	Copper	0.504	Spike	P	0 - 20
2246664	Lead	0.744	Spike	P	0 - 20
2246664	Nickel	0.817	Spike	P	0 - 20
2246664	Selenium	2.26	Spike	P	0 - 20
2246664	Silver	0.907	Spike	P	0 - 20
2246664	Thallium	2.20	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P398646

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246890	Chloride	1.82	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P398649

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246890	Sulfate	1.58	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398306

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246485	Ammonia-N	1.29	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398245

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246482	Kjeldahl Nitrogen	1.35	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P398124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246526	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246556	Total-P	0.651	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P398025

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246655	O-Phosphate-P	0.494	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P398011

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246580	Color (true)	0.418	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P398477

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246580	Total Alkalinity	0.470	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P398440

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246524	TDS	5.76	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P398697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246889	Fluoride	0.479	Spike	P	0 - 2.1

Reference Method: SM 5310 B-2011
Batch ID: P398166

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2246354	Organic Carbon	0.510	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: A105342

Included Lab Sample IDs: 2246555

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.0	99.5	P/P	95 - 105

Reference Method: SM 2120 B-2011

Run ID: A105343

Included Lab Sample IDs: 2246555

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A105353

Included Lab Sample IDs: 2246557

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.7	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A105396

Included Lab Sample IDs: 2246556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	102	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A105417

Included Lab Sample IDs: 2246556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.9	98.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A105465

Included Lab Sample IDs: 2246556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.8	97.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A105472

Included Lab Sample IDs: 2246556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.1	99.9	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105545

Included Lab Sample IDs: 2246566, 2246567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	96.1	97.1	P/P	90 - 110
Aluminum	97.1	98.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105545

Included Lab Sample IDs: 2246566, 2246567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	97.1	96.8	P/P	90 - 110
Antimony	98.0	97.1	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Arsenic	103	102	P/P	90 - 110
Beryllium	100	99.5	P/P	90 - 110
Beryllium	99.5	98.3	P/P	90 - 110
Boron	96.5	99.9	P/P	90 - 110
Boron	99.9	101	P/P	90 - 110
Cadmium	99.1	99.4	P/P	90 - 110
Cadmium	99.4	98.7	P/P	90 - 110
Chromium	94.9	96.5	P/P	90 - 110
Chromium	96.7	94.9	P/P	90 - 110
Copper	97.1	99.5	P/P	90 - 110
Copper	98.7	97.1	P/P	90 - 110
Lead	93.9	94.3	P/P	90 - 110
Lead	94.1	93.9	P/P	90 - 110
Nickel	96.9	101	P/P	90 - 110
Nickel	98.8	96.9	P/P	90 - 110
Silver	98.3	99.0	P/P	90 - 110
Silver	99.0	98.3	P/P	90 - 110
Thallium	97.4	97.4	P/P	90 - 110
Thallium	97.7	97.4	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A105548

Included Lab Sample IDs: 2246555

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	97.2	98.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A105550

Included Lab Sample IDs: 2246555

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	101	P/P	90 - 110
Sulfate	99.7	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A105557

Included Lab Sample IDs: 2246556

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105578

Included Lab Sample IDs: 2246566, 2246567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Selenium	95.5	93.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A105578

Included Lab Sample IDs: 2246566, 2246567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Selenium	97.5	95.5	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A105626

Included Lab Sample IDs: 2246555

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.5	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A105650

Included Lab Sample IDs: 2246566, 2246567

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.8	97.5	P/P	90 - 110
Calcium	100	97.8	P/P	90 - 110
Iron	102	101	P/P	90 - 110
Magnesium	101	98.9	P/P	90 - 110
Manganese	102	101	P/P	90 - 110
Potassium	98.9	97.7	P/P	90 - 110
Sodium	99.8	98.5	P/P	90 - 110
Zinc	94.9	90.7	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					3.05	
EPA 200.7 Rev. 4.4	Barium	99.5	97.0	91.8	88.1		4.01
	Calcium	108	99.5	101	94.4		5.54
	Iron	106	108	99.9	95.4		4.17
	Magnesium	105	97.2	98.2	93.8		4.11
	Manganese	104	102	95.4	91.4		3.99
	Potassium	99.6	94.4	97.4	92.5		5.22
	Sodium	99.6	99.1	94.4	85.2		7.03
	Zinc	94.6	95.6	85.9	83.1		3.35
EPA 200.8 Rev. 5.4	Aluminum	92.7	92.9	92.8	91.5		0.0861
	Antimony	95.9	95.9	96.8	96.9		0.975
	Arsenic	102	100	101	100		0.752
	Beryllium	93.8	91.3	93.0	93.8		1.72
	Boron	94.5	92.7	94.2	94.5		1.58
	Cadmium	99.3	97.7	102	99.2		4.73
	Chromium	95.7	95.7	96.9	97.4		1.27
	Copper	99.2	99.1	98.6	101		0.504
	Lead	90.5	91.4	92.1	92.3		0.744
	Nickel	100	98.1	98.9	98.9		0.817
	Selenium	93.8	91.3	93.4	94.6		2.26
	Silver	98.7	99.3	100	98.6		0.907
	Thallium	103	104	106	108		2.20
EPA 300.0 Rev. 2.1	Chloride	104	101	102		1.82	
	Sulfate	103	107	101		1.58	
EPA 350.1 Rev. 2.0	Ammonia-N	98.0	92.2	93.8			1.29
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.3					1.35
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	100	100			0.0
EPA 365.1 Rev. 2.0	Total-P	101	102	103			0.651
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	102	101			0.494
SM 2120 B-2011	Color (true)	101				0.418	
SM 2320 B-2011	Total Alkalinity	98.9				0.470	
SM 2540 C-2011	TDS					5.76	
SM 4500 F-C-2011	Fluoride	96.0	98.2	98.8			0.479
SM 5310 B-2011	Organic Carbon	96.5	97.0	97.8			0.510

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2246555
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2246566, 2246567
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2246566, 2246567
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2246555
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2246555
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2246556
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2246556
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2246556
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2246556
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2246557
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2246555
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2246555

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2246566, 2246567
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2246555
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2246555
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2246555
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2246556

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	05/11/2021			05/11/2021 16:10	Yen Ta	2246555
EPA 200.7 Rev. 4.4	05/11/2021	05/18/2021 14:25	Elliott D. Healy	05/25/2021 19:51	Betina Topolski	2246566
	05/11/2021	05/18/2021 14:25	Elliott D. Healy	05/25/2021 20:12	Betina Topolski	2246567
EPA 200.8 Rev. 5.4	05/11/2021	05/18/2021 14:25	Elliott D. Healy	05/20/2021 05:27	Alexander Thompson	2246566
	05/11/2021	05/18/2021 14:25	Elliott D. Healy	05/20/2021 06:53	Alexander Thompson	2246567
	05/11/2021	05/18/2021 14:25	Elliott D. Healy	05/20/2021 22:20	Alexander Thompson	2246566
	05/11/2021	05/18/2021 14:25	Elliott D. Healy	05/20/2021 23:20	Alexander Thompson	2246567
EPA 300.0 Rev. 2.1	05/11/2021			05/21/2021 22:22	Lipi Saha	2246555
EPA 350.1 Rev. 2.0	05/11/2021			05/17/2021 14:25	Roberta Tatti	2246556
EPA 351.2 Rev. 2.0	05/11/2021	05/14/2021 17:30	Benjamin T. Nordmann	05/17/2021 11:12	Virginia P. Brown	2246556
EPA 353.2 Rev. 2.0	05/11/2021			05/13/2021 10:52	Beverly Y. Sanders	2246556
EPA 365.1 Rev. 2.0	05/11/2021	05/19/2021 14:24	Yen Ta	05/20/2021 10:41	Shengyu Ding	2246556
EPA 365.1 Rev. 2.0 dissolved	05/11/2021			05/11/2021 16:15	Blanca Fach	2246557
SM 2120 B-2011	05/11/2021			05/11/2021 16:25	Sarah A Nixon	2246555
SM 2320 B-2011	05/11/2021			05/18/2021 17:40	Dale L. Simmons	2246555
SM 2340B	05/11/2021			05/25/2021 19:51	Betina Topolski	2246566
	05/11/2021			05/25/2021 20:12	Betina Topolski	2246567
SM 2540 C-2011	05/11/2021			05/14/2021 15:25	Yijie Li	2246555
SM 2540 D-2011	05/11/2021			05/14/2021 15:25	Yijie Li	2246555
SM 4500 F-C-2011	05/11/2021			05/24/2021 19:47	Dale L. Simmons	2246555
SM 5310 B-2011	05/11/2021			05/13/2021 08:53	Madeline Gruver	2246556