Chemical Analysis Report

NE-DIST-2021-07-02-01

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-2021-06-28-41**
Customer: **NE-DIST**
Project ID: **SMP**

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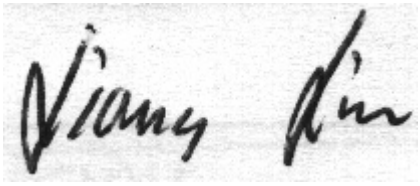
Certified by: Liang Lin, Environmental Administrator

Date Certified: 26-JUL-2021 13:43



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: 07/01/2021 08:40**

Field ID: 20030858 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2259780	EPA 200.7 Rev. 4.4	Barium	24.5		ug/L	P400630	
		Calcium	31.3		mg/L	P400630	
		Iron	570		ug/L	P400630	
		Magnesium	8.08		mg/L	P400630	
		Manganese	15.8		ug/L	P400630	
		Potassium	2.9		mg/L	P400630	
		Sodium	18.2		mg/L	P400630	
		Zinc	5.0	U	ug/L	P400630	
	EPA 200.8 Rev. 5.4	Aluminum	192		ug/L	P400630	
		Antimony	0.079	I	ug/L	P400630	
		Arsenic	2.03		ug/L	P400630	
		Beryllium	0.039	I	ug/L	P400630	
		Boron**	30.5		ug/L	P400630	
		Cadmium	0.020	U	ug/L	P400630	
		Chromium	0.41	I	ug/L	P400630	
		Copper	4.24		ug/L	P400630	
		Lead	0.20	U	ug/L	P400630	
		Nickel	0.50	U	ug/L	P400630	
		Selenium	0.20	U	ug/L	P400630	
		Silver	0.010	U	ug/L	P400630	
		Thallium	0.10	U	ug/L	P400630	
	SM 2340B	Hardness	111		mg/L	P400630	

Ref. Method and Comment:
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.

Sample Location: Open Creek at Powerlines East of Danforth Rd. Collection Date/Time: 07/01/2021 09:00

Field ID: 20030950 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2259773	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P400603	
	EPA 300.0 Rev. 2.1	Chloride	36		mg Cl/L	P400973	
		Sulfate	57		mg SO4/L	P400976	
	SM 2120 B-2011	Color (true)	43	A	PCU	P400544	
	SM 2320 B-2011	Total Alkalinity	65		mg CaCO3/L	P400783	
	SM 2540 C-2011	TDS	210		mg/L	P400991	
	SM 2540 D-2011	TSS	6	I	mg/L	P400979	
	SM 4500 F-C-2011	Fluoride	0.093	I	mg F/L	P400787	
2259774	EPA 350.1 Rev. 2.0	Ammonia-N	0.060		mg N/L	P400948	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.68		mg N/L	P400644	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P400566	
	EPA 365.1 Rev. 2.0	Total-P	0.066		mg P/L	P400659	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P401072	
2259775	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.014		mg P/L	P400538	
2259779	EPA 200.7 Rev. 4.4	Barium	33.0		ug/L	P400630	
		Calcium	42.4		mg/L	P400630	
		Iron	390		ug/L	P400630	
		Magnesium	8.36		mg/L	P400630	
		Manganese	21.6		ug/L	P400630	
		Potassium	3.9		mg/L	P400630	
		Sodium	23.0		mg/L	P400630	
		Zinc	5.0	U	ug/L	P400630	
	EPA 200.8 Rev. 5.4	Aluminum	210		ug/L	P400630	
		Antimony	0.12	I	ug/L	P400630	
		Arsenic	1.47		ug/L	P400630	
		Beryllium	0.050		ug/L	P400630	
		Boron**	35.5		ug/L	P400630	
		Cadmium	0.020	U	ug/L	P400630	
		Chromium	0.40	U	ug/L	P400630	
		Copper	5.29		ug/L	P400630	
		Lead	0.20	U	ug/L	P400630	
		Nickel	0.50	U	ug/L	P400630	
		Selenium	0.20	U	ug/L	P400630	
		Silver	0.010	U	ug/L	P400630	
		Thallium	0.10	U	ug/L	P400630	
	SM 2340B	Hardness	140		mg/L	P400630	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
SM 2540 D-2011: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for potassium are unavailable for one of two spiked samples 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: P400603

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P400630

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: P400630

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: P400973

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P400976

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400948

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: P400644

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400566

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400659

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400538

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

Reference Method: SM 2120 B-2011
Batch ID: P400544

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P400783

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

Reference Method: SM 2540 C-2011
Batch ID: P400991

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P400979

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P400787

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: P401072

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: P400630

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	104		P	85 - 115
Calcium	100		P	85 - 115
Iron	112		P	85 - 115
Magnesium	101		P	85 - 115
Manganese	102		P	85 - 115
Potassium	99.6		P	85 - 115
Sodium	102		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P400630

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	113		P	85 - 115
Antimony	115		P	85 - 115
Arsenic	111		P	85 - 115
Beryllium	109		P	80 - 120
Boron	114		P	85 - 115
Cadmium	110		P	85 - 115
Chromium	108		P	85 - 115
Copper	110		P	85 - 115
Lead	109		P	85 - 115
Nickel	110		P	85 - 115
Selenium	109		P	85 - 115
Silver	114		P	85 - 115
Thallium	110		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P400973

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	97.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P400976

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400948

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400644

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	105		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400566

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400659

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400538

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

Reference Method: SM 2120 B-2011
Batch ID: P400544

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

Reference Method: SM 2320 B-2011
Batch ID: P400783

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

Reference Method: SM 4500 F-C-2011
Batch ID: P400787

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	101		P	93 - 104

Reference Method: SM 5310 B-2011
Batch ID: P401072

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.3		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P400630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2258571	Barium	108	95.8	P/P	80 - 120
2258571	Calcium	80.5		P	80 - 120
2258571	Iron	118	107	P/P	80 - 120
2258571	Magnesium	84.3		P	80 - 120
2258571	Manganese	106	94.6	P/P	80 - 120
2258571	Sodium	90.1		P	80 - 120
2258571	Zinc	105	92.3	P/P	80 - 120
2259780	Barium	101		P	80 - 120
2259780	Calcium	101		P	80 - 120
2259780	Iron	114		P	80 - 120
2259780	Magnesium	106		P	80 - 120
2259780	Manganese	99.5		P	80 - 120
2259780	Potassium	115		P	80 - 120
2259780	Sodium	109		P	80 - 120
2259780	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P400630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2258571	Aluminum	110	112	P/P	80 - 120
2258571	Antimony	114	117	P/P	80 - 120
2258571	Arsenic	109	111	P/P	80 - 120
2258571	Beryllium	110	111	P/P	80 - 120
2258571	Boron	112	114	P/P	80 - 120
2258571	Cadmium	107	109	P/P	80 - 120
2258571	Chromium	103	105	P/P	80 - 120
2258571	Copper	105	105	P/P	80 - 120
2258571	Lead	106	109	P/P	80 - 120
2258571	Nickel	104	106	P/P	80 - 120
2258571	Selenium	104	107	P/P	80 - 120
2258571	Silver	109	108	P/P	80 - 120
2258571	Thallium	110	113	P/P	80 - 120
2259780	Aluminum	104		P	80 - 120
2259780	Antimony	111		P	80 - 120
2259780	Arsenic	107		P	80 - 120
2259780	Beryllium	107		P	80 - 120
2259780	Boron	108		P	80 - 120
2259780	Cadmium	106		P	80 - 120
2259780	Chromium	102		P	80 - 120
2259780	Copper	101		P	80 - 120
2259780	Lead	106		P	80 - 120
2259780	Nickel	105		P	80 - 120
2259780	Selenium	104		P	80 - 120
2259780	Silver	108		P	80 - 120
2259780	Thallium	112		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P400973

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2259726	Chloride	99.2		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P400973

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2260231	Chloride	99.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P400976

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2259726	Sulfate	98.8		P	90 - 110
2260231	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400948

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2259656	Ammonia-N	98.4	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400644

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2259727	Kjeldahl Nitrogen	104	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400566

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2259774	NO2NO3-N	97.5	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400659

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2259652	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400538

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2259775	O-Phosphate-P	94.7	94.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P400787

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2259970	Fluoride	101	100	P/P	92 - 107

Reference Method: SM 5310 B-2011
Batch ID: P401072

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2260602	Organic Carbon	99.0	97.4	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P400603

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259726	Turbidity	1.05	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P400630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2258571	Barium	11.4	Spike	P	0 - 20
2258571	Calcium	11.0	Spike	P	0 - 20
2258571	Iron	9.76	Spike	P	0 - 20
2258571	Magnesium	9.43	Spike	P	0 - 20
2258571	Manganese	11.1	Spike	P	0 - 20
2258571	Potassium	5.41	Spike	P	0 - 20
2258571	Sodium	10.2	Spike	P	0 - 20
2258571	Zinc	12.1	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P400630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2258571	Aluminum	1.96	Spike	P	0 - 20
2258571	Antimony	2.26	Spike	P	0 - 20
2258571	Arsenic	1.60	Spike	P	0 - 20
2258571	Beryllium	0.278	Spike	P	0 - 20
2258571	Boron	0.937	Spike	P	0 - 20
2258571	Cadmium	1.87	Spike	P	0 - 20
2258571	Chromium	1.23	Spike	P	0 - 20
2258571	Copper	0.488	Spike	P	0 - 20
2258571	Lead	2.43	Spike	P	0 - 20
2258571	Nickel	1.73	Spike	P	0 - 20
2258571	Selenium	2.80	Spike	P	0 - 20
2258571	Silver	0.380	Spike	P	0 - 20
2258571	Thallium	2.73	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P400973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259726	Chloride	0.264	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400948

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259656	Ammonia-N	0.654	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400644

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259727	Kjeldahl Nitrogen	5.29	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400566

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259774	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259652	Total-P	0.767	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400538

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259775	O-Phosphate-P	0.0916	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P400544

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259773	Color (true)	2.38	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P400783

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259970	Total Alkalinity	0.392	Sample	P	0 - 5.2

Reference Method: SM 2540 C-2011
Batch ID: P400991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259649	TDS	3.51	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P400787

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2259970	Fluoride	0.467	Spike	P	0 - 2.1

Quality Assurance Report
Precision

Reference Method: SM 5310 B-2011
Batch ID: P401072

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2260602	Organic Carbon	1.01	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: A106433
Included Lab Sample IDs: 2259775

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	98.5	P/P	90 - 110

Reference Method: SM 2120 B-2011
Run ID: A106435
Included Lab Sample IDs: 2259773

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.8	102	P/P	90 - 115

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A106453
Included Lab Sample IDs: 2259774

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A106472
Included Lab Sample IDs: 2259773

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A106503
Included Lab Sample IDs: 2259774

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A106504
Included Lab Sample IDs: 2259774

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

Reference Method: SM 2320 B-2011
Run ID: A106546
Included Lab Sample IDs: 2259773

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

Reference Method: SM 4500 F-C-2011
Run ID: A106546
Included Lab Sample IDs: 2259773

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	104	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A106567
Included Lab Sample IDs: 2259779, 2259780

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	91.2	90.7	P/P	90 - 110
Calcium	99.4	95.3	P/P	90 - 110
Iron	101	99.0	P/P	90 - 110
Magnesium	101	98.0	P/P	90 - 110
Manganese	90.5	90.2	P/P	90 - 110
Potassium	105	104	P/P	90 - 110
Sodium	104	103	P/P	90 - 110
Zinc	94.8	93.2	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A106571
Included Lab Sample IDs: 2259779, 2259780

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	101	P/P	90 - 110
Aluminum	101	102	P/P	90 - 110
Antimony	104	106	P/P	90 - 110
Antimony	106	106	P/P	90 - 110
Arsenic	102	100	P/P	90 - 110
Boron	101	103	P/P	90 - 110
Boron	98.7	101	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	96.4	95.9	P/P	90 - 110
Chromium	96.5	96.4	P/P	90 - 110
Copper	98.2	98.4	P/P	90 - 110
Copper	99.7	98.2	P/P	90 - 110
Lead	98.5	99.9	P/P	90 - 110
Lead	98.7	98.5	P/P	90 - 110
Nickel	100	98.2	P/P	90 - 110
Nickel	98.2	97.5	P/P	90 - 110
Selenium	98.8	98.1	P/P	90 - 110
Selenium	99.9	98.8	P/P	90 - 110
Silver	105	106	P/P	90 - 110
Silver	106	105	P/P	90 - 110
Thallium	96.0	96.4	P/P	90 - 110
Thallium	96.4	97.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A106591
Included Lab Sample IDs: 2259773

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A106612
Included Lab Sample IDs: 2259774

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A106612
Included Lab Sample IDs: 2259774

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	98.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A106617
Included Lab Sample IDs: 2259779, 2259780

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	100	99.7	P/P	90 - 110
Beryllium	100	99.8	P/P	90 - 110
Beryllium	99.5	100	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A106660
Included Lab Sample IDs: 2259774

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.9	97.2	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						1.05	
EPA 200.7 Rev. 4.4	Barium	104	108	95.8	101			11.4
	Calcium	100	80.5	101				11.0
	Iron	112	118	107	114			9.76
	Magnesium	101	84.3	106				9.43
	Manganese	102	106	94.6	99.5			11.1
	Potassium	99.6	115					5.41
	Sodium	102	90.1	109				10.2
	Zinc	103	105	92.3	101			12.1
EPA 200.8 Rev. 5.4	Aluminum	113	104	110	112			1.96
	Antimony	115	111	114	117			2.26
	Arsenic	111	107	109	111			1.60
	Beryllium	109	107	110	111			0.278
	Boron	114	108	112	114			0.937
	Cadmium	110	106	107	109			1.87
	Chromium	108	102	103	105			1.23
	Copper	110	101	105	105			0.488
	Lead	109	106	106	109			2.43
	Nickel	110	105	104	106			1.73
	Selenium	109	104	104	107			2.80
	Silver	114	108	109	108			0.380
	Thallium	110	112	110	113			2.73
EPA 300.0 Rev. 2.1	Chloride	97.2	99.2	99.5			0.264	
	Sulfate	100	98.8	101				
EPA 350.1 Rev. 2.0	Ammonia-N	98.6	98.4	99.6				0.654
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	104	109				5.29
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	97.5	97.5				0.0
EPA 365.1 Rev. 2.0	Total-P	102	106	105				0.767
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	94.7	94.6				0.0916
SM 2120 B-2011	Color (true)	101					2.38	
SM 2320 B-2011	Total Alkalinity	102					0.392	
SM 2540 C-2011	TDS						3.51	
SM 4500 F-C-2011	Fluoride	101	101	100				0.467
SM 5310 B-2011	Organic Carbon	97.3	99.0	97.4				1.01

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2259773
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2259779, 2259780
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2259779, 2259780
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2259773
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2259773
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2259774
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2259774
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2259774
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2259774
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2259775
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2259773
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2259773

Reference Method Descriptions

Method	Description	Associated Samples
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2259779, 2259780
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2259773
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2259773
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2259773
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2259774

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	07/02/2021			07/02/2021 15:25	Blanca Fach	2259773
EPA 200.7 Rev. 4.4	07/02/2021	07/07/2021 14:10	Elliott D. Healy	07/12/2021 17:34	Betina Topolski	2259779
	07/02/2021	07/07/2021 14:10	Elliott D. Healy	07/12/2021 17:42	Betina Topolski	2259780
EPA 200.8 Rev. 5.4	07/02/2021	07/07/2021 14:10	Elliott D. Healy	07/12/2021 18:02	McKinley C Carter	2259780
	07/02/2021	07/07/2021 14:10	Elliott D. Healy	07/12/2021 19:32	McKinley C Carter	2259779
	07/02/2021	07/07/2021 14:10	Elliott D. Healy	07/14/2021 13:07	Alexander Thompson	2259780
	07/02/2021	07/07/2021 14:10	Elliott D. Healy	07/14/2021 14:21	Alexander Thompson	2259779
EPA 300.0 Rev. 2.1	07/02/2021			07/14/2021 21:38	Lipi Saha	2259773
EPA 350.1 Rev. 2.0	07/02/2021			07/14/2021 13:26	Roberta Tatti	2259774
EPA 351.2 Rev. 2.0	07/02/2021	07/07/2021 13:18	Benjamin T. Nordmann	07/08/2021 12:38	Letuzia M De Oliveira	2259774
EPA 353.2 Rev. 2.0	07/02/2021			07/06/2021 10:21	Beverly Y. Sanders	2259774
EPA 365.1 Rev. 2.0	07/02/2021	07/08/2021 08:43	Shengyu Ding	07/08/2021 12:20	Shengyu Ding	2259774
EPA 365.1 Rev. 2.0 dissolved	07/02/2021			07/02/2021 15:27	Ping Hua	2259775
SM 2120 B-2011	07/02/2021			07/02/2021 20:15	Benjamin T. Nordmann	2259773
SM 2320 B-2011	07/02/2021			07/10/2021 12:55	Dale L. Simmons	2259773
SM 2340B	07/02/2021			07/12/2021 17:34	Betina Topolski	2259779
	07/02/2021			07/12/2021 17:42	Betina Topolski	2259780
SM 2540 C-2011	07/02/2021			07/07/2021 14:08	Yijie Li	2259773
SM 2540 D-2011	07/02/2021			07/07/2021 14:08	Yijie Li	2259773
SM 4500 F-C-2011	07/02/2021			07/10/2021 12:55	Dale L. Simmons	2259773
SM 5310 B-2011	07/02/2021			07/15/2021 04:41	Madeline Gruver	2259774