Chemical Analysis Report

NE-DIST-2020-07-09-01

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

Event Description: **Interlachen 2020**
Request ID: **RQ-2020-06-29-11**
Customer: **NE-DIST**
Project ID: **SMP**

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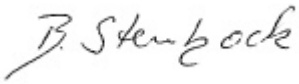
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 29-JUL-2020 17:24



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: Hardesty lake Center **Collection Date/Time: 07/08/2020 10:05**

Field ID: G1NE0869 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2182010	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P384315	
	EPA 300.0 Rev. 2.1	Chloride	8.2		mg Cl/L	P384898	
		Sulfate	1.6		mg SO4/L	P384902	
	SM 2120 B-2011	Color (true)	150	A	PCU	P384323	
	SM 2320 B-2011	Total Alkalinity	2.1	I	mg CaCO3/L	P384613	
	SM 2540 C-2011	TDS	43		mg/L	P384838	
	SM 2540 D-2011	TSS	5	I	mg/L	P384577	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P384925	
2182013	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P384448	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.92		mg N/L	P384568	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P384550	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P384507	
	SM 5310 B-2011	Organic Carbon	15		mg C/L	P384465	
2182016	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384300	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples and batch relative percent difference are unavailable because of high 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.

Sample Location: Church Lake Center **Collection Date/Time: 07/08/2020 10:40**

Field ID: G1NE0867 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2182007	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P384315	
	EPA 300.0 Rev. 2.1	Chloride	5.7		mg Cl/L	P384898	
		Sulfate	3.1		mg SO4/L	P384902	
	SM 2120 B-2011	Color (true)	9.4		PCU	P384323	
	SM 2320 B-2011	Total Alkalinity	3.8		mg CaCO3/L	P384612	
	SM 2540 C-2011	TDS	28		mg/L	P384838	
	SM 2540 D-2011	TSS	2	I	mg/L	P384577	
	SM 4500 F-C-2011	Fluoride	0.035	UA	mg F/L	P384925	
2182008	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P384448	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.36		mg N/L	P384568	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P384550	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P384507	
	SM 5310 B-2011	Organic Carbon	4.4		mg C/L	P384465	
2182009	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384300	
2182024	EPA 200.7 Rev. 4.4	Barium	2.0	I	ug/L	P384495	
		Calcium	2.06		mg/L	P384495	
		Iron	31	I	ug/L	P384495	
		Magnesium	0.75		mg/L	P384495	
		Potassium	0.81	I	mg/L	P384495	
		Sodium	4.0		mg/L	P384495	
		Zinc	5.0	U	ug/L	P384495	
	EPA 200.8 Rev. 5.4	Aluminum	23		ug/L	P384495	
		Antimony	0.097	I	ug/L	P384495	
		Arsenic	8.43		ug/L	P384495	
		Boron**	21.1		ug/L	P384495	
		Cadmium	0.020	U	ug/L	P384495	
		Chromium	0.40	U	ug/L	P384495	
		Copper	0.40	U	ug/L	P384495	
		Lead	0.20	U	ug/L	P384495	
		Nickel	0.50	U	ug/L	P384495	
		Selenium	0.20	U	ug/L	P384495	
		Silver	0.010	U	ug/L	P384495	
		Thallium	0.10	U	ug/L	P384495	
	SM 2340B	Hardness	8.2		mg/L	P384495	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples and batch relative percent difference are unavailable because of high 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.

Sample Location: Gillis Pond Center **Collection Date/Time: 07/08/2020 11:35**

Field ID: G1NE0863 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2182011	EPA 180.1 Rev. 2.0	Turbidity	3.5	A	NTU	P384315	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P384898	
		Sulfate	3.8		mg SO4/L	P384902	
	SM 2120 B-2011	Color (true)	23		PCU	P384323	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P384613	
	SM 2540 C-2011	TDS	29		mg/L	P384838	
	SM 2540 D-2011	TSS	4	I	mg/L	P384577	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P384925	
2182014	EPA 350.1 Rev. 2.0	Ammonia-N	0.069		mg N/L	P384448	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.88		mg N/L	P384568	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.032		mg N/L	P384550	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P384507	
	SM 5310 B-2011	Organic Carbon	6.6		mg C/L	P384465	
2182017	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384300	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples and batch relative percent difference are unavailable because of high 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.

Sample Location: Smith lake Center **Collection Date/Time: 07/08/2020 12:30**

Field ID: G2NE1156 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2182012	EPA 180.1 Rev. 2.0	Turbidity	0.60		NTU	P384315	
	EPA 300.0 Rev. 2.1	Chloride	5.6		mg Cl/L	P384898	
		Sulfate	4.3		mg SO4/L	P384902	
	SM 2120 B-2011	Color (true)	20		PCU	P384323	
	SM 2320 B-2011	Total Alkalinity	1.3	I	mg CaCO3/L	P384613	
	SM 2540 C-2011	TDS	34		mg/L	P384838	
	SM 2540 D-2011	TSS	2	U	mg/L	P384577	
	SM 4500 F-C-2011	Fluoride	0.037	I	mg F/L	P384925	
2182015	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P384448	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P384568	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P384550	
	EPA 365.1 Rev. 2.0	Total-P	0.006		mg P/L	P384507	
	SM 5310 B-2011	Organic Carbon	7.3		mg C/L	P384465	
2182018	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384300	

Ref. Method and Comment:
EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples and batch relative percent difference are unavailable because of high 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.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P384315

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P384495

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: P384495

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: P384898

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384902

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384448

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: P384568

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384550

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384507

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384300

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

Reference Method: SM 2120 B-2011
Batch ID: P384323

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P384612

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

Reference Method: SM 2320 B-2011
Batch ID: P384613

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

Reference Method: SM 2540 C-2011
Batch ID: P384838

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P384577

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 4500 F-C-2011
Batch ID: P384925

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P384465

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: P384495

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	100		P	85 - 115
Calcium	106		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	105		P	85 - 115
Sodium	106		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P384495

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	98.5		P	85 - 115
Antimony	98.3		P	85 - 115
Arsenic	105		P	85 - 115
Boron	99.9		P	85 - 115
Cadmium	102		P	85 - 115
Chromium	98.8		P	85 - 115
Copper	107		P	85 - 115
Lead	99.6		P	85 - 115
Nickel	103		P	85 - 115
Selenium	103		P	85 - 115
Silver	100		P	85 - 115
Thallium	103		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384898

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384902

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384448

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384568

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: P384550

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384507

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384300

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.4		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P384323

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	103		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P384612

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.1		P	93 - 104

Reference Method: SM 2320 B-2011
Batch ID: P384613

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.8		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P384925

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.3		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P384465

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.4		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P384495

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2181167	Barium	105		P	80 - 120
2181167	Calcium	103		P	80 - 120
2181167	Iron	108		P	80 - 120
2181167	Magnesium	108		P	80 - 120
2181167	Potassium	106		P	80 - 120
2181167	Sodium	104		P	80 - 120
2181167	Zinc	107		P	80 - 120
2182024	Barium	104	104	P/P	80 - 120
2182024	Calcium	110	107	P/P	80 - 120
2182024	Iron	108	106	P/P	80 - 120
2182024	Magnesium	108	106	P/P	80 - 120
2182024	Potassium	106	104	P/P	80 - 120
2182024	Sodium	105	101	P/P	80 - 120
2182024	Zinc	107	107	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P384495

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2181167	Aluminum	111		P	80 - 120
2181167	Antimony	95.3		P	80 - 120
2181167	Arsenic	102		P	80 - 120
2181167	Boron	102		P	80 - 120
2181167	Cadmium	103		P	80 - 120
2181167	Chromium	95.8		P	80 - 120
2181167	Copper	97.1		P	80 - 120
2181167	Lead	101		P	80 - 120
2181167	Nickel	101		P	80 - 120
2181167	Selenium	97.7		P	80 - 120
2181167	Silver	99.5		P	80 - 120
2181167	Thallium	104		P	80 - 120
2182024	Aluminum	96.9	97.1	P/P	80 - 120
2182024	Antimony	97.1	97.5	P/P	80 - 120
2182024	Arsenic	102	103	P/P	80 - 120
2182024	Boron	97.5	99.2	P/P	80 - 120
2182024	Cadmium	102	100	P/P	80 - 120
2182024	Chromium	100	100	P/P	80 - 120
2182024	Copper	101	100	P/P	80 - 120
2182024	Lead	98.9	99.6	P/P	80 - 120
2182024	Nickel	100	99.0	P/P	80 - 120
2182024	Selenium	97.3	99.3	P/P	80 - 120
2182024	Silver	99.7	99.9	P/P	80 - 120
2182024	Thallium	102	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384898

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2181974	Chloride	100		P	90 - 110
2182331	Chloride	101		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384902

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2181974	Sulfate	98.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384448

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2182008	Ammonia-N	100	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384568

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2182014	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384550

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2181976	NO2NO3-N	98.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384507

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2181978	Total-P	106	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384300

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2181959	O-Phosphate-P	95.4	95.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P384925

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2182007	Fluoride	104	105	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P384465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2181977	Organic Carbon	100	101	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P384315

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182011	Turbidity	0.863	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P384495

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182024	Barium	0.418	Spike	P	0 - 20
2182024	Calcium	1.60	Spike	P	0 - 20
2182024	Iron	1.80	Spike	P	0 - 20
2182024	Magnesium	1.56	Spike	P	0 - 20
2182024	Potassium	1.49	Spike	P	0 - 20
2182024	Sodium	1.76	Spike	P	0 - 20
2182024	Zinc	0.286	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P384495

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182024	Aluminum	0.185	Spike	P	0 - 20
2182024	Antimony	0.397	Spike	P	0 - 20
2182024	Arsenic	0.492	Spike	P	0 - 20
2182024	Boron	1.40	Spike	P	0 - 20
2182024	Cadmium	1.20	Spike	P	0 - 20
2182024	Chromium	0.122	Spike	P	0 - 20
2182024	Copper	0.429	Spike	P	0 - 20
2182024	Lead	0.705	Spike	P	0 - 20
2182024	Nickel	1.20	Spike	P	0 - 20
2182024	Selenium	2.10	Spike	P	0 - 20
2182024	Silver	0.283	Spike	P	0 - 20
2182024	Thallium	2.26	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P384898

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182331	Chloride	1.12	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384448

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182008	Ammonia-N	0.701	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384568

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182014	Kjeldahl Nitrogen	0.682	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384550

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2181976	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384507

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2181978	Total-P	1.75	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384300

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2181959	O-Phosphate-P	0.176	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P384323

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182010	Color (true)	0.0105	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P384612

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2181423	Total Alkalinity	0.0372	Sample	P	0 - 8.1

Reference Method: SM 2320 B-2011
Batch ID: P384613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182490	Total Alkalinity	0.339	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P384838

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182089	TDS	4.08	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P384925

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2182007	Fluoride	0.983	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P384465

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2181977	Organic Carbon	0.313	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: A99772
Included Lab Sample IDs: 2182009, 2182016, 2182017, 2182018

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	94.8	94.8	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A99774
Included Lab Sample IDs: 2182007, 2182010, 2182011, 2182012

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	102	101	P/P	95 - 105

Reference Method: SM 2120 B-2011
Run ID: A99775
Included Lab Sample IDs: 2182007, 2182010, 2182011, 2182012

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	102	P/P	90 - 115
Color (true)	102	104	P/P	90 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A99810
Included Lab Sample IDs: 2182008, 2182013, 2182014, 2182015

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

Reference Method: SM 5310 B-2011
Run ID: A99817
Included Lab Sample IDs: 2182008, 2182013, 2182014, 2182015

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.4	99.3	P/P	90 - 110
Organic Carbon	99.6	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A99852
Included Lab Sample IDs: 2182008, 2182013, 2182014, 2182015

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A99871
Included Lab Sample IDs: 2182024

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A99871
Included Lab Sample IDs: 2182024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Zinc	101	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A99876
Included Lab Sample IDs: 2182008, 2182013, 2182014, 2182015

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

Reference Method: SM 2320 B-2011
Run ID: A99877
Included Lab Sample IDs: 2182007, 2182010, 2182011, 2182012

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	103	100	P/P	90 - 110
Total Alkalinity	99.3	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A99895
Included Lab Sample IDs: 2182008, 2182013, 2182014, 2182015

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	103	P/P	90 - 110
Kjeldahl Nitrogen	103	93.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A99923
Included Lab Sample IDs: 2182024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	97.5	98.5	P/P	90 - 110
Antimony	97.1	96.5	P/P	90 - 110
Arsenic	104	102	P/P	90 - 110
Boron	95.3	98.2	P/P	90 - 110
Cadmium	99.7	99.4	P/P	90 - 110
Lead	99.3	99.1	P/P	90 - 110
Nickel	101	99.7	P/P	90 - 110
Selenium	101	100	P/P	90 - 110
Silver	98.9	97.5	P/P	90 - 110
Thallium	98.3	98.2	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A99978
Included Lab Sample IDs: 2182007, 2182010, 2182011, 2182012

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A99979
Included Lab Sample IDs: 2182024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	97.5	96.4	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Run ID: A99986
Included Lab Sample IDs: 2182007, 2182010, 2182011, 2182012

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

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A99999
Included Lab Sample IDs: 2182024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	97.5	97.3	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						0.863	
EPA 200.7 Rev. 4.4	Barium	100	105	104	104			0.418
	Calcium	106	103	110	107			1.60
	Iron	105	108	108	106			1.80
	Magnesium	105	108	108	106			1.56
	Potassium	105	106	106	104			1.49
	Sodium	106	104	105	101			1.76
	Zinc	102	107	107	107			0.286
EPA 200.8 Rev. 5.4	Aluminum	98.5	96.9	97.1	111			0.185
	Antimony	98.3	97.1	97.5	95.3			0.397
	Arsenic	105	102	103	102			0.492
	Boron	99.9	97.5	99.2	102			1.40
	Cadmium	102	102	100	103			1.20
	Chromium	98.8	100	100	95.8			0.122
	Copper	107	101	100	97.1			0.429
	Lead	99.6	98.9	99.6	101			0.705
	Nickel	103	100	99.0	101			1.20
	Selenium	103	97.3	99.3	97.7			2.10
	Silver	100	99.7	99.9	99.5			0.283
	Thallium	103	102	104	104			2.26
EPA 300.0 Rev. 2.1	Chloride	100	101	100			1.12	
	Sulfate	99.1	98.8					
EPA 350.1 Rev. 2.0	Ammonia-N	101	100	99.5				0.701
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	103	104				0.682
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	98.8					0.0
EPA 365.1 Rev. 2.0	Total-P	104	106	104				1.75
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.4	95.4	95.6				0.176
SM 2120 B-2011	Color (true)	103					0.0105	
SM 2320 B-2011	Total Alkalinity	99.1					0.0372	
	Total Alkalinity	99.8					0.339	
SM 2540 C-2011	TDS						4.08	
SM 4500 F-C-2011	Fluoride	99.3	104	105				0.983
SM 5310 B-2011	Organic Carbon	99.4	100	101				0.313

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2182007, 2182010, 2182011, 2182012
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2182024
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2182024
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2182007, 2182010, 2182011, 2182012
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2182007, 2182010, 2182011, 2182012
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2182008, 2182013, 2182014, 2182015
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2182008, 2182013, 2182014, 2182015
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2182008, 2182013, 2182014, 2182015
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2182008, 2182013, 2182014, 2182015
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2182009, 2182016, 2182017, 2182018
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2182007, 2182010, 2182011, 2182012
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2182007, 2182010, 2182011, 2182012
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2182024

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2182007, 2182010, 2182011, 2182012
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2182007, 2182010, 2182011, 2182012
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2182007, 2182010, 2182011, 2182012
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2182008, 2182013, 2182014, 2182015

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	07/09/2020			07/09/2020 15:38	Yen Ta	2182007, 2182010, 2182011, 2182012
EPA 200.7 Rev. 4.4	07/09/2020	07/13/2020 14:40	Elliott D. Healy	07/14/2020 20:02	Betina Topolski	2182024
EPA 200.8 Rev. 5.4	07/09/2020	07/13/2020 14:40	Elliott D. Healy	07/16/2020 19:15	Alexander Thompson	2182024
	07/09/2020	07/13/2020 14:40	Elliott D. Healy	07/17/2020 14:04	Alexander Thompson	2182024
	07/09/2020	07/13/2020 14:40	Elliott D. Healy	07/21/2020 18:49	Alexander Thompson	2182024
EPA 300.0 Rev. 2.1	07/09/2020			07/17/2020 10:32	Julia Storbeck	2182007
	07/09/2020			07/17/2020 10:44	Julia Storbeck	2182010
	07/09/2020			07/17/2020 11:20	Julia Storbeck	2182011
	07/09/2020			07/17/2020 11:32	Julia Storbeck	2182012
EPA 350.1 Rev. 2.0	07/09/2020			07/12/2020 13:12	Ping Hua	2182008
	07/09/2020			07/12/2020 13:28	Ping Hua	2182013
	07/09/2020			07/12/2020 13:29	Ping Hua	2182014
	07/09/2020			07/12/2020 13:31	Ping Hua	2182015
EPA 351.2 Rev. 2.0	07/09/2020	07/14/2020 11:20	Sima Feizi	07/15/2020 14:59	Julia Storbeck	2182014
	07/09/2020	07/14/2020 11:20	Sima Feizi	07/15/2020 15:10	Julia Storbeck	2182008
	07/09/2020	07/14/2020 11:20	Sima Feizi	07/15/2020 15:15	Julia Storbeck	2182013
	07/09/2020	07/14/2020 11:20	Sima Feizi	07/15/2020 15:16	Julia Storbeck	2182015
EPA 353.2 Rev. 2.0	07/09/2020			07/14/2020 08:10	Beverly Y. Sanders	2182008
	07/09/2020			07/14/2020 08:11	Beverly Y. Sanders	2182013
	07/09/2020			07/14/2020 08:13	Beverly Y. Sanders	2182014
	07/09/2020			07/14/2020 08:14	Beverly Y. Sanders	2182015
EPA 365.1 Rev. 2.0	07/09/2020	07/13/2020 14:29	Yen Ta	07/15/2020 09:35	Lipi Saha	2182008
	07/09/2020	07/13/2020 14:29	Yen Ta	07/15/2020 09:36	Lipi Saha	2182013
	07/09/2020	07/13/2020 14:29	Yen Ta	07/15/2020 09:37	Lipi Saha	2182014
	07/09/2020	07/13/2020 14:29	Yen Ta	07/15/2020 09:38	Lipi Saha	2182015
EPA 365.1 Rev. 2.0 dissolved	07/09/2020			07/09/2020 13:57	Samantha Davila	2182009
	07/09/2020			07/09/2020 13:58	Samantha Davila	2182016
	07/09/2020			07/09/2020 13:59	Samantha Davila	2182017
	07/09/2020			07/09/2020 14:00	Samantha Davila	2182018
SM 2120 B-2011	07/09/2020			07/09/2020 16:30	Benjamin T. Nordmann	2182007
	07/09/2020			07/09/2020 16:31	Benjamin T. Nordmann	2182011
	07/09/2020			07/09/2020 16:32	Benjamin T. Nordmann	2182012
	07/09/2020			07/09/2020 16:46	Benjamin T. Nordmann	2182010
SM 2320 B-2011	07/09/2020			07/14/2020 05:55	Dale L. Simmons	2182007
	07/09/2020			07/14/2020 08:00	Dale L. Simmons	2182010
	07/09/2020			07/14/2020 08:07	Dale L. Simmons	2182011
	07/09/2020			07/14/2020 08:17	Dale L. Simmons	2182012
SM 2340B	07/09/2020			07/14/2020 20:02	Betina Topolski	2182024
SM 2540 C-2011	07/09/2020			07/10/2020 19:47	Madeline Gruver	2182007, 2182010, 2182011, 2182012
SM 2540 D-2011	07/09/2020			07/10/2020 19:47	Madeline Gruver	2182007, 2182010, 2182011, 2182012

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 4500 F-C-2011	07/09/2020			07/20/2020 21:37	Samantha Davila	2182007
	07/09/2020			07/20/2020 22:52	Samantha Davila	2182010
	07/09/2020			07/20/2020 22:57	Samantha Davila	2182011
	07/09/2020			07/20/2020 23:02	Samantha Davila	2182012
SM 5310 B-2011	07/09/2020			07/10/2020 17:57	David Boose	2182008
	07/09/2020			07/10/2020 18:09	David Boose	2182013
	07/09/2020			07/10/2020 18:22	David Boose	2182014
	07/09/2020			07/10/2020 19:02	David Boose	2182015