Chemical Analysis Report

CEN-DIST-2020-03-27-01

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

Event Description:	**Ann / Marshall / Ellen / Asher / Park / Gem / Lotus / Florida / Adelaide / Searc**
Request ID:	**RQ-2020-03-23-11**
Customer:	**CEN-DIST**
Project ID:	**SMP**

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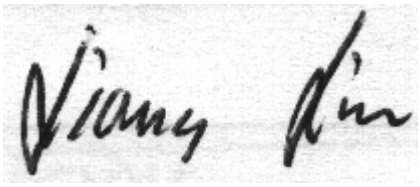
Date Certified: 15-APR-2020 16:33



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: Lake Park at center **Collection Date/Time: 03/26/2020 14:10**

Field ID: G2CE0009 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2168652	EPA 300.0 Rev. 2.1	Chloride	15		mg Cl/L	P381946	
		Sulfate	24		mg SO4/L	P381950	
	SM 2320 B-2011	Total Alkalinity	57	A	mg CaCO3/L	P381659	
	SM 2540 C-2011	TDS	110		mg/L	P381902	
	SM 2540 D-2011	TSS	4	I	mg/L	P381895	
	SM 4500 F-C-2011	Fluoride	0.054	I	mg F/L	P381823	
2168656	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P381445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.73		mg N/L	P381600	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381694	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P381618	
	SM 5310 B-2011	Organic Carbon	6.2		mg C/L	P381642	

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

Sample Location: Asher Lake @ Center **Collection Date/Time: 03/26/2020 12:37**

Field ID: G2CE0130 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2168653	EPA 300.0 Rev. 2.1	Chloride	29		mg Cl/L	P381946	
		Sulfate	8.2		mg SO4/L	P381950	
	SM 2320 B-2011	Total Alkalinity	27		mg CaCO3/L	P381659	
	SM 2540 C-2011	TDS	95		mg/L	P381902	
	SM 2540 D-2011	TSS	6	I	mg/L	P381895	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P381823	
2168657	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P381445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.92		mg N/L	P381600	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381694	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P381618	
	SM 5310 B-2011	Organic Carbon	9.4		mg C/L	P381642	

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

Sample Location: Lake Lotus @ Center **Collection Date/Time: 03/26/2020 13:15**

Field ID: G2CE0015 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2168654	EPA 300.0 Rev. 2.1	Chloride	22		mg Cl/L	P381946	
		Sulfate	11		mg SO4/L	P381950	
	SM 2320 B-2011	Total Alkalinity	70		mg CaCO3/L	P381659	
	SM 2540 C-2011	TDS	124		mg/L	P381902	
	SM 2540 D-2011	TSS	5	I	mg/L	P381895	
	SM 4500 F-C-2011	Fluoride	0.083	I	mg F/L	P381823	
2168658	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P381445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P381600	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381694	
	EPA 365.1 Rev. 2.0	Total-P	0.082		mg P/L	P381618	
	SM 5310 B-2011	Organic Carbon	8.8		mg C/L	P381642	

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

Sample Location: Marshall Lake @ Center **Collection Date/Time: 03/26/2020 11:56**

Field ID: G1CE0110 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2168650	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P381946	
		Sulfate	15		mg SO4/L	P381950	
	SM 2320 B-2011	Total Alkalinity	52		mg CaCO3/L	P381659	
	SM 2540 C-2011	TDS	112	A	mg/L	P381902	
	SM 2540 D-2011	TSS	2	I A	mg/L	P381895	
	SM 4500 F-C-2011	Fluoride	0.071	I	mg F/L	P381823	
2168651	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P381445	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.90		mg N/L	P381600	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P381694	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P381618	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P381642	
2168660	EPA 200.7 Rev. 4.4	Barium	12.2		ug/L	P381775	
		Calcium	22.2		mg/L	P381775	
		Iron	30	U	ug/L	P381775	
		Magnesium	3.59		mg/L	P381775	
		Potassium	3.8		mg/L	P381775	
		Sodium	8.4		mg/L	P381775	
		Zinc	5.0	U	ug/L	P381775	
	EPA 200.8 Rev. 5.4	Aluminum	9.1	I	ug/L	P381775	
		Antimony	0.20		ug/L	P381775	
		Arsenic	1.26		ug/L	P381775	
		Boron**	34.6		ug/L	P381775	
		Cadmium	0.020	U	ug/L	P381775	
		Chromium	0.40	U	ug/L	P381775	
		Copper	0.40	U	ug/L	P381775	
		Lead	0.20	U	ug/L	P381775	
		Nickel	0.50	U	ug/L	P381775	
		Selenium	0.20	U	ug/L	P381775	
		Silver	0.010	U	ug/L	P381775	
		Thallium	0.10	U	ug/L	P381775	
	SM 2340B	Hardness	70.2		mg/L	P381775	

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

Sample Location: Lake Gem at Center **Collection Date/Time: 03/26/2020 14:22**

Field ID: G2CE0204 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2168655	EPA 300.0 Rev. 2.1	Chloride	14		mg Cl/L	P381946	
		Sulfate	71		mg SO4/L	P381950	
	SM 2320 B-2011	Total Alkalinity	40		mg CaCO3/L	P381659	
	SM 2540 C-2011	TDS	144		mg/L	P381902	
	SM 2540 D-2011	TSS	2	I	mg/L	P381895	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P381823	
2168659	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P381447	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.38		mg N/L	P381600	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.008	I	mg N/L	P381694	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P381618	
	SM 5310 B-2011	Organic Carbon	4.5		mg C/L	P381642	

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P381775

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: P381775

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: P381946

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381950

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381445

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381447

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: P381600

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381694

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381618

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

Reference Method: SM 2320 B-2011
Batch ID: P381659

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

Reference Method: SM 2540 C-2011
Batch ID: P381902

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P381895

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P381823

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P381642

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: P381775

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	100		P	85 - 115
Calcium	103		P	85 - 115
Iron	102		P	85 - 115
Magnesium	101		P	85 - 115
Potassium	97.8		P	85 - 115
Sodium	101		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P381775

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.4		P	85 - 115
Antimony	97.8		P	85 - 115
Arsenic	97.3		P	85 - 115
Boron	100		P	85 - 115
Cadmium	97.7		P	85 - 115
Chromium	100		P	85 - 115
Copper	97.4		P	85 - 115
Lead	93.8		P	85 - 115
Nickel	96.4		P	85 - 115
Selenium	96.0		P	85 - 115
Silver	97.2		P	85 - 115
Thallium	94.4		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381946

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381950

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381445

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381447

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381600

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381694

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381618

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

Reference Method: SM 2320 B-2011
Batch ID: P381659

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-2011
Batch ID: P381823

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	94.1		P	92 - 104

Reference Method: SM 5310 B-2011
Batch ID: P381642

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	95.9		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P381775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168741	Barium	98.3	97.6	P/P	80 - 120
2168741	Calcium	105		P	80 - 120
2168741	Iron	98.7	100	P/P	80 - 120
2168741	Magnesium	102		P	80 - 120
2168741	Potassium	94.9	95.4	P/P	80 - 120
2168741	Sodium	93.7	93.7	P/P	80 - 120
2168741	Zinc	98.9	98.0	P/P	80 - 120
2168742	Barium	97.9		P	80 - 120
2168742	Calcium	99.3		P	80 - 120
2168742	Iron	99.8		P	80 - 120
2168742	Magnesium	98.2		P	80 - 120
2168742	Potassium	91.3		P	80 - 120
2168742	Sodium	100		P	80 - 120
2168742	Zinc	97.6		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P381775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168741	Aluminum	95.7	95.4	P/P	80 - 120
2168741	Antimony	99.9	99.6	P/P	80 - 120
2168741	Arsenic	98.8	99.0	P/P	80 - 120
2168741	Boron	101	99.3	P/P	80 - 120
2168741	Cadmium	102	99.9	P/P	80 - 120
2168741	Chromium	105	105	P/P	80 - 120
2168741	Copper	97.8	97.4	P/P	80 - 120
2168741	Lead	95.0	94.4	P/P	80 - 120
2168741	Nickel	96.2	96.7	P/P	80 - 120
2168741	Selenium	97.6	97.8	P/P	80 - 120
2168741	Silver	98.7	98.7	P/P	80 - 120
2168741	Thallium	97.1	98.0	P/P	80 - 120
2168742	Aluminum	94.7		P	80 - 120
2168742	Antimony	100		P	80 - 120
2168742	Arsenic	98.9		P	80 - 120
2168742	Boron	97.2		P	80 - 120
2168742	Cadmium	101		P	80 - 120
2168742	Chromium	102		P	80 - 120
2168742	Copper	96.1		P	80 - 120
2168742	Lead	95.2		P	80 - 120
2168742	Nickel	94.0		P	80 - 120
2168742	Selenium	96.8		P	80 - 120
2168742	Silver	98.9		P	80 - 120
2168742	Thallium	98.4		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381946

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168297	Chloride	100		P	90 - 110
2168541	Chloride	101		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381950

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168297	Sulfate	101		P	90 - 110
2168541	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381445

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168544	Ammonia-N	102	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381447

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168659	Ammonia-N	100	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381600

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168656	Kjeldahl Nitrogen	104	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381694

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168542	NO2NO3-N	96.2	96.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381618

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168542	Total-P	105	104	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P381823

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168543	Fluoride	96.8	96.8	P/P	91 - 105

Reference Method: SM 5310 B-2011
Batch ID: P381642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2168590	Organic Carbon	95.3	95.5	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P381775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168741	Barium	0.701	Spike	P	0 - 20
2168741	Calcium	0.0339	Spike	P	0 - 20
2168741	Iron	1.53	Spike	P	0 - 20
2168741	Magnesium	1.36	Spike	P	0 - 20
2168741	Potassium	0.454	Spike	P	0 - 20
2168741	Sodium	0.0149	Spike	P	0 - 20
2168741	Zinc	0.878	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P381775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168741	Aluminum	0.267	Spike	P	0 - 20
2168741	Antimony	0.272	Spike	P	0 - 20
2168741	Arsenic	0.178	Spike	P	0 - 20
2168741	Boron	1.73	Spike	P	0 - 20
2168741	Cadmium	1.98	Spike	P	0 - 20
2168741	Chromium	0.215	Spike	P	0 - 20
2168741	Copper	0.406	Spike	P	0 - 20
2168741	Lead	0.673	Spike	P	0 - 20
2168741	Nickel	0.459	Spike	P	0 - 20
2168741	Selenium	0.105	Spike	P	0 - 20
2168741	Silver	0.0412	Spike	P	0 - 20
2168741	Thallium	0.837	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381946

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168297	Chloride	0.131	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P381950

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168297	Sulfate	0.240	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381445

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168544	Ammonia-N	0.475	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P381447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168659	Ammonia-N	2.07	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P381600

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168656	Kjeldahl Nitrogen	0.0151	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381694

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168542	NO2NO3-N	0.491	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P381618

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168542	Total-P	1.37	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P381659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168652	Total Alkalinity	0.299	Sample	P	0 - 3.3

Reference Method: SM 2540 C-2011
Batch ID: P381902

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168650	TDS	5.36	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P381823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168543	Fluoride	0.0	Spike	P	0 - 2.0

Reference Method: SM 5310 B-2011
Batch ID: P381642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2168590	Organic Carbon	0.112	Spike	P	0 - 20

Quality Assurance Report
Precision

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A98492
Included Lab Sample IDs: 2168651, 2168656, 2168657, 2168658, 2168659

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	104	P/P	90 - 110
Ammonia-N	104	102	P/P	90 - 110
Ammonia-N	104	103	P/P	90 - 110
Ammonia-N	104	104	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A98573
Included Lab Sample IDs: 2168651, 2168656, 2168657, 2168658, 2168659

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.3	93.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A98577
Included Lab Sample IDs: 2168657, 2168658

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A98579
Included Lab Sample IDs: 2168651, 2168656, 2168657, 2168658, 2168659

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

Reference Method: SM 2320 B-2011
Run ID: A98581
Included Lab Sample IDs: 2168650, 2168652, 2168653, 2168654, 2168655

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.8	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A98590
Included Lab Sample IDs: 2168651, 2168656, 2168657, 2168658, 2168659

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.0	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A98630
Included Lab Sample IDs: 2168651, 2168656, 2168659

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.8	99.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 4500 F-C-2011
Run ID: A98655
Included Lab Sample IDs: 2168650, 2168652, 2168653, 2168654, 2168655

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	97.2	97.5	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A98686
Included Lab Sample IDs: 2168650, 2168652, 2168653, 2168654, 2168655

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.9	99.6	P/P	90 - 110
Chloride	99.6	98.9	P/P	90 - 110
Sulfate	100	101	P/P	90 - 110
Sulfate	101	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A98700
Included Lab Sample IDs: 2168660

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	98.6	98.3	P/P	90 - 110
Antimony	99.5	101	P/P	90 - 110
Arsenic	101	102	P/P	90 - 110
Boron	106	99.0	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Chromium	104	105	P/P	90 - 110
Copper	99.7	100	P/P	90 - 110
Lead	97.8	97.8	P/P	90 - 110
Nickel	101	101	P/P	90 - 110
Selenium	100	102	P/P	90 - 110
Silver	102	101	P/P	90 - 110
Thallium	92.9	92.7	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A98711
Included Lab Sample IDs: 2168660

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	100	102	P/P	90 - 110
Calcium	103	105	P/P	90 - 110
Iron	103	104	P/P	90 - 110
Magnesium	101	103	P/P	90 - 110
Potassium	99.1	103	P/P	90 - 110
Sodium	101	104	P/P	90 - 110
Zinc	99.2	99.6	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 200.7 Rev. 4.4	Barium	100	98.3	97.6	97.9			0.701
	Calcium	103	105	99.3				0.0339
	Iron	102	98.7	100	99.8			1.53
	Magnesium	101	102	98.2				1.36
	Potassium	97.8	94.9	95.4	91.3			0.454
	Sodium	101	93.7	93.7	100			0.0149
	Zinc	100	98.9	98.0	97.6			0.878
EPA 200.8 Rev. 5.4	Aluminum	95.4	95.7	95.4	94.7			0.267
	Antimony	97.8	99.9	99.6	100			0.272
	Arsenic	97.3	99.0	98.9	98.8			0.178
	Boron	100	101	99.3	97.2			1.73
	Cadmium	97.7	102	99.9	101			1.98
	Chromium	100	105	105	102			0.215
	Copper	97.4	97.8	97.4	96.1			0.406
	Lead	93.8	95.0	94.4	95.2			0.673
	Nickel	96.4	96.2	96.7	94.0			0.459
	Selenium	96.0	97.6	97.8	96.8			0.105
	Silver	97.2	98.7	98.7	98.9			0.0412
	Thallium	94.4	97.1	98.0	98.4			0.837
EPA 300.0 Rev. 2.1	Chloride	101	100	101			0.131	
	Sulfate	102	101	101			0.240	
EPA 350.1 Rev. 2.0	Ammonia-N	101	102	101				0.475
	Ammonia-N	99.5	100	103				2.07
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	104	104				0.0151
EPA 353.2 Rev. 2.0	NO2NO3-N	98.0	96.2	96.8				0.491
EPA 365.1 Rev. 2.0	Total-P	109	105	104				1.37
SM 2320 B-2011	Total Alkalinity	101					0.299	
SM 2540 C-2011	TDS						5.36	
SM 4500 F-C-2011	Fluoride	94.1	96.8	96.8				0.0
SM 5310 B-2011	Organic Carbon	95.9	95.3	95.5				0.112

Reference Method Descriptions

Method	Description	Associated Samples
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2168660
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2168660
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2168650, 2168652, 2168653, 2168654, 2168655
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2168650, 2168652, 2168653, 2168654, 2168655
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2168651, 2168656, 2168657, 2168658, 2168659
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2168651, 2168656, 2168657, 2168658, 2168659
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2168651, 2168656, 2168657, 2168658, 2168659
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2168651, 2168656, 2168657, 2168658, 2168659
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2168650, 2168652, 2168653, 2168654, 2168655
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2168660
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2168650, 2168652, 2168653, 2168654, 2168655

Reference Method Descriptions

Method	Description	Associated Samples
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2168650, 2168652, 2168653, 2168654, 2168655
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2168650, 2168652, 2168653, 2168654, 2168655
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2168651, 2168656, 2168657, 2168658, 2168659

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	03/27/2020	04/03/2020 13:56	Alexander Thompson	04/08/2020 14:42	Betina Topolski	2168660
EPA 200.8 Rev. 5.4	03/27/2020	04/03/2020 13:56	Alexander Thompson	04/07/2020 16:57	Justin Cutchin	2168660
EPA 300.0 Rev. 2.1	03/27/2020			04/08/2020 06:12	Jhamieka S. Greenwood	2168650
	03/27/2020			04/08/2020 06:25	Jhamieka S. Greenwood	2168652
	03/27/2020			04/08/2020 06:38	Jhamieka S. Greenwood	2168653
	03/27/2020			04/08/2020 07:17	Jhamieka S. Greenwood	2168654
	03/27/2020			04/08/2020 07:30	Jhamieka S. Greenwood	2168655
EPA 350.1 Rev. 2.0	03/27/2020			03/29/2020 13:38	Ping Hua	2168656
	03/27/2020			03/29/2020 13:39	Ping Hua	2168657
	03/27/2020			03/29/2020 13:47	Ping Hua	2168658
	03/27/2020			03/29/2020 14:14	Ping Hua	2168659
	03/27/2020			03/29/2020 15:05	Ping Hua	2168651
EPA 351.2 Rev. 2.0	03/27/2020	03/31/2020 10:05	Sima Feizi	04/01/2020 12:01	Jhamieka S. Greenwood	2168656
	03/27/2020	03/31/2020 10:05	Sima Feizi	04/01/2020 12:17	Jhamieka S. Greenwood	2168651
	03/27/2020	03/31/2020 10:05	Sima Feizi	04/01/2020 12:19	Jhamieka S. Greenwood	2168657
	03/27/2020	03/31/2020 10:05	Sima Feizi	04/01/2020 12:21	Jhamieka S. Greenwood	2168658
	03/27/2020	03/31/2020 10:05	Sima Feizi	04/01/2020 12:22	Jhamieka S. Greenwood	2168659
EPA 353.2 Rev. 2.0	03/27/2020			04/02/2020 09:44	Beverly Y. Sanders	2168651
	03/27/2020			04/02/2020 09:45	Beverly Y. Sanders	2168656
	03/27/2020			04/02/2020 09:46	Beverly Y. Sanders	2168657
	03/27/2020			04/02/2020 09:47	Beverly Y. Sanders	2168658
	03/27/2020			04/02/2020 09:48	Beverly Y. Sanders	2168659
EPA 365.1 Rev. 2.0	03/27/2020	03/31/2020 16:23	Yen Ta	04/01/2020 11:37	Julia Storbeck	2168657
	03/27/2020	03/31/2020 16:23	Yen Ta	04/01/2020 11:38	Julia Storbeck	2168658
	03/27/2020	03/31/2020 16:23	Yen Ta	04/01/2020 15:58	Julia Storbeck	2168651
	03/27/2020	03/31/2020 16:23	Yen Ta	04/01/2020 15:59	Julia Storbeck	2168656
	03/27/2020	03/31/2020 16:23	Yen Ta	04/01/2020 16:00	Julia Storbeck	2168659
SM 2320 B-2011	03/27/2020			04/01/2020 11:05	Dale L. Simmons	2168652
	03/27/2020			04/01/2020 11:34	Dale L. Simmons	2168650
	03/27/2020			04/01/2020 11:44	Dale L. Simmons	2168653
	03/27/2020			04/01/2020 11:54	Dale L. Simmons	2168654
	03/27/2020			04/01/2020 12:04	Dale L. Simmons	2168655
SM 2340B	03/27/2020			04/08/2020 14:42	Betina Topolski	2168660
SM 2540 C-2011	03/27/2020			04/01/2020 16:21	Yijie Li	2168650, 2168652, 2168653, 2168654, 2168655
SM 2540 D-2011	03/27/2020			04/01/2020 16:21	Yijie Li	2168650, 2168652, 2168653, 2168654, 2168655
SM 4500 F-C-2011	03/27/2020			04/03/2020 21:37	Samantha Davila	2168650
	03/27/2020			04/03/2020 21:42	Samantha Davila	2168652
	03/27/2020			04/03/2020 21:47	Samantha Davila	2168653

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	03/27/2020			04/03/2020 21:52	Samantha Davila	2168654
	03/27/2020			04/03/2020 21:57	Samantha Davila	2168655
SM 5310 B-2011	03/27/2020			03/31/2020 04:56	Madeline Gruver	2168651
	03/27/2020			03/31/2020 05:14	Madeline Gruver	2168656
	03/27/2020			03/31/2020 05:27	Madeline Gruver	2168657
	03/27/2020			03/31/2020 05:40	Madeline Gruver	2168658
	03/27/2020			03/31/2020 05:54	Madeline Gruver	2168659