

Chemical Analysis Report

SE-DIST-2020-03-11-01

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

Event Description: **SMP- Kevin (Odd Months)**
Request ID: **RQ-2020-03-09-49**
Customer: **SE-DIST**
Project ID: **SMP**

Send Reports to:
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2199 South Rock Road
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 31-MAR-2020 17:25

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored background.

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: L-63N canal @ SR 70

Collection Date/Time: 03/10/2020 11:30

Field ID: G1SE0023

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2163814	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P380532	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P380615	
		Sulfate	48		mg SO4/L	P380619	
		Color (true)	160		PCU	P380479	
	SM 2320 B-2011	Total Alkalinity	96		mg CaCO3/L	P380926	
	SM 2540 C-2011	TDS	409		mg/L	P381108	
	SM 2540 D-2011	TSS	3	I	mg/L	P380981	
	SM 4500 F-C-2011	Fluoride	0.12		mg F/L	P381258	
2163817	EPA 350.1 Rev. 2.0	Ammonia-N	0.036		mg N/L	P380968	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P380630	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.071		mg N/L	P381095	
	EPA 365.1 Rev. 2.0	Total-P	0.31		mg P/L	P380797	
	SM 5310 B-2011	Organic Carbon	25		mg C/L	P380667	
2163820	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.25		mg P/L	P380502	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples 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: L-63 @ SE 59th Blvd.

Collection Date/Time: 03/10/2020 12:45

Field ID: G1SE0029

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2163823	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P380532	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P380615	
		Sulfate	48		mg SO4/L	P380619	
		Color (true)	200		PCU	P380479	
	SM 2320 B-2011	Total Alkalinity	89		mg CaCO3/L	P380926	
	SM 2540 C-2011	TDS	381		mg/L	P381108	
	SM 2540 D-2011	TSS	2	I	mg/L	P380981	
	SM 4500 F-C-2011	Fluoride	0.12		mg F/L	P381258	
2163824	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P380968	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P380630	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.17		mg N/L	P381095	
	EPA 365.1 Rev. 2.0	Total-P	0.34		mg P/L	P380797	
	SM 5310 B-2011	Organic Carbon	26		mg C/L	P380667	
2163825	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.27		mg P/L	P380502	
2163835	EPA 200.7 Rev. 4.4	Barium	24.2		ug/L	P380556	
		Calcium	44.0		mg/L	P380556	
		Iron	300		ug/L	P380556	
		Magnesium	11.8		mg/L	P380556	
		Potassium	14.8		mg/L	P380556	
		Sodium	56.1		mg/L	P380556	
		Zinc	5.0	U	ug/L	P380556	
	EPA 200.8 Rev. 5.4	Aluminum	120		ug/L	P380556	
		Antimony	0.065	I	ug/L	P380556	
		Arsenic	0.83		ug/L	P380556	
		Boron**	54.6		ug/L	P380556	
		Cadmium	0.020	U	ug/L	P380556	
		Chromium	0.75	I	ug/L	P380556	
		Copper	1.01		ug/L	P380875	
		Lead	0.20	U	ug/L	P380556	
		Nickel	0.51	I	ug/L	P380556	
		Selenium	0.20	U	ug/L	P380556	
		Silver	0.010	U	ug/L	P380556	
		Thallium	0.10	U	ug/L	P380556	
		Hardness	158		mg/L	P380556	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples 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: L-63 canal @ SE 86th Blvd.

Collection Date/Time: 03/10/2020 13:10

Field ID: G1SE0022

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2163815	EPA 180.1 Rev. 2.0	Turbidity	2.0		NTU	P380532	
	EPA 300.0 Rev. 2.1	Chloride	110		mg Cl/L	P380615	
		Sulfate	39		mg SO4/L	P380619	
		Color (true)	250		PCU	P380479	
	SM 2320 B-2011	Total Alkalinity	84		mg CaCO3/L	P380926	
	SM 2540 C-2011	TDS	380		mg/L	P381108	
	SM 2540 D-2011	TSS	2	I	mg/L	P380981	
	SM 4500 F-C-2011	Fluoride	0.12		mg F/L	P381258	
2163818	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P380968	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.5		mg N/L	P380630	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P381196	
	EPA 365.1 Rev. 2.0	Total-P	0.32		mg P/L	P380797	
	SM 5310 B-2011	Organic Carbon	30		mg C/L	P380667	
2163821	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.26		mg P/L	P380502	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples 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: L-65 upstream of S-153

Collection Date/Time: 03/10/2020 13:45

Field ID: G1SE0050

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2163816	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P380532	
	EPA 300.0 Rev. 2.1	Chloride	150		mg Cl/L	P380615	
		Sulfate	38		mg SO4/L	P380619	
		Color (true)	130		PCU	P380479	
	SM 2320 B-2011	Total Alkalinity	175		mg CaCO3/L	P380926	
	SM 2540 C-2011	TDS	547		mg/L	P381108	
	SM 2540 D-2011	TSS	2	I	mg/L	P380981	
	SM 4500 F-C-2011	Fluoride	0.22		mg F/L	P381258	
2163819	EPA 350.1 Rev. 2.0	Ammonia-N	0.056		mg N/L	P380968	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P380630	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.16		mg N/L	P381095	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P380797	
	SM 5310 B-2011	Organic Carbon	24		mg C/L	P380667	
2163822	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.16		mg P/L	P380502	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch matrix spike recoveries for one of two spiked samples 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: P380532

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P380556

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: P380556

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
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 200.8 Rev. 5.4
Batch ID: P380875

Component	Result	Code	Units
Copper	0.40	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380615

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380619

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380968

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380968

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380630

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381095

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381196

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380797

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380502

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

Reference Method: SM 2120 B-2011
Batch ID: P380479

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P380926

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

Reference Method: SM 2540 C-2011
Batch ID: P381108

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 D-2011
Batch ID: P380981

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P381258

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P380667

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: P380556

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.9		P	85 - 115
Calcium	101		P	85 - 115
Iron	105		P	85 - 115
Magnesium	105		P	85 - 115
Potassium	101		P	85 - 115
Sodium	99.0		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380556

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.4		P	85 - 115
Antimony	90.6		P	85 - 115
Arsenic	97.4		P	85 - 115
Boron	98.1		P	85 - 115
Cadmium	102		P	80 - 120
Chromium	97.4		P	85 - 115
Lead	96.5		P	85 - 115
Nickel	96.6		P	85 - 115
Selenium	96.3		P	85 - 115
Silver	95.1		P	85 - 115
Thallium	99.9		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380875

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Copper	107		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380615

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380619

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380968

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380630

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380630

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381095

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381196

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380797

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380502

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.9		P	90 - 110

Reference Method: SM 2120 B-2011
Batch ID: P380479

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P380926

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	104		P	98 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P381258

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.7		P	92 - 103

Reference Method: SM 5310 B-2011
Batch ID: P380667

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.1		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P380556

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163644	Barium	101	103	P/P	80 - 120
2163644	Calcium	103		P	80 - 120
2163644	Iron	104	104	P/P	80 - 120
2163644	Magnesium	102	102	P/P	80 - 120
2163644	Potassium	101	101	P/P	80 - 120
2163644	Sodium	100		P	80 - 120
2163644	Zinc	102	104	P/P	80 - 120
2164291	Barium	99.2		P	80 - 120
2164291	Calcium	102		P	80 - 120
2164291	Iron	105		P	80 - 120
2164291	Magnesium	103		P	80 - 120
2164291	Potassium	97.4		P	80 - 120
2164291	Sodium	99.7		P	80 - 120
2164291	Zinc	102		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380556

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163644	Aluminum	93.9	95.6	P/P	80 - 120
2163644	Antimony	97.8	100	P/P	80 - 120
2163644	Arsenic	97.4	99.4	P/P	80 - 120
2163644	Boron	98.2	100	P/P	80 - 120
2163644	Cadmium	96.5	101	P/P	80 - 120
2163644	Chromium	97.9	99.8	P/P	80 - 120
2163644	Lead	98.9	99.0	P/P	80 - 120
2163644	Nickel	95.5	97.4	P/P	80 - 120
2163644	Selenium	87.7	90.8	P/P	80 - 120
2163644	Silver	98.2	99.4	P/P	80 - 120
2163644	Thallium	102	103	P/P	80 - 120
2164291	Aluminum	95.8		P	80 - 120
2164291	Antimony	96.5		P	80 - 120
2164291	Arsenic	100		P	80 - 120
2164291	Boron	99.9		P	80 - 120
2164291	Cadmium	96.5		P	80 - 120
2164291	Chromium	101		P	80 - 120
2164291	Lead	99.8		P	80 - 120
2164291	Nickel	94.1		P	80 - 120
2164291	Selenium	91.5		P	80 - 120
2164291	Silver	98.5		P	80 - 120
2164291	Thallium	105		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380875

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163421	Copper	105	109	P/P	80 - 120
2163799	Copper	116		P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380615

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163754	Chloride	97.5		P	90 - 110
2163855	Chloride	99.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380619

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163855	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163861	Ammonia-N	99.4	99.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163847	Kjeldahl Nitrogen	99.2	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381095

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163817	NO2NO3-N	97.0	96.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2164377	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380797

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163817	Total-P	105	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380502

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163898	O-Phosphate-P	98.8	98.0	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P381258

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163858	Fluoride	97.8	97.8	P/P	89 - 106

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P380667

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2163862	Organic Carbon	100	103	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P380532

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163796	Turbidity	6.08	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P380556

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163644	Barium	2.16	Spike	P	0 - 20
2163644	Calcium	0.515	Spike	P	0 - 20
2163644	Iron	0.231	Spike	P	0 - 20
2163644	Magnesium	0.246	Spike	P	0 - 20
2163644	Potassium	0.291	Spike	P	0 - 20
2163644	Sodium	0.544	Spike	P	0 - 20
2163644	Zinc	2.47	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380556

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163644	Aluminum	1.74	Spike	P	0 - 20
2163644	Antimony	2.36	Spike	P	0 - 20
2163644	Arsenic	1.87	Spike	P	0 - 20
2163644	Boron	1.63	Spike	P	0 - 20
2163644	Cadmium	4.72	Spike	P	0 - 20
2163644	Chromium	1.91	Spike	P	0 - 20
2163644	Lead	0.110	Spike	P	0 - 20
2163644	Nickel	2.01	Spike	P	0 - 20
2163644	Selenium	3.46	Spike	P	0 - 20
2163644	Silver	1.27	Spike	P	0 - 20
2163644	Thallium	1.52	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P380875

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163421	Copper	3.15	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380615

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163754	Chloride	0.470	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380619

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P380619

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163754	Sulfate	0.350	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P380968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163861	Ammonia-N	0.298	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P380630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163847	Kjeldahl Nitrogen	0.168	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381095

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163817	NO2NO3-N	0.758	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P381196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164377	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P380797

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163817	Total-P	1.26	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P380502

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163898	O-Phosphate-P	0.813	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P380479

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163857	Color (true)	5.68	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-2011
Batch ID: P380926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2164176	Total Alkalinity	0.203	Sample	P	0 - 2.8

Reference Method: SM 2540 C-2011
Batch ID: P381108

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163665	TDS	3.35	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P381258

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163858	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-2011
Batch ID: P380667

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2163862	Organic Carbon	1.67	Spike	P	0 - 20

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A98096

Included Lab Sample IDs: 2163814, 2163815, 2163816, 2163823

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.0	99.9	P/P	90 - 110
Chloride	99.9	99.4	P/P	90 - 110
Sulfate	100	100	P/P	90 - 110
Sulfate	99.7	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A98133

Included Lab Sample IDs: 2163820, 2163821, 2163822, 2163825

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	98.4	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A98135

Included Lab Sample IDs: 2163814, 2163815, 2163816, 2163823

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	100	P/P	90 - 115
Color (true)	102	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A98149

Included Lab Sample IDs: 2163814, 2163815, 2163816, 2163823

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A98192

Included Lab Sample IDs: 2163835

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	101	P/P	90 - 110
Antimony	96.1	98.4	P/P	90 - 110
Arsenic	102	103	P/P	90 - 110
Boron	103	106	P/P	90 - 110
Chromium	101	102	P/P	90 - 110
Lead	100	101	P/P	90 - 110
Nickel	102	103	P/P	90 - 110
Selenium	99.2	100	P/P	90 - 110
Silver	94.6	95.8	P/P	90 - 110
Thallium	98.4	98.8	P/P	90 - 110

Reference Method: SM 5310 B-2011

Run ID: A98194

Included Lab Sample IDs: 2163817, 2163818, 2163819, 2163824

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	101	102	P/P	90 - 110
Organic Carbon	103	101	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A98222

Included Lab Sample IDs: 2163817, 2163818, 2163819, 2163824

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	102	P/P	90 - 110
Kjeldahl Nitrogen	99.9	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A98232

Included Lab Sample IDs: 2163835

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cadmium	107	106	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A98252

Included Lab Sample IDs: 2163835

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	103	P/P	90 - 110
Calcium	103	102	P/P	90 - 110
Iron	104	104	P/P	90 - 110
Magnesium	102	103	P/P	90 - 110
Potassium	100	99.4	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Zinc	99.7	103	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A98293

Included Lab Sample IDs: 2163814, 2163815, 2163816, 2163823

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A98309

Included Lab Sample IDs: 2163817, 2163818, 2163819, 2163824

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A98317

Included Lab Sample IDs: 2163817, 2163818, 2163819, 2163824

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A98374

Included Lab Sample IDs: 2163817, 2163819, 2163824

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	99.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A98402

Included Lab Sample IDs: 2163818

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

Reference Method: SM 4500 F-C-2011

Run ID: A98428

Included Lab Sample IDs: 2163814, 2163815, 2163816, 2163823

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	97.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A98446

Included Lab Sample IDs: 2163835

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	99.8	102	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					6.08	
EPA 200.7 Rev. 4.4	Barium	99.9	101	103	99.2		2.16
	Calcium	101	103	102			0.515
	Iron	105	104	104	105		0.231
	Magnesium	105	102	102	103		0.246
	Potassium	101	101	101	97.4		0.291
	Sodium	99.0	100	99.7			0.544
	Zinc	100	102	104	102		2.47
EPA 200.8 Rev. 5.4	Aluminum	95.4	93.9	95.6	95.8		1.74
	Antimony	90.6	97.8	100	96.5		2.36
	Arsenic	97.4	97.4	99.4	100		1.87
	Boron	98.1	98.2	100	99.9		1.63
	Cadmium	102	96.5	101	96.5		4.72
	Chromium	97.4	97.9	99.8	101		1.91
	Copper	107	105	109	116		3.15
	Lead	96.5	98.9	99.0	99.8		0.110
	Nickel	96.6	95.5	97.4	94.1		2.01
	Selenium	96.3	87.7	90.8	91.5		3.46
	Silver	95.1	98.2	99.4	98.5		1.27
	Thallium	99.9	102	103	105		1.52
EPA 300.0 Rev. 2.1	Chloride	100	97.5	99.1		0.470	
	Sulfate	100	100			0.350	
EPA 350.1 Rev. 2.0	Ammonia-N	102	99.4	99.1			0.298
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	99.2	99.5			0.168
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	98.0	97.0	96.0			0.758
	NO ₂ NO ₃ -N	100	100	100			0.0
EPA 365.1 Rev. 2.0	Total-P	103	105	103			1.26
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.9	98.8	98.0			0.813
SM 2120 B-2011	Color (true)	100				5.68	
SM 2320 B-2011	Total Alkalinity	104				0.203	
SM 2540 C-2011	TDS					3.35	
SM 4500 F-C-2011	Fluoride	96.7	97.8	97.8			0.0
SM 5310 B-2011	Organic Carbon	98.1	100	103			1.67

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2163814, 2163815, 2163816, 2163823
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2163835
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2163835
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2163814, 2163815, 2163816, 2163823
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2163814, 2163815, 2163816, 2163823
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2163817, 2163818, 2163819, 2163824
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2163817, 2163818, 2163819, 2163824
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2163817, 2163818, 2163819, 2163824
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2163817, 2163818, 2163819, 2163824
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2163820, 2163821, 2163822, 2163825
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2163814, 2163815, 2163816, 2163823
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2163814, 2163815, 2163816, 2163823
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2163835

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2163814, 2163815, 2163816, 2163823
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2163814, 2163815, 2163816, 2163823
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2163814, 2163815, 2163816, 2163823
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2163817, 2163818, 2163819, 2163824

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	03/11/2020			03/11/2020 19:16	Yen Ta	2163814, 2163815, 2163816, 2163823
EPA 200.7 Rev. 4.4	03/11/2020	03/12/2020 15:45	Elliott D. Healy	03/17/2020 16:17	Betina Topolski	2163835
EPA 200.8 Rev. 5.4	03/11/2020	03/12/2020 15:45	Elliott D. Healy	03/13/2020 23:50	Alexander Thompson	2163835
	03/11/2020	03/12/2020 15:45	Elliott D. Healy	03/16/2020 13:39	Justin Cutchin	2163835
	03/11/2020	03/18/2020 14:20	Elliott D. Healy	03/24/2020 17:46	Justin Cutchin	2163835
EPA 300.0 Rev. 2.1	03/11/2020			03/13/2020 04:17	Lipi Saha	2163814
	03/11/2020			03/13/2020 04:29	Lipi Saha	2163815
	03/11/2020			03/13/2020 05:06	Lipi Saha	2163816
	03/11/2020			03/13/2020 05:18	Lipi Saha	2163823
EPA 350.1 Rev. 2.0	03/11/2020			03/19/2020 12:15	Ping Hua	2163817
	03/11/2020			03/19/2020 12:17	Ping Hua	2163818
	03/11/2020			03/19/2020 12:18	Ping Hua	2163819
	03/11/2020			03/19/2020 12:20	Ping Hua	2163824
EPA 351.2 Rev. 2.0	03/11/2020	03/13/2020 12:19	Sima Feizi	03/16/2020 14:57	Julia Storbeck	2163817
	03/11/2020	03/13/2020 12:19	Sima Feizi	03/16/2020 15:02	Julia Storbeck	2163818
	03/11/2020	03/13/2020 12:19	Sima Feizi	03/16/2020 15:03	Julia Storbeck	2163819
	03/11/2020	03/13/2020 12:19	Sima Feizi	03/16/2020 15:05	Julia Storbeck	2163824
EPA 353.2 Rev. 2.0	03/11/2020			03/20/2020 10:24	Beverly Y. Sanders	2163817
	03/11/2020			03/20/2020 10:31	Beverly Y. Sanders	2163819
	03/11/2020			03/20/2020 10:32	Beverly Y. Sanders	2163824
	03/11/2020			03/24/2020 12:11	Beverly Y. Sanders	2163818
EPA 365.1 Rev. 2.0	03/11/2020	03/17/2020 13:34	Yen Ta	03/18/2020 11:08	Benjamin T. Nordmann	2163817
	03/11/2020	03/17/2020 13:34	Yen Ta	03/18/2020 11:14	Benjamin T. Nordmann	2163818
	03/11/2020	03/17/2020 13:34	Yen Ta	03/18/2020 11:15	Benjamin T. Nordmann	2163819
	03/11/2020	03/17/2020 13:34	Yen Ta	03/18/2020 11:16	Benjamin T. Nordmann	2163824
EPA 365.1 Rev. 2.0 dissolved	03/11/2020			03/11/2020 14:33	Carlos Miranda	2163820
	03/11/2020			03/11/2020 14:34	Carlos Miranda	2163821
	03/11/2020			03/11/2020 14:35	Carlos Miranda	2163822
	03/11/2020			03/11/2020 14:36	Carlos Miranda	2163825
SM 2120 B-2011	03/11/2020			03/11/2020 18:14	Madeline Gruver	2163816
	03/11/2020			03/11/2020 18:58	Madeline Gruver	2163814
	03/11/2020			03/11/2020 18:59	Madeline Gruver	2163815
	03/11/2020			03/11/2020 19:00	Madeline Gruver	2163823
SM 2320 B-2011	03/11/2020			03/18/2020 23:04	Dale L. Simmons	2163814
	03/11/2020			03/18/2020 23:17	Dale L. Simmons	2163815
	03/11/2020			03/18/2020 23:30	Dale L. Simmons	2163816
	03/11/2020			03/18/2020 23:43	Dale L. Simmons	2163823
SM 2340B	03/11/2020			03/17/2020 16:17	Betina Topolski	2163835
SM 2540 C-2011	03/11/2020			03/13/2020 15:32	Yijie Li	2163814, 2163815, 2163816, 2163823
SM 2540 D-2011	03/11/2020			03/13/2020 15:32	Yijie Li	2163814, 2163815, 2163816, 2163823

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	03/11/2020			03/24/2020 14:21	Dale L. Simmons	2163814
	03/11/2020			03/24/2020 14:26	Dale L. Simmons	2163815
	03/11/2020			03/24/2020 14:31	Dale L. Simmons	2163816
	03/11/2020			03/24/2020 14:36	Dale L. Simmons	2163823
SM 5310 B-2011	03/11/2020			03/13/2020 01:31	Lauren Lees	2163817
	03/11/2020			03/13/2020 01:45	Lauren Lees	2163818
	03/11/2020			03/13/2020 02:25	Lauren Lees	2163819
	03/11/2020			03/13/2020 02:38	Lauren Lees	2163824