

Chemical Analysis Report

NW-DIST-2020-02-14-01

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

Event Description: **NW Run**
Request ID: **RQ-2020-02-10-37**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

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

Date Certified: 09-MAR-2020 10:30

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Jones Creek upstream of N Navy Blvd

Collection Date/Time: 02/13/2020 08:55

Field ID: G4NW0429

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2157717	EPA 180.1 Rev. 2.0	Turbidity	3.2		NTU	P378979	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P379680	
		Sulfate	8.5		mg SO4/L	P379683	
	SM 2120 B-2011	Color (true)	110		PCU	P378976	
	SM 2320 B-2011	Total Alkalinity	6.0		mg CaCO3/L	P379415	
	SM 2540 C-2011	TDS	65		mg/L	P379529	
	SM 2540 D-2011	TSS	3	I	mg/L	P379342	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P379420	
2157719	EPA 350.1 Rev. 2.0	Ammonia-N	0.030		mg N/L	P379457	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.50		mg N/L	P379281	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.046		mg N/L	P379549	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P379655	
	SM 5310 B-2011	Organic Carbon	14		mg C/L	P379079	
2157721	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P378973	
2157728	EPA 200.7 Rev. 4.4	Barium	11.4		ug/L	P379132	
		Calcium	6.69		mg/L	P379132	
		Iron	470		ug/L	P379132	
		Magnesium	1.16		mg/L	P379132	
		Potassium	0.47	I	mg/L	P379132	
		Sodium	6.8		mg/L	P379132	
		Zinc	9.3	I	ug/L	P379132	
		Aluminum	376		ug/L	P379132	
		Antimony	0.13	I	ug/L	P379132	
		Arsenic	0.80		ug/L	P379132	
	EPA 200.8 Rev. 5.4	Boron**	20.0		ug/L	P379132	
		Cadmium	0.020	U	ug/L	P379132	
		Chromium	0.50	I	ug/L	P379132	
		Copper	0.44	I	ug/L	P379132	
		Lead	0.62		ug/L	P379132	
		Nickel	0.50	U	ug/L	P379132	
		Selenium	0.25	I	ug/L	P379132	MS
		Silver	0.010	U	ug/L	P379132	
		Thallium	0.10	U	ug/L	P379132	

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.

SM 4500 F-C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and sodium are unavailable because of high analyte concentration in the QC sample.

The iron result was confirmed in the undigested sample on 02/21/2020.

EPA 200.8 Rev. 5.4: The aluminum and lead result was confirmed in the undigested sample on 02/24/2020.

Sample Location: Jones Creek upstream of N Navy Blvd

Collection Date/Time: 02/13/2020 09:00

Field ID: G4NW0429_DUP

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2157718	EPA 180.1 Rev. 2.0	Turbidity	2.9		NTU	P378979	
	EPA 300.0 Rev. 2.1	Chloride	11		mg Cl/L	P379680	
		Sulfate	8.5		mg SO4/L	P379683	
		Color (true)	110		PCU	P378976	
	SM 2320 B-2011	Total Alkalinity	5.9		mg CaCO3/L	P379415	
	SM 2540 C-2011	TDS	70		mg/L	P379529	
	SM 2540 D-2011	TSS	3	I	mg/L	P379342	
	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P379420	
2157720	EPA 350.1 Rev. 2.0	Ammonia-N	0.029		mg N/L	P379457	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P379281	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.044		mg N/L	P379549	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P379655	
	SM 5310 B-2011	Organic Carbon	14		mg C/L	P379079	
2157722	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P378973	
2157729	EPA 200.7 Rev. 4.4	Barium	11.6		ug/L	P379132	
		Calcium	6.77		mg/L	P379132	
		Iron	680		ug/L	P379132	
		Magnesium	1.15		mg/L	P379132	
		Potassium	0.45	I	mg/L	P379132	
		Sodium	6.8		mg/L	P379132	
		Zinc	10	I	ug/L	P379132	
	EPA 200.8 Rev. 5.4	Aluminum	501		ug/L	P379132	
		Antimony	0.14	I	ug/L	P379132	
		Arsenic	0.95		ug/L	P379132	
		Boron**	20.0		ug/L	P379132	
		Cadmium	0.020	U	ug/L	P379132	
		Chromium	0.63	I	ug/L	P379132	
		Copper	0.60	I	ug/L	P379132	
		Lead	0.98		ug/L	P379132	
		Nickel	0.74	I	ug/L	P379132	
		Selenium	0.20	U	ug/L	P379132	MS
		Silver	0.010	U	ug/L	P379132	
		Thallium	0.10	U	ug/L	P379132	

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.

SM 4500 F-C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and sodium are unavailable because of high analyte concentration in the QC sample.

The iron result was confirmed in the undigested sample on 02/21/2020.

EPA 200.8 Rev. 5.4: The aluminum and lead result was confirmed in the undigested sample on 02/24/2020.

Sample Location: Jones Creek upstream of N Navy Blvd

Collection Date/Time: 02/13/2020 09:05

Field ID: FB_02132020

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2157723	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P378980	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P379680	
		Sulfate	0.20	U	mg SO4/L	P379683	
	SM 2120 B-2011	Color (true)	2.5	U	PCU	P378976	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P379415	
	SM 2540 C-2011	TDS	15	U	mg/L	P379526	
	SM 2540 D-2011	TSS	2	U	mg/L	P379339	
2157724	SM 4500 F-C-2011	Fluoride	0.035	U	mg F/L	P379420	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P379457	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P379313	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P379549	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P379655	
2157725	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P379079	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P378973	
2157730	EPA 200.7 Rev. 4.4	Barium	1.0	U	ug/L	P379132	
		Calcium	0.075	U	mg/L	P379132	
		Iron	30	U	ug/L	P379132	
		Magnesium	0.040	U	mg/L	P379132	
		Potassium	0.30	U	mg/L	P379132	
		Sodium	0.50	U	mg/L	P379132	
		Zinc	5.0	U	ug/L	P379132	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	U	ug/L	P379132	
		Antimony	0.050	U	ug/L	P379132	
		Arsenic	0.050	U	ug/L	P379132	
		Boron**	2.0	U	ug/L	P379132	
		Cadmium	0.020	U	ug/L	P379132	
		Chromium	0.40	U	ug/L	P379132	
		Copper	0.40	U	ug/L	P379132	
		Lead	0.20	U	ug/L	P379132	
		Nickel	0.50	U	ug/L	P379132	
		Selenium	0.20	U	ug/L	P379132	MS
		Silver	0.010	U	ug/L	P379132	
		Thallium	0.10	U	ug/L	P379132	

Ref. Method and Comment:

EPA 180.1 Rev. 2.0: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample

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.

SM 4500 F-C-2011: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium and sodium are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P378979

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P378980

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P379132

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: P379132

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: P379680

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379683

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379457

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379281

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379313

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379549

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379655

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378973

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

Reference Method: SM 2120 B-2011
Batch ID: P378976

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P379415

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-2011
Batch ID: P379526

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-2011
Batch ID: P379529

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P379339

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P379342

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P379420

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-2011
Batch ID: P379079

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: P379132

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	104		P	85 - 115
Iron	103		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	101		P	85 - 115
Sodium	102		P	85 - 115
Zinc	98.2		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P379132

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	95.3		P	85 - 115
Antimony	105		P	85 - 115
Arsenic	102		P	85 - 115
Boron	93.3		P	85 - 115
Cadmium	104		P	85 - 115
Chromium	102		P	85 - 115
Copper	98.0		P	85 - 115
Lead	96.7		P	85 - 115
Nickel	97.0		P	85 - 115
Selenium	102		P	85 - 115
Silver	99.9		P	85 - 115
Thallium	93.7		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379680

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379683

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379457

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: P379281

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

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379313

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379549

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: P379655

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378973

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

Reference Method: SM 2120 B-2011
Batch ID: P378976

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.6		P	85 - 115

Reference Method: SM 2320 B-2011
Batch ID: P379415

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 4500 F-C-2011
Batch ID: P379420

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.1		P	92 - 103

Reference Method: SM 5310 B-2011
Batch ID: P379079

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P379132

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157604	Barium	97.4	98.0	P/P	80 - 120
2157604	Iron	102	102	P/P	80 - 120
2157604	Magnesium	98.9		P	80 - 120
2157604	Potassium	96.5	94.2	P/P	80 - 120
2157604	Zinc	96.3	97.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P379132

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157604	Aluminum	99.0	98.2	P/P	80 - 120
2157604	Antimony	110	108	P/P	80 - 120
2157604	Arsenic	109	107	P/P	80 - 120
2157604	Boron	100	97.0	P/P	80 - 120
2157604	Cadmium	107	103	P/P	80 - 120
2157604	Chromium	107	105	P/P	80 - 120
2157604	Copper	97.8	96.3	P/P	80 - 120
2157604	Lead	98.2	97.5	P/P	80 - 120
2157604	Nickel	98.4	98.0	P/P	80 - 120
2157604	Selenium	39.9	39.5	F/F	80 - 120
2157604	Silver	97.7	97.5	P/P	80 - 120
2157604	Thallium	97.3	96.0	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379680

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157681	Chloride	99.3		P	90 - 110
2158277	Chloride	100		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379683

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157681	Sulfate	99.7		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379457

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2158280	Ammonia-N	98.9	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379281

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2158298	Kjeldahl Nitrogen	97.3	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379313

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379313

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2158527	Kjeldahl Nitrogen	104	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379549

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157701	NO2NO3-N	99.9	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379655

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157636	Total-P	105	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378973

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157703	O-Phosphate-P	99.0	101	P/P	90 - 110

Reference Method: SM 5310 B-2011
Batch ID: P379079

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2157599	Organic Carbon	97.8	97.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P378979

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157616	Turbidity	1.09	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P379132

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157604	Barium	0.562	Spike	P	0 - 20
2157604	Calcium	0.641	Spike	P	0 - 20
2157604	Iron	0.119	Spike	P	0 - 20
2157604	Magnesium	0.627	Spike	P	0 - 20
2157604	Potassium	1.29	Spike	P	0 - 20
2157604	Sodium	0.436	Spike	P	0 - 20
2157604	Zinc	1.36	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P379132

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157604	Aluminum	0.819	Spike	P	0 - 20
2157604	Antimony	1.48	Spike	P	0 - 20
2157604	Arsenic	1.46	Spike	P	0 - 20
2157604	Boron	2.56	Spike	P	0 - 20
2157604	Cadmium	3.64	Spike	P	0 - 20
2157604	Chromium	2.50	Spike	P	0 - 20
2157604	Copper	1.50	Spike	P	0 - 20
2157604	Lead	0.628	Spike	P	0 - 20
2157604	Nickel	0.409	Spike	P	0 - 20
2157604	Selenium	1.07	Spike	P	0 - 20
2157604	Silver	0.263	Spike	P	0 - 20
2157604	Thallium	1.37	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379680

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2158277	Chloride	0.954	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P379683

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2158277	Sulfate	1.24	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379457

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2158280	Ammonia-N	0.418	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379281

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2158298	Kjeldahl Nitrogen	6.22	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P379313

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2158527	Kjeldahl Nitrogen	2.20	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379549

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157701	NO2NO3-N	0.338	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P379655

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157636	Total-P	0.191	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157703	O-Phosphate-P	1.15	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P378976

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157584	Color (true)	1.38	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P379415

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2158798	Total Alkalinity	0.155	Sample	P	0 - 2.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-2011
Batch ID: P379526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157233	TDS	3.35	Sample	P	0 - 10

Reference Method: SM 2540 C-2011
Batch ID: P379529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2158279	TDS	0.423	Sample	P	0 - 10

Reference Method: SM 4500 F-C-2011
Batch ID: P379420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2158798	Fluoride	1.45	Spike	P	0 - 2.5

Reference Method: SM 5310 B-2011
Batch ID: P379079

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2157599	Organic Carbon	0.435	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: A97554

Included Lab Sample IDs: 2157721, 2157722, 2157725

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.6	97.8	P/P	90 - 110
O-Phosphate-P	97.1	96.6	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A97555

Included Lab Sample IDs: 2157717, 2157718, 2157723

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.7	101	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A97556

Included Lab Sample IDs: 2157717, 2157718, 2157723

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105
Turbidity	99.5	100	P/P	95 - 105

Reference Method: SM 5310 B-2011

Run ID: A97590

Included Lab Sample IDs: 2157719, 2157720, 2157724

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.6	99.0	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A97693

Included Lab Sample IDs: 2157728, 2157729, 2157730

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	101	102	P/P	90 - 110
Barium	102	103	P/P	90 - 110
Calcium	101	102	P/P	90 - 110
Calcium	102	101	P/P	90 - 110
Iron	102	104	P/P	90 - 110
Iron	103	102	P/P	90 - 110
Magnesium	101	102	P/P	90 - 110
Magnesium	102	101	P/P	90 - 110
Potassium	100	99.2	P/P	90 - 110
Potassium	99.2	100	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Sodium	102	101	P/P	90 - 110
Zinc	101	101	P/P	90 - 110
Zinc	98.9	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A97709

Included Lab Sample IDs: 2157719, 2157720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	97.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A97713

Included Lab Sample IDs: 2157728, 2157729, 2157730

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.1	94.5	P/P	90 - 110
Aluminum	95.9	94.1	P/P	90 - 110
Antimony	103	104	P/P	90 - 110
Antimony	104	103	P/P	90 - 110
Arsenic	99.2	99.9	P/P	90 - 110
Arsenic	99.9	100	P/P	90 - 110
Boron	101	95.9	P/P	90 - 110
Boron	95.9	96.7	P/P	90 - 110
Cadmium	100	99.7	P/P	90 - 110
Cadmium	101	100	P/P	90 - 110
Chromium	100	99.2	P/P	90 - 110
Chromium	99.2	98.4	P/P	90 - 110
Copper	95.4	95.1	P/P	90 - 110
Copper	97.1	95.4	P/P	90 - 110
Lead	94.9	94.4	P/P	90 - 110
Lead	95.4	94.9	P/P	90 - 110
Nickel	95.0	94.8	P/P	90 - 110
Nickel	96.5	95.0	P/P	90 - 110
Selenium	101	102	P/P	90 - 110
Selenium	102	99.8	P/P	90 - 110
Silver	101	100	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Thallium	96.5	96.7	P/P	90 - 110
Thallium	96.7	96.5	P/P	90 - 110

Reference Method: SM 2320 B-2011

Run ID: A97739

Included Lab Sample IDs: 2157717, 2157718, 2157723

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	104	101	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A97739

Included Lab Sample IDs: 2157717, 2157718, 2157723

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A97754

Included Lab Sample IDs: 2157719, 2157720, 2157724

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A97758

Included Lab Sample IDs: 2157719, 2157720, 2157724

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A97758

Included Lab Sample IDs: 2157719, 2157720, 2157724

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A97771

Included Lab Sample IDs: 2157717, 2157718, 2157723

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.0	99.6	P/P	90 - 110
Sulfate	99.3	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A97781

Included Lab Sample IDs: 2157724

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.7	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A97912

Included Lab Sample IDs: 2157719, 2157720

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A97931

Included Lab Sample IDs: 2157724

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	98.8	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		LCS	Precision	MS
						SMP	
EPA 180.1 Rev. 2.0	Turbidity					1.09	
EPA 200.7 Rev. 4.4	Barium	101	97.4	98.0			0.562
	Calcium	104					0.641
	Iron	103	102	102			0.119
	Magnesium	103	98.9				0.627
	Potassium	101	96.5	94.2			1.29
	Sodium	102					0.436
	Zinc	98.2	96.3	97.7			1.36
EPA 200.8 Rev. 5.4	Aluminum	95.3	99.0	98.2			0.819
	Antimony	105	110	108			1.48
	Arsenic	102	109	107			1.46
	Boron	93.3	100	97.0			2.56
	Cadmium	104	107	103			3.64
	Chromium	102	107	105			2.50
	Copper	98.0	97.8	96.3			1.50
	Lead	96.7	98.2	97.5			0.628
	Nickel	97.0	98.4	98.0			0.409
	Selenium	102	39.9	39.5			1.07
	Silver	99.9	97.7	97.5			0.263
	Thallium	93.7	97.3	96.0			1.37
EPA 300.0 Rev. 2.1	Chloride	100	99.3	100		0.954	
	Sulfate	100	99.7			1.24	
EPA 350.1 Rev. 2.0	Ammonia-N	102	98.9	98.4			0.418
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.0	97.3	104			6.22
	Kjeldahl Nitrogen	102	104	100			2.20
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	99.9	100			0.338
EPA 365.1 Rev. 2.0	Total-P	101	105	105			0.191
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	99.0	101			1.15
SM 2120 B-2011	Color (true)	99.6				1.38	
SM 2320 B-2011	Total Alkalinity	103				0.155	
SM 2540 C-2011	TDS					3.35	
	TDS					0.423	
SM 4500 F-C-2011	Fluoride	98.1					1.45
SM 5310 B-2011	Organic Carbon	97.2	97.8	97.3			0.435

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2157717, 2157718, 2157723
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2157728, 2157729, 2157730
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2157728, 2157729, 2157730
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2157717, 2157718, 2157723
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2157717, 2157718, 2157723
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2157719, 2157720, 2157724
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2157719, 2157720, 2157724
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2157719, 2157720, 2157724
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2157719, 2157720, 2157724
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2157721, 2157722, 2157725
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2157717, 2157718, 2157723
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2157717, 2157718, 2157723

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2157717, 2157718, 2157723
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2157717, 2157718, 2157723
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2157717, 2157718, 2157723
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2157719, 2157720, 2157724

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	02/14/2020			02/14/2020 15:04	Samantha Davila	2157717, 2157718, 2157723
EPA 200.7 Rev. 4.4	02/14/2020	02/18/2020 15:40	Elliott D. Healy	02/20/2020 20:02	Betina Topolski	2157730
	02/14/2020	02/18/2020 15:40	Elliott D. Healy	02/20/2020 21:55	Betina Topolski	2157728
	02/14/2020	02/18/2020 15:40	Elliott D. Healy	02/20/2020 22:03	Betina Topolski	2157729
EPA 200.8 Rev. 5.4	02/14/2020	02/18/2020 15:40	Elliott D. Healy	02/20/2020 18:54	Justin Cutchin	2157730
	02/14/2020	02/18/2020 15:40	Elliott D. Healy	02/20/2020 20:22	Justin Cutchin	2157728
	02/14/2020	02/18/2020 15:40	Elliott D. Healy	02/20/2020 20:29	Justin Cutchin	2157729
EPA 300.0 Rev. 2.1	02/14/2020			02/25/2020 21:56	Lipi Saha	2157717
	02/14/2020			02/25/2020 22:08	Lipi Saha	2157718
	02/14/2020			02/25/2020 22:20	Lipi Saha	2157723
EPA 350.1 Rev. 2.0	02/14/2020			02/21/2020 10:16	Ping Hua	2157719
	02/14/2020			02/21/2020 10:17	Ping Hua	2157720
	02/14/2020			02/21/2020 10:23	Ping Hua	2157724
EPA 351.2 Rev. 2.0	02/14/2020	02/20/2020 13:30	Sima Feizi	02/21/2020 08:24	Jhamieka S. Greenwood	2157719
	02/14/2020	02/20/2020 13:30	Sima Feizi	02/21/2020 08:26	Jhamieka S. Greenwood	2157720
	02/14/2020	02/21/2020 09:20	Sima Feizi	02/24/2020 17:10	Jhamieka S. Greenwood	2157724
EPA 353.2 Rev. 2.0	02/14/2020			02/24/2020 11:55	Beverly Y. Sanders	2157719
	02/14/2020			02/24/2020 11:56	Beverly Y. Sanders	2157720
	02/14/2020			02/24/2020 11:58	Beverly Y. Sanders	2157724
EPA 365.1 Rev. 2.0	02/14/2020	02/26/2020 14:15	Lipi Saha	03/02/2020 11:14	Lipi Saha	2157719
	02/14/2020	02/26/2020 14:15	Lipi Saha	03/02/2020 11:15	Lipi Saha	2157720
	02/14/2020	02/26/2020 14:15	Lipi Saha	03/02/2020 13:10	Lipi Saha	2157724
EPA 365.1 Rev. 2.0 dissolved	02/14/2020			02/14/2020 15:22	Carlos Miranda	2157722
	02/14/2020			02/14/2020 15:23	Carlos Miranda	2157725
	02/14/2020			02/14/2020 15:35	Carlos Miranda	2157721
SM 2120 B-2011	02/14/2020			02/14/2020 16:49	Julia Storbeck	2157717, 2157718
	02/14/2020			02/14/2020 16:50	Julia Storbeck	2157723
SM 2320 B-2011	02/14/2020			02/22/2020 15:18	Dale L. Simmons	2157717
	02/14/2020			02/22/2020 15:30	Dale L. Simmons	2157718
	02/14/2020			02/22/2020 15:44	Dale L. Simmons	2157723
SM 2540 C-2011	02/14/2020			02/18/2020 15:02	Yijie Li	2157717, 2157718, 2157723
SM 2540 D-2011	02/14/2020			02/18/2020 15:02	Yijie Li	2157717, 2157718, 2157723
SM 4500 F-C-2011	02/14/2020			02/22/2020 15:18	Dale L. Simmons	2157717
	02/14/2020			02/22/2020 15:30	Dale L. Simmons	2157718
	02/14/2020			02/22/2020 15:44	Dale L. Simmons	2157723
SM 5310 B-2011	02/14/2020			02/17/2020 23:39	Madeline Funaro	2157719
	02/14/2020			02/17/2020 23:52	Madeline Funaro	2157720
	02/14/2020			02/18/2020 00:04	Madeline Funaro	2157724