

Chemical Analysis Report

WAS-SECT-2019-09-16-01

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

Event Description: **Little River**
Request ID: **RQ-2019-08-19-27**
Customer: **WAS-SECT**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
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Tallahassee, FL 32399
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 08-OCT-2019 11:06



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: McBride South

Collection Date/Time: 09/16/2019 10:14

Field ID: G1WA0088

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2119475	EPA 180.1 Rev. 2.0	Turbidity	4.3		NTU	P370837	
	EPA 300.0 Rev. 2.1	Sulfate	0.20	U	mg SO4/L	P370978	
	SM 2120 B	Color (true)	9.6		PCU	P370939	
	SM 2320 B-97	Total Alkalinity	6.1		mg CaCO3/L	P371100	
	SM 2540 C-97	TDS	21	I	mg/L	P371185	
	SM 2540 D-97	TSS	2	I	mg/L	P371159	
	SM 4500 F-C-97	Fluoride	0.039	I	mg F/L	P371105	
2119478	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P370931	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.45		mg N/L	P370896	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P370855	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P370853	
	SM 5310 B-00	Organic Carbon	4.9		mg C/L	P371021	
2119481	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P370816	
2119490	EPA 200.7 Rev. 4.4	Barium	9.9		ug/L	P370802	
		Calcium	1.80		mg/L	P370802	
		Iron	200		ug/L	P370802	
		Magnesium	1.03		mg/L	P370802	
		Potassium	0.74	I	mg/L	P370802	
		Sodium	4.8		mg/L	P370802	
		Zinc	5.0	U	ug/L	P370802	
	EPA 200.8 Rev. 5.4	Aluminum	8.6	I	ug/L	P370802	
		Antimony	0.050	U	ug/L	P370802	
		Arsenic	0.52		ug/L	P370802	
		Boron**	15.3		ug/L	P370802	
		Cadmium	0.020	U	ug/L	P370802	
		Chromium	0.40	U	ug/L	P370802	
		Copper	0.40	U	ug/L	P370802	
		Lead	0.20	U	ug/L	P370802	
		Nickel	0.50	U	ug/L	P370802	
		Selenium	0.20	U	ug/L	P370802	
		Silver	0.010	U	ug/L	P370802	
		Thallium	0.10	U	ug/L	P370802	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: McBride Mid

Collection Date/Time: 09/16/2019 10:47

Field ID: G1WA0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2119476	EPA 180.1 Rev. 2.0	Turbidity	4.3		NTU	P370837	
	EPA 300.0 Rev. 2.1	Sulfate	0.20	U	mg SO4/L	P370978	
	SM 2120 B	Color (true)	8.9		PCU	P370940	
	SM 2320 B-97	Total Alkalinity	6.2		mg CaCO3/L	P371100	
	SM 2540 C-97	TDS	24	I	mg/L	P371185	
	SM 2540 D-97	TSS	4	I	mg/L	P371159	
	SM 4500 F-C-97	Fluoride	0.039	I	mg F/L	P371105	
2119479	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P370931	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.44		mg N/L	P370896	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P370856	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P370853	
	SM 5310 B-00	Organic Carbon	4.7		mg C/L	P371021	
2119482	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P370816	
2119491	EPA 200.7 Rev. 4.4	Barium	10.3		ug/L	P370802	
		Calcium	1.83		mg/L	P370802	
		Iron	210		ug/L	P370802	
		Magnesium	1.05		mg/L	P370802	
		Potassium	0.79	I	mg/L	P370802	
		Sodium	4.9		mg/L	P370802	
		Zinc	5.0	U	ug/L	P370802	
	EPA 200.8 Rev. 5.4	Aluminum	8.6	I	ug/L	P370802	
		Antimony	0.050	U	ug/L	P370802	
		Arsenic	0.54		ug/L	P370802	
		Boron**	15.3		ug/L	P370802	
		Cadmium	0.020	U	ug/L	P370802	
		Chromium	0.40	U	ug/L	P370802	
		Copper	0.40	U	ug/L	P370802	
		Lead	0.20	U	ug/L	P370802	
		Nickel	0.50	U	ug/L	P370802	
		Selenium	0.20	U	ug/L	P370802	
		Silver	0.010	U	ug/L	P370802	
		Thallium	0.10	U	ug/L	P370802	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: McBride West

Collection Date/Time: 09/16/2019 11:29

Field ID: G1WA0089

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2119477	EPA 180.1 Rev. 2.0	Turbidity	2.5		NTU	P370837	
	EPA 300.0 Rev. 2.1	Sulfate	0.20	U	mg SO4/L	P370978	
	SM 2120 B	Color (true)	9.3		PCU	P370940	
	SM 2320 B-97	Total Alkalinity	6.3		mg CaCO3/L	P371100	
	SM 2540 C-97	TDS	30		mg/L	P371185	
	SM 2540 D-97	TSS	3	I	mg/L	P371159	
	SM 4500 F-C-97	Fluoride	0.039	I	mg F/L	P371105	
2119480	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P370931	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.43		mg N/L	P370896	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P370856	
	EPA 365.1 Rev. 2.0	Total-P	0.036		mg P/L	P370853	
	SM 5310 B-00	Organic Carbon	4.5		mg C/L	P371021	
2119483	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P370816	
2119492	EPA 200.7 Rev. 4.4	Barium	9.2		ug/L	P370802	
		Calcium	1.81		mg/L	P370802	
		Iron	160		ug/L	P370802	
		Magnesium	1.04		mg/L	P370802	
		Potassium	0.74	I	mg/L	P370802	
		Sodium	4.9		mg/L	P370802	
		Zinc	5.0	U	ug/L	P370802	
	EPA 200.8 Rev. 5.4	Aluminum	5.7	I	ug/L	P370802	
		Antimony	0.050	U	ug/L	P370802	
		Arsenic	0.52		ug/L	P370802	
		Boron**	15.6		ug/L	P370802	
		Cadmium	0.020	U	ug/L	P370802	
		Chromium	0.40	U	ug/L	P370802	
		Copper	0.40	U	ug/L	P370802	
		Lead	0.20	U	ug/L	P370802	
		Nickel	0.50	U	ug/L	P370802	
		Selenium	0.20	U	ug/L	P370802	
		Silver	0.010	U	ug/L	P370802	
		Thallium	0.10	U	ug/L	P370802	

Ref. Method and Comment:

SM 2540 D-97: 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: P370837

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P370802

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: P370802

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: P370978

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P370931

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P370896

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370855

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370856

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370853

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370816

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

Reference Method: SM 2120 B
Batch ID: P370939

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P370940

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P371100

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

Reference Method: SM 2540 C-97
Batch ID: P371185

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P371159

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P371105

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P371021

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: P370802

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	103		P	85 - 115
Iron	102		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	103		P	85 - 115
Sodium	98.5		P	85 - 115
Zinc	100		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P370802

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.6		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	93.5		P	85 - 115
Boron	103		P	85 - 115
Cadmium	94.5		P	85 - 115
Chromium	92.1		P	85 - 115
Copper	99.1		P	85 - 115
Lead	99.0		P	85 - 115
Nickel	102		P	85 - 115
Selenium	93.9		P	85 - 115
Silver	101		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P370978

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P370931

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P370896

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: P370855

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370856

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: P370853

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	95.9		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370816

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P370939

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

Reference Method: SM 2120 B
Batch ID: P370940

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

Reference Method: SM 2320 B-97
Batch ID: P371100

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

Reference Method: SM 4500 F-C-97
Batch ID: P371105

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.1		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P371021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	104		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P370802

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118927	Barium	100		P	80 - 120
2118927	Calcium	106		P	80 - 120
2118927	Iron	103		P	80 - 120
2118927	Magnesium	109		P	80 - 120
2118927	Potassium	108		P	80 - 120
2118927	Sodium	97.7		P	80 - 120
2118927	Zinc	100		P	80 - 120
2119171	Barium	100	96.3	P/P	80 - 120
2119171	Calcium	102		P	80 - 120
2119171	Iron	102	99.3	P/P	80 - 120
2119171	Magnesium	109	104	P/P	80 - 120
2119171	Potassium	98.0	95.2	P/P	80 - 120
2119171	Sodium	97.5		P	80 - 120
2119171	Zinc	101	97.0	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P370802

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2118927	Aluminum	98.8		P	80 - 120
2118927	Antimony	100		P	80 - 120
2118927	Arsenic	94.5		P	80 - 120
2118927	Boron	103		P	80 - 120
2118927	Cadmium	95.0		P	80 - 120
2118927	Chromium	95.6		P	80 - 120
2118927	Copper	101		P	80 - 120
2118927	Lead	99.2		P	80 - 120
2118927	Nickel	103		P	80 - 120
2118927	Selenium	93.9		P	80 - 120
2118927	Silver	100		P	80 - 120
2118927	Thallium	103		P	80 - 120
2119171	Aluminum	97.4	98.6	P/P	80 - 120
2119171	Antimony	99.2	100	P/P	80 - 120
2119171	Arsenic	94.0	93.8	P/P	80 - 120
2119171	Boron	102	103	P/P	80 - 120
2119171	Cadmium	95.1	95.7	P/P	80 - 120
2119171	Chromium	94.7	95.1	P/P	80 - 120
2119171	Copper	99.9	102	P/P	80 - 120
2119171	Lead	100	100	P/P	80 - 120
2119171	Nickel	100	110	P/P	80 - 120
2119171	Selenium	94.1	93.0	P/P	80 - 120
2119171	Silver	102	101	P/P	80 - 120
2119171	Thallium	102	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P370978

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119106	Sulfate	104		P	90 - 110
2119178	Sulfate	100		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P370931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119478	Ammonia-N	98.8	99.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119507	Kjeldahl Nitrogen	101	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370855

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119158	NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370856

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119479	NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370853

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119478	Total-P	97.4	95.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370816

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119483	O-Phosphate-P	95.3	97.0	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P371105

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119562	Fluoride	95.6	95.6	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P371021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2119161	Organic Carbon	103	102	P/P	85 - 115

Quality Assurance Report

Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P370837

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119502	Turbidity	0.687	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P370802

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119171	Barium	4.02	Spike	P	0 - 20
2119171	Calcium	2.37	Spike	P	0 - 20
2119171	Iron	2.86	Spike	P	0 - 20
2119171	Magnesium	3.39	Spike	P	0 - 20
2119171	Potassium	1.88	Spike	P	0 - 20
2119171	Sodium	3.08	Spike	P	0 - 20
2119171	Zinc	3.76	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P370802

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119171	Aluminum	1.18	Spike	P	0 - 20
2119171	Antimony	0.963	Spike	P	0 - 20
2119171	Arsenic	0.205	Spike	P	0 - 20
2119171	Boron	0.401	Spike	P	0 - 20
2119171	Cadmium	0.592	Spike	P	0 - 20
2119171	Chromium	0.463	Spike	P	0 - 20
2119171	Copper	2.33	Spike	P	0 - 20
2119171	Lead	0.0841	Spike	P	0 - 20
2119171	Nickel	9.58	Spike	P	0 - 20
2119171	Selenium	1.25	Spike	P	0 - 20
2119171	Silver	1.16	Spike	P	0 - 20
2119171	Thallium	0.319	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P370978

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119106	Sulfate	0.00305	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P370931

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119478	Ammonia-N	0.852	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P370896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119507	Kjeldahl Nitrogen	1.47	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370855

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119158	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P370856

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119479	NO2NO3-N	1.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P370853

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119478	Total-P	1.76	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P370816

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119483	O-Phosphate-P	1.77	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P370939

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119574	Color (true)	0.555	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P370940

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119562	Color (true)	1.49	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P371100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119562	Total Alkalinity	1.13	Sample	P	0 - 2.8

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P371185

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119106	TDS	6.22	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P371105

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119562	Fluoride	0.0	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P371021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2119161	Organic Carbon	0.553	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: A94268

Included Lab Sample IDs: 2119475, 2119476, 2119477

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A94279

Included Lab Sample IDs: 2119481, 2119482, 2119483

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	102	102	P/P	90 - 110
O-Phosphate-P	99.7	102	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A94291

Included Lab Sample IDs: 2119475, 2119476, 2119477

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A94302

Included Lab Sample IDs: 2119478, 2119479, 2119480

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A94334

Included Lab Sample IDs: 2119478, 2119479, 2119480

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

Reference Method: SM 2120 B

Run ID: A94335

Included Lab Sample IDs: 2119475, 2119476, 2119477

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 115
Color (true)	99.7	100	P/P	90 - 115

Reference Method: SM 5310 B-00

Run ID: A94349

Included Lab Sample IDs: 2119478, 2119479, 2119480

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	104	105	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A94350

Included Lab Sample IDs: 2119478, 2119479, 2119480

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	103	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A94354

Included Lab Sample IDs: 2119490, 2119491, 2119492

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A94374

Included Lab Sample IDs: 2119478, 2119479, 2119480

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94386

Included Lab Sample IDs: 2119490, 2119491, 2119492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	99.5	P/P	90 - 110
Arsenic	93.4	92.9	P/P	90 - 110
Boron	101	102	P/P	90 - 110
Cadmium	95.9	95.9	P/P	90 - 110
Selenium	95.4	95.4	P/P	90 - 110
Thallium	94.5	94.2	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A94392

Included Lab Sample IDs: 2119475, 2119476, 2119477

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	103	P/P	90 - 110
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A94392

Included Lab Sample IDs: 2119475, 2119476, 2119477

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	100	99.5	P/P	90 - 110
Fluoride	99.0	100	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A9471

Included Lab Sample IDs: 2119490, 2119491, 2119492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	95.6	96.2	P/P	90 - 110
Nickel	101	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A94722

Included Lab Sample IDs: 2119490, 2119491, 2119492

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	96.1	96.1	P/P	90 - 110
Copper	101	100	P/P	90 - 110
Lead	101	99.8	P/P	90 - 110
Silver	98.6	98.7	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					0.687	
EPA 200.7 Rev. 4.4	Barium	102	100	100	96.3		4.02
	Calcium	103	106	102			2.37
	Iron	102	103	102	99.3		2.86
	Magnesium	110	109	109	104		3.39
	Potassium	103	108	98.0	95.2		1.88
	Sodium	98.5	97.7	97.5			3.08
	Zinc	100	100	101	97.0		3.76
EPA 200.8 Rev. 5.4	Aluminum	97.6	98.8	97.4	98.6		1.18
	Antimony	100	100	99.2	100		0.963
	Arsenic	93.5	94.5	94.0	93.8		0.205
	Boron	103	103	102	103		0.401
	Cadmium	94.5	95.0	95.1	95.7		0.592
	Chromium	92.1	95.6	94.7	95.1		0.463
	Copper	99.1	101	99.9	102		2.33
	Lead	99.0	99.2	100	100		0.0841
	Nickel	102	103	100	110		9.58
	Selenium	93.9	93.9	94.1	93.0		1.25
	Silver	101	100	102	101		1.16
	Thallium	101	103	102	103		0.319
EPA 300.0 Rev. 2.1	Sulfate	100	104	100		0.0030	
EPA 350.1 Rev. 2.0	Ammonia-N	99.7	98.8	99.7			0.852
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	101	103			1.47
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	99.5			0.501
	NO2NO3-N	100	100	99.5			1.00
EPA 365.1 Rev. 2.0	Total-P	95.9	97.4	95.6			1.76
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	95.3	97.0			1.77
SM 2120 B	Color (true)	101				0.555	
	Color (true)	101				1.49	
SM 2320 B-97	Total Alkalinity	103				1.13	
SM 2540 C-97	TDS					6.22	
SM 4500 F-C-97	Fluoride	96.1	95.6	95.6			0.0
SM 5310 B-00	Organic Carbon	104	103	102			0.553

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2119475, 2119476, 2119477
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2119490, 2119491, 2119492
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2119490, 2119491, 2119492
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2119475, 2119476, 2119477
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2119478, 2119479, 2119480
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2119478, 2119479, 2119480
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2119478, 2119479, 2119480
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2119478, 2119479, 2119480
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2119481, 2119482, 2119483

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
SM 2120 B / E31780	True Color measured at 450 nm	2119475, 2119476, 2119477
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2119475, 2119476, 2119477
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2119475, 2119476, 2119477
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2119475, 2119476, 2119477
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2119475, 2119476, 2119477
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2119478, 2119479, 2119480

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	09/16/2019			09/17/2019 15:16	Samantha Davila	2119475, 2119476, 2119477
EPA 200.7 Rev. 4.4	09/16/2019	09/17/2019 15:15	Elliott D. Healy	09/19/2019 15:04	Betina Topolski	2119490
	09/16/2019	09/17/2019 15:15	Elliott D. Healy	09/19/2019 15:11	Betina Topolski	2119491
	09/16/2019	09/17/2019 15:15	Elliott D. Healy	09/19/2019 15:18	Betina Topolski	2119492
EPA 200.8 Rev. 5.4	09/16/2019	09/17/2019 15:15	Elliott D. Healy	09/21/2019 00:56	Justin Cutchin	2119490
	09/16/2019	09/17/2019 15:15	Elliott D. Healy	09/21/2019 01:05	Justin Cutchin	2119491
	09/16/2019	09/17/2019 15:15	Elliott D. Healy	09/21/2019 01:15	Justin Cutchin	2119492
	09/16/2019	09/17/2019 15:15	Elliott D. Healy	10/03/2019 23:37	Justin Cutchin	2119490
	09/16/2019	09/17/2019 15:15	Elliott D. Healy	10/03/2019 23:46	Justin Cutchin	2119491
	09/16/2019	09/17/2019 15:15	Elliott D. Healy	10/03/2019 23:56	Justin Cutchin	2119492
	09/16/2019	09/17/2019 15:15	Elliott D. Healy	10/05/2019 01:39	Justin Cutchin	2119490
	09/16/2019	09/17/2019 15:15	Elliott D. Healy	10/05/2019 01:48	Justin Cutchin	2119491
	09/16/2019	09/17/2019 15:15	Elliott D. Healy	10/05/2019 01:58	Justin Cutchin	2119492
EPA 300.0 Rev. 2.1	09/16/2019			09/19/2019 00:38	Jhamieka S. Greenwood	2119475
	09/16/2019			09/19/2019 00:50	Jhamieka S. Greenwood	2119476
	09/16/2019			09/19/2019 01:02	Jhamieka S. Greenwood	2119477
EPA 350.1 Rev. 2.0	09/16/2019			09/18/2019 13:02	Ping Hua	2119478
	09/16/2019			09/18/2019 13:13	Ping Hua	2119479
	09/16/2019			09/18/2019 13:14	Ping Hua	2119480
EPA 351.2 Rev. 2.0	09/16/2019	09/18/2019 12:00	Sima Feizi	09/19/2019 14:14	Julia Storbeck	2119478
	09/16/2019	09/18/2019 12:00	Sima Feizi	09/19/2019 14:16	Julia Storbeck	2119479
	09/16/2019	09/18/2019 12:00	Sima Feizi	09/19/2019 14:17	Julia Storbeck	2119480
EPA 353.2 Rev. 2.0	09/16/2019			09/18/2019 08:59	Beverly Y. Sanders	2119478
	09/16/2019			09/18/2019 09:06	Beverly Y. Sanders	2119479
	09/16/2019			09/18/2019 10:34	Beverly Y. Sanders	2119480
EPA 365.1 Rev. 2.0	09/16/2019	09/18/2019 15:11	Lipi Saha	09/19/2019 16:36	Rosalyn Ballman	2119478
	09/16/2019	09/18/2019 15:11	Lipi Saha	09/19/2019 16:37	Rosalyn Ballman	2119479
	09/16/2019	09/18/2019 15:11	Lipi Saha	09/19/2019 16:38	Rosalyn Ballman	2119480
EPA 365.1 Rev. 2.0 dissolved	09/16/2019			09/17/2019 14:48	Jhamieka S. Greenwood	2119483
	09/16/2019			09/17/2019 15:12	Jhamieka S. Greenwood	2119481
	09/16/2019			09/17/2019 15:13	Jhamieka S. Greenwood	2119482
SM 2120 B	09/16/2019			09/17/2019 18:11	Madeline Funaro	2119475
	09/16/2019			09/17/2019 18:17	Madeline Funaro	2119476, 2119477
SM 2320 B-97	09/16/2019			09/19/2019 02:24	Dale L. Simmons	2119475
	09/16/2019			09/19/2019 02:36	Dale L. Simmons	2119476
	09/16/2019			09/19/2019 03:33	Dale L. Simmons	2119477
SM 2540 C-97	09/16/2019			09/17/2019 14:10	Yijie Li	2119475, 2119476, 2119477
SM 2540 D-97	09/16/2019			09/17/2019 14:10	Yijie Li	2119475, 2119476, 2119477
SM 4500 F-C-97	09/16/2019			09/19/2019 02:24	Dale L. Simmons	2119475
	09/16/2019			09/19/2019 02:36	Dale L. Simmons	2119476

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 4500 F-C-97	09/16/2019			09/19/2019 03:33	Dale L. Simmons	2119477
SM 5310 B-00	09/16/2019			09/18/2019 16:40	Madeline Funaro	2119478
	09/16/2019			09/18/2019 16:57	Madeline Funaro	2119479
	09/16/2019			09/18/2019 17:09	Madeline Funaro	2119480