

Chemical Analysis Report

WAS-SECT-2019-11-14-01

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

Event Description: **McBride Little River**
Request ID: **RQ-2019-11-11-19**
Customer: **WAS-SECT**
Project ID: **SMP**

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Date Certified: 03-DEC-2019 10:39



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: 11/14/2019 10:44

Field ID: G1WA0088

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2136427	EPA 180.1 Rev. 2.0	Turbidity	3.4		NTU	P374350	
	EPA 300.0 Rev. 2.1	Chloride	8.6		mg Cl/L	P374400	
		Sulfate	0.20	U	mg SO4/L	P374403	
		Color (true)	7.5		PCU	P374313	
	SM 2120 B	Total Alkalinity	5.1		mg CaCO3/L	P374661	
	SM 2540 C-97	TDS	23	I	mg/L	P374861	
	SM 2540 D-97	TSS	4	I	mg/L	P374853	
	SM 4500 F-C-97	Fluoride	0.036	I	mg F/L	P374663	
2136430	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P374676	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.44		mg N/L	P374617	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P374475	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P374585	
	SM 5310 B-00	Organic Carbon	4.3		mg C/L	P374428	
2136433	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P374378	
2136442	EPA 200.7 Rev. 4.4	Barium	7.6		ug/L	P374364	
		Calcium	1.43		mg/L	P374364	
		Iron	110	I	ug/L	P374364	
		Magnesium	0.96		mg/L	P374364	
		Potassium	0.96	I	mg/L	P374364	
		Sodium	5.1		mg/L	P374364	
		Zinc	5.0	U	ug/L	P374364	
	EPA 200.8 Rev. 5.4	Aluminum	12	I	ug/L	P374364	
		Antimony	0.050	U	ug/L	P374364	
		Arsenic	0.44		ug/L	P374364	
		Boron**	16.1		ug/L	P374364	
		Cadmium	0.020	U	ug/L	P374364	
		Chromium	0.40	U	ug/L	P374364	
		Copper	0.40	U	ug/L	P374364	
		Lead	0.20	U	ug/L	P374364	
		Nickel	0.50	U	ug/L	P374364	
		Selenium	0.20	U	ug/L	P374364	
		Silver	0.010	U	ug/L	P374364	
		Thallium	0.10	U	ug/L	P374364	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: McBride Mid

Collection Date/Time: 11/14/2019 11:21

Field ID: G1WA0006

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2136428	EPA 180.1 Rev. 2.0	Turbidity	3.2	A	NTU	P374351	
	EPA 300.0 Rev. 2.1	Chloride	8.7		mg Cl/L	P374400	
		Sulfate	0.20	U	mg SO4/L	P374403	
		Color (true)	7.0		PCU	P374313	
	SM 2120 B	Total Alkalinity	5.1		mg CaCO3/L	P374661	
	SM 2540 C-97	TDS	22	I	mg/L	P374861	
	SM 2540 D-97	TSS	4	I	mg/L	P374853	
	SM 4500 F-C-97	Fluoride	0.036	I	mg F/L	P374663	
2136431	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P374676	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.40		mg N/L	P374617	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P374475	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P374585	
	SM 5310 B-00	Organic Carbon	4.3		mg C/L	P374428	
2136434	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P374378	
2136443	EPA 200.7 Rev. 4.4	Barium	7.5		ug/L	P374364	
		Calcium	1.44		mg/L	P374364	
		Iron	120		ug/L	P374364	
		Magnesium	0.96		mg/L	P374364	
		Potassium	0.98	I	mg/L	P374364	
		Sodium	5.1		mg/L	P374364	
		Zinc	5.0	U	ug/L	P374364	
	EPA 200.8 Rev. 5.4	Aluminum	12	I	ug/L	P374364	
		Antimony	0.050	U	ug/L	P374364	
		Arsenic	0.44		ug/L	P374364	
		Boron**	16.4		ug/L	P374364	
		Cadmium	0.020	U	ug/L	P374364	
		Chromium	0.40	U	ug/L	P374364	
		Copper	0.40	U	ug/L	P374364	
		Lead	0.20	U	ug/L	P374364	
		Nickel	0.50	U	ug/L	P374364	
		Selenium	0.20	U	ug/L	P374364	
		Silver	0.010	U	ug/L	P374364	
		Thallium	0.10	U	ug/L	P374364	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: McBride West

Collection Date/Time: 11/14/2019 11:44

Field ID: G1WA0089

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2136429	EPA 180.1 Rev. 2.0	Turbidity	1.5		NTU	P374351	
	EPA 300.0 Rev. 2.1	Chloride	8.8		mg Cl/L	P374400	
		Sulfate	0.20	U	mg SO4/L	P374403	
		Color (true)	12		PCU	P374313	
	SM 2320 B-97	Total Alkalinity	5.4		mg CaCO3/L	P374661	
	SM 2540 C-97	TDS	32		mg/L	P374860	
	SM 2540 D-97	TSS	2	I	mg/L	P374852	
	SM 4500 F-C-97	Fluoride	0.036	I	mg F/L	P374663	
2136432	EPA 350.1 Rev. 2.0	Ammonia-N	0.026		mg N/L	P374465	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39		mg N/L	P374617	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P374475	
	EPA 365.1 Rev. 2.0	Total-P	0.023		mg P/L	P374585	
	SM 5310 B-00	Organic Carbon	4.1		mg C/L	P374428	
2136435	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P374378	
2136444	EPA 200.7 Rev. 4.4	Barium	7.7		ug/L	P374364	
		Calcium	1.47		mg/L	P374364	
		Iron	170		ug/L	P374364	
		Magnesium	0.98		mg/L	P374364	
		Potassium	1.1	I	mg/L	P374364	
		Sodium	5.3		mg/L	P374364	
		Zinc	5.0	U	ug/L	P374364	
		Aluminum	5.9	I	ug/L	P374364	
		Antimony	0.050	U	ug/L	P374364	
		Arsenic	0.43		ug/L	P374364	
	EPA 200.8 Rev. 5.4	Boron**	16.3		ug/L	P374364	
		Cadmium	0.020	U	ug/L	P374364	
		Chromium	0.40	U	ug/L	P374364	
		Copper	0.59	I	ug/L	P374364	
		Lead	0.20	U	ug/L	P374364	
		Nickel	0.50	U	ug/L	P374364	
		Selenium	0.20	U	ug/L	P374364	
		Silver	0.010	U	ug/L	P374364	
		Thallium	0.10	U	ug/L	P374364	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries 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: P374350

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P374351

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P374364

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: P374364

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: P374400

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P374403

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: P374465

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374676

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374617

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374475

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: P374585

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374378

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

Reference Method: SM 2120 B
Batch ID: P374313

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P374661

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

Reference Method: SM 2540 C-97
Batch ID: P374860

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P374861

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P374852

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P374853

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P374663

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P374428

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: P374364

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	99.4		P	85 - 115
Calcium	102		P	85 - 115
Iron	101		P	85 - 115
Magnesium	110		P	85 - 115
Potassium	103		P	85 - 115
Sodium	101		P	85 - 115
Zinc	96.5		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P374364

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.6		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	96.1		P	85 - 115
Boron	101		P	85 - 115
Cadmium	91.4		P	85 - 115
Chromium	94.0		P	85 - 115
Copper	100		P	85 - 115
Lead	93.0		P	85 - 115
Nickel	98.2		P	85 - 115
Selenium	87.8		P	85 - 115
Silver	97.8		P	85 - 115
Thallium	97.9		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P374400

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P374403

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P374465

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P374676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.3		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374617

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.3		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374475

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374585

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374378

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.4		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P374313

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.0		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P374661

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P374663

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.9		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P374428

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P374364

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136241	Barium	98.5		P	80 - 120
2136241	Calcium	98.2		P	80 - 120
2136241	Iron	105		P	80 - 120
2136241	Magnesium	111		P	80 - 120
2136241	Potassium	112		P	80 - 120
2136241	Sodium	105		P	80 - 120
2136241	Zinc	95.5		P	80 - 120
2136502	Barium	96.9	96.2	P/P	80 - 120
2136502	Calcium	102		P	80 - 120
2136502	Iron	105	104	P/P	80 - 120
2136502	Magnesium	111	108	P/P	80 - 120
2136502	Potassium	101	100	P/P	80 - 120
2136502	Sodium	99.7		P	80 - 120
2136502	Zinc	96.3	95.2	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P374364

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136241	Aluminum	94.2		P	80 - 120
2136241	Antimony	102		P	80 - 120
2136241	Arsenic	93.7		P	80 - 120
2136241	Boron	99.1		P	80 - 120
2136241	Cadmium	92.8		P	80 - 120
2136241	Chromium	92.0		P	80 - 120
2136241	Copper	97.5		P	80 - 120
2136241	Lead	90.9		P	80 - 120
2136241	Nickel	96.3		P	80 - 120
2136241	Selenium	84.8		P	80 - 120
2136241	Silver	99.5		P	80 - 120
2136241	Thallium	98.0		P	80 - 120
2136502	Aluminum	97.5	97.2	P/P	80 - 120
2136502	Antimony	103	101	P/P	80 - 120
2136502	Arsenic	97.1	95.3	P/P	80 - 120
2136502	Boron	105	104	P/P	80 - 120
2136502	Cadmium	95.6	95.2	P/P	80 - 120
2136502	Chromium	97.0	95.5	P/P	80 - 120
2136502	Copper	101	102	P/P	80 - 120
2136502	Lead	95.8	94.2	P/P	80 - 120
2136502	Nickel	97.8	99.3	P/P	80 - 120
2136502	Selenium	84.3	86.4	P/P	80 - 120
2136502	Silver	99.8	100	P/P	80 - 120
2136502	Thallium	101	103	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P374400

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136190	Chloride	98.2		P	90 - 110
2136427	Chloride	99.9		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P374403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136190	Sulfate	97.2		P	90 - 110
2136427	Sulfate	99.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136452	Ammonia-N	99.8	95.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136430	Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374475

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136430	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374585

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136273	Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374378

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136434	O-Phosphate-P	96.1	98.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P374663

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136533	Fluoride	97.9	98.8	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P374428

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2136271	Organic Carbon	103		P	85 - 115

Quality Assurance Report

Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P374350

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136605	Turbidity	10.5	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P374351

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136428	Turbidity	3.76	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P374364

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136502	Barium	0.684	Spike	P	0 - 20
2136502	Calcium	0.160	Spike	P	0 - 20
2136502	Iron	1.24	Spike	P	0 - 20
2136502	Magnesium	1.50	Spike	P	0 - 20
2136502	Potassium	0.768	Spike	P	0 - 20
2136502	Sodium	0.639	Spike	P	0 - 20
2136502	Zinc	1.09	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P374364

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136502	Aluminum	0.163	Spike	P	0 - 20
2136502	Antimony	1.67	Spike	P	0 - 20
2136502	Arsenic	1.81	Spike	P	0 - 20
2136502	Boron	0.853	Spike	P	0 - 20
2136502	Cadmium	0.339	Spike	P	0 - 20
2136502	Chromium	1.57	Spike	P	0 - 20
2136502	Copper	1.13	Spike	P	0 - 20
2136502	Lead	1.61	Spike	P	0 - 20
2136502	Nickel	1.33	Spike	P	0 - 20
2136502	Selenium	2.51	Spike	P	0 - 20
2136502	Silver	0.447	Spike	P	0 - 20
2136502	Thallium	1.81	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P374400

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136190	Chloride	0.582	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P374403

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136190	Sulfate	0.327	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374465

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136452	Ammonia-N	4.36	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136430	Ammonia-N	0.981	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374617

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136273	Kjeldahl Nitrogen	4.44	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374475

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136430	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136273	Total-P	0.439	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136434	O-Phosphate-P	2.37	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P374313

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136472	Color (true)	2.27	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P374661

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136533	Total Alkalinity	0.443	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P374860

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136193	TDS	4.35	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P374861

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136270	TDS	2.56	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P374663

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136533	Fluoride	0.473	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P374428

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2136271	Organic Carbon	0.565	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: A95765

Included Lab Sample IDs: 2136427, 2136428, 2136429

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

Reference Method: SM 2120 B

Run ID: A95771

Included Lab Sample IDs: 2136427, 2136428, 2136429

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	99.1	102	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A95786

Included Lab Sample IDs: 2136427, 2136428, 2136429

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A95799

Included Lab Sample IDs: 2136433, 2136434, 2136435

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.3	97.4	P/P	90 - 110
O-Phosphate-P	97.9	96.7	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A95823

Included Lab Sample IDs: 2136430, 2136431, 2136432

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A95833

Included Lab Sample IDs: 2136442, 2136443, 2136444

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.9	97.3	P/P	90 - 110
Calcium	99.6	99.5	P/P	90 - 110
Iron	100	102	P/P	90 - 110
Magnesium	103	104	P/P	90 - 110
Potassium	96.3	96.5	P/P	90 - 110
Sodium	100	102	P/P	90 - 110
Zinc	99.3	97.0	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A95834

Included Lab Sample IDs: 2136432

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	99.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A95835

Included Lab Sample IDs: 2136430, 2136431, 2136432

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

Reference Method: SM 2320 B-97

Run ID: A95901

Included Lab Sample IDs: 2136427, 2136428, 2136429

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	97.8	P/P	90 - 110
Total Alkalinity	97.8	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A95901

Included Lab Sample IDs: 2136427, 2136428, 2136429

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.5	98.6	P/P	90 - 110
Fluoride	98.6	98.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A95904

Included Lab Sample IDs: 2136430, 2136431

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A95912

Included Lab Sample IDs: 2136430, 2136431, 2136432

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A95945

Included Lab Sample IDs: 2136430, 2136431, 2136432

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

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A95998

Included Lab Sample IDs: 2136442, 2136443, 2136444

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	97.8	P/P	90 - 110
Antimony	95.2	94.8	P/P	90 - 110
Arsenic	102	101	P/P	90 - 110
Boron	109	104	P/P	90 - 110
Cadmium	98.6	97.4	P/P	90 - 110
Chromium	100	98.6	P/P	90 - 110
Copper	106	105	P/P	90 - 110
Lead	98.6	97.3	P/P	90 - 110
Nickel	104	101	P/P	90 - 110
Selenium	94.3	93.3	P/P	90 - 110
Silver	101	101	P/P	90 - 110
Thallium	95.4	94.0	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						10.5	
	Turbidity						3.76	
EPA 200.7 Rev. 4.4	Barium	99.4	98.5	96.9	96.2			0.684
	Calcium	102	98.2	102				0.160
	Iron	101	105	105	104			1.24
	Magnesium	110	111	111	108			1.50
	Potassium	103	112	101	100			0.768
	Sodium	101	105	99.7				0.639
	Zinc	96.5	95.5	96.3	95.2			1.09
EPA 200.8 Rev. 5.4	Aluminum	94.6	94.2	97.5	97.2			0.163
	Antimony	100	103	101	102			1.67
	Arsenic	96.1	97.1	95.3	93.7			1.81
	Boron	101	99.1	105	104			0.853
	Cadmium	91.4	92.8	95.6	95.2			0.339
	Chromium	94.0	97.0	95.5	92.0			1.57
	Copper	100	97.5	101	102			1.13
	Lead	93.0	95.8	94.2	90.9			1.61
	Nickel	98.2	96.3	97.8	99.3			1.33
	Selenium	87.8	84.8	84.3	86.4			2.51
	Silver	97.8	99.5	99.8	100			0.447
	Thallium	97.9	98.0	101	103			1.81
EPA 300.0 Rev. 2.1	Chloride	100	98.2	99.9			0.582	
	Sulfate	100	97.2	99.3			0.327	
EPA 350.1 Rev. 2.0	Ammonia-N	97.5	99.8	95.3				4.36
	Ammonia-N	97.3	103	104				0.981
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.3						4.44
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	100	100				0.0
EPA 365.1 Rev. 2.0	Total-P	104	102	103				0.439
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.4	96.1	98.4				2.37
SM 2120 B	Color (true)	99.0					2.27	
SM 2320 B-97	Total Alkalinity	101					0.443	
SM 2540 C-97	TDS						4.35	
	TDS						2.56	
SM 4500 F-C-97	Fluoride	95.9	97.9	98.8				0.473
SM 5310 B-00	Organic Carbon	103	103					0.565

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2136427, 2136428, 2136429
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2136442, 2136443, 2136444
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2136442, 2136443, 2136444
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2136427, 2136428, 2136429
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2136427, 2136428, 2136429
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2136430, 2136431, 2136432
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2136430, 2136431, 2136432
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2136430, 2136431, 2136432

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2136430, 2136431, 2136432
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2136433, 2136434, 2136435
SM 2120 B / E31780	True Color measured at 450 nm	2136427, 2136428, 2136429
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2136427, 2136428, 2136429
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2136427, 2136428, 2136429
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2136427, 2136428, 2136429
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2136427, 2136428, 2136429
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2136430, 2136431, 2136432

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	11/14/2019			11/15/2019 17:09	Samantha Davila	2136427, 2136428, 2136429
EPA 200.7 Rev. 4.4	11/14/2019	11/18/2019 14:25	Elliott D. Healy	11/19/2019 13:15	Betina Topolski	2136442
	11/14/2019	11/18/2019 14:25	Elliott D. Healy	11/19/2019 13:21	Betina Topolski	2136443
	11/14/2019	11/18/2019 14:25	Elliott D. Healy	11/19/2019 13:27	Betina Topolski	2136444
EPA 200.8 Rev. 5.4	11/14/2019	11/18/2019 14:25	Elliott D. Healy	11/27/2019 06:01	Robert K Palmer	2136442
	11/14/2019	11/18/2019 14:25	Elliott D. Healy	11/27/2019 06:10	Robert K Palmer	2136443
	11/14/2019	11/18/2019 14:25	Elliott D. Healy	11/27/2019 06:20	Robert K Palmer	2136444
EPA 300.0 Rev. 2.1	11/14/2019			11/18/2019 22:00	Lipi Saha	2136427
	11/14/2019			11/19/2019 01:26	Lipi Saha	2136428
	11/14/2019			11/19/2019 01:38	Lipi Saha	2136429
EPA 350.1 Rev. 2.0	11/14/2019			11/19/2019 13:54	Ping Hua	2136432
	11/14/2019			11/21/2019 11:55	Ping Hua	2136430
	11/14/2019			11/21/2019 11:59	Ping Hua	2136431
EPA 351.2 Rev. 2.0	11/14/2019	11/21/2019 12:36	Sima Feizi	11/22/2019 16:04	Jhamieka S. Greenwood	2136430
	11/14/2019	11/21/2019 12:36	Sima Feizi	11/22/2019 16:06	Jhamieka S. Greenwood	2136431
	11/14/2019	11/21/2019 12:36	Sima Feizi	11/22/2019 16:08	Jhamieka S. Greenwood	2136432
EPA 353.2 Rev. 2.0	11/14/2019			11/19/2019 09:27	Beverly Y. Sanders	2136430
	11/14/2019			11/19/2019 09:34	Beverly Y. Sanders	2136431
	11/14/2019			11/19/2019 09:36	Beverly Y. Sanders	2136432
EPA 365.1 Rev. 2.0	11/14/2019	11/21/2019 13:00	Yen Ta	11/25/2019 14:32	Benjamin T. Nordmann	2136430
	11/14/2019	11/21/2019 13:00	Yen Ta	11/25/2019 14:33	Benjamin T. Nordmann	2136431
	11/14/2019	11/21/2019 13:00	Yen Ta	11/25/2019 14:43	Benjamin T. Nordmann	2136432
EPA 365.1 Rev. 2.0 dissolved	11/14/2019			11/15/2019 14:27	Ping Hua	2136434
	11/14/2019			11/15/2019 14:56	Ping Hua	2136433, 2136435
SM 2120 B	11/14/2019			11/15/2019 17:09	Madeline Funaro	2136427, 2136428
	11/14/2019			11/15/2019 17:10	Madeline Funaro	2136429
SM 2320 B-97	11/14/2019			11/20/2019 18:47	Dale L. Simmons	2136427
	11/14/2019			11/20/2019 19:00	Dale L. Simmons	2136428
	11/14/2019			11/20/2019 19:42	Dale L. Simmons	2136429
SM 2540 C-97	11/14/2019			11/19/2019 15:21	Yijie Li	2136427, 2136428, 2136429
SM 2540 D-97	11/14/2019			11/19/2019 15:21	Yijie Li	2136427, 2136428, 2136429
SM 4500 F-C-97	11/14/2019			11/20/2019 18:47	Dale L. Simmons	2136427
	11/14/2019			11/20/2019 19:00	Dale L. Simmons	2136428
	11/14/2019			11/20/2019 19:42	Dale L. Simmons	2136429
SM 5310 B-00	11/14/2019			11/18/2019 18:53	Lauren Lees	2136430
	11/14/2019			11/18/2019 19:06	Lauren Lees	2136431
	11/14/2019			11/18/2019 19:22	Lauren Lees	2136432