

Chemical Analysis Report

WAS-SECT-2019-04-03-01

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

Event Description: **Willson Mill Creek**

Request ID: **RQ-2019-04-01-10**

Customer: **WAS-SECT**

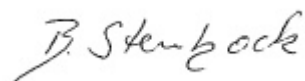
Project ID: **SMP**

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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 23-APR-2019 17:56



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: Willson Mill Creek Upstream of 274

Collection Date/Time: 04/03/2019 13:05

Field ID: G2WA0020

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2075064	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P361527	
	EPA 300.0 Rev. 2.1	Chloride	7.4		mg Cl/L	P361966	
		Sulfate	0.99		mg SO4/L	P361968	
		Color (true)	49		PCU	P361551	
	SM 2320 B-97	Total Alkalinity	14		mg CaCO3/L	P361984	
	SM 2540 C-97	TDS	74		mg/L	P362130	
	SM 2540 D-97	TSS	2	I	mg/L	P362040	
	SM 4500 F-C-97	Fluoride	0.041	I	mg F/L	P361987	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P361947	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.46		mg N/L	P361829	
2075065	EPA 353.2 Rev. 2.0	NO2NO3-N	1.8		mg N/L	P362050	
	EPA 365.1 Rev. 2.0	Total-P	0.015		mg P/L	P361805	
	SM 5310 B-00	Organic Carbon	4.6		mg C/L	P361726	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P361532	
	EPA 200.7 Rev. 4.4	Barium	56.3		ug/L	P361749	
2075069	EPA 200.8 Rev. 5.4	Calcium	6.92		mg/L	P361749	
		Iron	650		ug/L	P361749	
		Magnesium	3.58		mg/L	P361749	
		Potassium	2.1		mg/L	P361749	
		Sodium	2.2		mg/L	P361749	
		Zinc	5.0	U	ug/L	P361749	
		Aluminum	122		ug/L	P361749	
		Antimony	0.050	U	ug/L	P361749	
		Arsenic	0.33		ug/L	P361749	
		Boron**	12.1		ug/L	P361749	
		Cadmium	0.020	U	ug/L	P361749	
		Chromium	0.40	U	ug/L	P361749	
		Copper	0.41	I	ug/L	P361749	
		Lead	0.20	U	ug/L	P361749	
		Nickel	0.50	U	ug/L	P361749	
		Selenium	0.20	U	ug/L	P361749	
		Silver	0.010	U	ug/L	P361749	
		Thallium	0.10	U	ug/L	P361749	

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: P361527

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P361749

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: P361749

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: P361966

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P361968

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P361947

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P361829

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362050

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P361805

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361532

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

Reference Method: SM 2120 B
Batch ID: P361551

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P361984

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

Reference Method: SM 2540 C-97
Batch ID: P362130

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P362040

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P361987

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-00

Batch ID: P361726

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: P361749

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	104		P	85 - 115
Iron	107		P	85 - 115
Magnesium	104		P	85 - 115
Potassium	104		P	85 - 115
Sodium	104		P	85 - 115
Zinc	102		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P361749

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	91.6		P	85 - 115
Antimony	93.8		P	85 - 115
Arsenic	96.7		P	85 - 115
Boron	91.8		P	85 - 115
Cadmium	95.8		P	85 - 115
Chromium	89.3		P	85 - 115
Copper	94.9		P	85 - 115
Lead	98.7		P	85 - 115
Nickel	95.3		P	85 - 115
Selenium	95.8		P	85 - 115
Silver	110		P	85 - 115
Thallium	93.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P361966

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

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P361968

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

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P361947

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: P361829

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	97.4		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362050

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P361805

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361532

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

Reference Method: SM 2120 B
Batch ID: P361551

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P361984

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	98.8		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P361987

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.5		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P361726

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

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P361749

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075698	Barium	100	101	P/P	80 - 120
2075698	Calcium	101		P	80 - 120
2075698	Iron	105	105	P/P	80 - 120
2075698	Magnesium	103		P	80 - 120
2075698	Potassium	104	105	P/P	80 - 120
2075698	Sodium	105		P	80 - 120
2075698	Zinc	101	103	P/P	80 - 120
2076328	Barium	99.5		P	80 - 120
2076328	Calcium	99.3		P	80 - 120
2076328	Iron	103		P	80 - 120
2076328	Magnesium	101		P	80 - 120
2076328	Potassium	106		P	80 - 120
2076328	Sodium	107		P	80 - 120
2076328	Zinc	101		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P361749

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075698	Aluminum	92.1	91.5	P/P	80 - 120
2075698	Antimony	93.9	92.1	P/P	80 - 120
2075698	Arsenic	96.4	95.5	P/P	80 - 120
2075698	Boron	94.4	93.5	P/P	80 - 120
2075698	Cadmium	94.8	94.8	P/P	80 - 120
2075698	Chromium	90.2	90.3	P/P	80 - 120
2075698	Copper	93.9	92.6	P/P	80 - 120
2075698	Lead	99.3	98.3	P/P	80 - 120
2075698	Nickel	94.9	94.1	P/P	80 - 120
2075698	Selenium	93.3	92.9	P/P	80 - 120
2075698	Silver	110	109	P/P	80 - 120
2075698	Thallium	95.5	95.6	P/P	80 - 120
2076328	Aluminum	91.9		P	80 - 120
2076328	Antimony	93.5		P	80 - 120
2076328	Arsenic	95.3		P	80 - 120
2076328	Boron	93.4		P	80 - 120
2076328	Cadmium	95.7		P	80 - 120
2076328	Chromium	89.9		P	80 - 120
2076328	Copper	92.7		P	80 - 120
2076328	Lead	99.0		P	80 - 120
2076328	Nickel	94.2		P	80 - 120
2076328	Selenium	90.9		P	80 - 120
2076328	Silver	110		P	80 - 120
2076328	Thallium	95.8		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P361966

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075064	Chloride	101		P	90 - 110
2075134	Chloride	102		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P361968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075064	Sulfate	99.7		P	90 - 110
2075134	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P361947

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075065	Ammonia-N	103	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P361829

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075065	Kjeldahl Nitrogen	90.7	92.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362050

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075075	NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P361805

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075065	Total-P	100	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361532

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2074967	O-Phosphate-P	97.6	99.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P361987

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075852	Fluoride	98.4	99.0	P/P	89 - 106

Reference Method: SM 5310 B-00
Batch ID: P361726

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2074863	Organic Carbon	100	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P361527

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075071	Turbidity	1.43	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4

Batch ID: P361749

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075698	Barium	0.668	Spike	P	0 - 20
2075698	Calcium	0.811	Spike	P	0 - 20
2075698	Iron	0.179	Spike	P	0 - 20
2075698	Magnesium	1.20	Spike	P	0 - 20
2075698	Potassium	0.570	Spike	P	0 - 20
2075698	Sodium	0.0388	Spike	P	0 - 20
2075698	Zinc	1.34	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4

Batch ID: P361749

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075698	Aluminum	0.589	Spike	P	0 - 20
2075698	Antimony	1.99	Spike	P	0 - 20
2075698	Arsenic	0.913	Spike	P	0 - 20
2075698	Boron	0.868	Spike	P	0 - 20
2075698	Cadmium	0.00787	Spike	P	0 - 20
2075698	Chromium	0.0971	Spike	P	0 - 20
2075698	Copper	1.40	Spike	P	0 - 20
2075698	Lead	0.968	Spike	P	0 - 20
2075698	Nickel	0.803	Spike	P	0 - 20
2075698	Selenium	0.416	Spike	P	0 - 20
2075698	Silver	1.20	Spike	P	0 - 20
2075698	Thallium	0.0718	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P361966

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075134	Chloride	1.46	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P361968

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075134	Sulfate	0.864	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P361947

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075065	Ammonia-N	0.658	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P361829

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075065	Kjeldahl Nitrogen	1.59	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075075	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P361805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075065	Total-P	4.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361532

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2074967	O-Phosphate-P	1.63	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P361551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2074836	Color (true)	3.70	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P361984

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075852	Total Alkalinity	0.826	Sample	P	0 - 2.8

Reference Method: SM 2540 C-97
Batch ID: P362130

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2074710	TDS	5.47	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-97
Batch ID: P361987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075852	Fluoride	0.479	Spike	P	0 - 2.5

Reference Method: SM 5310 B-00
Batch ID: P361726

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2074863	Organic Carbon	0.622	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A90416

Included Lab Sample IDs: 2075064

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A90417

Included Lab Sample IDs: 2075066

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.9	97.1	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A90429

Included Lab Sample IDs: 2075064

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	102	101	P/P	85 - 115

Reference Method: SM 5310 B-00

Run ID: A90508

Included Lab Sample IDs: 2075065

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

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A90538

Included Lab Sample IDs: 2075064

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

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A90556

Included Lab Sample IDs: 2075069

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	102	P/P	95 - 105
Calcium	101	103	P/P	95 - 105
Iron	99.9	100	P/P	95 - 105
Magnesium	101	102	P/P	95 - 105
Potassium	99.7	101	P/P	95 - 105
Sodium	101	105	P/P	95 - 105
Zinc	103	103	P/P	95 - 105

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A90591

Included Lab Sample IDs: 2075065

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.3	99.1	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A90598

Included Lab Sample IDs: 2075065

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

Reference Method: SM 2320 B-97

Run ID: A90626

Included Lab Sample IDs: 2075064

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.9	99.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A90626

Included Lab Sample IDs: 2075064

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A90637

Included Lab Sample IDs: 2075065

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	98.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A90667

Included Lab Sample IDs: 2075065

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A90781

Included Lab Sample IDs: 2075069

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	95.5	95.6	P/P	90 - 110
Antimony	95.8	95.3	P/P	90 - 110
Arsenic	98.4	97.7	P/P	90 - 110
Boron	93.4	93.1	P/P	90 - 110
Cadmium	96.8	96.3	P/P	90 - 110
Chromium	96.8	96.7	P/P	90 - 110
Copper	97.3	96.4	P/P	90 - 110
Lead	103	103	P/P	90 - 110
Nickel	97.5	97.7	P/P	90 - 110
Selenium	97.2	96.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A90797

Included Lab Sample IDs: 2075069

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

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A90797

Included Lab Sample IDs: 2075069

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Thallium	92.0	92.6	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A90835

Included Lab Sample IDs: 2075069

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Silver	102	101	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					1.43	
EPA 200.7 Rev. 4.4	Barium	102	100	101	99.5		0.668
	Calcium	104	101	99.3			0.811
	Iron	107	105	105	103		0.179
	Magnesium	104	103	101			1.20
	Potassium	104	104	105	106		0.570
	Sodium	104	105	107			0.0388
	Zinc	102	101	103	101		1.34
EPA 200.8 Rev. 5.4	Aluminum	91.6	92.1	91.5	91.9		0.589
	Antimony	93.8	93.9	92.1	93.5		1.99
	Arsenic	96.7	96.4	95.5	95.3		0.913
	Boron	91.8	94.4	93.5	93.4		0.868
	Cadmium	95.8	94.8	94.8	95.7		0.0078
	Chromium	89.3	90.2	90.3	89.9		0.0971
	Copper	94.9	93.9	92.6	92.7		1.40
	Lead	98.7	99.3	98.3	99.0		0.968
	Nickel	95.3	94.9	94.1	94.2		0.803
	Selenium	95.8	93.3	92.9	90.9		0.416
	Silver	110	110	109	110		1.20
	Thallium	93.3	95.5	95.6	95.8		0.0718
EPA 300.0 Rev. 2.1	Chloride	99.5	102	101		1.46	
	Sulfate	101	101	99.7		0.864	
EPA 350.1 Rev. 2.0	Ammonia-N	102	103	102			0.658
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.4	90.7	92.7			1.59
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	98.5	99.0			0.487
EPA 365.1 Rev. 2.0	Total-P	103	100	104			4.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.8	97.6	99.2			1.63
SM 2120 B	Color (true)	102				3.70	
SM 2320 B-97	Total Alkalinity	98.8				0.826	
SM 2540 C-97	TDS					5.47	
SM 4500 F-C-97	Fluoride	97.5	98.4	99.0			0.479
SM 5310 B-00	Organic Carbon	102	100	101			0.622

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2075064
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2075069
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2075069
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2075064
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2075064
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2075065
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2075065
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2075065
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2075065

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2075066
SM 2120 B / E31780	True Color measured at 450 nm	2075064
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2075064
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2075064
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2075064
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2075064
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2075065

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	04/03/2019			04/03/2019 16:46	Adrian Shelby	2075064
EPA 200.7 Rev. 4.4	04/03/2019	04/08/2019 14:10	Elliott D. Healy	04/09/2019 14:05	Betina Topolski	2075069
EPA 200.8 Rev. 5.4	04/03/2019	04/08/2019 14:10	Elliott D. Healy	04/16/2019 17:30	Robert K Palmer	2075069
	04/03/2019	04/08/2019 14:10	Elliott D. Healy	04/17/2019 18:38	Robert K Palmer	2075069
	04/03/2019	04/08/2019 14:10	Elliott D. Healy	04/18/2019 18:06	Robert K Palmer	2075069
EPA 300.0 Rev. 2.1	04/03/2019			04/11/2019 00:26	Lipi Saha	2075064
EPA 350.1 Rev. 2.0	04/03/2019			04/09/2019 11:37	Ping Hua	2075065
EPA 351.2 Rev. 2.0	04/03/2019	04/09/2019 12:30	Adrian Shelby	04/10/2019 15:52	Joseph Suarez	2075065
EPA 353.2 Rev. 2.0	04/03/2019			04/12/2019 10:20	Beverly Y. Sanders	2075065
EPA 365.1 Rev. 2.0	04/03/2019	04/09/2019 16:50	Sima Feizi	04/11/2019 13:09	Rosalyn Ballman	2075065
EPA 365.1 Rev. 2.0 dissolved	04/03/2019			04/03/2019 18:32	Jhamieka S. Greenwood	2075066
SM 2120 B	04/03/2019			04/03/2019 16:58	Mariam Hanna	2075064
SM 2320 B-97	04/03/2019			04/11/2019 05:21	Dale L. Simmons	2075064
SM 2540 C-97	04/03/2019			04/05/2019 15:52	Yijie Li	2075064
SM 2540 D-97	04/03/2019			04/05/2019 15:52	Yijie Li	2075064
SM 4500 F-C-97	04/03/2019			04/11/2019 05:21	Dale L. Simmons	2075064
SM 5310 B-00	04/03/2019			04/05/2019 23:51	Julia Storbeck	2075065