Chemical Analysis Report

SO-DIST-2018-11-21-01

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

Event Description: **SCI -Bobcat Creek 2033**
Request ID: **RQ-2018-11-12-59**
Customer: **SO-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FLDEP South District Office
2295 Victoria Ave. Suite 364
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Certified by: Colin Wright, Program Administrator

Date Certified: 12-DEC-2018 13:10

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 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: BobcatCreek in Preserve **Collection Date/Time: 11/20/2018 13:35**

Field ID: G3SD0131 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2043489	EPA 180.1 Rev. 2.0	Turbidity	37		NTU	P355041	
	EPA 300.0 Rev. 2.1	Chloride	30		mg Cl/L	P355505	
		Sulfate	11		mg SO4/L	P355507	
	SM 2120 B	Color (true)	64	A	PCU	P355038	
	SM 2320 B-97	Total Alkalinity	95		mg CaCO3/L	P355469	
	SM 2540 C-97	TDS	194		mg/L	P355461	
	SM 2540 D-97	TSS	55		mg/L	P355463	
	SM 4500 F-C-97	Fluoride	0.46		mg F/L	P355474	
2043490	EPA 350.1 Rev. 2.0	Ammonia-N	0.075		mg N/L	P355305	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P355216	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.20		mg N/L	P355330	
	EPA 365.1 Rev. 2.0	Total-P	1.7		mg P/L	P355222	
	SM 5310 B-00	Organic Carbon	16		mg C/L	P355326	
2043491	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.76		mg P/L	P355045	
2043494	EPA 200.7 Rev. 4.4	Barium	12.8		ug/L	P355105	
		Calcium	34.9		mg/L	P355105	
		Iron	5.46E+03		ug/L	P355105	
		Magnesium	8.25		mg/L	P355105	
		Potassium	1.5		mg/L	P355105	
		Sodium	19.7		mg/L	P355105	
		Zinc	5.0	U	ug/L	P355105	
	EPA 200.8 Rev. 5.4	Aluminum	942		ug/L	P355105	
		Antimony	0.072	I	ug/L	P355105	
		Arsenic	2.10		ug/L	P355105	
		Boron**	43.4		ug/L	P355105	
		Cadmium	0.049	I	ug/L	P355105	
		Chromium	4.7		ug/L	P355105	
		Copper	0.95		ug/L	P355105	
		Lead	1.02		ug/L	P355105	
		Nickel	0.86		ug/L	P355105	
		Selenium	0.20	U	ug/L	P355105	
		Silver	0.010	U	ug/L	P355105	
		Thallium	0.10	U	ug/L	P355105	

Ref. Method and Comment:
SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.
EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for calcium, magnesium, potassium, and sodium are unavailable for one of two spiked samples because of high analyte concentration in the QC sample.
EPA 200.8 Rev. 5.4: Batch matrix spike recoveries for boron are unavailable for one of two spiked samples 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: P355041

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355105

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: P355105

Component	Result	Code	Units
Aluminum	3.0	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	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	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: P355505

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355507

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355305

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: P355216

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355330

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355222

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355045

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

Reference Method: SM 2120 B
Batch ID: P355038

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P355469

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

Reference Method: SM 2540 C-97
Batch ID: P355461

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P355463

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P355474

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: P355326

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: P355105

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	100		P	85 - 115
Calcium	100		P	85 - 115
Iron	104		P	85 - 115
Magnesium	100		P	85 - 115
Potassium	102		P	85 - 115
Sodium	96.9		P	85 - 115
Zinc	99.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355105

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	103		P	85 - 115
Antimony	103		P	85 - 115
Arsenic	109		P	85 - 115
Boron	105		P	85 - 115
Cadmium	105		P	85 - 115
Chromium	104		P	85 - 115
Copper	105		P	85 - 115
Lead	104		P	85 - 115
Nickel	105		P	85 - 115
Selenium	105		P	85 - 115
Silver	104		P	85 - 115
Thallium	105		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355505

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355507

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355305

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355216

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355330

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	94.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355222

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: P355045

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

Reference Method: SM 2120 B
Batch ID: P355038

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.2		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P355469

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P355474

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.9		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P355326

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	94.5		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355105

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043083	Barium	92.7	92.1	P/P	80 - 120
2043083	Iron	97.4	98.1	P/P	80 - 120
2043083	Zinc	96.2	96.3	P/P	80 - 120
2043420	Barium	93.8		P	80 - 120
2043420	Calcium	97.0		P	80 - 120
2043420	Iron	100		P	80 - 120
2043420	Magnesium	98.1		P	80 - 120
2043420	Potassium	95.8		P	80 - 120
2043420	Sodium	97.3		P	80 - 120
2043420	Zinc	94.7		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355105

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043083	Aluminum	112	109	P/P	80 - 120
2043083	Antimony	108	106	P/P	80 - 120
2043083	Arsenic	115	115	P/P	80 - 120
2043083	Cadmium	103	102	P/P	80 - 120
2043083	Chromium	84.4	82.9	P/P	80 - 120
2043083	Copper	97.0	96.5	P/P	80 - 120
2043083	Lead	107	105	P/P	80 - 120
2043083	Nickel	92.4	91.8	P/P	80 - 120
2043083	Selenium	106	106	P/P	80 - 120
2043083	Silver	96.8	93.6	P/P	80 - 120
2043083	Thallium	108	107	P/P	80 - 120
2043420	Aluminum	103		P	80 - 120
2043420	Antimony	103		P	80 - 120
2043420	Arsenic	107		P	80 - 120
2043420	Boron	110		P	80 - 120
2043420	Cadmium	108		P	80 - 120
2043420	Chromium	102		P	80 - 120
2043420	Copper	100		P	80 - 120
2043420	Lead	102		P	80 - 120
2043420	Nickel	99.4		P	80 - 120
2043420	Selenium	103		P	80 - 120
2043420	Silver	102		P	80 - 120
2043420	Thallium	104		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043287	Chloride	98.1		P	90 - 110
2043510	Chloride	98.7		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355507

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043287	Sulfate	99.1		P	90 - 110
2043510	Sulfate	99.1		P	90 - 110

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355305

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043387	Ammonia-N	100	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355216

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043511	Kjeldahl Nitrogen	102	98.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355330

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043490	NO2NO3-N	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355222

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043544	Total-P	97.8	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355045

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043430	O-Phosphate-P	97.8	99.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P355474

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043543	Fluoride	98.8	99.9	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P355326

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2043289	Organic Carbon	97.4	94.1	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P355041

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043393	Turbidity	3.52	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355105

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043083	Barium	0.640	Spike	P	0 - 20
2043083	Calcium	0.00614	Spike	P	0 - 20
2043083	Iron	0.634	Spike	P	0 - 20
2043083	Magnesium	0.426	Spike	P	0 - 20
2043083	Potassium	0.671	Spike	P	0 - 20
2043083	Sodium	1.62	Spike	P	0 - 20
2043083	Zinc	0.0857	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355105

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043083	Aluminum	2.04	Spike	P	0 - 20
2043083	Antimony	1.60	Spike	P	0 - 20
2043083	Arsenic	0.360	Spike	P	0 - 20
2043083	Boron	0.643	Spike	P	0 - 20
2043083	Cadmium	1.66	Spike	P	0 - 20
2043083	Chromium	1.84	Spike	P	0 - 20
2043083	Copper	0.537	Spike	P	0 - 20
2043083	Lead	1.71	Spike	P	0 - 20
2043083	Nickel	0.611	Spike	P	0 - 20
2043083	Selenium	0.194	Spike	P	0 - 20
2043083	Silver	3.41	Spike	P	0 - 20
2043083	Thallium	1.14	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043287	Chloride	0.513	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355507

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043287	Sulfate	0.739	Sample	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355305

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043387	Ammonia-N	1.99	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355216

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043511	Kjeldahl Nitrogen	2.34	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355330

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043490	NO2NO3-N	0.244	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P355222

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043544	Total-P	5.43	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P355045

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043430	O-Phosphate-P	1.32	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P355038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043489	Color (true)	2.21	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P355469

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043543	Total Alkalinity	1.09	Sample	P	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P355461

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043287	TDS	7.53	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500 F-C-97
Batch ID: P355474

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043543	Fluoride	0.979	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P355326

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2043289	Organic Carbon	2.29	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: SM 2120 B
Run ID: A87929
Included Lab Sample IDs: 2043489

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	99.5	P/P	85 - 115

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A87930
Included Lab Sample IDs: 2043489

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A87931
Included Lab Sample IDs: 2043491

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A88031
Included Lab Sample IDs: 2043490

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A88036
Included Lab Sample IDs: 2043490

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	98.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A88037
Included Lab Sample IDs: 2043490

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	104	P/P	90 - 110

Reference Method: SM 5310 B-00
Run ID: A88042
Included Lab Sample IDs: 2043490

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	95.4	96.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A88043
Included Lab Sample IDs: 2043490

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A88044
Included Lab Sample IDs: 2043494

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.7	98.3	P/P	90 - 110
Calcium	97.9	98.9	P/P	90 - 110
Iron	97.0	97.9	P/P	90 - 110
Magnesium	97.2	98.0	P/P	90 - 110
Potassium	97.9	98.2	P/P	90 - 110
Sodium	95.9	96.3	P/P	90 - 110
Zinc	99.2	98.1	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A88046
Included Lab Sample IDs: 2043494

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	100	97.9	P/P	90 - 110
Antimony	101	101	P/P	90 - 110
Arsenic	100	101	P/P	90 - 110
Boron	105	105	P/P	90 - 110
Cadmium	99.9	101	P/P	90 - 110
Chromium	98.8	99.2	P/P	90 - 110
Copper	100	99.2	P/P	90 - 110
Lead	100	100	P/P	90 - 110
Nickel	99.0	98.7	P/P	90 - 110
Selenium	93.5	90.3	P/P	90 - 110
Silver	99.8	99.9	P/P	90 - 110
Thallium	99.2	98.6	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A88097
Included Lab Sample IDs: 2043489

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.5	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Run ID: A88097
Included Lab Sample IDs: 2043489

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A88113
Included Lab Sample IDs: 2043489

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

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						3.52	
EPA 200.7 Rev. 4.4	Barium	100	92.7	92.1	93.8			0.640
	Calcium	100	97.0					0.0061
	Iron	104	97.4	98.1	100			0.634
	Magnesium	100	98.1					0.426
	Potassium	102	95.8					0.671
	Sodium	96.9	97.3					1.62
	Zinc	99.8	96.2	96.3	94.7			0.0857
EPA 200.8 Rev. 5.4	Aluminum	103	112	109	103			2.04
	Antimony	103	108	106	103			1.60
	Arsenic	109	115	115	107			0.360
	Boron	105	110					0.643
	Cadmium	105	103	102	108			1.66
	Chromium	104	84.4	82.9	102			1.84
	Copper	105	97.0	96.5	100			0.537
	Lead	104	107	105	102			1.71
	Nickel	105	92.4	91.8	99.4			0.611
	Selenium	105	106	106	103			0.194
	Silver	104	96.8	93.6	102			3.41
	Thallium	105	108	107	104			1.14
EPA 300.0 Rev. 2.1	Chloride	101	98.1	98.7			0.513	
	Sulfate	100	99.1	99.1			0.739	
EPA 350.1 Rev. 2.0	Ammonia-N	101	100	103				1.99
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	102	98.5				2.34
EPA 353.2 Rev. 2.0	NO2NO3-N	94.5	105	106				0.244
EPA 365.1 Rev. 2.0	Total-P	103	97.8	104				5.43
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.4	97.8	99.1				1.32
SM 2120 B	Color (true)	97.2					2.21	
SM 2320 B-97	Total Alkalinity	100					1.09	
SM 2540 C-97	TDS						7.53	
SM 4500 F-C-97	Fluoride	98.9	98.8	99.9				0.979
SM 5310 B-00	Organic Carbon	94.5	97.4	94.1				2.29

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2043489
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2043494
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2043494
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2043489
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2043489
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2043490
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2043490
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2043490
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2043490

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2043491
SM 2120 B / E31780	True Color measured at 450 nm	2043489
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2043489
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2043489
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2043489
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2043489
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2043490

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	11/21/2018			11/21/2018 15:37	Megan Treadwell	2043489
EPA 200.7 Rev. 4.4	11/21/2018	11/26/2018 17:30	Elliott D. Healy	11/28/2018 16:31	Betina Topolski	2043494
EPA 200.8 Rev. 5.4	11/21/2018	11/26/2018 17:30	Elliott D. Healy	11/29/2018 18:41	Robert K Palmer	2043494
EPA 300.0 Rev. 2.1	11/21/2018			12/03/2018 20:08	Lipi Saha	2043489
EPA 350.1 Rev. 2.0	11/21/2018			11/29/2018 11:03	Ping Hua	2043490
EPA 351.2 Rev. 2.0	11/21/2018	11/28/2018 11:50	Adrian Shelby	11/29/2018 09:56	Joseph Suarez	2043490
EPA 353.2 Rev. 2.0	11/21/2018			11/29/2018 12:16	Lauren Bottorf	2043490
EPA 365.1 Rev. 2.0	11/21/2018	11/28/2018 12:35	Sima Feizi	11/29/2018 10:34	Beverly Y. Sanders	2043490
EPA 365.1 Rev. 2.0 dissolved	11/21/2018			11/21/2018 16:14	Jhamieka S. Greenwood	2043491
SM 2120 B	11/21/2018			11/21/2018 16:19	Chelsea Hernandez	2043489
SM 2320 B-97	11/21/2018			11/30/2018 09:46	Dale L. Simmons	2043489
SM 2540 C-97	11/21/2018			11/26/2018 16:02	Yijie Li	2043489
SM 2540 D-97	11/21/2018			11/26/2018 16:02	Yijie Li	2043489
SM 4500 F-C-97	11/21/2018			11/30/2018 09:46	Dale L. Simmons	2043489
SM 5310 B-00	11/21/2018			11/29/2018 03:01	Megan Treadwell	2043490