

Chemical Analysis Report

BSSP-2018-08-28-01

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

Event Description: **Reference Lake Sampling**

Request ID: **RQ-2018-08-27-15**

Customer: **BSSP**

Project ID: **LAKESREF**

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Date Certified: 19-SEP-2018 11:08



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: Fishing Fool Lake

Collection Date/Time: 08/28/2018 11:00

Field ID: FISHFOOLLK

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2020563	EPA 300.0	Bromide	0.013	UA	mg Br/L	P351339	
	EPA 300.0 Rev. 2.1	Chloride	5.4		mg Cl/L	P350987	
		Sulfate	0.44	I	mg SO4/L	P350990	
		Color (true)	84	A	PCU	P350926	
	SM 2320 B-97	Total Alkalinity	3.0		mg CaCO3/L	P351050	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P351053	
2020565	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P351085	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P350983	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P351127	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P350956	
2020567	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P350919	
2020573	EPA 200.7 Rev. 4.4	Calcium	0.35		mg/L	P350964	
		Iron	74	I	ug/L	P350964	
		Magnesium	1.06		mg/L	P350964	
		Potassium	0.56	I	mg/L	P350964	
		Sodium	4.7		mg/L	P350964	
		Zinc	5.0	U	ug/L	P350964	
	EPA 200.8 Rev. 5.4	Arsenic	0.16	I	ug/L	P350964	
		Cadmium	0.020	U	ug/L	P350964	
		Chromium	0.40	U	ug/L	P350964	
		Copper	0.20	U	ug/L	P350964	
		Lead	0.19	I	ug/L	P350964	
		Nickel	0.20	U	ug/L	P350964	
		Silver	0.010	U	ug/L	P350964	

Ref. Method and Comment:

EPA 300.0: Bromide: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Low Flying Plane Lake

Collection Date/Time: 08/28/2018 14:00

Field ID: LOWFLYNPLN

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2020564	EPA 300.0	Bromide	0.020	I	mg Br/L	P351339	
	EPA 300.0 Rev. 2.1	Chloride	8.8		mg Cl/L	P350987	
		Sulfate	0.50	I	mg SO4/L	P350990	
		Color (true)	230		PCU	P350926	
	SM 2320 B-97	Total Alkalinity	1.2	I	mg CaCO3/L	P351050	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P351053	
2020566	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P351085	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77		mg N/L	P350983	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P351127	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P350956	
2020568	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P350919	
2020574	EPA 200.7 Rev. 4.4	Calcium	1.0		mg/L	P350964	
		Iron	290		ug/L	P350964	
		Magnesium	1.26		mg/L	P350964	
		Potassium	0.30	U	mg/L	P350964	
		Sodium	6.0		mg/L	P350964	
		Zinc	5.0	U	ug/L	P350964	
	EPA 200.8 Rev. 5.4	Arsenic	0.12	I	ug/L	P350964	
		Cadmium	0.020	U	ug/L	P350964	
		Chromium	0.40	U	ug/L	P350964	
		Copper	0.20	U	ug/L	P350964	
		Lead	0.19	I	ug/L	P350964	
		Nickel	0.20	U	ug/L	P350964	
		Silver	0.010	U	ug/L	P350964	

Ref. Method and Comment:

EPA 300.0: Bromide: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350964

Component	Result	Code	Units
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: P350964

Component	Result	Code	Units
Arsenic	0.050	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
Silver	0.010	U	ug/L

Reference Method: EPA 300.0
Batch ID: P351339

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350987

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350990

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351085

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350983

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: P351127

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350956

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350919

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

Reference Method: SM 2120 B
Batch ID: P350926

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P351050

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

Reference Method: SM 4500 F-C-97
Batch ID: P351053

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	102		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	110		P	85 - 115
Sodium	101		P	85 - 115
Zinc	103		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	93.8		P	85 - 115
Cadmium	93.0		P	85 - 115
Chromium	88.5		P	85 - 115
Copper	87.3		P	85 - 115
Lead	91.5		P	85 - 115
Nickel	89.8		P	85 - 115
Silver	92.7		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P351339

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350987

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350990

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351085

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350983

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	105		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351127

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: P350956

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350919

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.7		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P350926

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	96.1		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P351050

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P351053

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.7		P	91 - 105

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020573	Calcium	104		P	80 - 120
2020573	Iron	99.3		P	80 - 120
2020573	Magnesium	105		P	80 - 120
2020573	Potassium	106		P	80 - 120
2020573	Sodium	101		P	80 - 120
2020573	Zinc	103		P	80 - 120
2020654	Calcium	99.7		P	80 - 120
2020654	Iron	99.5	98.4	P/P	80 - 120
2020654	Magnesium	105	103	P/P	80 - 120
2020654	Potassium	110	107	P/P	80 - 120
2020654	Sodium	97.7		P	80 - 120
2020654	Zinc	104	101	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020573	Arsenic	99.8		P	80 - 120
2020573	Cadmium	98.4		P	80 - 120
2020573	Chromium	94.9		P	80 - 120
2020573	Copper	95.4		P	80 - 120
2020573	Lead	97.4		P	80 - 120
2020573	Nickel	95.4		P	80 - 120
2020573	Silver	95.4		P	80 - 120
2020654	Arsenic	101	102	P/P	80 - 120
2020654	Cadmium	101	103	P/P	80 - 120
2020654	Chromium	97.9	96.9	P/P	80 - 120
2020654	Copper	96.1	96.8	P/P	80 - 120
2020654	Lead	100	101	P/P	80 - 120
2020654	Nickel	97.1	97.5	P/P	80 - 120
2020654	Silver	95.9	96.7	P/P	80 - 120

Reference Method: EPA 300.0
Batch ID: P351339

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020563	Bromide	96.0		P	90 - 110
2022795	Bromide	103		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350987

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020175	Chloride	97.6		P	90 - 110
2020467	Chloride	97.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350990

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020175	Sulfate	98.1		P	90 - 110
2020467	Sulfate	101		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351085

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020524	Ammonia-N	96.7	97.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350983

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020565	Kjeldahl Nitrogen	98.2	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351127

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020524	NO2NO3-N	98.7	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350956

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020603	Total-P	95.8	91.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350919

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020642	O-Phosphate-P	95.0	95.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P351053

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2020698	Fluoride	98.6	98.6	P/P	91 - 105

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P350964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020654	Calcium	1.54	Spike	P	0 - 20
2020654	Iron	1.09	Spike	P	0 - 20
2020654	Magnesium	1.22	Spike	P	0 - 20
2020654	Potassium	2.36	Spike	P	0 - 20
2020654	Sodium	1.98	Spike	P	0 - 20
2020654	Zinc	2.87	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P350964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020654	Arsenic	0.432	Spike	P	0 - 20
2020654	Cadmium	2.18	Spike	P	0 - 20
2020654	Chromium	1.05	Spike	P	0 - 20
2020654	Copper	0.672	Spike	P	0 - 20
2020654	Lead	0.662	Spike	P	0 - 20
2020654	Nickel	0.452	Spike	P	0 - 20
2020654	Silver	0.801	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020175	Chloride	8.28	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P350990

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020175	Sulfate	9.98	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P351085

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020524	Ammonia-N	0.546	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P350983

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020565	Kjeldahl Nitrogen	2.97	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P351127

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020524	NO2NO3-N	2.44	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P350956

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020603	Total-P	3.86	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P350919

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020642	O-Phosphate-P	0.734	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P350926

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020563	Color (true)	3.96	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P351050

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020698	Total Alkalinity	0.556	Sample	P	0 - 1.6

Reference Method: SM 4500 F-C-97
Batch ID: P351053

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2020698	Fluoride	0.0	Spike	P	0 - 3.5

* 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 365.1 Rev. 2.0 dissolved

Run ID: A86187

Included Lab Sample IDs: 2020567, 2020568

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

Reference Method: SM 2120 B

Run ID: A86191

Included Lab Sample IDs: 2020563, 2020564

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.9	98.5	P/P	90 - 115
Color (true)	99.3	98.3	P/P	90 - 115

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A86194

Included Lab Sample IDs: 2020563, 2020564

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	106	95.8	P/P	90 - 110
Sulfate	104	94.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A86233

Included Lab Sample IDs: 2020565, 2020566

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

Reference Method: SM 2320 B-97

Run ID: A86252

Included Lab Sample IDs: 2020563, 2020564

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

Reference Method: SM 4500 F-C-97

Run ID: A86252

Included Lab Sample IDs: 2020563, 2020564

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A86268

Included Lab Sample IDs: 2020565, 2020566

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	109	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A86276

Included Lab Sample IDs: 2020565, 2020566

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A86276
Included Lab Sample IDs: 2020565, 2020566

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.0	100	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A86277
Included Lab Sample IDs: 2020573, 2020574

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	94.2	95.1	P/P	90 - 110
Arsenic	94.8	94.2	P/P	90 - 110
Cadmium	93.7	93.9	P/P	90 - 110
Cadmium	93.9	94.8	P/P	90 - 110
Chromium	91.4	93.1	P/P	90 - 110
Chromium	91.4	91.4	P/P	90 - 110
Copper	92.7	93.3	P/P	90 - 110
Copper	93.9	92.7	P/P	90 - 110
Lead	101	102	P/P	90 - 110
Lead	102	101	P/P	90 - 110
Nickel	92.9	93.4	P/P	90 - 110
Nickel	94.4	92.9	P/P	90 - 110
Silver	92.9	93.8	P/P	90 - 110
Silver	93.8	92.9	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A86281
Included Lab Sample IDs: 2020573, 2020574

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	97.9	97.3	P/P	90 - 110
Iron	94.7	93.3	P/P	90 - 110
Magnesium	97.8	96.7	P/P	90 - 110
Potassium	101	101	P/P	90 - 110
Sodium	98.2	97.6	P/P	90 - 110
Zinc	101	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A86298
Included Lab Sample IDs: 2020565, 2020566

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 300.0
Run ID: A86363
Included Lab Sample IDs: 2020563, 2020564

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	106	104	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 200.7 Rev. 4.4	Calcium	102	104	99.7			1.54
	Iron	102	99.3	99.5	98.4		1.09
	Magnesium	109	105	105	103		1.22
	Potassium	110	106	110	107		2.36
	Sodium	101	101	97.7			1.98
	Zinc	103	103	104	101		2.87
EPA 200.8 Rev. 5.4	Arsenic	93.8	99.8	101	102		0.432
	Cadmium	93.0	98.4	101	103		2.18
	Chromium	88.5	94.9	97.9	96.9		1.05
	Copper	87.3	95.4	96.1	96.8		0.672
	Lead	91.5	97.4	100	101		0.662
	Nickel	89.8	95.4	97.1	97.5		0.452
	Silver	92.7	95.4	95.9	96.7		0.801
EPA 300.0	Bromide	99.5	96.0	103			
EPA 300.0 Rev. 2.1	Chloride	102	97.6	97.0		8.28	
	Sulfate	101	98.1	101		9.98	
EPA 350.1 Rev. 2.0	Ammonia-N	96.7	96.7	97.3			0.546
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	98.2	104			2.97
EPA 353.2 Rev. 2.0	NO2NO3-N	100	98.7	101			2.44
EPA 365.1 Rev. 2.0	Total-P	96.2	95.8	91.8			3.86
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	95.0	95.7			0.734
SM 2120 B	Color (true)	96.1				3.96	
SM 2320 B-97	Total Alkalinity	103				0.556	
SM 4500 F-C-97	Fluoride	98.7	98.6	98.6			0.0

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2020573, 2020574
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2020573, 2020574
EPA 300.0 / E31780	Bromide in aqueous matrices	2020563, 2020564
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2020563, 2020564
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2020563, 2020564
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2020565, 2020566
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2020565, 2020566
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2020565, 2020566
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2020565, 2020566
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2020567, 2020568
SM 2120 B / E31780	True Color measured at 450 nm	2020563, 2020564
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2020563, 2020564
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2020563, 2020564

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 200.7 Rev. 4.4	08/28/2018	08/30/2018 14:20	Elliott D. Healy	08/31/2018 14:23	Martin Acosta	2020573
	08/28/2018	08/30/2018 14:20	Elliott D. Healy	08/31/2018 14:43	Martin Acosta	2020574
EPA 200.8 Rev. 5.4	08/28/2018	08/30/2018 14:20	Elliott D. Healy	09/04/2018 15:57	Allison Taylor	2020573
	08/28/2018	08/30/2018 14:20	Elliott D. Healy	09/04/2018 16:45	Allison Taylor	2020574
EPA 300.0	08/28/2018			09/07/2018 23:32	Lipi Saha	2020563
	08/28/2018			09/08/2018 00:39	Lipi Saha	2020564
EPA 300.0 Rev. 2.1	08/28/2018			08/30/2018 22:18	Lipi Saha	2020563
	08/28/2018			08/30/2018 22:30	Lipi Saha	2020564
EPA 350.1 Rev. 2.0	08/28/2018			09/04/2018 11:29	Ping Hua	2020565
	08/28/2018			09/04/2018 11:31	Ping Hua	2020566
EPA 351.2 Rev. 2.0	08/28/2018	08/31/2018 15:00	Adrian Shelby	09/04/2018 09:52	Joseph Suarez	2020565
	08/28/2018	08/31/2018 15:00	Adrian Shelby	09/04/2018 09:57	Joseph Suarez	2020566
EPA 353.2 Rev. 2.0	08/28/2018			09/05/2018 14:01	Lauren Bottorf	2020565
	08/28/2018			09/05/2018 14:03	Lauren Bottorf	2020566
EPA 365.1 Rev. 2.0	08/28/2018	08/30/2018 11:37	Sima Feizi	08/31/2018 11:56	Beverly Y. Sanders	2020565
	08/28/2018	08/30/2018 11:37	Sima Feizi	08/31/2018 11:57	Beverly Y. Sanders	2020566
EPA 365.1 Rev. 2.0 dissolved	08/28/2018			08/29/2018 15:39	Julia Storbeck	2020567
	08/28/2018			08/29/2018 15:40	Julia Storbeck	2020568
SM 2120 B	08/28/2018			08/29/2018 15:45	DeAsia Armster	2020563
	08/28/2018			08/29/2018 16:11	DeAsia Armster	2020564
SM 2320 B-97	08/28/2018			08/31/2018 08:05	Dale L. Simmons	2020563
	08/28/2018			08/31/2018 08:15	Dale L. Simmons	2020564
SM 4500 F-C-97	08/28/2018			08/31/2018 08:05	Dale L. Simmons	2020563
	08/28/2018			08/31/2018 08:15	Dale L. Simmons	2020564