

Chemical Analysis Report

CEN-DIST-2020-10-21-02

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

Event Description: **Lake Wales LVI**
Request ID: **RQ-2020-10-19-67**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Natalie Ayala

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 13-NOV-2020 15:31

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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: Lake Wales @ Center

Collection Date/Time: 10/20/2020 11:36

Field ID: G4CE0110

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2203927	EPA 180.1 Rev. 2.0	Turbidity	4.3		NTU	P389055	
	EPA 300.0 Rev. 2.1	Chloride	9.9		mg Cl/L	P389374	
		Sulfate	10		mg SO4/L	P389377	
		Color (true)	19		PCU	P389052	
	SM 2320 B-2011	Total Alkalinity	33		mg CaCO3/L	P389230	
	SM 2540 C-2011	TDS	74		mg/L	P389660	
	SM 2540 D-2011	TSS	5	I	mg/L	P389608	
	SM 4500 F-C-2011	Fluoride	0.098	I	mg F/L	P389236	
2203928	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P389209	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P389283	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P389247	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P389510	
	SM 5310 B-2011	Organic Carbon	8.4		mg C/L	P389222	
2203929	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P389048	
2203931	EPA 200.7 Rev. 4.4	Barium	15.0		ug/L	P389253	
		Calcium	13.0		mg/L	P389253	
		Iron	30	U	ug/L	P389253	
		Magnesium	3.08		mg/L	P389253	
		Potassium	1.4		mg/L	P389253	
		Sodium	5.5		mg/L	P389253	
		Zinc	5.0	U	ug/L	P389253	
	EPA 200.8 Rev. 5.4	Aluminum	5.0	I	ug/L	P389253	
		Antimony	0.080	I	ug/L	P389253	
		Arsenic	0.34		ug/L	P389253	
		Beryllium	0.010	U	ug/L	P389253	
		Boron**	26.1		ug/L	P389253	
		Cadmium	0.020	U	ug/L	P389253	
		Chromium	0.40	U	ug/L	P389253	
		Copper	0.40	U	ug/L	P389253	
		Lead	0.20	U	ug/L	P389253	
		Nickel	0.50	U	ug/L	P389253	
		Selenium	0.20	U	ug/L	P389253	
		Silver	0.010	U	ug/L	P389253	
		Thallium	0.10	U	ug/L	P389253	
	SM 2340B	Hardness	45.2		mg/L	P389253	

Ref. Method and Comment:

SM 2540 D-2011: 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: P389055

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P389253

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: P389253

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Beryllium	0.010	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: P389374

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389377

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389209

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: P389283

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389247

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: P389510

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389048

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

Reference Method: SM 2120 B-2011
Batch ID: P389052

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-2011
Batch ID: P389230

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

Reference Method: SM 2540 C-2011
Batch ID: P389660

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2011
Batch ID: P389608

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-2011
Batch ID: P389236

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P389222

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: P389253

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	101		P	85 - 115
Calcium	105		P	85 - 115
Iron	104		P	85 - 115
Magnesium	103		P	85 - 115
Potassium	102		P	85 - 115
Sodium	99.4		P	85 - 115
Zinc	96.8		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P389253

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	97.5		P	85 - 115
Antimony	100		P	85 - 115
Arsenic	96.8		P	85 - 115
Beryllium	93.1		P	85 - 115
Boron	99.3		P	85 - 115
Cadmium	100		P	85 - 115
Chromium	98.4		P	85 - 115
Copper	98.8		P	85 - 115
Lead	95.6		P	85 - 115
Nickel	98.1		P	85 - 115
Selenium	93.8		P	85 - 115
Silver	102		P	85 - 115
Thallium	102		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389374

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389377

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389209

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: P389283

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	107		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389247

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: P389510

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389048

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

Reference Method: SM 2120 B-2011
Batch ID: P389052

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

Reference Method: SM 2320 B-2011
Batch ID: P389230

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	93 - 104

Reference Method: SM 4500 F-C-2011
Batch ID: P389236

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.6		P	90 - 106

Reference Method: SM 5310 B-2011
Batch ID: P389222

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: P389253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203925	Barium	100		P	80 - 120
2203925	Calcium	98.0		P	80 - 120
2203925	Iron	106		P	80 - 120
2203925	Magnesium	97.1		P	80 - 120
2203925	Potassium	94.4		P	80 - 120
2203925	Sodium	95.9		P	80 - 120
2203925	Zinc	97.8		P	80 - 120
2204072	Barium	98.7	99.3	P/P	80 - 120
2204072	Calcium	105	106	P/P	80 - 120
2204072	Iron	105	103	P/P	80 - 120
2204072	Magnesium	106	104	P/P	80 - 120
2204072	Potassium	103	103	P/P	80 - 120
2204072	Sodium	96.9		P	80 - 120
2204072	Zinc	97.9	97.2	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P389253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203925	Aluminum	96.9		P	80 - 120
2203925	Antimony	101		P	80 - 120
2203925	Arsenic	99.5		P	80 - 120
2203925	Beryllium	100		P	80 - 120
2203925	Boron	96.6		P	80 - 120
2203925	Cadmium	99.1		P	80 - 120
2203925	Chromium	99.5		P	80 - 120
2203925	Copper	100		P	80 - 120
2203925	Lead	95.4		P	80 - 120
2203925	Nickel	99.0		P	80 - 120
2203925	Selenium	95.0		P	80 - 120
2203925	Silver	102		P	80 - 120
2203925	Thallium	104		P	80 - 120
2204072	Aluminum	93.8	96.8	P/P	80 - 120
2204072	Antimony	97.4	99.6	P/P	80 - 120
2204072	Arsenic	95.2	97.6	P/P	80 - 120
2204072	Beryllium	92.8	95.0	P/P	80 - 120
2204072	Boron	92.9	96.6	P/P	80 - 120
2204072	Cadmium	95.2	98.6	P/P	80 - 120
2204072	Chromium	97.2	98.4	P/P	80 - 120
2204072	Copper	98.4	102	P/P	80 - 120
2204072	Lead	92.5	95.5	P/P	80 - 120
2204072	Nickel	95.5	97.7	P/P	80 - 120
2204072	Selenium	94.6	96.4	P/P	80 - 120
2204072	Silver	101	102	P/P	80 - 120
2204072	Thallium	101	104	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389374

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203665	Chloride	105		P	90 - 110
2203917	Chloride	102		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389377

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203665	Sulfate	105		P	90 - 110
2203917	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389209

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203928	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389247

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203918	NO2NO3-N	99.3	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203670	Total-P	108	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389048

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203919	O-Phosphate-P	96.1	96.6	P/P	90 - 110

Reference Method: SM 4500 F-C-2011
Batch ID: P389236

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204041	Fluoride	99.7	98.0	P/P	94 - 107

Reference Method: SM 5310 B-2011
Batch ID: P389222

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203987	Organic Carbon	101	101	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P389055

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203734	Turbidity	2.67	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P389253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204072	Barium	0.618	Spike	P	0 - 20
2204072	Calcium	0.505	Spike	P	0 - 20
2204072	Iron	2.24	Spike	P	0 - 20
2204072	Magnesium	1.59	Spike	P	0 - 20
2204072	Potassium	0.500	Spike	P	0 - 20
2204072	Sodium	0.316	Spike	P	0 - 20
2204072	Zinc	0.720	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P389253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204072	Aluminum	3.01	Spike	P	0 - 20
2204072	Antimony	2.27	Spike	P	0 - 20
2204072	Arsenic	2.39	Spike	P	0 - 20
2204072	Beryllium	2.40	Spike	P	0 - 20
2204072	Boron	3.08	Spike	P	0 - 20
2204072	Cadmium	3.54	Spike	P	0 - 20
2204072	Chromium	1.20	Spike	P	0 - 20
2204072	Copper	3.68	Spike	P	0 - 20
2204072	Lead	3.11	Spike	P	0 - 20
2204072	Nickel	2.29	Spike	P	0 - 20
2204072	Selenium	1.93	Spike	P	0 - 20
2204072	Silver	1.39	Spike	P	0 - 20
2204072	Thallium	3.31	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389374

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203917	Chloride	0.123	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P389377

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203917	Sulfate	0.375	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389209

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203928	Ammonia-N	0.0204	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389283

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203781	Kjeldahl Nitrogen	0.370	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389247

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203918	NO2NO3-N	0.484	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389510

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203670	Total-P	0.542	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389048

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203919	O-Phosphate-P	0.519	Spike	P	0 - 20

Reference Method: SM 2120 B-2011
Batch ID: P389052

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203746	Color (true)	1.72	Sample	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P389230

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204041	Total Alkalinity	5.18	Sample	P	0 - 8.1

Reference Method: SM 2540 C-2011
Batch ID: P389660

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203943	TDS	5.31	Sample	P	0 - 10

Quality Assurance Report Precision

Reference Method: SM 4500 F-C-2011
Batch ID: P389236

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204041	Fluoride	1.50	Spike	P	0 - 2.8

Reference Method: SM 5310 B-2011
Batch ID: P389222

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203987	Organic Carbon	0.222	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A101664

Included Lab Sample IDs: 2203929

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.8	P/P	90 - 110

Reference Method: SM 2120 B-2011

Run ID: A101665

Included Lab Sample IDs: 2203927

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

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A101666

Included Lab Sample IDs: 2203927

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.5	P/P	95 - 105

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101740

Included Lab Sample IDs: 2203928

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

Reference Method: SM 5310 B-2011

Run ID: A101747

Included Lab Sample IDs: 2203928

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

Reference Method: SM 2320 B-2011

Run ID: A101749

Included Lab Sample IDs: 2203927

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.3	102	P/P	90 - 110

Reference Method: SM 4500 F-C-2011

Run ID: A101749

Included Lab Sample IDs: 2203927

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101763

Included Lab Sample IDs: 2203928

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A101798

Included Lab Sample IDs: 2203927

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101801

Included Lab Sample IDs: 2203928

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.7	97.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A101807

Included Lab Sample IDs: 2203931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	98.4	97.2	P/P	90 - 110
Calcium	100	99.0	P/P	90 - 110
Iron	102	100	P/P	90 - 110
Magnesium	99.7	98.8	P/P	90 - 110
Potassium	98.6	97.4	P/P	90 - 110
Sodium	98.7	97.4	P/P	90 - 110
Zinc	97.1	97.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101926

Included Lab Sample IDs: 2203928

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.2	96.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102002

Included Lab Sample IDs: 2203931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.2	94.3	P/P	90 - 110
Antimony	98.7	97.3	P/P	90 - 110
Arsenic	96.3	97.0	P/P	90 - 110
Beryllium	98.7	100	P/P	90 - 110
Boron	99.4	99.5	P/P	90 - 110
Cadmium	96.9	96.8	P/P	90 - 110
Chromium	95.2	95.2	P/P	90 - 110
Nickel	96.1	95.5	P/P	90 - 110
Selenium	96.1	96.4	P/P	90 - 110
Silver	105	104	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102029

Included Lab Sample IDs: 2203931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
-----------	---------	---------	------------	----------------

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102029

Included Lab Sample IDs: 2203931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Copper	96.8	97.3	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A102030

Included Lab Sample IDs: 2203931

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Lead	95.7	94.9	P/P	90 - 110
Thallium	97.7	96.7	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery			MS % Recovery			Precision	
								LCS	SMP
EPA 180.1 Rev. 2.0	Turbidity								2.67
EPA 200.7 Rev. 4.4	Barium	101			100	98.7	99.3		0.618
	Calcium	105			98.0	105	106		0.505
	Iron	104			106	105	103		2.24
	Magnesium	103			97.1	106	104		1.59
	Potassium	102			94.4	103	103		0.500
	Sodium	99.4			95.9	96.9			0.316
	Zinc	96.8			97.8	97.9	97.2		0.720
EPA 200.8 Rev. 5.4	Aluminum	97.5			93.8	96.8	96.9		3.01
	Antimony	100			97.4	99.6	101		2.27
	Arsenic	96.8			95.2	97.6	99.5		2.39
	Beryllium	93.1			92.8	95.0	100		2.40
	Boron	99.3			92.9	96.6	96.6		3.08
	Cadmium	100			95.2	98.6	99.1		3.54
	Chromium	98.4			97.2	98.4	99.5		1.20
	Copper	98.8			98.4	102	100		3.68
	Lead	95.6			92.5	95.5	95.4		3.11
	Nickel	98.1			95.5	97.7	99.0		2.29
	Selenium	93.8			94.6	96.4	95.0		1.93
	Silver	102			101	102	102		1.39
	Thallium	102			101	104	104		3.31
EPA 300.0 Rev. 2.1	Chloride	103			102	105		0.123	
	Sulfate	103			101	105		0.375	
EPA 350.1 Rev. 2.0	Ammonia-N	101			102	102			0.0204
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107							0.370
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100			99.3	98.8			0.484
EPA 365.1 Rev. 2.0	Total-P	106			108	108			0.542
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.8			96.1	96.6			0.519
SM 2120 B-2011	Color (true)	101						1.72	
SM 2320 B-2011	Total Alkalinity	102						5.18	
SM 2540 C-2011	TDS							5.31	
SM 4500 F-C-2011	Fluoride	97.6			99.7	98.0			1.50
SM 5310 B-2011	Organic Carbon	102			101	101			0.222

Reference Method Descriptions

Method	Description	Associated Samples
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2203927
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2203931
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2203931
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2203927
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2203927
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2203928
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2203928
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2203928
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2203928
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2203929
SM 2120 B-2011	True Color measured at 450 nm (not valid for NPDES monitoring)	2203927
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2203927
SM 2340B	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO ₃	2203931

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
SM 2540 C-2011	Total Dissolved Solids in aqueous matrices	2203927
SM 2540 D-2011	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2203927
SM 4500 F-C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2203927
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2203928

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	10/21/2020			10/21/2020 17:12	Samantha Davila	2203927
EPA 200.7 Rev. 4.4	10/21/2020	10/26/2020 13:40	Elliott D. Healy	10/27/2020 15:14	Betina Topolski	2203931
EPA 200.8 Rev. 5.4	10/21/2020	10/26/2020 13:40	Elliott D. Healy	11/05/2020 21:01	Alexander Thompson	2203931
	10/21/2020	10/26/2020 13:40	Elliott D. Healy	11/06/2020 13:43	Alexander Thompson	2203931
	10/21/2020	10/26/2020 13:40	Elliott D. Healy	11/06/2020 21:50	Alexander Thompson	2203931
EPA 300.0 Rev. 2.1	10/21/2020			10/28/2020 09:04	Lipi Saha	2203927
EPA 350.1 Rev. 2.0	10/21/2020			10/25/2020 10:58	Ping Hua	2203928
EPA 351.2 Rev. 2.0	10/21/2020	10/26/2020 11:45	David Boose	10/27/2020 13:59	Elliott Rodriguez	2203928
EPA 353.2 Rev. 2.0	10/21/2020			10/26/2020 10:45	Beverly Y. Sanders	2203928
EPA 365.1 Rev. 2.0	10/21/2020	10/29/2020 15:54	Yen Ta	11/03/2020 14:07	Shengyu Wang	2203928
EPA 365.1 Rev. 2.0 dissolved	10/21/2020			10/21/2020 16:30	Blanca Fach	2203929
SM 2120 B-2011	10/21/2020			10/21/2020 17:18	Benjamin T. Nordmann	2203927
SM 2320 B-2011	10/21/2020			10/24/2020 04:16	Samantha Davila	2203927
SM 2340B	10/21/2020			10/27/2020 15:14	Betina Topolski	2203931
SM 2540 C-2011	10/21/2020			10/26/2020 15:36	Yijie Li	2203927
SM 2540 D-2011	10/21/2020			10/26/2020 15:36	Yijie Li	2203927
SM 4500 F-C-2011	10/21/2020			10/24/2020 04:16	Samantha Davila	2203927
SM 5310 B-2011	10/21/2020			10/24/2020 00:04	Lauren Lees	2203928