

Chemical Analysis Report

WQAP-2020-10-22-01

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

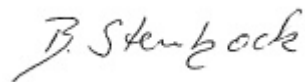
Event Description: **Lake O Release SED**
Request ID: **RQ-2020-10-19-55**
Customer: **WQAP**
Project ID: **LKORELEASE**

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

Date Certified: 28-OCT-2020 17:32



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: Nutrients and Pesticides.

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: S308_Lakeside

Collection Date/Time: 10/21/2020 10:30

Field ID: S308_Lakeside

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2204170	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P388945	
		Cylindrospermopsin**	0.25	U	ug/L	P388945	
		Desmethyl microcystin LR**	0.25	U	ug/L	P388945	
		Microcystin LA**	0.25	U	ug/L	P388945	
		Microcystin LF**	0.25	U	ug/L	P388945	
		Microcystin LR**	0.25	U	ug/L	P388945	
		Microcystin LW**	0.25	U	ug/L	P388945	
		Microcystin LY**	0.25	U	ug/L	P388945	
		Microcystin RR**	0.25	U	ug/L	P388945	
		Microcystin WR**	0.50	U	ug/L	P388945	
		Microcystin YR**	0.25	U	ug/L	P388945	
2204174	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P389199	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.99		mg N/L	P389189	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.24		mg N/L	P389157	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P389168	
2204176	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.071		mg P/L	P389120	

Sample Location: S308_East

Collection Date/Time: 10/21/2020 11:00

Field ID: S308_East

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2204171	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P388945	
		Cylindrospermopsin**	0.25	U	ug/L	P388945	
		Desmethyl microcystin LR**	0.25	U	ug/L	P388945	
		Microcystin LA**	0.25	U	ug/L	P388945	
		Microcystin LF**	0.25	U	ug/L	P388945	
		Microcystin LR**	0.25	U	ug/L	P388945	
		Microcystin LW**	0.25	U	ug/L	P388945	
		Microcystin LY**	0.25	U	ug/L	P388945	
		Microcystin RR**	0.25	U	ug/L	P388945	
		Microcystin WR**	0.50	U	ug/L	P388945	
		Microcystin YR**	0.25	U	ug/L	P388945	
2204175	EPA 350.1 Rev. 2.0	Ammonia-N	0.045		mg N/L	P389199	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P389189	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.24		mg N/L	P389157	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P389168	
2204177	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.074		mg P/L	P389120	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389199

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389189

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389157

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389168

Component	Result	Code	Units
Total-P	0.005	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389120

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

Reference Method: EPA 8321B
Batch ID: P388945

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin LA	0.25	U	ug/L
Microcystin LF	0.25	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P389199

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: P389189

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

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P389157

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: P389168

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: P389120

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

Reference Method: EPA 8321B
 Batch ID: P388945

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	91.8		P	40 - 140
Cylindrospermopsin	109		P	40 - 140
Desmethyl microcystin LR	104		P	40 - 140
Microcystin LA	106		P	40 - 140
Microcystin LF	96.2		P	40 - 140
Microcystin LR	94.7		P	40 - 140
Microcystin LW	106		P	40 - 140
Microcystin LY	106		P	40 - 140
Microcystin RR	91.5		P	40 - 140
Microcystin WR	95.4		P	40 - 140
Microcystin YR	98.1		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P389199

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203334	Ammonia-N	103	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P389189

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203672	Kjeldahl Nitrogen	108	108	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P389157

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204174	NO2NO3-N	97.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P389168

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203556	Total-P	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P389120

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204107	O-Phosphate-P	94.8	94.8	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P388945

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2203227	Anatoxin-a	112	110	P/P	40 - 140
2203227	Cylindrospermopsin	89.6	94.1	P/P	40 - 140
2203227	Desmethyl microcystin LR	94.2	93.5	P/P	40 - 140
2203227	Microcystin LA	86.4	94.8	P/P	40 - 140
2203227	Microcystin LF	89.7	99.0	P/P	40 - 140
2203227	Microcystin LR	81.3	91.4	P/P	40 - 140
2203227	Microcystin LW	86.8	95.7	P/P	40 - 140
2203227	Microcystin LY	86.9	91.4	P/P	40 - 140
2203227	Microcystin RR	87.1	87.4	P/P	40 - 140
2203227	Microcystin WR	91.7	98.5	P/P	40 - 140
2203227	Microcystin YR	83.1	89.3	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P389199

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203334	Ammonia-N	2.01	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P389189

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203672	Kjeldahl Nitrogen	0.0844	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P389157

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204174	NO2NO3-N	0.454	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P389168

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203556	Total-P	1.77	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P389120

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204107	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P388945

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2203227	Anatoxin-a	2.05	Spike	P	0 - 30
2203227	Cylindrospermopsin	4.84	Spike	P	0 - 30
2203227	Desmethyl microcystin LR	0.713	Spike	P	0 - 30
2203227	Microcystin LA	9.21	Spike	P	0 - 30
2203227	Microcystin LF	9.86	Spike	P	0 - 30
2203227	Microcystin LR	10.1	Spike	P	0 - 30
2203227	Microcystin LW	9.81	Spike	P	0 - 30
2203227	Microcystin LY	4.97	Spike	P	0 - 30
2203227	Microcystin RR	0.303	Spike	P	0 - 30
2203227	Microcystin WR	7.15	Spike	P	0 - 30
2203227	Microcystin YR	7.19	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2204170

Field Sample ID: S308_Lakeside

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	91.5	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	66.8	P	30 - 160

Lab Sample ID: 2204171

Field Sample ID: S308_East

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	94.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	83.4	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A101695

Included Lab Sample IDs: 2204176, 2204177

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	100	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A101698

Included Lab Sample IDs: 2204170, 2204171

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	94.0	93.9	P/P	50 - 160
Cylindrospermopsin	120	99.8	P/P	60 - 160
Desmethyl microcystin LR	109	111	P/P	60 - 160
Microcystin LA	110	115	P/P	50 - 160
Microcystin LF	115	125	P/P	60 - 160
Microcystin LR	110	118	P/P	60 - 160
Microcystin LW	99.9	125	P/P	60 - 160
Microcystin LY	124	136	P/P	60 - 160
Microcystin RR	96.2	93.2	P/P	60 - 160
Microcystin WR	103	110	P/P	60 - 160
Microcystin YR	101	102	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A101724

Included Lab Sample IDs: 2204174, 2204175

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A101736

Included Lab Sample IDs: 2204174, 2204175

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A101768

Included Lab Sample IDs: 2204174, 2204175

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A101775

Included Lab Sample IDs: 2204174, 2204175

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.3	99.1	P/P	90 - 110

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

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	102	103	105			2.01
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	108	108			0.0844
EPA 353.2 Rev. 2.0	NO2NO3-N	100	97.2				0.454
EPA 365.1 Rev. 2.0	Total-P	106	103	105			1.77
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.4	94.8	94.8			0.0
EPA 8321B	Anatoxin-a	91.8	112	110			2.05
	Cylindrospermopsin	109	89.6	94.1			4.84
	Desmethyl microcystin LR	104	94.2	93.5			0.713
	Microcystin LA	106	86.4	94.8			9.21
	Microcystin LF	96.2	89.7	99.0			9.86
	Microcystin LR	94.7	81.3	91.4			10.1
	Microcystin LW	106	86.8	95.7			9.81
	Microcystin LY	106	86.9	91.4			4.97
	Microcystin RR	91.5	87.1	87.4			0.303
	Microcystin WR	95.4	91.7	98.5			7.15
	Microcystin YR	98.1	83.1	89.3			7.19

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2204174, 2204175
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2204174, 2204175
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2204174, 2204175
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2204174, 2204175
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2204176, 2204177
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2204170, 2204171

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 350.1 Rev. 2.0	10/22/2020			10/24/2020 15:52	Ping Hua	2204174
	10/22/2020			10/24/2020 15:54	Ping Hua	2204175
EPA 351.2 Rev. 2.0	10/22/2020	10/23/2020 14:03	David Boose	10/26/2020 10:27	Elliott Rodriguez	2204174
	10/22/2020	10/23/2020 14:03	David Boose	10/26/2020 10:29	Elliott Rodriguez	2204175
EPA 353.2 Rev. 2.0	10/22/2020			10/23/2020 11:15	Beverly Y. Sanders	2204174
	10/22/2020			10/23/2020 11:28	Beverly Y. Sanders	2204175
EPA 365.1 Rev. 2.0	10/22/2020	10/23/2020 15:15	Shengyu Wang	10/26/2020 11:01	Lipi Saha	2204174
	10/22/2020	10/23/2020 15:15	Shengyu Wang	10/26/2020 11:02	Lipi Saha	2204175
EPA 365.1 Rev. 2.0 dissolved	10/22/2020			10/22/2020 15:50	Virginia P. Brown	2204176
	10/22/2020			10/22/2020 15:51	Virginia P. Brown	2204177
EPA 8321B	10/22/2020	10/22/2020 12:00	Juyoung Kim	10/22/2020 16:49	Juyoung Kim	2204170
	10/22/2020	10/22/2020 12:00	Juyoung Kim	10/22/2020 17:06	Juyoung Kim	2204171