Chemical Analysis Report

WQAP-2020-10-30-01

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

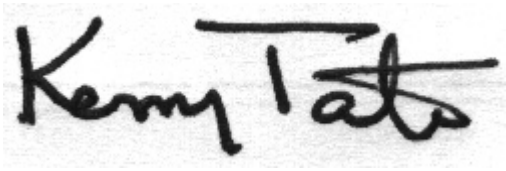
Event Description: **Lake O Release**
Request ID: **RQ-2020-10-26-48**
Customer: **WQAP**
Project ID: **LKORELEASE**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
Tallahassee, FL 32399-2400
Attn: Dave Whiting

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: 09-NOV-2020 10:32



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: 10/29/2020 10:30**

Field ID: S308_Lakeside Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2205555	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P389748	
		Cylindrospermopsin**	0.25	U	ug/L	P389748	
		Desmethyl microcystin LR**	0.25	U	ug/L	P389748	
		Microcystin LA**	0.25	U	ug/L	P389748	
		Microcystin LF**	0.25	U	ug/L	P389748	
		Microcystin LR**	0.34	I	ug/L	P389748	
		Microcystin LW**	0.25	U	ug/L	P389748	
		Microcystin LY**	0.25	U	ug/L	P389748	
		Microcystin RR**	0.25	U	ug/L	P389748	
		Microcystin WR**	0.50	U	ug/L	P389748	
		Microcystin YR**	0.25	U	ug/L	P389748	
2205557	EPA 350.1 Rev. 2.0	Ammonia-N	0.022		mg N/L	P389577	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P389630	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.48		mg N/L	P389735	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P389638	
2205559	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.078		mg P/L	P389564	

Sample Location: S308_East **Collection Date/Time: 10/29/2020 11:00**

Field ID: S308_East Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2205556	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P389748	
		Cylindrospermopsin**	0.25	U	ug/L	P389748	
		Desmethyl microcystin LR**	0.25	U	ug/L	P389748	
		Microcystin LA**	0.25	U	ug/L	P389748	
		Microcystin LF**	0.25	U	ug/L	P389748	
		Microcystin LR**	0.28	I	ug/L	P389748	
		Microcystin LW**	0.25	U	ug/L	P389748	
		Microcystin LY**	0.25	U	ug/L	P389748	
		Microcystin RR**	0.25	U	ug/L	P389748	
		Microcystin WR**	0.50	U	ug/L	P389748	
		Microcystin YR**	0.25	U	ug/L	P389748	
2205558	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P389577	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P389630	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.47		mg N/L	P389735	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P389638	
2205560	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.076		mg P/L	P389564	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389577

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389630

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389735

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389638

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389564

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

Reference Method: EPA 8321B
Batch ID: P389748

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: P389577

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389630

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389735

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: P389638

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: P389564

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

Reference Method: EPA 8321B
Batch ID: P389748

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	105		P	40 - 150
Cylindrospermopsin	102		P	40 - 150
Desmethyl microcystin LR	104		P	40 - 150
Microcystin LA	120		P	40 - 150
Microcystin LF	114		P	40 - 150
Microcystin LR	109		P	40 - 150
Microcystin LW	91.1		P	40 - 150
Microcystin LY	108		P	40 - 150
Microcystin RR	105		P	40 - 150
Microcystin WR	99.4		P	40 - 150
Microcystin YR	84.5		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204726	Ammonia-N	103	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2204630	Kjeldahl Nitrogen	109	110	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389735

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2205491	NO2NO3-N	98.5	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389638

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2205510	Total-P	102	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389564

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2205511	O-Phosphate-P	99.5	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P389748

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2205555	Anatoxin-a	82.4	78.7	P/P	40 - 150
2205555	Cylindrospermopsin	81.3	82.1	P/P	40 - 150
2205555	Desmethyl microcystin LR	103	95.7	P/P	40 - 150
2205555	Microcystin LA	103	103	P/P	40 - 150
2205555	Microcystin LF	90.5	87.8	P/P	40 - 150
2205555	Microcystin LR	87.9	82.9	P/P	40 - 150
2205555	Microcystin LW	71.1	71.0	P/P	40 - 150
2205555	Microcystin LY	92.1	91.8	P/P	40 - 150
2205555	Microcystin RR	94.8	94.3	P/P	40 - 150
2205555	Microcystin WR	83.7	83.0	P/P	40 - 150
2205555	Microcystin YR	75.9	73.6	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P389577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204726	Ammonia-N	0.310	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P389630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2204630	Kjeldahl Nitrogen	0.643	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P389735

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2205491	NO2NO3-N	0.897	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P389638

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2205510	Total-P	2.73	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P389564

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2205511	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P389748

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2205555	Anatoxin-a	4.60	Spike	P	0 - 30
2205555	Cylindrospermopsin	1.02	Spike	P	0 - 30
2205555	Desmethyl microcystin LR	7.03	Spike	P	0 - 30
2205555	Microcystin LA	0.287	Spike	P	0 - 30
2205555	Microcystin LF	3.06	Spike	P	0 - 30
2205555	Microcystin LR	5.59	Spike	P	0 - 30
2205555	Microcystin LW	0.188	Spike	P	0 - 30
2205555	Microcystin LY	0.420	Spike	P	0 - 30
2205555	Microcystin RR	0.483	Spike	P	0 - 30
2205555	Microcystin WR	0.788	Spike	P	0 - 30
2205555	Microcystin YR	3.04	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2205555
Field Sample ID: S308_Lakeside

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	91.1	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	61.4	P	30 - 160

Lab Sample ID: 2205556
Field Sample ID: S308_East

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	89.7	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	61.3	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A101885
Included Lab Sample IDs: 2205559, 2205560

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	99.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A101890
Included Lab Sample IDs: 2205557, 2205558

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	104	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A101932
Included Lab Sample IDs: 2205557, 2205558

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A101935
Included Lab Sample IDs: 2205557, 2205558

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A101952
Included Lab Sample IDs: 2205557, 2205558

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A101973
Included Lab Sample IDs: 2205555, 2205556

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	90.7	96.2	P/P	50 - 160
Cylindrospermopsin	92.3	103	P/P	60 - 160
Desmethyl microcystin LR	97.1	106	P/P	60 - 160
Microcystin LA	105	114	P/P	50 - 160
Microcystin LF	118	92.4	P/P	50 - 160
Microcystin LR	103	109	P/P	60 - 160
Microcystin LW	93.6	78.7	P/P	60 - 160
Microcystin LY	101	98.3	P/P	60 - 160
Microcystin RR	92.8	101	P/P	60 - 160
Microcystin WR	97.0	97.0	P/P	60 - 160
Microcystin YR	84.4	72.3	P/P	60 - 160

* 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 350.1 Rev. 2.0	Ammonia-N	103	103	103			0.310
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	109	110			0.643
EPA 353.2 Rev. 2.0	NO2NO3-N	100	98.5	97.0			0.897
EPA 365.1 Rev. 2.0	Total-P	103	102	105			2.73
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	99.5	99.5			0.0
EPA 8321B	Anatoxin-a	105	82.4	78.7			4.60
	Cylindrospermopsin	102	81.3	82.1			1.02
	Desmethyl microcystin LR	104	103	95.7			7.03
	Microcystin LA	120	103	103			0.287
	Microcystin LF	114	90.5	87.8			3.06
	Microcystin LR	109	87.9	82.9			5.59
	Microcystin LW	91.1	71.1	71.0			0.188
	Microcystin LY	108	92.1	91.8			0.420
	Microcystin RR	105	94.8	94.3			0.483
	Microcystin WR	99.4	83.7	83.0			0.788
	Microcystin YR	84.5	75.9	73.6			3.04

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2205557, 2205558
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2205557, 2205558
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2205557, 2205558
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2205557, 2205558
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2205559, 2205560
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2205555, 2205556

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	10/30/2020			10/31/2020 14:18	Ping Hua	2205557
	10/30/2020			10/31/2020 14:20	Ping Hua	2205558
EPA 351.2 Rev. 2.0	10/30/2020	11/02/2020 13:30	David Boose	11/03/2020 14:44	Elliott Rodriguez	2205557
	10/30/2020	11/02/2020 13:30	David Boose	11/03/2020 14:45	Elliott Rodriguez	2205558
EPA 353.2 Rev. 2.0	10/30/2020			11/04/2020 11:09	Beverly Y. Sanders	2205557
	10/30/2020			11/04/2020 11:10	Beverly Y. Sanders	2205558
EPA 365.1 Rev. 2.0	10/30/2020	11/02/2020 10:01	Yen Ta	11/03/2020 14:03	Benjamin T. Nordmann	2205557
	10/30/2020	11/02/2020 10:01	Yen Ta	11/03/2020 14:04	Benjamin T. Nordmann	2205558
EPA 365.1 Rev. 2.0 dissolved	10/30/2020			10/30/2020 15:23	Blanca Fach	2205559
	10/30/2020			10/30/2020 15:24	Blanca Fach	2205560
EPA 8321B	10/30/2020	11/05/2020 06:30	Juyoung Kim	11/05/2020 08:41	Pramila Ghimire	2205555
	10/30/2020	11/05/2020 06:30	Juyoung Kim	11/05/2020 08:58	Pramila Ghimire	2205556