Chemical Analysis Report

WQAP-2021-03-19-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2021-02-08-17**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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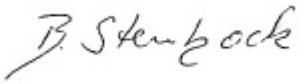

Case Narrative

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: Lake Estelle near OMA **Collection Date/Time: 03/18/2021 13:43**

Field ID: HABCE0058_LakeEstelle Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2232639	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P395216	
		Cylindrospermopsin	0.25	U	ug/L	P395216	
		Desmethyl microcystin LR	0.25	U	ug/L	P395216	
		Microcystin HilR**	0.25	U	ug/L	P395216	
		Microcystin HtyR**	0.25	U	ug/L	P395216	
		Microcystin LA	0.25	U	ug/L	P395216	
		Microcystin LF	0.25	U	ug/L	P395216	
		Microcystin LR	0.25	U	ug/L	P395216	
		Microcystin LW	0.25	U	ug/L	P395216	
		Microcystin LY	0.25	U	ug/L	P395216	
		Microcystin RR	0.25	U	ug/L	P395216	
		Microcystin WR	0.50	U	ug/L	P395216	
		Microcystin YR	0.25	U	ug/L	P395216	
2232641	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P395763	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.52		mg N/L	P395282	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P395336	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P395326	
2232643	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P395241	

Sample Location: Lake Mabel @ 25m from NW shore **Collection Date/Time: 03/18/2021 10:54**

Field ID: HABCE0059_LakeMabel Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2232640	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P395216	
		Cylindrospermopsin	0.25	U	ug/L	P395216	
		Desmethyl microcystin LR	0.25	U	ug/L	P395216	
		Microcystin HilR**	0.25	U	ug/L	P395216	
		Microcystin HtyR**	0.25	U	ug/L	P395216	
		Microcystin LA	0.25	U	ug/L	P395216	
		Microcystin LF	0.25	U	ug/L	P395216	
		Microcystin LR	0.25	U	ug/L	P395216	
		Microcystin LW	0.25	U	ug/L	P395216	
		Microcystin LY	0.25	U	ug/L	P395216	
		Microcystin RR	0.25	U	ug/L	P395216	
		Microcystin WR	0.50	U	ug/L	P395216	
		Microcystin YR	0.25	U	ug/L	P395216	
2232642	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P395763	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.69		mg N/L	P395282	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.023		mg N/L	P395336	
	EPA 365.1 Rev. 2.0	Total-P	0.017		mg P/L	P395326	
2232644	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P395241	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395763

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395282

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395336

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395326

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395241

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

Reference Method: EPA 8321B
Batch ID: P395216

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 HilR	0.25	U	ug/L
Microcystin HtyR	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: P395763

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395282

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395336

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: P395326

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	109		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395241

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

Reference Method: EPA 8321B
Batch ID: P395216

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	114		P	40 - 150
Cylindrospermopsin	103		P	40 - 150
Desmethyl microcystin LR	93.6		P	40 - 150
Microcystin HilR	98.3		P	40 - 150
Microcystin HtyR	93.1		P	40 - 150
Microcystin LA	98.5		P	40 - 150
Microcystin LF	99.2		P	40 - 150
Microcystin LR	80.0		P	40 - 150
Microcystin LW	109		P	40 - 150
Microcystin LY	99.7		P	40 - 150
Microcystin RR	101		P	40 - 150
Microcystin WR	97.8		P	40 - 150
Microcystin YR	92.1		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395763

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2232575	Ammonia-N	101	99.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395282

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2231326	Kjeldahl Nitrogen	108	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2232641	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395326

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2232641	Total-P	109	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395241

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2232643	O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P395216

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2232639	Anatoxin-a	117	109	P/P	40 - 150
2232639	Cylindrospermopsin	100	95.5	P/P	40 - 150
2232639	Desmethyl microcystin LR	93.1	84.6	P/P	40 - 150
2232639	Microcystin HilR	97.3	93.1	P/P	40 - 150
2232639	Microcystin HtyR	95.3	89.2	P/P	40 - 150
2232639	Microcystin LA	96.0	90.1	P/P	40 - 150
2232639	Microcystin LF	100	85.9	P/P	40 - 150
2232639	Microcystin LR	90.7	90.3	P/P	40 - 150
2232639	Microcystin LW	99.5	77.8	P/P	40 - 150
2232639	Microcystin LY	101	85.4	P/P	40 - 150
2232639	Microcystin RR	98.7	94.9	P/P	40 - 150
2232639	Microcystin WR	101	81.3	P/P	40 - 150
2232639	Microcystin YR	96.6	82.0	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395763

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232575	Ammonia-N	1.80	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P395282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2231326	Kjeldahl Nitrogen	3.10	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395336

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232641	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395326

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232641	Total-P	1.87	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395241

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232643	O-Phosphate-P	1.19	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P395216

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2232639	Anatoxin-a	7.18	Spike	P	0 - 30
2232639	Cylindrospermopsin	4.62	Spike	P	0 - 30
2232639	Desmethyl microcystin LR	9.54	Spike	P	0 - 30
2232639	Microcystin HilR	4.43	Spike	P	0 - 30
2232639	Microcystin HtyR	6.59	Spike	P	0 - 30
2232639	Microcystin LA	6.36	Spike	P	0 - 30
2232639	Microcystin LF	15.3	Spike	P	0 - 30
2232639	Microcystin LR	0.470	Spike	P	0 - 30
2232639	Microcystin LW	24.5	Spike	P	0 - 30
2232639	Microcystin LY	16.6	Spike	P	0 - 30
2232639	Microcystin RR	3.89	Spike	P	0 - 30
2232639	Microcystin WR	21.1	Spike	P	0 - 30
2232639	Microcystin YR	16.3	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2232639
Field Sample ID: HABCE0058_LakeEstelle

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	88.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	72.4	P	30 - 160

Lab Sample ID: 2232640
Field Sample ID: HABCE0059_LakeMabel

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	92.2	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	63.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A104176
Included Lab Sample IDs: 2232643, 2232644

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

Reference Method: EPA 8321B
Run ID: A104181
Included Lab Sample IDs: 2232639, 2232640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	107	96.2	P/P	50 - 160
Cylindrospermopsin	99.4	101	P/P	60 - 160
Desmethyl microcystin LR	86.7	86.3	P/P	60 - 160
Microcystin HilR	98.4	90.3	P/P	60 - 160
Microcystin HtyR	92.0	85.7	P/P	60 - 160
Microcystin LA	99.7	95.7	P/P	50 - 160
Microcystin LF	106	89.3	P/P	50 - 160
Microcystin LR	84.4	84.2	P/P	60 - 160
Microcystin LW	101	88.9	P/P	60 - 160
Microcystin LY	103	93.2	P/P	60 - 160
Microcystin RR	93.7	98.7	P/P	60 - 160
Microcystin WR	99.3	89.5	P/P	60 - 160
Microcystin YR	87.1	84.2	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A104215
Included Lab Sample IDs: 2232641, 2232642

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A104247
Included Lab Sample IDs: 2232641, 2232642

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.5	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A104250
Included Lab Sample IDs: 2232641, 2232642

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	105	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A104401
Included Lab Sample IDs: 2232641, 2232642

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.0	99.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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	98.8	101	99.2			1.80
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	108	105			3.10
EPA 353.2 Rev. 2.0	NO2NO3-N	100	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	109	109	107			1.87
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	100	101			1.19
EPA 8321B	Anatoxin-a	114	117	109			7.18
	Cylindrospermopsin	103	100	95.5			4.62
	Desmethyl microcystin LR	93.6	93.1	84.6			9.54
	Microcystin HilR	98.3	97.3	93.1			4.43
	Microcystin HtyR	93.1	95.3	89.2			6.59
	Microcystin LA	98.5	96.0	90.1			6.36
	Microcystin LF	99.2	100	85.9			15.3
	Microcystin LR	80.0	90.7	90.3			0.470
	Microcystin LW	109	99.5	77.8			24.5
	Microcystin LY	99.7	101	85.4			16.6
	Microcystin RR	101	98.7	94.9			3.89
	Microcystin WR	97.8	101	81.3			21.1
	Microcystin YR	92.1	96.6	82.0			16.3

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2232641, 2232642
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2232641, 2232642
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2232641, 2232642
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2232641, 2232642
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2232643, 2232644
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2232639, 2232640

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	03/19/2021			03/31/2021 17:23	Ping Hua	2232641
	03/19/2021			03/31/2021 17:24	Ping Hua	2232642
EPA 351.2 Rev. 2.0	03/19/2021	03/22/2021 13:25	Benjamin T. Nordmann	03/23/2021 22:07	Julia Storbeck	2232641
	03/19/2021	03/22/2021 13:25	Benjamin T. Nordmann	03/23/2021 22:09	Julia Storbeck	2232642
EPA 353.2 Rev. 2.0	03/19/2021			03/23/2021 09:29	Beverly Y. Sanders	2232641
	03/19/2021			03/23/2021 09:30	Beverly Y. Sanders	2232642
EPA 365.1 Rev. 2.0	03/19/2021	03/23/2021 09:29	Yen Ta	03/24/2021 11:35	Shengyu Ding	2232641
	03/19/2021	03/23/2021 09:29	Yen Ta	03/24/2021 11:36	Shengyu Ding	2232642
EPA 365.1 Rev. 2.0 dissolved	03/19/2021			03/19/2021 15:17	Blanca Fach	2232643
	03/19/2021			03/19/2021 15:20	Blanca Fach	2232644
EPA 8321B	03/19/2021	03/19/2021 12:00	Pramila Ghimire	03/19/2021 19:02	Pramila Ghimire	2232639
	03/19/2021	03/19/2021 12:00	Pramila Ghimire	03/19/2021 19:19	Pramila Ghimire	2232640