

Chemical Analysis Report

WQAP-2020-02-06-03

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

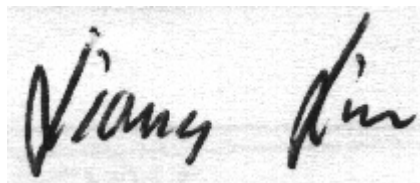
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2020-01-20-10**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd
Suite 232
Orlando, FL 32806
Attn: Mike Linger

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: Liang Lin, Environmental Administrator

Date Certified: 28-FEB-2020 16:05

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

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 Minneola @ NE Corner

Collection Date/Time: 02/05/2020 12:33

Field ID: HABCE0016_Minneola2 NE

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2155099	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P378316	
		Cylindrospermopsin**	0.25	U	ug/L	P378316	
		Desmethyl microcystin LR**	0.25	U	ug/L	P378316	
		Microcystin LA**	0.25	U	ug/L	P378316	
		Microcystin LF**	0.25	U	ug/L	P378316	
		Microcystin LR**	0.25	U	ug/L	P378316	
		Microcystin LW**	0.25	U	ug/L	P378316	
		Microcystin LY**	0.25	U	ug/L	P378316	
		Microcystin RR**	0.25	U	ug/L	P378316	
		Microcystin WR**	0.50	U	ug/L	P378316	
		Microcystin YR**	0.25	U	ug/L	P378316	
2155101	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P379055	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P378758	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P379425	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P378817	
2155103	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P378444	

Sample Location: Lake Minneola @ West of Lee's Villa

Collection Date/Time: 02/05/2020 13:00

Field ID: HABCE0017_Minneola1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2155100	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P378316	
		Cylindrospermopsin**	0.25	U	ug/L	P378316	
		Desmethyl microcystin LR**	0.25	U	ug/L	P378316	
		Microcystin LA**	0.25	U	ug/L	P378316	
		Microcystin LF**	0.25	U	ug/L	P378316	
		Microcystin LR**	0.25	U	ug/L	P378316	
		Microcystin LW**	0.25	U	ug/L	P378316	
		Microcystin LY**	0.25	U	ug/L	P378316	
		Microcystin RR**	0.25	U	ug/L	P378316	
		Microcystin WR**	0.50	U	ug/L	P378316	
		Microcystin YR**	0.25	U	ug/L	P378316	
2155102	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P379055	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P378758	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P379425	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P378817	
2155104	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P378444	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379055

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P378758

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379425

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P378817

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378444

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

Reference Method: EPA 8321B
Batch ID: P378316

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: P379055

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P378758

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379425

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: P378817

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378444

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P378316

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	102		P	40 - 140
Cylindrospermopsin	101		P	40 - 140
Desmethyl microcystin LR	81.8		P	40 - 140
Microcystin LA	82.9		P	40 - 140
Microcystin LF	99.3		P	40 - 140
Microcystin LR	83.6		P	40 - 140
Microcystin LW	98.0		P	40 - 140
Microcystin LY	123		P	40 - 140
Microcystin RR	91.5		P	40 - 140
Microcystin WR	76.3		P	40 - 140
Microcystin YR	91.3		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379055

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2155011	Ammonia-N	100	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P378758

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2155121	Kjeldahl Nitrogen	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379425

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2155214	NO2NO3-N	100	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P378817

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2155058	Total-P	105	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378444

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2155031	O-Phosphate-P	95.4	95.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P378316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2154169	Anatoxin-a	110	108	P/P	40 - 140
2154169	Cylindrospermopsin	98.2	91.1	P/P	40 - 140
2154169	Desmethyl microcystin LR	93.8	90.6	P/P	40 - 140
2154169	Microcystin LA	85.5	97.7	P/P	40 - 140
2154169	Microcystin LF	103	87.2	P/P	40 - 140
2154169	Microcystin LR	90.2	89.4	P/P	40 - 140
2154169	Microcystin LW	111	105	P/P	40 - 140
2154169	Microcystin LY	90.7	106	P/P	40 - 140
2154169	Microcystin RR	101	101	P/P	40 - 140
2154169	Microcystin WR	84.6	88.1	P/P	40 - 140
2154169	Microcystin YR	93.2	96.4	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P379055

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2155011	Ammonia-N	0.387	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P378758

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2155121	Kjeldahl Nitrogen	0.134	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P379425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2155214	NO2NO3-N	0.409	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P378817

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2155058	Total-P	1.24	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P378444

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2155031	O-Phosphate-P	0.364	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P378316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2154169	Anatoxin-a	1.93	Spike	P	0 - 30
2154169	Cylindrospermopsin	7.47	Spike	P	0 - 30
2154169	Desmethyl microcystin LR	3.47	Spike	P	0 - 30
2154169	Microcystin LA	13.3	Spike	P	0 - 30
2154169	Microcystin LF	16.6	Spike	P	0 - 30
2154169	Microcystin LR	0.840	Spike	P	0 - 30
2154169	Microcystin LW	4.95	Spike	P	0 - 30
2154169	Microcystin LY	15.7	Spike	P	0 - 30
2154169	Microcystin RR	0.0757	Spike	P	0 - 30
2154169	Microcystin WR	4.11	Spike	P	0 - 30
2154169	Microcystin YR	3.38	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2155099

Field Sample ID: HABCE0016_Minneola2 NE

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	112	P	30 - 165

Lab Sample ID: 2155100

Field Sample ID: HABCE0017_Minneola1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	107	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A97357

Included Lab Sample IDs: 2155099, 2155100

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	99.1	98.6	P/P	50 - 160
Cylindrospermopsin	102	96.4	P/P	60 - 160
Desmethyl microcystin LR	88.0	71.6	P/P	60 - 160
Microcystin LA	89.4	88.5	P/P	50 - 160
Microcystin LF	107	104	P/P	60 - 160
Microcystin LR	86.4	81.0	P/P	60 - 160
Microcystin LW	99.3	97.6	P/P	60 - 160
Microcystin LY	104	120	P/P	60 - 160
Microcystin RR	93.8	94.5	P/P	60 - 160
Microcystin WR	80.2	78.6	P/P	60 - 160
Microcystin YR	90.5	93.9	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A97361

Included Lab Sample IDs: 2155103, 2155104

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	96.9	P/P	90 - 110
O-Phosphate-P	98.3	98.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A97523

Included Lab Sample IDs: 2155101, 2155102

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	106	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A97585

Included Lab Sample IDs: 2155101, 2155102

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A97594

Included Lab Sample IDs: 2155101, 2155102

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A97741

Included Lab Sample IDs: 2155101, 2155102

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	101	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	99.2	100	100			0.387
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.8	102	102			0.134
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	99.8			0.409
EPA 365.1 Rev. 2.0	Total-P	104	105	103			1.24
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	95.4	95.9			0.364
EPA 8321B	Anatoxin-a	102	110	108			1.93
	Cylindrospermopsin	101	98.2	91.1			7.47
	Desmethyl microcystin LR	81.8	93.8	90.6			3.47
	Microcystin LA	82.9	85.5	97.7			13.3
	Microcystin LF	99.3	103	87.2			16.6
	Microcystin LR	83.6	90.2	89.4			0.840
	Microcystin LW	98.0	111	105			4.95
	Microcystin LY	123	90.7	106			15.7
	Microcystin RR	91.5	101	101			0.0757
	Microcystin WR	76.3	84.6	88.1			4.11
	Microcystin YR	91.3	93.2	96.4			3.38

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2155101, 2155102
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2155101, 2155102
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2155101, 2155102
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2155101, 2155102
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2155103, 2155104
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2155099, 2155100

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	02/06/2020			02/14/2020 10:44	Ping Hua	2155101
	02/06/2020			02/14/2020 10:46	Ping Hua	2155102
EPA 351.2 Rev. 2.0	02/06/2020	02/12/2020 12:30	Elliott Rodriguez	02/13/2020 14:05	Julia Storbeck	2155101
	02/06/2020	02/12/2020 12:30	Elliott Rodriguez	02/13/2020 14:07	Julia Storbeck	2155102
EPA 353.2 Rev. 2.0	02/06/2020			02/20/2020 10:11	Beverly Y. Sanders	2155101
	02/06/2020			02/20/2020 10:13	Beverly Y. Sanders	2155102
EPA 365.1 Rev. 2.0	02/06/2020	02/12/2020 14:34	Yen Ta	02/17/2020 15:57	Benjamin T. Nordmann	2155101
	02/06/2020	02/12/2020 14:34	Yen Ta	02/17/2020 15:58	Benjamin T. Nordmann	2155102
EPA 365.1 Rev. 2.0 dissolved	02/06/2020			02/06/2020 15:02	Carlos Miranda	2155103
	02/06/2020			02/06/2020 15:21	Carlos Miranda	2155104
EPA 8321B	02/06/2020	02/06/2020 12:00	Juyoung Kim	02/06/2020 13:51	Juyoung Kim	2155099
	02/06/2020	02/06/2020 12:00	Juyoung Kim	02/06/2020 14:08	Juyoung Kim	2155100