

Chemical Analysis Report

WQAP-2020-07-02-05

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-2020-03-23-39**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 21-JUL-2020 10:04

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: 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 Mann @ boat ramp

Collection Date/Time: 07/01/2020 14:52

Field ID: HABCE0035_Lake Mann1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2180360	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P383984	
		Cylindrospermopsin**	0.25	U	ug/L	P383984	
		Desmethyl microcystin LR**	0.25	U	ug/L	P383984	
		Microcystin LA**	0.25	U	ug/L	P383984	
		Microcystin LF**	0.25	U	ug/L	P383984	
		Microcystin LR**	0.25	U	ug/L	P383984	
		Microcystin LW**	0.25	U	ug/L	P383984	
		Microcystin LY**	0.25	U	ug/L	P383984	
		Microcystin RR**	0.25	U	ug/L	P383984	
		Microcystin WR**	0.50	U	ug/L	P383984	
		Microcystin YR**	0.25	U	ug/L	P383984	
2180361	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P384038	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.75		mg N/L	P384691	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P384115	
	EPA 365.1 Rev. 2.0	Total-P	0.022		mg P/L	P384084	
2180362	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P384086	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P384038

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P384691

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384115

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384084

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384086

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

Reference Method: EPA 8321B
Batch ID: P383984

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: P384038

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: P384691

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P384115

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P384084

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P384086

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.5		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P383984

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	130		P	40 - 140
Cylindrospermopsin	107		P	40 - 140
Desmethyl microcystin LR	97.3		P	40 - 140
Microcystin LA	106		P	40 - 140
Microcystin LF	113		P	40 - 140
Microcystin LR	95.3		P	40 - 140
Microcystin LW	110		P	40 - 140
Microcystin LY	116		P	40 - 140
Microcystin RR	116		P	40 - 140
Microcystin WR	97.8		P	40 - 140
Microcystin YR	97.9		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P384038

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180361	Ammonia-N	100	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P384691

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2183073	Kjeldahl Nitrogen	102	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P384115

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180263	NO2NO3-N	98.2	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P384084

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180328	Total-P	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P384086

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180353	O-Phosphate-P	96.0	97.0	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P383984

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2180325	Anatoxin-a	111	123	P/P	40 - 140
2180325	Cylindrospermopsin	102	101	P/P	40 - 140
2180325	Desmethyl microcystin LR	116	112	P/P	40 - 140
2180325	Microcystin LA	108	103	P/P	40 - 140
2180325	Microcystin LF	96.2	108	P/P	40 - 140
2180325	Microcystin LR	114	111	P/P	40 - 140
2180325	Microcystin LW	106	93.7	P/P	40 - 140
2180325	Microcystin LY	113	102	P/P	40 - 140
2180325	Microcystin RR	130	128	P/P	40 - 140
2180325	Microcystin WR	108	102	P/P	40 - 140
2180325	Microcystin YR	112	103	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P384038

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180361	Ammonia-N	0.718	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P384691

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2183073	Kjeldahl Nitrogen	4.04	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P384115

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180263	NO2NO3-N	0.462	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P384084

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180328	Total-P	1.92	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P384086

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180353	O-Phosphate-P	1.04	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P383984

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2180325	Anatoxin-a	9.70	Spike	P	0 - 30
2180325	Cylindrospermopsin	1.15	Spike	P	0 - 30
2180325	Desmethyl microcystin LR	3.20	Spike	P	0 - 30
2180325	Microcystin LA	4.70	Spike	P	0 - 30
2180325	Microcystin LF	11.2	Spike	P	0 - 30
2180325	Microcystin LR	2.97	Spike	P	0 - 30
2180325	Microcystin LW	12.7	Spike	P	0 - 30
2180325	Microcystin LY	9.70	Spike	P	0 - 30
2180325	Microcystin RR	1.57	Spike	P	0 - 30
2180325	Microcystin WR	5.11	Spike	P	0 - 30
2180325	Microcystin YR	8.20	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2180360

Field Sample ID: HABCE0035_Lake Mann1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	112	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A99660
Included Lab Sample IDs: 2180360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	110	110	P/P	50 - 160
Cylindrospermopsin	101	110	P/P	60 - 160
Desmethyl microcystin LR	96.2	105	P/P	60 - 160
Microcystin LA	102	103	P/P	50 - 160
Microcystin LF	106	103	P/P	60 - 160
Microcystin LR	91.0	96.9	P/P	60 - 160
Microcystin LW	96.7	99.3	P/P	60 - 160
Microcystin LY	98.8	115	P/P	60 - 160
Microcystin RR	110	121	P/P	60 - 160
Microcystin WR	90.4	91.3	P/P	60 - 160
Microcystin YR	94.0	101	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A99668
Included Lab Sample IDs: 2180361

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A99692
Included Lab Sample IDs: 2180362

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A99705
Included Lab Sample IDs: 2180361

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A99779
Included Lab Sample IDs: 2180361

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A99951
Included Lab Sample IDs: 2180361

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	97.0	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	Precision SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	102	100	99.6			0.718
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	102	109			4.04
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	98.2	98.8			0.462
EPA 365.1 Rev. 2.0	Total-P	99.2	101	103			1.92
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	96.0	97.0			1.04
EPA 8321B	Anatoxin-a	130	111	123			9.70
	Cylindrospermopsin	107	102	101			1.15
	Desmethyl microcystin LR	97.3	116	112			3.20
	Microcystin LA	106	108	103			4.70
	Microcystin LF	113	96.2	108			11.2
	Microcystin LR	95.3	114	111			2.97
	Microcystin LW	110	106	93.7			12.7
	Microcystin LY	116	113	102			9.70
	Microcystin RR	116	130	128			1.57
	Microcystin WR	97.8	108	102			5.11
	Microcystin YR	97.9	112	103			8.20

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2180361
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2180361
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2180361
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2180361
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2180362
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2180360

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	07/02/2020			07/05/2020 20:06	Ping Hua	2180361
EPA 351.2 Rev. 2.0	07/02/2020	07/16/2020 09:35	Sima Feizi	07/17/2020 13:52	Jhamieka S. Greenwood	2180361
EPA 353.2 Rev. 2.0	07/02/2020			07/07/2020 08:40	Beverly Y. Sanders	2180361
EPA 365.1 Rev. 2.0	07/02/2020	07/06/2020 12:28	Yen Ta	07/09/2020 08:20	Lipi Saha	2180361
EPA 365.1 Rev. 2.0 dissolved	07/02/2020			07/02/2020 16:58	Carlos Miranda	2180362
EPA 8321B	07/02/2020	07/02/2020 12:30	Juyoung Kim	07/02/2020 14:53	Juyoung Kim	2180360