Chemical Analysis Report

WQAP-2022-03-24-01

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-2022-02-28-27**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 08-APR-2022 14:05

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 - McQueen Park **Collection Date/Time: 03/23/2022 09:30**

Field ID: HABCE0112_LakeMann Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2314320	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P411546	
		Cylindrospermopsin	0.10	U	ug/L	P411546	
		Desmethyl microcystin LR	0.25	U	ug/L	P411546	
		Microcystin HilR**	0.25	U	ug/L	P411546	
		Microcystin HtyR**	0.25	U	ug/L	P411546	
		Microcystin LA	2.2		ug/L	P411546	
		Microcystin LF	0.10	U	ug/L	P411546	
		Microcystin LR	1.5		ug/L	P411546	
		Microcystin LW	0.25	U	ug/L	P411546	
		Microcystin LY	0.10	U	ug/L	P411546	
		Microcystin RR	0.10	U	ug/L	P411546	
		Microcystin WR	0.50	U	ug/L	P411546	
		Microcystin YR	0.25	U	ug/L	P411546	
		Nodularin-R**	0.10	U	ug/L	P411546	
2314321	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P411703	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P411638	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P411588	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P411683	
2314322	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P411557	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411703

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411638

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411588

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411683

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P411557

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

Reference Method: EPA 8321B
Batch ID: P411546

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.10	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	0.10	U	ug/L
Microcystin LF	0.10	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.10	U	ug/L
Microcystin RR	0.10	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.10	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411703

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411638

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411588

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: P411683

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P411557

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

Reference Method: EPA 8321B
Batch ID: P411546

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	81.6		P	40 - 150
Cylindrospermopsin	79.9		P	40 - 150
Desmethyl microcystin LR	73.7		P	40 - 150
Microcystin HilR	75.8		P	40 - 150
Microcystin HtyR	79.5		P	40 - 150
Microcystin LA	81.3		P	40 - 150
Microcystin LF	60.7		P	40 - 150
Microcystin LR	62.0		P	40 - 150
Microcystin LW	72.6		P	40 - 150
Microcystin LY	80.2		P	40 - 150
Microcystin RR	79.5		P	40 - 150
Microcystin WR	82.5		P	40 - 150
Microcystin YR	78.2		P	40 - 150
Nodularin-R	71.7		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411703

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314321	Ammonia-N	96.8	97.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411638

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2313858	Kjeldahl Nitrogen	98.5	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411588

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314204	NO2NO3-N	96.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411683

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314298	Total-P	103	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P411557

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314322	O-Phosphate-P	98.5	98.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P411546

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2314306	Anatoxin-a	87.8	88.7	P/P	40 - 150
2314306	Cylindrospermopsin	86.0	86.5	P/P	40 - 150
2314306	Desmethyl microcystin LR	76.2	87.8	P/P	40 - 150
2314306	Microcystin HilR	86.8	83.4	P/P	40 - 150
2314306	Microcystin HtyR	80.9	83.1	P/P	40 - 150
2314306	Microcystin LA	83.0	88.4	P/P	40 - 150
2314306	Microcystin LF	72.2	79.4	P/P	40 - 150
2314306	Microcystin LR	63.9	72.1	P/P	40 - 150
2314306	Microcystin LW	78.0	79.9	P/P	40 - 150
2314306	Microcystin LY	86.8	85.0	P/P	40 - 150
2314306	Microcystin RR	85.2	83.9	P/P	40 - 150
2314306	Microcystin WR	85.0	77.7	P/P	40 - 150
2314306	Microcystin YR	84.8	79.9	P/P	40 - 150
2314306	Nodularin-R	80.6	76.8	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P411703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314321	Ammonia-N	0.362	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P411638

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2313858	Kjeldahl Nitrogen	1.58	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P411588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314204	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P411683

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314298	Total-P	2.65	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P411557

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314322	O-Phosphate-P	0.101	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P411546

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2314306	Anatoxin-a	0.988	Spike	P	0 - 30
2314306	Cylindrospermopsin	0.511	Spike	P	0 - 30
2314306	Desmethyl microcystin LR	14.1	Spike	P	0 - 30
2314306	Microcystin HilR	4.07	Spike	P	0 - 30
2314306	Microcystin HtyR	2.76	Spike	P	0 - 30
2314306	Microcystin LA	6.26	Spike	P	0 - 30
2314306	Microcystin LF	9.42	Spike	P	0 - 30
2314306	Microcystin LR	11.5	Spike	P	0 - 30
2314306	Microcystin LW	2.35	Spike	P	0 - 30
2314306	Microcystin LY	2.08	Spike	P	0 - 30
2314306	Microcystin RR	1.49	Spike	P	0 - 30
2314306	Microcystin WR	8.99	Spike	P	0 - 30
2314306	Microcystin YR	5.93	Spike	P	0 - 30
2314306	Nodularin-R	4.85	Spike	P	0 - 30

Quality Assurance Report
Precision

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2314320
Field Sample ID: HABCE0112_LakeMann

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	62.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A111136
Included Lab Sample IDs: 2314322

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A111149
Included Lab Sample IDs: 2314321

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

Reference Method: EPA 8321B
Run ID: A111152
Included Lab Sample IDs: 2314320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	99.2	121	P/P	50 - 160
Cylindrospermopsin	98.2	121	P/P	60 - 160
Desmethyl microcystin LR	90.5	112	P/P	60 - 160
Microcystin HilR	87.9	115	P/P	60 - 160
Microcystin HtyR	93.1	109	P/P	60 - 160
Microcystin LA	95.7	122	P/P	50 - 160
Microcystin LF	86.8	104	P/P	60 - 160
Microcystin LR	78.1	106	P/P	60 - 160
Microcystin LW	81.6	105	P/P	60 - 160
Microcystin LY	95.8	121	P/P	60 - 160
Microcystin RR	93.0	114	P/P	60 - 160
Microcystin WR	97.3	115	P/P	60 - 160
Microcystin YR	82.4	113	P/P	60 - 160
Nodularin-R	91.6	119	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A111210
Included Lab Sample IDs: 2314321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A111251
Included Lab Sample IDs: 2314321

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A111315
Included Lab Sample IDs: 2314321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.6	96.6	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	99.8	96.8	97.2			0.362
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	98.5	100			1.58
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	96.2				0.0
EPA 365.1 Rev. 2.0	Total-P	101	103	101			2.65
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	98.5	98.6			0.101
EPA 8321B	Anatoxin-a	81.6	87.8	88.7			0.988
	Cylindrospermopsin	79.9	86.0	86.5			0.511
	Desmethyl microcystin LR	73.7	76.2	87.8			14.1
	Microcystin HilR	75.8	86.8	83.4			4.07
	Microcystin HtyR	79.5	80.9	83.1			2.76
	Microcystin LA	81.3	83.0	88.4			6.26
	Microcystin LF	60.7	72.2	79.4			9.42
	Microcystin LR	62.0	63.9	72.1			11.5
	Microcystin LW	72.6	78.0	79.9			2.35
	Microcystin LY	80.2	86.8	85.0			2.08
	Microcystin RR	79.5	85.2	83.9			1.49
	Microcystin WR	82.5	85.0	77.7			8.99
	Microcystin YR	78.2	84.8	79.9			5.93
	Nodularin-R	71.7	80.6	76.8			4.85

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2314321
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2314321
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2314321
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2314321
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2314322
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2314320

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	03/24/2022			03/29/2022 12:21	Ping Hua	2314321
EPA 351.2 Rev. 2.0	03/24/2022	03/29/2022 08:58	Samantha L Bates	04/05/2022 13:07	Alexandra J Mattheus	2314321
EPA 353.2 Rev. 2.0	03/24/2022			03/25/2022 10:46	Beverly Y. Sanders	2314321
EPA 365.1 Rev. 2.0	03/24/2022	03/29/2022 16:02	Simonne.V. Calhoun	03/31/2022 12:39	James L Waggerby	2314321
EPA 365.1 Rev. 2.0 dissolved	03/24/2022			03/24/2022 14:37	Ping Hua	2314322
EPA 8321B	03/24/2022	03/24/2022 14:00	Manjita Shrestha	03/25/2022 12:20	Manjita Shrestha	2314320