

Chemical Analysis Report

WQAP-2022-09-20-03

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-08-29-41**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd. Suite 232
Orlando, FL 32803
Attn: Matt Bearden

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 10-OCT-2022 09:37

A handwritten signature in black ink, appearing to read "Liang Lin", is shown 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 Mariam - Boat Ramp

Collection Date/Time: 09/19/2022 14:26

Field ID: HABCE0137_LakeMariam2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2357525	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P419828	
		Cylindrospermopsin	0.10	U	ug/L	P419827	
		Desmethyl microcystin LR	0.25	U	ug/L	P419827	
		Microcystin HIR	0.25	U	ug/L	P419827	
		Microcystin HtyR	0.25	U	ug/L	P419827	
		Microcystin LA	0.10	U	ug/L	P419827	
		Microcystin LF	0.10	U	ug/L	P419827	
		Microcystin LR	0.25	U	ug/L	P419827	
		Microcystin LW	0.25	U	ug/L	P419827	
		Microcystin LY	0.10	U	ug/L	P419827	
		Microcystin RR	0.10	U	ug/L	P419827	
		Microcystin WR	0.50	U	ug/L	P419827	
		Microcystin YR	0.25	U	ug/L	P419827	
		Nodularin-R	0.10	U	ug/L	P419827	
2357526	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P420248	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P420077	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.010		mg N/L	P420155	
	EPA 365.1 Rev. 2.0	Total-P	0.050		mg P/L	P419947	
2357527	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P419844	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420248

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420077

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420155

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419947

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419844

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

Reference Method: EPA 8321B
Batch ID: P419827

Component	Result	Code	Units
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

Reference Method: EPA 8321B
Batch ID: P419828

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420248

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P420077

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420155

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419947

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419844

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

Reference Method: EPA 8321B
Batch ID: P419827

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	87.4		P	40 - 150
Desmethyl microcystin LR	90.6		P	40 - 150
Microcystin HILR	90.0		P	40 - 150
Microcystin HtyR	87.5		P	40 - 150
Microcystin LA	83.1		P	40 - 150
Microcystin LF	62.2		P	40 - 150
Microcystin LR	86.6		P	40 - 150
Microcystin LW	93.1		P	40 - 150
Microcystin LY	83.0		P	40 - 150
Microcystin RR	86.3		P	40 - 150
Microcystin WR	89.6		P	40 - 150
Microcystin YR	87.8		P	40 - 150
Nodularin-R	84.4		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419828

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	90.7		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P420248

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357534	Ammonia-N	99.8	99.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P420155

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357472	NO2NO3-N	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P419947

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357504	Total-P	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P419844

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357507	O-Phosphate-P	98.3	98.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P419827

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357444	Cylindrospermopsin	79.3	88.2	P/P	40 - 150
2357444	Desmethyl microcystin LR	95.1	108	P/P	40 - 150
2357444	Microcystin HilR	92.4	110	P/P	40 - 150
2357444	Microcystin HtyR	92.8	103	P/P	40 - 150
2357444	Microcystin LA	82.4	90.4	P/P	40 - 150
2357444	Microcystin LF	67.1	75.9	P/P	40 - 150
2357444	Microcystin LR	93.1	105	P/P	40 - 150
2357444	Microcystin LW	92.0	103	P/P	40 - 150
2357444	Microcystin LY	83.5	92.1	P/P	40 - 150
2357444	Microcystin RR	82.7	94.2	P/P	40 - 150
2357444	Microcystin WR	92.7	106	P/P	40 - 150
2357444	Microcystin YR	97.1	108	P/P	40 - 150
2357444	Nodularin-R	98.1	108	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P419828

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2357444	Anatoxin-a	91.1	89.9	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P420248

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357534	Ammonia-N	0.551	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P420077

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357741	Kjeldahl Nitrogen	3.12	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P420155

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357472	NO2NO3-N	1.32	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P419947

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357504	Total-P	0.732	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P419844

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357507	O-Phosphate-P	0.204	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P419827

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357444	Cylindrospermopsin	10.6	Spike	P	0 - 30
2357444	Desmethyl microcystin LR	12.7	Spike	P	0 - 30
2357444	Microcystin H1LR	17.3	Spike	P	0 - 30
2357444	Microcystin HtyR	10.9	Spike	P	0 - 30
2357444	Microcystin LA	9.24	Spike	P	0 - 30
2357444	Microcystin LF	12.3	Spike	P	0 - 30
2357444	Microcystin LR	10.7	Spike	P	0 - 30
2357444	Microcystin LW	11.2	Spike	P	0 - 30
2357444	Microcystin LY	9.85	Spike	P	0 - 30
2357444	Microcystin RR	12.9	Spike	P	0 - 30
2357444	Microcystin WR	13.2	Spike	P	0 - 30
2357444	Microcystin YR	10.4	Spike	P	0 - 30
2357444	Nodularin-R	9.79	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P419828

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2357444	Anatoxin-a	1.32	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2357525

Field Sample ID: HABCE0137_LakeMariam2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	80.1	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	55.0	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A114827

Included Lab Sample IDs: 2357527

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	97.2	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A114870

Included Lab Sample IDs: 2357525

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	93.8	97.1	P/P	50 - 160
Desmethyl microcystin LR	94.9	94.9	P/P	50 - 160
Microcystin HtR	96.8	102	P/P	50 - 160
Microcystin HtyR	99.5	96.1	P/P	50 - 160
Microcystin LA	95.9	91.7	P/P	50 - 160
Microcystin LF	75.6	93.4	P/P	50 - 160
Microcystin LR	90.9	93.2	P/P	50 - 160
Microcystin LW	94.5	77.6	P/P	50 - 160
Microcystin LY	99.8	89.1	P/P	50 - 160
Microcystin RR	100	90.2	P/P	50 - 160
Microcystin WR	99.1	103	P/P	50 - 160
Microcystin YR	93.1	95.2	P/P	50 - 160
Nodularin-R	94.9	88.7	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A114901

Included Lab Sample IDs: 2357525

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	95.9	99.8	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A114913

Included Lab Sample IDs: 2357526

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A114957

Included Lab Sample IDs: 2357526

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A114974

Included Lab Sample IDs: 2357526

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	109	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A114997

Included Lab Sample IDs: 2357526

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	100	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	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	96.8	99.8	99.2			0.551
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105					3.12
EPA 353.2 Rev. 2.0	NO2NO3-N	103	103	105			1.32
EPA 365.1 Rev. 2.0	Total-P	100	101	102			0.732
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	98.3	98.1			0.204
EPA 8321B	Anatoxin-a	90.7	91.1	89.9			1.32
	Cylindrospermopsin	87.4	79.3	88.2			10.6
	Desmethyl microcystin LR	90.6	95.1	108			12.7
	Microcystin HiLR	90.0	92.4	110			17.3
	Microcystin HtyR	87.5	92.8	103			10.9
	Microcystin LA	83.1	82.4	90.4			9.24
	Microcystin LF	62.2	67.1	75.9			12.3
	Microcystin LR	86.6	93.1	105			10.7
	Microcystin LW	93.1	92.0	103			11.2
	Microcystin LY	83.0	83.5	92.1			9.85
	Microcystin RR	86.3	82.7	94.2			12.9
	Microcystin WR	89.6	92.7	106			13.2
	Microcystin YR	87.8	97.1	108			10.4
	Nodularin-R	84.4	98.1	108			9.79

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2357526
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2357526
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2357526
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2357526
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2357527
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2357525
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2357525

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	09/20/2022			09/28/2022 13:18	Ping Hua	2357526
EPA 351.2 Rev. 2.0	09/20/2022	09/26/2022 13:48	Alexandra J Mattheus	09/27/2022 12:11	Alexandra J Mattheus	2357526
EPA 353.2 Rev. 2.0	09/20/2022			09/27/2022 10:56	Judith K. Clark	2357526
EPA 365.1 Rev. 2.0	09/20/2022	09/22/2022 14:19	Adam P Silver	09/22/2022 18:51	Simonne.V. Calhoun	2357526
EPA 365.1 Rev. 2.0 dissolved	09/20/2022			09/20/2022 14:23	Elise M. Gillis	2357527
EPA 8321B	09/20/2022	09/21/2022 10:00	Manjita Shrestha	09/21/2022 14:29	Manjita Shrestha	2357525
	09/20/2022	09/21/2022 13:00	Manjita Shrestha	09/22/2022 15:47	Manjita Shrestha	2357525