

Chemical Analysis Report

WQAP-2022-11-22-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-10-03-59**
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

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: 09-DEC-2022 11:29

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 Pickett - SE Corner

Collection Date/Time: 11/21/2022 11:02

Field ID: HABCE0150_LakePickett

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2371195	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P422768	
		Cylindrospermopsin	0.10	U	ug/L	P422767	
		Desmethyl microcystin LR	0.25	U	ug/L	P422767	
		Microcystin HILR	0.25	U	ug/L	P422767	
		Microcystin HtyR	0.25	U	ug/L	P422767	
		Microcystin LA	0.10	U	ug/L	P422767	
		Microcystin LF	0.10	U	ug/L	P422767	
		Microcystin LR	0.25	U	ug/L	P422767	
		Microcystin LW	0.25	U	ug/L	P422767	
		Microcystin LY	0.10	U	ug/L	P422767	
		Microcystin RR	0.10	U	ug/L	P422767	
		Microcystin WR	0.50	U	ug/L	P422767	
		Neosaxitoxin	0.50	U	ug/L	P422768	
		Microcystin YR	0.25	U	ug/L	P422767	
		Saxitoxin	0.50	U	ug/L	P422768	
		Nodularin-R	0.10	U	ug/L	P422767	
2371196	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P423240	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.49		mg N/L	P422898	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.018		mg N/L	P422801	
	EPA 365.1 Rev. 2.0	Total-P	0.014		mg P/L	P422851	
2371197	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P422733	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423240

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422898

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422801

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422851

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422733

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

Reference Method: EPA 8321B
Batch ID: P422767

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1LR	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: P422768

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423240

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422898

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.4		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422801

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422851

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: P422733

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

Reference Method: EPA 8321B
Batch ID: P422767

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	100		P	40 - 150
Desmethyl microcystin LR	93.1		P	40 - 150
Microcystin H1R	98.8		P	40 - 150
Microcystin HtyR	94.3		P	40 - 150
Microcystin LA	103		P	40 - 150
Microcystin LF	95.3		P	40 - 150
Microcystin LR	95.9		P	40 - 150
Microcystin LW	107		P	40 - 150
Microcystin LY	104		P	40 - 150
Microcystin RR	99.9		P	40 - 150
Microcystin WR	88.1		P	40 - 150
Microcystin YR	90.9		P	40 - 150
Nodularin-R	99.5		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P422768

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	93.0		P	40 - 150
Neosaxitoxin	95.9		P	40 - 150
Saxitoxin	74.8		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423240

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371160	Ammonia-N	98.0	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422898

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371175	Kjeldahl Nitrogen	101	95.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422801

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371196	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422851

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371196	Total-P	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422733

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371163	O-Phosphate-P	102	101	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P422767

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371195	Cylindrospermopsin	98.0	98.7	P/P	40 - 150
2371195	Desmethyl microcystin LR	95.7	97.1	P/P	40 - 150
2371195	Microcystin HiLR	96.2	103	P/P	40 - 150
2371195	Microcystin HtyR	90.8	95.1	P/P	40 - 150
2371195	Microcystin LA	93.0	106	P/P	40 - 150
2371195	Microcystin LF	85.3	115	P/P	40 - 150
2371195	Microcystin LR	91.3	95.3	P/P	40 - 150
2371195	Microcystin LW	106	113	P/P	40 - 150
2371195	Microcystin LY	92.8	98.1	P/P	40 - 150
2371195	Microcystin RR	91.8	97.0	P/P	40 - 150
2371195	Microcystin WR	88.5	88.7	P/P	40 - 150
2371195	Microcystin YR	85.6	94.4	P/P	40 - 150
2371195	Nodularin-R	90.9	95.8	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P422768

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2371195	Anatoxin-a	102	102	P/P	40 - 150
2371195	Neosaxitoxin	82.4	80.9	P/P	40 - 150
2371195	Saxitoxin	68.8	69.6	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P423240

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371160	Ammonia-N	0.227	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P422898

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371175	Kjeldahl Nitrogen	3.61	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P422801

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371196	NO2NO3-N	0.447	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P422851

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371196	Total-P	0.760	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P422733

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371163	O-Phosphate-P	1.38	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P422767

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371195	Cylindrospermopsin	0.654	Spike	P	0 - 30
2371195	Desmethyl microcystin LR	1.37	Spike	P	0 - 30
2371195	Microcystin H1LR	6.68	Spike	P	0 - 30
2371195	Microcystin HtyR	4.59	Spike	P	0 - 30
2371195	Microcystin LA	13.4	Spike	P	0 - 30
2371195	Microcystin LF	29.9	Spike	P	0 - 30
2371195	Microcystin LR	4.23	Spike	P	0 - 30
2371195	Microcystin LW	6.15	Spike	P	0 - 30
2371195	Microcystin LY	5.46	Spike	P	0 - 30
2371195	Microcystin RR	5.52	Spike	P	0 - 30
2371195	Microcystin WR	0.223	Spike	P	0 - 30
2371195	Microcystin YR	9.74	Spike	P	0 - 30
2371195	Nodularin-R	5.16	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P422768

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2371195	Anatoxin-a	0.592	Spike	P	0 - 30
2371195	Neosaxitoxin	1.87	Spike	P	0 - 30
2371195	Saxitoxin	1.09	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2371195

Field Sample ID: HABCE0150_LakePickett

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	80.0	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	81.1	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A116107

Included Lab Sample IDs: 2371197

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A116148

Included Lab Sample IDs: 2371196

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A116192

Included Lab Sample IDs: 2371196

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A116206

Included Lab Sample IDs: 2371196

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.4	99.2	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A116213

Included Lab Sample IDs: 2371195

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	93.8	105	P/P	50 - 160
Desmethyl microcystin LR	93.1	96.4	P/P	50 - 160
Microcystin HILR	93.1	98.8	P/P	50 - 160
Microcystin HtyR	89.9	94.8	P/P	50 - 160
Microcystin LA	102	96.3	P/P	50 - 160
Microcystin LF	96.4	128	P/P	50 - 160
Microcystin LR	85.9	94.3	P/P	50 - 160
Microcystin LW	115	112	P/P	50 - 160
Microcystin LY	102	111	P/P	50 - 160
Microcystin RR	92.0	97.7	P/P	50 - 160
Microcystin WR	82.4	91.7	P/P	50 - 160
Microcystin YR	85.3	88.3	P/P	50 - 160
Nodularin-R	91.1	93.2	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A116215

Included Lab Sample IDs: 2371195

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	102	94.1	P/P	50 - 160
Neosaxitoxin	108	96.6	P/P	50 - 160
Saxitoxin	79.6	75.5	P/P	50 - 160

Quality Assurance Report

Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A116310

Included Lab Sample IDs: 2371196

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	99.2	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	97.6	98.0	98.4			0.227
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.4	101	95.0			3.61
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	103	102			0.447
EPA 365.1 Rev. 2.0	Total-P	104	105	104			0.760
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	102	101			1.38
EPA 8321B	Anatoxin-a	93.0	102	102			0.592
	Cylindrospermopsin	100	98.0	98.7			0.654
	Desmethyl microcystin LR	93.1	95.7	97.1			1.37
	Microcystin HiLR	98.8	96.2	103			6.68
	Microcystin HtyR	94.3	90.8	95.1			4.59
	Microcystin LA	103	93.0	106			13.4
	Microcystin LF	95.3	85.3	115			29.9
	Microcystin LR	95.9	91.3	95.3			4.23
	Microcystin LW	107	106	113			6.15
	Microcystin LY	104	92.8	98.1			5.46
	Microcystin RR	99.9	91.8	97.0			5.52
	Microcystin WR	88.1	88.5	88.7			0.223
	Microcystin YR	90.9	85.6	94.4			9.74
	Neosaxitoxin	95.9	82.4	80.9			1.87
	Nodularin-R	99.5	90.9	95.8			5.16
	Saxitoxin	74.8	68.8	69.6			1.09

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2371196
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2371196
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2371196
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2371196
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2371197
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2371195
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2371195

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	11/22/2022			12/07/2022 14:29	Ping Hua	2371196
EPA 351.2 Rev. 2.0	11/22/2022	11/30/2022 11:45	Simonne.V. Calhoun	12/01/2022 11:05	Judith K. Clark	2371196
EPA 353.2 Rev. 2.0	11/22/2022			11/28/2022 11:25	Beverly Y. Sanders	2371196
EPA 365.1 Rev. 2.0	11/22/2022	11/29/2022 14:43	Adam P Silver	11/30/2022 11:51	James L Waggeberby	2371196
EPA 365.1 Rev. 2.0 dissolved	11/22/2022			11/22/2022 14:10	Elise M. Gillis	2371197
EPA 8321B	11/22/2022	11/28/2022 09:00	Umesh Chiluwal	12/01/2022 10:03	Umesh Chiluwal	2371195
	11/22/2022	11/28/2022 09:00	Umesh Chiluwal	12/01/2022 16:35	Umesh Chiluwal	2371195