

Chemical Analysis Report

WQAP-2022-05-05-01

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

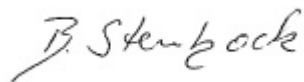
Event Description: **Algal Bloom Response- NEROC**
Request ID: **RQ-2022-04-11-48**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Jacksonville, FL 32256
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Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 16-MAY-2022 11:23



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: Orange Lake - McIntosh Bay

Collection Date/Time: 05/04/2022 11:40

Field ID: NEHAB0065

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2324905	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P413340	
		Cylindrospermopsin	0.50	U	ug/L	P413393	
		Desmethyl microcystin LR	1.2	U	ug/L	P413393	
		Microcystin HIR**	1.2	U	ug/L	P413393	
		Microcystin HtyR**	1.2	U	ug/L	P413393	
		Microcystin LA	0.85	I	ug/L	P413393	
		Microcystin LF	0.50	U	ug/L	P413393	
		Microcystin LR	1.2	U	ug/L	P413393	
		Microcystin LW	1.2	U	ug/L	P413393	
		Microcystin LY	0.50	U	ug/L	P413393	
		Microcystin RR	0.50	U	ug/L	P413393	
		Microcystin WR	2.5	U	ug/L	P413393	
		Neosaxitoxin**	0.50	U	ug/L	P413340	
		Microcystin YR	1.2	U	ug/L	P413393	
		Saxitoxin	0.50	U	ug/L	P413340	
		Nodularin-R**	0.50	U	ug/L	P413393	
2324913	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P413429	

Ref. Method and Comment:

EPA 8321B: MDL elevated due to matrix interference.

Sample Location: 183rd ave Canal off Cross Creek

Collection Date/Time: 05/04/2022 12:55

Field ID: NEHAB0076

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2324908	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P413340	
		Cylindrospermopsin	0.10	U	ug/L	P413393	
		Desmethyl microcystin LR	0.25	U	ug/L	P413393	
		Microcystin HIR**	0.25	U	ug/L	P413393	
		Microcystin HtyR**	0.25	U	ug/L	P413393	
		Microcystin LA	0.24	I	ug/L	P413393	
		Microcystin LF	0.10	U	ug/L	P413393	
		Microcystin LR	1.7		ug/L	P413393	
		Microcystin LW	0.25	U	ug/L	P413393	
		Microcystin LY	0.10	U	ug/L	P413393	
		Microcystin RR	0.14	I	ug/L	P413393	
		Microcystin WR	0.50	U	ug/L	P413393	
		Neosaxitoxin**	0.50	U	ug/L	P413340	
		Microcystin YR	0.25	U	ug/L	P413393	
		Saxitoxin	0.50	U	ug/L	P413340	
		Nodularin-R**	0.10	U	ug/L	P413393	
2324916	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.060		mg P/L	P413429	

Sample Location: Lake Wauberg

Collection Date/Time: 05/04/2022 15:05

Field ID: NEHAB0072

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2324906	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P413340	
		Cylindrospermopsin	0.10	U	ug/L	P413393	
		Desmethyl microcystin LR	0.25	U	ug/L	P413393	
		Microcystin HILR**	0.25	U	ug/L	P413393	
		Microcystin HtyR**	0.25	U	ug/L	P413393	
		Microcystin LA	0.94		ug/L	P413393	
		Microcystin LF	0.10	U	ug/L	P413393	
		Microcystin LR	0.57	I	ug/L	P413393	
		Microcystin LW	0.25	U	ug/L	P413393	
		Microcystin LY	0.10	U	ug/L	P413393	
		Microcystin RR	0.10	U	ug/L	P413393	
		Microcystin WR	0.50	U	ug/L	P413393	
		Neosaxitoxin**	0.50	U	ug/L	P413340	
		Microcystin YR	0.25	U	ug/L	P413393	
		Saxitoxin	0.50	U	ug/L	P413340	
		Nodularin-R**	0.10	U	ug/L	P413393	
2324914	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.081		mg P/L	P413429	

Sample Location: Orange Lake HAB Center

Collection Date/Time: 05/04/2022 12:10

Field ID: NEHAB0075

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2324907	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P413340	
		Cylindrospermopsin	0.10	U	ug/L	P413393	
		Desmethyl microcystin LR	0.25	U	ug/L	P413393	
		Microcystin HILR**	0.25	U	ug/L	P413393	
		Microcystin HtyR**	0.25	U	ug/L	P413393	
		Microcystin LA	0.28	I	ug/L	P413393	
		Microcystin LF	0.20	I	ug/L	P413393	
		Microcystin LR	0.41	I	ug/L	P413393	
		Microcystin LW	0.25	U	ug/L	P413393	
		Microcystin LY	0.10	U	ug/L	P413393	
		Microcystin RR	0.10	U	ug/L	P413393	
		Microcystin WR	0.50	U	ug/L	P413393	
		Neosaxitoxin**	0.50	U	ug/L	P413340	
		Microcystin YR	0.25	U	ug/L	P413393	
		Saxitoxin	0.50	U	ug/L	P413340	
		Nodularin-R**	0.10	U	ug/L	P413393	
2324915	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P413429	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P413429

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

Reference Method: EPA 8321B
Batch ID: P413340

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

Reference Method: EPA 8321B
Batch ID: P413393

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1R	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 365.1 Rev. 2.0 dissolved
Batch ID: P413429

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.7		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P413340

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	104		P	40 - 150
Neosaxitoxin	104		P	40 - 150
Saxitoxin	81.0		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P413393

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	91.3		P	40 - 150
Desmethyl microcystin LR	82.8		P	40 - 150
Microcystin H1R	81.5		P	40 - 150
Microcystin HtyR	84.0		P	40 - 150
Microcystin LA	83.9		P	40 - 150
Microcystin LF	56.7		P	40 - 150
Microcystin LR	76.2		P	40 - 150
Microcystin LW	99.3		P	40 - 150
Microcystin LY	90.1		P	40 - 150
Microcystin RR	88.1		P	40 - 150
Microcystin WR	83.3		P	40 - 150
Microcystin YR	67.5		P	40 - 150
Nodularin-R	81.4		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P413429

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324749	O-Phosphate-P	97.2	98.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P413340

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2323105	Anatoxin-a	105	109	P/P	40 - 150
2323105	Neosaxitoxin	48.8	48.2	P/P	40 - 150
2323105	Saxitoxin	49.3	50.9	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P413393

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2324833	Cylindrospermopsin	100	100	P/P	40 - 150
2324833	Desmethyl microcystin LR	86.6	92.3	P/P	40 - 150
2324833	Microcystin HilR	86.5	93.2	P/P	40 - 150
2324833	Microcystin HtyR	91.2	93.1	P/P	40 - 150
2324833	Microcystin LA	82.7	102	P/P	40 - 150
2324833	Microcystin LF	65.6	63.4	P/P	40 - 150
2324833	Microcystin LR	85.5	91.6	P/P	40 - 150
2324833	Microcystin LW	91.3	94.7	P/P	40 - 150
2324833	Microcystin LY	81.6	80.6	P/P	40 - 150
2324833	Microcystin RR	93.6	94.4	P/P	40 - 150
2324833	Microcystin WR	80.4	87.3	P/P	40 - 150
2324833	Microcystin YR	82.8	83.2	P/P	40 - 150
2324833	Nodularin-R	88.8	89.8	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P413429

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324749	O-Phosphate-P	0.762	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P413340

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2323105	Anatoxin-a	3.98	Spike	P	0 - 30
2323105	Neosaxitoxin	1.24	Spike	P	0 - 30
2323105	Saxitoxin	3.12	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P413393

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2324833	Cylindrospermopsin	0.314	Spike	P	0 - 30
2324833	Desmethyl microcystin LR	6.30	Spike	P	0 - 30
2324833	Microcystin H1LR	7.41	Spike	P	0 - 30
2324833	Microcystin HtyR	2.10	Spike	P	0 - 30
2324833	Microcystin LA	20.9	Spike	P	0 - 30
2324833	Microcystin LF	3.42	Spike	P	0 - 30
2324833	Microcystin LR	6.93	Spike	P	0 - 30
2324833	Microcystin LW	3.66	Spike	P	0 - 30
2324833	Microcystin LY	1.20	Spike	P	0 - 30
2324833	Microcystin RR	0.843	Spike	P	0 - 30
2324833	Microcystin WR	8.26	Spike	P	0 - 30
2324833	Microcystin YR	0.409	Spike	P	0 - 30
2324833	Nodularin-R	1.06	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2324905
Field Sample ID: NEHAB0065

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	77.3	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	77.7	P	30 - 160

Lab Sample ID: 2324906
Field Sample ID: NEHAB0072

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	92.6	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	84.0	P	30 - 160

Lab Sample ID: 2324907
Field Sample ID: NEHAB0075

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	80.0	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	72.7	P	30 - 160

Lab Sample ID: 2324908
Field Sample ID: NEHAB0076

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	89.1	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	71.6	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A111942

Included Lab Sample IDs: 2324913, 2324914, 2324915, 2324916

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	99.9	P/P	90 - 110
O-Phosphate-P	99.7	100	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A111946

Included Lab Sample IDs: 2324905, 2324906, 2324907, 2324908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	94.4	94.5	P/P	50 - 160
Cylindrospermopsin	98.2	95.2	P/P	50 - 160
Desmethyl microcystin LR	72.8	77.1	P/P	50 - 160
Desmethyl microcystin LR	76.8	79.1	P/P	50 - 160
Microcystin H1R	75.8	79.5	P/P	50 - 160
Microcystin H1R	76.1	71.5	P/P	50 - 160
Microcystin HtyR	85.4	80.2	P/P	50 - 160
Microcystin HtyR	86.9	89.6	P/P	50 - 160
Microcystin LA	75.3	73.8	P/P	50 - 160
Microcystin LA	100	79.9	P/P	50 - 160
Microcystin LF	52.4	50.4	P/P	50 - 160
Microcystin LF	75.2	51.5	P/P	50 - 160
Microcystin LR	78.2	75.6	P/P	50 - 160
Microcystin LR	81.5	82.6	P/P	50 - 160
Microcystin LW	72.8	71.9	P/P	50 - 160
Microcystin LW	81.8	58.7	P/P	50 - 160
Microcystin LY	65.6	84.2	P/P	50 - 160
Microcystin LY	80.0	65.7	P/P	50 - 160
Microcystin RR	84.3	88.5	P/P	50 - 160
Microcystin RR	86.9	93.1	P/P	50 - 160
Microcystin WR	73.8	82.2	P/P	50 - 160
Microcystin WR	76.1	71.7	P/P	50 - 160
Microcystin YR	72.1	67.3	P/P	50 - 160
Microcystin YR	74.6	71.7	P/P	50 - 160
Nodularin-R	78.3	80.2	P/P	50 - 160
Nodularin-R	79.9	77.0	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A111977

Included Lab Sample IDs: 2324905, 2324906, 2324907, 2324908

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	104	93.6	P/P	50 - 160
Neosaxitoxin	101	87.6	P/P	50 - 160
Saxitoxin	98.7	88.8	P/P	50 - 160

* 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 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	97.2	98.2			0.762
EPA 8321B	Anatoxin-a	104	105	109			3.98
	Cylindrospermopsin	91.3	100	100			0.314
	Desmethyl microcystin LR	82.8	86.6	92.3			6.30
	Microcystin HlIR	81.5	86.5	93.2			7.41
	Microcystin HtyR	84.0	91.2	93.1			2.10
	Microcystin LA	83.9	82.7	102			20.9
	Microcystin LF	56.7	65.6	63.4			3.42
	Microcystin LR	76.2	85.5	91.6			6.93
	Microcystin LW	99.3	91.3	94.7			3.66
	Microcystin LY	90.1	81.6	80.6			1.20
	Microcystin RR	88.1	93.6	94.4			0.843
	Microcystin WR	83.3	80.4	87.3			8.26
	Microcystin YR	67.5	82.8	83.2			0.409
	Neosaxitoxin	104	48.8	48.2			1.24
	Nodularin-R	81.4	88.8	89.8			1.06
	Saxitoxin	81.0	49.3	50.9			3.12

Reference Method Descriptions

Method	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2324913, 2324914, 2324915, 2324916
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2324905, 2324906, 2324907, 2324908
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2324905, 2324906, 2324907, 2324908

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 365.1 Rev. 2.0 dissolved	05/05/2022			05/05/2022 15:43	Nathaniel J Jones	2324913, 2324914
	05/05/2022			05/05/2022 15:44	Nathaniel J Jones	2324915
	05/05/2022			05/05/2022 15:49	Nathaniel J Jones	2324916
EPA 8321B	05/05/2022	05/05/2022 11:15	Manjita Shrestha	05/06/2022 21:10	Manjita Shrestha	2324905
	05/05/2022	05/05/2022 11:15	Manjita Shrestha	05/06/2022 21:24	Manjita Shrestha	2324906
	05/05/2022	05/05/2022 11:15	Manjita Shrestha	05/06/2022 21:38	Manjita Shrestha	2324907
	05/05/2022	05/05/2022 11:15	Manjita Shrestha	05/06/2022 21:52	Manjita Shrestha	2324908
	05/05/2022	05/05/2022 15:00	Manjita Shrestha	05/05/2022 23:13	Manjita Shrestha	2324906
	05/05/2022	05/05/2022 15:00	Manjita Shrestha	05/05/2022 23:30	Manjita Shrestha	2324907
	05/05/2022	05/05/2022 15:00	Manjita Shrestha	05/05/2022 23:47	Manjita Shrestha	2324908
	05/05/2022	05/05/2022 15:00	Manjita Shrestha	05/06/2022 15:50	Manjita Shrestha	2324905