

Chemical Analysis Report

WQAP-2022-08-30-03

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

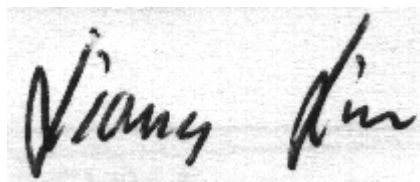
Event Description: **Algal Bloom Response- Alachua Co. for NEROC**
Request ID: **RQ-2022-07-25-53**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
8800 Baymeadows Way West
Jacksonville, FL 32256
Attn: Jeremy Parrish

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 15-SEP-2022 15:59

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: Bivens arm @ SR 441 outflow

Collection Date/Time: 08/29/2022 12:45

Field ID: Biven's Arm

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2353043	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P418835	
		Cylindrospermopsin	0.10	U	ug/L	P418834	
		Desmethyl microcystin LR	0.25	U	ug/L	P418834	
		Microcystin HILR	0.25	U	ug/L	P418834	
		Microcystin HtyR	0.25	U	ug/L	P418834	
		Microcystin LA	0.10	U	ug/L	P418834	
		Microcystin LF	0.10	U	ug/L	P418834	
		Microcystin LR	0.25	U	ug/L	P418834	
		Microcystin LW	0.25	U	ug/L	P418834	
		Microcystin LY	0.10	U	ug/L	P418834	
		Microcystin RR	0.10	U	ug/L	P418834	
		Microcystin WR	0.50	U	ug/L	P418834	
		Microcystin YR	0.25	U	ug/L	P418834	
		Nodularin-R	0.10	U	ug/L	P418834	
2353044	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P419004	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.6		mg N/L	P418962	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P419058	
	EPA 365.1 Rev. 2.0	Total-P	0.22		mg P/L	P418987	
2353045	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P418883	

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: P419004

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418962

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419058

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418987

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418883

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

Reference Method: EPA 8321B
Batch ID: P418834

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: P418835

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: P419004

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418962

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419058

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: P418987

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418883

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

Reference Method: EPA 8321B
Batch ID: P418834

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	95.9		P	40 - 150
Desmethyl microcystin LR	90.6		P	40 - 150
Microcystin HILR	99.0		P	40 - 150
Microcystin HtyR	95.6		P	40 - 150
Microcystin LA	76.1		P	40 - 150
Microcystin LF	68.7		P	40 - 150
Microcystin LR	99.1		P	40 - 150
Microcystin LW	86.2		P	40 - 150
Microcystin LY	67.6		P	40 - 150
Microcystin RR	125		P	40 - 150
Microcystin WR	99.3		P	40 - 150
Microcystin YR	90.9		P	40 - 150
Nodularin-R	109		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P418835

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	92.9		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P419004

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353076	Ammonia-N	99.8	107	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P419058

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353062	NO2NO3-N	98.8	99.2	P/P	90 - 110
2353062	NO2NO3-N	99.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418987

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353064	Total-P	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418883

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2353077	O-Phosphate-P	102	98.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P418834

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352945	Cylindrospermopsin	97.3	98.2	P/P	40 - 150
2352945	Desmethyl microcystin LR	111	111	P/P	40 - 150
2352945	Microcystin HilR	115	116	P/P	40 - 150
2352945	Microcystin HtyR	107	115	P/P	40 - 150
2352945	Microcystin LA	88.1	83.5	P/P	40 - 150
2352945	Microcystin LF	68.8	72.3	P/P	40 - 150
2352945	Microcystin LR	120	125	P/P	40 - 150
2352945	Microcystin LW	72.1	63.5	P/P	40 - 150
2352945	Microcystin LY	75.1	67.3	P/P	40 - 150
2352945	Microcystin RR	136	139	P/P	40 - 150
2352945	Microcystin WR	101	111	P/P	40 - 150
2352945	Microcystin YR	118	119	P/P	40 - 150
2352945	Nodularin-R	142	150	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P418835

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352945	Anatoxin-a	71.5	72.3	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P419004

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353076	Ammonia-N	6.33	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P418962

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352954	Kjeldahl Nitrogen	2.67	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P419058

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353062	NO2NO3-N	0.467	Spike	P	0 - 15

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P418987

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353064	Total-P	0.0154	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P418883

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2353077	O-Phosphate-P	3.09	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P418834

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352945	Cylindrospermopsin	0.934	Spike	P	0 - 30
2352945	Desmethyl microcystin LR	0.0426	Spike	P	0 - 30
2352945	Microcystin HiLR	0.701	Spike	P	0 - 30
2352945	Microcystin HtyR	7.01	Spike	P	0 - 30
2352945	Microcystin LA	5.39	Spike	P	0 - 30
2352945	Microcystin LF	4.99	Spike	P	0 - 30
2352945	Microcystin LR	4.03	Spike	P	0 - 30
2352945	Microcystin LW	12.8	Spike	P	0 - 30
2352945	Microcystin LY	10.9	Spike	P	0 - 30
2352945	Microcystin RR	2.15	Spike	P	0 - 30
2352945	Microcystin WR	9.52	Spike	P	0 - 30
2352945	Microcystin YR	1.29	Spike	P	0 - 30
2352945	Nodularin-R	5.57	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P418835

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352945	Anatoxin-a	1.11	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2353043
Field Sample ID: Biven's Arm

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	135	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	52.2	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A114436

Included Lab Sample IDs: 2353045

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	99.3	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A114467

Included Lab Sample IDs: 2353043

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	93.9	108	P/P	50 - 160
Desmethyl microcystin LR	93.0	98.5	P/P	50 - 160
Microcystin HtR	101	106	P/P	50 - 160
Microcystin HtyR	103	99.6	P/P	50 - 160
Microcystin LA	79.4	81.7	P/P	50 - 160
Microcystin LF	72.6	74.5	P/P	50 - 160
Microcystin LR	105	101	P/P	50 - 160
Microcystin LW	92.1	89.7	P/P	50 - 160
Microcystin LY	75.3	75.7	P/P	50 - 160
Microcystin RR	126	148	P/P	50 - 160
Microcystin WR	99.4	98.8	P/P	50 - 160
Microcystin YR	102	97.0	P/P	50 - 160
Nodularin-R	116	130	P/P	50 - 160

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A114487

Included Lab Sample IDs: 2353044

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.9	99.1	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A114502

Included Lab Sample IDs: 2353043

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	71.2	78.8	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A114512

Included Lab Sample IDs: 2353044

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A114514

Included Lab Sample IDs: 2353044

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

Quality Assurance Report

Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A114561

Included Lab Sample IDs: 2353044

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.5	106	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 SMP	MS
			LCS				
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	99.8	107			6.33
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.5					2.67
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	103	98.8	99.8	99.2		0.467 RSD
EPA 365.1 Rev. 2.0	Total-P	106	104	104			0.0154
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	102	98.8			3.09
EPA 8321B	Anatoxin-a	92.9	71.5	72.3			1.11
	Cylindrospermopsin	95.9	97.3	98.2			0.934
	Desmethyl microcystin LR	90.6	111	111			0.0426
	Microcystin HiLR	99.0	115	116			0.701
	Microcystin HtyR	95.6	107	115			7.01
	Microcystin LA	76.1	88.1	83.5			5.39
	Microcystin LF	68.7	68.8	72.3			4.99
	Microcystin LR	99.1	120	125			4.03
	Microcystin LW	86.2	72.1	63.5			12.8
	Microcystin LY	67.6	75.1	67.3			10.9
	Microcystin RR	125	136	139			2.15
	Microcystin WR	99.3	101	111			9.52
	Microcystin YR	90.9	118	119			1.29
	Nodularin-R	109	142	150			5.57

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2353044
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2353044
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2353044
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2353044
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2353045
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2353043
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2353043

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	08/30/2022			09/01/2022 13:06	Ping Hua	2353044
EPA 351.2 Rev. 2.0	08/30/2022	09/02/2022 08:53	Samantha L Bates	09/06/2022 14:29	Samantha L Bates	2353044
EPA 353.2 Rev. 2.0	08/30/2022			09/02/2022 10:45	Beverly Y. Sanders	2353044
EPA 365.1 Rev. 2.0	08/30/2022	09/01/2022 15:55	Simonne.V. Calhoun	09/02/2022 11:21	Simonne.V. Calhoun	2353044
EPA 365.1 Rev. 2.0 dissolved	08/30/2022			08/30/2022 15:14	Elise M. Gillis	2353045
EPA 8321B	08/30/2022	08/31/2022 09:15	Manjita Shrestha	08/31/2022 13:48	Manjita Shrestha	2353043
	08/30/2022	08/31/2022 13:00	Manjita Shrestha	09/01/2022 23:51	Manjita Shrestha	2353043