Chemical Analysis Report

WQAP-2023-03-17-01

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

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2023-01-09-47**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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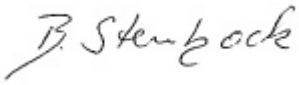
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 30-MAR-2023 14:53



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 Marian - Boat Ramp **Collection Date/Time: 03/16/2023 10:15**

Field ID: SEHAB0089 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2394635	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P427330	
		Cylindrospermopsin	0.10	U	ug/L	P427325	
		Desmethyl microcystin LR	0.25	U	ug/L	P427325	
		Microcystin HilR	0.25	U	ug/L	P427325	
		Microcystin HtyR	0.25	U	ug/L	P427325	
		Microcystin LA	0.49		ug/L	P427325	
		Microcystin LF	0.12	I	ug/L	P427325	
		Microcystin LR	1.2		ug/L	P427325	
		Microcystin LW	0.25	U	ug/L	P427325	
		Microcystin LY	0.46		ug/L	P427325	
		Microcystin RR	0.25	I	ug/L	P427325	
		Microcystin WR	0.50	U	ug/L	P427325	
		Neosaxitoxin	0.50	U	ug/L	P427330	
		Microcystin YR	0.25	U	ug/L	P427325	
		Saxitoxin	0.50	U	ug/L	P427330	
		Nodularin-R	0.10	U	ug/L	P427325	
2394636	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P427498	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.1		mg N/L	P427465	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P427467	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P427337	
2394637	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.008	I	mg P/L	P427312	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427498

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427465

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427467

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427337

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427312

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

Reference Method: EPA 8321B
Batch ID: P427325

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: P427330

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: P427498

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427465

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	102		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427467

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427337

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427312

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

Reference Method: EPA 8321B
Batch ID: P427325

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	94.4		P	40 - 150
Desmethyl microcystin LR	96.0		P	40 - 150
Microcystin HilR	101		P	40 - 150
Microcystin HtyR	95.9		P	40 - 150
Microcystin LA	106		P	40 - 150
Microcystin LF	99.3		P	40 - 150
Microcystin LR	106		P	40 - 150
Microcystin LW	104		P	40 - 150
Microcystin LY	97.1		P	40 - 150
Microcystin RR	103		P	40 - 150
Microcystin WR	102		P	40 - 150
Microcystin YR	101		P	40 - 150
Nodularin-R	101		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P427330

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	83.3		P	40 - 150
Neosaxitoxin	116		P	40 - 150
Saxitoxin	84.7		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427498

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394559	Ammonia-N	98.2	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394642	Kjeldahl Nitrogen	97.6	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427467

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394557	NO2NO3-N	98.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427337

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394665	Total-P	107	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394637	O-Phosphate-P	99.3	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P427325

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394630	Cylindrospermopsin	99.5	103	P/P	40 - 150
2394630	Desmethyl microcystin LR	105	102	P/P	40 - 150
2394630	Microcystin HilR	107	112	P/P	40 - 150
2394630	Microcystin HtyR	103	105	P/P	40 - 150
2394630	Microcystin LA	97.3	97.1	P/P	40 - 150
2394630	Microcystin LF	103	79.5	P/P	40 - 150
2394630	Microcystin LR	107	111	P/P	40 - 150
2394630	Microcystin LW	99.7	97.8	P/P	40 - 150
2394630	Microcystin LY	106	99.5	P/P	40 - 150
2394630	Microcystin RR	109	107	P/P	40 - 150
2394630	Microcystin WR	97.4	114	P/P	40 - 150
2394630	Microcystin YR	105	103	P/P	40 - 150
2394630	Nodularin-R	105	106	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P427330

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2394630	Anatoxin-a	76.0	73.7	P/P	40 - 150
2394630	Neosaxitoxin	86.5	85.3	P/P	40 - 150
2394630	Saxitoxin	67.0	68.5	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427498

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394559	Ammonia-N	0.408	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427465

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394642	Kjeldahl Nitrogen	5.17	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427467

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394557	NO2NO3-N	0.266	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427337

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394665	Total-P	0.453	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394637	O-Phosphate-P	0.187	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P427325

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394630	Cylindrospermopsin	3.62	Spike	P	0 - 30
2394630	Desmethyl microcystin LR	2.75	Spike	P	0 - 30
2394630	Microcystin HilR	4.82	Spike	P	0 - 30
2394630	Microcystin HtyR	1.73	Spike	P	0 - 30
2394630	Microcystin LA	0.159	Spike	P	0 - 30
2394630	Microcystin LF	25.9	Spike	P	0 - 30
2394630	Microcystin LR	3.99	Spike	P	0 - 30
2394630	Microcystin LW	1.89	Spike	P	0 - 30
2394630	Microcystin LY	6.74	Spike	P	0 - 30
2394630	Microcystin RR	1.16	Spike	P	0 - 30
2394630	Microcystin WR	15.5	Spike	P	0 - 30
2394630	Microcystin YR	1.92	Spike	P	0 - 30
2394630	Nodularin-R	0.951	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P427330

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2394630	Anatoxin-a	3.08	Spike	P	0 - 30
2394630	Neosaxitoxin	1.31	Spike	P	0 - 30
2394630	Saxitoxin	2.18	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2394635
Field Sample ID: SEHAB0089

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	75.4	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	82.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A118061
Included Lab Sample IDs: 2394637

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	98.0	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A118087
Included Lab Sample IDs: 2394635

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	92.7	95.2	P/P	50 - 160
Desmethyl microcystin LR	93.5	96.8	P/P	50 - 160
Microcystin HilR	102	92.4	P/P	50 - 160
Microcystin HtyR	96.2	95.8	P/P	50 - 160
Microcystin LA	111	94.4	P/P	50 - 160
Microcystin LF	85.6	83.8	P/P	50 - 160
Microcystin LR	96.5	99.8	P/P	50 - 160
Microcystin LW	83.9	94.4	P/P	50 - 160
Microcystin LY	89.3	98.3	P/P	50 - 160
Microcystin RR	102	105	P/P	50 - 160
Microcystin WR	89.2	91.9	P/P	50 - 160
Microcystin YR	90.4	98.2	P/P	50 - 160
Nodularin-R	97.0	101	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A118088
Included Lab Sample IDs: 2394635

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	74.2	68.6	P/P	50 - 160
Neosaxitoxin	107	96.1	P/P	50 - 160
Saxitoxin	76.6	73.6	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A118094
Included Lab Sample IDs: 2394636

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A118130
Included Lab Sample IDs: 2394636

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A118136
Included Lab Sample IDs: 2394636

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	98.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A118246
Included Lab Sample IDs: 2394636

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.4	91.6	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		
					LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	94.8	98.2	97.8			0.408
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	97.6	106			5.17
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	98.5	99.0			0.266
EPA 365.1 Rev. 2.0	Total-P	102	107	107			0.453
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	99.3	99.5			0.187
EPA 8321B	Anatoxin-a	83.3	76.0	73.7			3.08
	Cylindrospermopsin	94.4	99.5	103			3.62
	Desmethyl microcystin LR	96.0	105	102			2.75
	Microcystin HilR	101	107	112			4.82
	Microcystin HtyR	95.9	103	105			1.73
	Microcystin LA	106	97.3	97.1			0.159
	Microcystin LF	99.3	103	79.5			25.9
	Microcystin LR	106	107	111			3.99
	Microcystin LW	104	99.7	97.8			1.89
	Microcystin LY	97.1	106	99.5			6.74
	Microcystin RR	103	109	107			1.16
	Microcystin WR	102	97.4	114			15.5
	Microcystin YR	101	105	103			1.92
	Neosaxitoxin	116	86.5	85.3			1.31
	Nodularin-R	101	105	106			0.951
	Saxitoxin	84.7	67.0	68.5			2.18

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2394636
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2394636
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2394636
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2394636
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2394637
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2394635
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2394635

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	03/17/2023			03/22/2023 14:14	Khloe J Berg	2394636
EPA 351.2 Rev. 2.0	03/17/2023	03/23/2023 12:00	Simonne.V. Calhoun	03/28/2023 14:39	Judith K. Clark	2394636
EPA 353.2 Rev. 2.0	03/17/2023			03/22/2023 09:24	Beverly Y. Sanders	2394636
EPA 365.1 Rev. 2.0	03/17/2023	03/20/2023 14:58	Adam P Silver	03/21/2023 10:58	James L Waggerby	2394636
EPA 365.1 Rev. 2.0 dissolved	03/17/2023			03/17/2023 15:43	Chandler E Cox	2394637
EPA 8321B	03/17/2023	03/20/2023 12:00	Manjita Shrestha	03/20/2023 18:02	Manjita Shrestha	2394635
	03/17/2023	03/20/2023 12:00	Manjita Shrestha	03/20/2023 23:55	Manjita Shrestha	2394635