Chemical Analysis Report

WQAP-2021-04-15-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2021-03-22-40**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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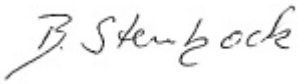
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 06-MAY-2021 18:34



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 Melva **Collection Date/Time: 04/14/2021 08:40**

Field ID: SEHAB0019 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2239875	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P396597	
		Cylindrospermopsin	0.25	U	ug/L	P396597	
		Desmethyl microcystin LR	0.25	U	ug/L	P396597	
		Microcystin HilR**	0.25	U	ug/L	P396597	
		Microcystin HtyR**	0.25	U	ug/L	P396597	
		Microcystin LA	0.25	U	ug/L	P396597	
		Microcystin LF	0.25	U	ug/L	P396597	
		Microcystin LR	0.80	I	ug/L	P396597	
		Microcystin LW	0.25	U	ug/L	P396597	
		Microcystin LY	0.25	U	ug/L	P396597	
		Microcystin RR	0.25	U	ug/L	P396597	
		Microcystin WR	0.50	U	ug/L	P396597	
		Microcystin YR	0.25	U	ug/L	P396597	
		Nodularin-R**	0.25	U	ug/L	P396597	
2239876	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P397094	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.83		mg N/L	P397233	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P396843	
	EPA 365.1 Rev. 2.0	Total-P	0.027		mg P/L	P396701	
2239877	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P396623	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397094

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397233

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P396843

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P396701

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396623

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

Reference Method: EPA 8321B
Batch ID: P396597

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	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	0.25	U	ug/L
Microcystin LF	0.25	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.25	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397094

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: P397233

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P396843

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P396701

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: P396623

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	96.7		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P396597

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	96.9		P	40 - 150
Cylindrospermopsin	86.1		P	40 - 150
Desmethyl microcystin LR	73.3		P	40 - 150
Microcystin HilR	80.3		P	40 - 150
Microcystin HtyR	83.0		P	40 - 150
Microcystin LA	77.4		P	40 - 150
Microcystin LF	70.2		P	40 - 150
Microcystin LR	70.1		P	40 - 150
Microcystin LW	73.5		P	40 - 150
Microcystin LY	59.9		P	40 - 150
Microcystin RR	91.1		P	40 - 150
Microcystin WR	83.2		P	40 - 150
Microcystin YR	83.3		P	40 - 150
Nodularin-R	85.3		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397094

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2239876	Ammonia-N	94.6	96.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2241154	Kjeldahl Nitrogen	104	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P396843

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2239876	NO2NO3-N	98.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P396701

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2239840	Total-P	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396623

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2239758	O-Phosphate-P	95.8	98.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P396597

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2239957	Anatoxin-a	92.4	96.0	P/P	40 - 150
2239957	Cylindrospermopsin	77.4	71.6	P/P	40 - 150
2239957	Desmethyl microcystin LR	83.4	73.1	P/P	40 - 150
2239957	Microcystin HilR	79.4	76.1	P/P	40 - 150
2239957	Microcystin HtyR	76.6	80.3	P/P	40 - 150
2239957	Microcystin LA	75.1	72.4	P/P	40 - 150
2239957	Microcystin LF	60.8	59.5	P/P	40 - 150
2239957	Microcystin LR	75.1	71.7	P/P	40 - 150
2239957	Microcystin LW	56.8	56.7	P/P	40 - 150
2239957	Microcystin LY	54.1	56.6	P/P	40 - 150
2239957	Microcystin RR	79.6	85.2	P/P	40 - 150
2239957	Microcystin WR	73.9	80.2	P/P	40 - 150
2239957	Microcystin YR	75.9	74.5	P/P	40 - 150
2239957	Nodularin-R	86.3	79.9	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P397094

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2239876	Ammonia-N	1.31	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2241154	Kjeldahl Nitrogen	0.935	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P396843

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2239876	NO2NO3-N	1.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P396701

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2239840	Total-P	0.338	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P396623

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2239758	O-Phosphate-P	2.38	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P396597

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2239957	Anatoxin-a	3.82	Spike	P	0 - 30
2239957	Cylindrospermopsin	7.83	Spike	P	0 - 30
2239957	Desmethyl microcystin LR	13.1	Spike	P	0 - 30
2239957	Microcystin HilR	4.34	Spike	P	0 - 30
2239957	Microcystin HtyR	4.76	Spike	P	0 - 30
2239957	Microcystin LA	3.60	Spike	P	0 - 30
2239957	Microcystin LF	2.15	Spike	P	0 - 30
2239957	Microcystin LR	4.60	Spike	P	0 - 30
2239957	Microcystin LW	0.265	Spike	P	0 - 30
2239957	Microcystin LY	4.68	Spike	P	0 - 30
2239957	Microcystin RR	6.79	Spike	P	0 - 30
2239957	Microcystin WR	8.16	Spike	P	0 - 30
2239957	Microcystin YR	1.85	Spike	P	0 - 30
2239957	Nodularin-R	7.67	Spike	P	0 - 30

Quality Assurance Report
Precision

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2239875
Field Sample ID: SEHAB0019

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	78.9	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	67.1	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A104762
Included Lab Sample IDs: 2239877

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	98.8	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A104766
Included Lab Sample IDs: 2239875

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	110	111	P/P	50 - 160
Cylindrospermopsin	98.8	90.2	P/P	60 - 160
Desmethyl microcystin LR	93.8	80.6	P/P	60 - 160
Microcystin HilR	94.3	77.1	P/P	60 - 160
Microcystin HtyR	94.8	86.1	P/P	60 - 160
Microcystin LA	92.1	86.3	P/P	50 - 160
Microcystin LF	85.8	77.0	P/P	50 - 160
Microcystin LR	80.3	72.2	P/P	60 - 160
Microcystin LW	83.7	76.0	P/P	60 - 160
Microcystin LY	82.1	63.7	P/P	60 - 160
Microcystin RR	96.8	93.1	P/P	60 - 160
Microcystin WR	88.7	91.2	P/P	60 - 160
Microcystin YR	88.2	83.8	P/P	60 - 160
Nodularin-R	94.6	94.4	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A104820
Included Lab Sample IDs: 2239876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	98.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A104844
Included Lab Sample IDs: 2239876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	97.5	97.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A104950
Included Lab Sample IDs: 2239876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	99.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105060
Included Lab Sample IDs: 2239876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	94.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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	97.6	94.6	96.0			1.31
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110	104	103			0.935
EPA 353.2 Rev. 2.0	NO2NO3-N	97.0	98.0	99.0			1.02
EPA 365.1 Rev. 2.0	Total-P	104	103	104			0.338
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	96.7	95.8	98.2			2.38
EPA 8321B	Anatoxin-a	96.9	92.4	96.0			3.82
	Cylindrospermopsin	86.1	77.4	71.6			7.83
	Desmethyl microcystin LR	73.3	83.4	73.1			13.1
	Microcystin HilR	80.3	79.4	76.1			4.34
	Microcystin HtyR	83.0	76.6	80.3			4.76
	Microcystin LA	77.4	75.1	72.4			3.60
	Microcystin LF	70.2	60.8	59.5			2.15
	Microcystin LR	70.1	75.1	71.7			4.60
	Microcystin LW	73.5	56.8	56.7			0.265
	Microcystin LY	59.9	54.1	56.6			4.68
	Microcystin RR	91.1	79.6	85.2			6.79
	Microcystin WR	83.2	73.9	80.2			8.16
	Microcystin YR	83.3	75.9	74.5			1.85
	Nodularin-R	85.3	86.3	79.9			7.67

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2239876
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2239876
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2239876
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2239876
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2239877
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2239875

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	04/15/2021			04/23/2021 17:52	Ping Hua	2239876
EPA 351.2 Rev. 2.0	04/15/2021	04/27/2021 13:45	Benjamin T. Nordmann	04/28/2021 16:14	Virginia P. Brown	2239876
EPA 353.2 Rev. 2.0	04/15/2021			04/19/2021 15:22	Touraj Touran	2239876
EPA 365.1 Rev. 2.0	04/15/2021	04/16/2021 13:47	Yen Ta	04/19/2021 12:06	Shengyu Ding	2239876
EPA 365.1 Rev. 2.0 dissolved	04/15/2021			04/15/2021 13:43	Lipi Saha	2239877
EPA 8321B	04/15/2021	04/15/2021 12:00	Pramila Ghimire	04/15/2021 14:47	Pramila Ghimire	2239875