

Chemical Analysis Report

SFWMD-2021-06-29-01

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

Event Description: **SFWMD Bloom Response--As Needed**
Request ID: **RQ-2021-05-24-56**
Customer: **SFWMD**
Project ID: **BLOOM-RESP**

Send Reports to:
South Florida Water Management District
SFWMD
8894 Belvedere Rd. B374
West Palm Beach, FL 33411
Attn: Michael Tompkins

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Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 30-JUN-2021 12:46

A handwritten signature in black ink that reads "Kerry Tate". The signature is written in a cursive, flowing style with a horizontal line above the first name.

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 group are included in this report: 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 Okeechobee Rim Canal-Boat Ramp

Collection Date/Time: 06/28/2021 12:09

Field ID: Lake Okeechobee Rim Canal-Boat

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2257478	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P400211	
		Cylindrospermopsin	0.10	U	ug/L	P400211	
		Desmethyl microcystin LR	0.25	U	ug/L	P400211	
		Microcystin HllR**	0.25	U	ug/L	P400211	
		Microcystin HtyR**	0.25	U	ug/L	P400211	
		Microcystin LA	0.10	U	ug/L	P400211	
		Microcystin LF	0.10	U	ug/L	P400211	
		Microcystin LR	0.25	U	ug/L	P400211	
		Microcystin LW	0.25	U	ug/L	P400211	
		Microcystin LY	0.10	U	ug/L	P400211	
		Microcystin RR	0.10	U	ug/L	P400211	
		Microcystin WR	0.50	U	ug/L	P400211	
		Microcystin YR	0.25	U	ug/L	P400211	
		Nodularin-R**	0.10	U	ug/L	P400211	

Sample Location: C44 Canal-S308C (Canal Side)

Collection Date/Time: 06/28/2021 14:01

Field ID: C44 Canal-S308C (Canal Side)

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2257477	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P400211	
		Cylindrospermopsin	0.10	U	ug/L	P400211	
		Desmethyl microcystin LR	1.4		ug/L	P400211	
		Microcystin H1LR**	0.58	I	ug/L	P400211	
		Microcystin HtyR**	0.25	U	ug/L	P400211	
		Microcystin LA	0.22	I	ug/L	P400211	
		Microcystin LF	0.10	U	ug/L	P400211	
		Microcystin LR	51		ug/L	P400211	
		Microcystin LW	0.25	U	ug/L	P400211	
		Microcystin LY	0.10	U	ug/L	P400211	
		Microcystin RR	0.11	I	ug/L	P400211	
		Microcystin WR	0.50	U	ug/L	P400211	
		Microcystin YR	0.25	U	ug/L	P400211	
		Nodularin-R**	0.10	U	ug/L	P400211	

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B

Batch ID: P400211

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
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 8321B

Batch ID: P400211

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	113		P	40 - 150
Cylindrospermopsin	123		P	40 - 150
Desmethyl microcystin LR	69.3		P	40 - 150
Microcystin HilR	78.4		P	40 - 150
Microcystin HtyR	85.4		P	40 - 150
Microcystin LA	109		P	40 - 150
Microcystin LF	103		P	40 - 150
Microcystin LR	81.3		P	40 - 150
Microcystin LW	86.6		P	40 - 150
Microcystin LY	114		P	40 - 150
Microcystin RR	132		P	40 - 150
Microcystin WR	73.8		P	40 - 150
Microcystin YR	99.1		P	40 - 150
Nodularin-R	116		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B

Batch ID: P400211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2257096	Anatoxin-a	124	123	P/P	40 - 150
2257096	Cylindrospermopsin	122	122	P/P	40 - 150
2257096	Desmethyl microcystin LR	74.9	75.2	P/P	40 - 150
2257096	Microcystin HilR	83.4	81.3	P/P	40 - 150
2257096	Microcystin HtyR	84.8	84.3	P/P	40 - 150
2257096	Microcystin LA	109	108	P/P	40 - 150
2257096	Microcystin LF	103	104	P/P	40 - 150
2257096	Microcystin LR	76.1	80.2	P/P	40 - 150
2257096	Microcystin LW	84.1	83.7	P/P	40 - 150
2257096	Microcystin LY	113	117	P/P	40 - 150
2257096	Microcystin RR	130	131	P/P	40 - 150
2257096	Microcystin WR	81.1	78.8	P/P	40 - 150
2257096	Microcystin YR	103	106	P/P	40 - 150
2257096	Nodularin-R	116	114	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 8321B

Batch ID: P400211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2257096	Anatoxin-a	0.243	Spike	P	0 - 30
2257096	Cylindrospermopsin	0.646	Spike	P	0 - 30
2257096	Desmethyl microcystin LR	0.471	Spike	P	0 - 30
2257096	Microcystin HlR	2.52	Spike	P	0 - 30
2257096	Microcystin HtyR	0.604	Spike	P	0 - 30
2257096	Microcystin LA	1.12	Spike	P	0 - 30
2257096	Microcystin LF	0.916	Spike	P	0 - 30
2257096	Microcystin LR	4.99	Spike	P	0 - 30
2257096	Microcystin LW	0.568	Spike	P	0 - 30
2257096	Microcystin LY	3.71	Spike	P	0 - 30
2257096	Microcystin RR	0.364	Spike	P	0 - 30
2257096	Microcystin WR	2.80	Spike	P	0 - 30
2257096	Microcystin YR	3.24	Spike	P	0 - 30
2257096	Nodularin-R	2.39	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2257477

Field Sample ID: C44 Canal-S308C (Canal Side)

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	113	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	84.0	P	30 - 160

Lab Sample ID: 2257478

Field Sample ID: Lake Okeechobee Rim Canal-Boat

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	107	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	80.9	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A106354

Included Lab Sample IDs: 2257477, 2257478

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	117	117	P/P	50 - 160
Cylindrospermopsin	114	118	P/P	50 - 160
Desmethyl microcystin LR	70.9	76.8	P/P	50 - 160
Microcystin H1R	80.0	85.6	P/P	50 - 160
Microcystin HtyR	81.9	90.6	P/P	50 - 160
Microcystin LA	114	125	P/P	50 - 160
Microcystin LF	117	131	P/P	50 - 160
Microcystin LR	72.8	77.2	P/P	50 - 160
Microcystin LW	88.6	94.3	P/P	50 - 160
Microcystin LY	115	128	P/P	50 - 160
Microcystin RR	126	134	P/P	50 - 160
Microcystin WR	69.7	86.7	P/P	50 - 160
Microcystin YR	94.6	103	P/P	50 - 160
Nodularin-R	110	119	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 SMP	MS
			LCS			
EPA 8321B	Anatoxin-a	113	124	123		0.243
	Cylindrospermopsin	123	122	122		0.646
	Desmethyl microcystin LR	69.3	74.9	75.2		0.471
	Microcystin HILR	78.4	83.4	81.3		2.52
	Microcystin HtyR	85.4	84.8	84.3		0.604
	Microcystin LA	109	109	108		1.12
	Microcystin LF	103	103	104		0.916
	Microcystin LR	81.3	76.1	80.2		4.99
	Microcystin LW	86.6	84.1	83.7		0.568
	Microcystin LY	114	113	117		3.71
	Microcystin RR	132	130	131		0.364
	Microcystin WR	73.8	81.1	78.8		2.80
	Microcystin YR	99.1	103	106		3.24
	Nodularin-R	116	116	114		2.39

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2257477, 2257478

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	06/29/2021	06/29/2021 10:00	Pramila Ghimire	06/29/2021 16:38	Pramila Ghimire	2257477
	06/29/2021	06/29/2021 10:00	Pramila Ghimire	06/29/2021 16:55	Pramila Ghimire	2257478
	06/29/2021	06/29/2021 10:00	Pramila Ghimire	06/29/2021 17:45	Pramila Ghimire	2257477