Chemical Analysis Report

SFWMD-2021-04-20-02

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

Event Description: **SFWMD Bloom Response (Okeechobee)**
Request ID: **RQ-2020-05-04-67**
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: Mickael Tompkins

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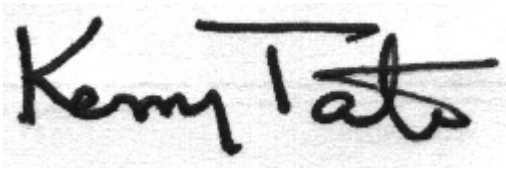
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 22-APR-2021 13:54



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: S77 **Collection Date/Time: 04/19/2021 08:50**

Field ID: S77 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2241000	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P396827	
		Cylindrospermopsin	0.25	U	ug/L	P396827	
		Desmethyl microcystin LR	0.25	U	ug/L	P396827	
		Microcystin HilR**	0.25	U	ug/L	P396827	
		Microcystin HtyR**	0.25	U	ug/L	P396827	
		Microcystin LA	0.25	U	ug/L	P396827	
		Microcystin LF	0.25	U	ug/L	P396827	
		Microcystin LR	2.0		ug/L	P396827	
		Microcystin LW	0.25	U	ug/L	P396827	
		Microcystin LY	0.25	U	ug/L	P396827	
		Microcystin RR	0.25	U	ug/L	P396827	
		Microcystin WR	0.50	U	ug/L	P396827	
		Microcystin YR	0.25	U	ug/L	P396827	
		Nodularin-R**	0.25	U	ug/L	P396827	

Sample Location: S79 **Collection Date/Time: 04/19/2021 11:00**

Field ID: S79 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2241001	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P396827	
		Cylindrospermopsin	0.25	U	ug/L	P396827	
		Desmethyl microcystin LR	0.25	U	ug/L	P396827	
		Microcystin HilR**	0.25	U	ug/L	P396827	
		Microcystin HtyR**	0.25	U	ug/L	P396827	
		Microcystin LA	0.25	U	ug/L	P396827	
		Microcystin LF	0.25	U	ug/L	P396827	
		Microcystin LR	0.27	I	ug/L	P396827	
		Microcystin LW	0.25	U	ug/L	P396827	
		Microcystin LY	0.25	U	ug/L	P396827	
		Microcystin RR	0.25	U	ug/L	P396827	
		Microcystin WR	0.50	U	ug/L	P396827	
		Microcystin YR	0.25	U	ug/L	P396827	
		Nodularin-R**	0.25	U	ug/L	P396827	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P396827

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 8321B
Batch ID: P396827

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	104		P	40 - 150
Cylindrospermopsin	93.7		P	40 - 150
Desmethyl microcystin LR	118		P	40 - 150
Microcystin HilR	116		P	40 - 150
Microcystin HtyR	116		P	40 - 150
Microcystin LA	95.9		P	40 - 150
Microcystin LF	109		P	40 - 150
Microcystin LR	125		P	40 - 150
Microcystin LW	110		P	40 - 150
Microcystin LY	77.0		P	40 - 150
Microcystin RR	103		P	40 - 150
Microcystin WR	114		P	40 - 150
Microcystin YR	111		P	40 - 150
Nodularin-R	110		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P396827

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2240859	Anatoxin-a	105	96.0	P/P	40 - 150
2240859	Cylindrospermopsin	73.9	65.8	P/P	40 - 150
2240859	Desmethyl microcystin LR	103	92.0	P/P	40 - 150
2240859	Microcystin HilR	93.8	103	P/P	40 - 150
2240859	Microcystin HtyR	103	107	P/P	40 - 150
2240859	Microcystin LA	87.6	95.7	P/P	40 - 150
2240859	Microcystin LF	80.3	82.8	P/P	40 - 150
2240859	Microcystin LR	111	102	P/P	40 - 150
2240859	Microcystin LW	85.0	78.5	P/P	40 - 150
2240859	Microcystin LY	66.0	66.1	P/P	40 - 150
2240859	Microcystin RR	97.2	100	P/P	40 - 150
2240859	Microcystin WR	94.7	93.3	P/P	40 - 150
2240859	Microcystin YR	96.3	96.7	P/P	40 - 150
2240859	Nodularin-R	103	103	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P396827

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2240859	Anatoxin-a	9.15	Spike	P	0 - 30
2240859	Cylindrospermopsin	11.5	Spike	P	0 - 30
2240859	Desmethyl microcystin LR	11.3	Spike	P	0 - 30
2240859	Microcystin HilR	9.47	Spike	P	0 - 30
2240859	Microcystin HtyR	3.39	Spike	P	0 - 30
2240859	Microcystin LA	8.88	Spike	P	0 - 30
2240859	Microcystin LF	3.11	Spike	P	0 - 30
2240859	Microcystin LR	8.07	Spike	P	0 - 30
2240859	Microcystin LW	7.93	Spike	P	0 - 30
2240859	Microcystin LY	0.120	Spike	P	0 - 30
2240859	Microcystin RR	2.81	Spike	P	0 - 30
2240859	Microcystin WR	1.45	Spike	P	0 - 30
2240859	Microcystin YR	0.464	Spike	P	0 - 30
2240859	Nodularin-R	0.381	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2241000
Field Sample ID: S77

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	106	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	92.7	P	30 - 160

Lab Sample ID: 2241001
Field Sample ID: S79

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	117	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	101	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A104848
Included Lab Sample IDs: 2241000, 2241001

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	100	105	P/P	50 - 160
Cylindrospermopsin	105	104	P/P	50 - 160
Desmethyl microcystin LR	120	114	P/P	50 - 160
Microcystin HilR	129	125	P/P	50 - 160
Microcystin HtyR	120	123	P/P	50 - 160
Microcystin LA	108	117	P/P	50 - 160
Microcystin LF	111	123	P/P	50 - 160
Microcystin LR	136	127	P/P	50 - 160
Microcystin LW	118	124	P/P	50 - 160
Microcystin LY	86.9	92.3	P/P	50 - 160
Microcystin RR	109	115	P/P	50 - 160
Microcystin WR	123	135	P/P	50 - 160
Microcystin YR	112	111	P/P	50 - 160
Nodularin-R	117	116	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 8321B	Anatoxin-a	104	105	96.0			9.15
	Cylindrospermopsin	93.7	73.9	65.8			11.5
	Desmethyl microcystin LR	118	103	92.0			11.3
	Microcystin HilR	116	93.8	103			9.47
	Microcystin HtyR	116	103	107			3.39
	Microcystin LA	95.9	87.6	95.7			8.88
	Microcystin LF	109	80.3	82.8			3.11
	Microcystin LR	125	111	102			8.07
	Microcystin LW	110	85.0	78.5			7.93
	Microcystin LY	77.0	66.0	66.1			0.120
	Microcystin RR	103	97.2	100			2.81
	Microcystin WR	114	94.7	93.3			1.45
	Microcystin YR	111	96.3	96.7			0.464
	Nodularin-R	110	103	103			0.381

Reference Method Descriptions

Method	Description	Associated Samples
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2241000, 2241001

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	04/20/2021	04/20/2021 12:00	Juyoung Kim	04/20/2021 15:36	Pramila Ghimire	2241000
	04/20/2021	04/20/2021 12:00	Juyoung Kim	04/20/2021 15:53	Pramila Ghimire	2241001