Chemical Analysis Report

SFWMD-2021-09-28-03

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 (WPB)**
Request ID: **RQ-2021-08-16-54**
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: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 29-SEP-2021 09:38

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 Okeechobee Rim Canal **Collection Date/Time: 09/27/2021 08:50**

Field ID: S77 Okeechobee Rim Canal Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2278585	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P404268	
		Cylindrospermopsin	0.10	U	ug/L	P404268	
		Desmethyl microcystin LR	0.25	U	ug/L	P404268	
		Microcystin HilR**	0.25	U	ug/L	P404268	
		Microcystin HtyR**	0.25	U	ug/L	P404268	
		Microcystin LA	0.10	U	ug/L	P404268	
		Microcystin LF	0.10	U	ug/L	P404268	
		Microcystin LR	0.25	U	ug/L	P404268	
		Microcystin LW	0.25	U	ug/L	P404268	
		Microcystin LY	0.10	U	ug/L	P404268	
		Microcystin RR	0.10	U	ug/L	P404268	
		Microcystin WR	0.50	U	ug/L	P404268	
		Microcystin YR	0.25	U	ug/L	P404268	
		Nodularin-R**	0.10	U	ug/L	P404268	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P404268

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 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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P404268

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	103		P	40 - 150
Cylindrospermopsin	100		P	40 - 150
Desmethyl microcystin LR	112		P	40 - 150
Microcystin HilR	106		P	40 - 150
Microcystin HtyR	105		P	40 - 150
Microcystin LA	88.6		P	40 - 150
Microcystin LF	122		P	40 - 150
Microcystin LR	101		P	40 - 150
Microcystin LW	110		P	40 - 150
Microcystin LY	98.5		P	40 - 150
Microcystin RR	105		P	40 - 150
Microcystin WR	101		P	40 - 150
Microcystin YR	102		P	40 - 150
Nodularin-R	112		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P404268

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2278524	Anatoxin-a	105	98.9	P/P	40 - 150
2278524	Cylindrospermopsin	93.9	89.0	P/P	40 - 150
2278524	Desmethyl microcystin LR	100	95.8	P/P	40 - 150
2278524	Microcystin HilR	98.8	88.7	P/P	40 - 150
2278524	Microcystin HtyR	93.0	94.5	P/P	40 - 150
2278524	Microcystin LA	85.0	84.2	P/P	40 - 150
2278524	Microcystin LF	98.5	108	P/P	40 - 150
2278524	Microcystin LR	96.5	97.9	P/P	40 - 150
2278524	Microcystin LW	100	95.3	P/P	40 - 150
2278524	Microcystin LY	99.8	95.4	P/P	40 - 150
2278524	Microcystin RR	91.8	90.8	P/P	40 - 150
2278524	Microcystin WR	93.5	88.0	P/P	40 - 150
2278524	Microcystin YR	92.7	91.7	P/P	40 - 150
2278524	Nodularin-R	99.3	93.3	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P404268

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2278524	Anatoxin-a	5.61	Spike	P	0 - 30
2278524	Cylindrospermopsin	5.38	Spike	P	0 - 30
2278524	Desmethyl microcystin LR	4.77	Spike	P	0 - 30
2278524	Microcystin HilR	10.7	Spike	P	0 - 30
2278524	Microcystin HtyR	1.54	Spike	P	0 - 30
2278524	Microcystin LA	0.952	Spike	P	0 - 30
2278524	Microcystin LF	9.14	Spike	P	0 - 30
2278524	Microcystin LR	1.31	Spike	P	0 - 30
2278524	Microcystin LW	4.99	Spike	P	0 - 30
2278524	Microcystin LY	4.51	Spike	P	0 - 30
2278524	Microcystin RR	1.11	Spike	P	0 - 30
2278524	Microcystin WR	6.07	Spike	P	0 - 30
2278524	Microcystin YR	1.12	Spike	P	0 - 30
2278524	Nodularin-R	6.21	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2278585
Field Sample ID: S77 Okeechobee Rim Canal

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	85.4	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	118	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A108038
Included Lab Sample IDs: 2278585

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	93.4	96.8	P/P	50 - 160
Cylindrospermopsin	93.5	89.2	P/P	60 - 160
Desmethyl microcystin LR	95.2	90.7	P/P	60 - 160
Microcystin HilR	95.1	94.7	P/P	60 - 160
Microcystin HtyR	91.3	94.2	P/P	60 - 160
Microcystin LA	80.1	81.5	P/P	50 - 160
Microcystin LF	99.9	105	P/P	60 - 160
Microcystin LR	100	95.6	P/P	60 - 160
Microcystin LW	95.6	97.9	P/P	60 - 160
Microcystin LY	87.3	86.8	P/P	60 - 160
Microcystin RR	92.8	86.9	P/P	60 - 160
Microcystin WR	88.8	88.4	P/P	60 - 160
Microcystin YR	94.0	92.1	P/P	60 - 160
Nodularin-R	94.4	101	P/P	60 - 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	103	105	98.9			5.61
	Cylindrospermopsin	100	93.9	89.0			5.38
	Desmethyl microcystin LR	112	100	95.8			4.77
	Microcystin HilR	106	98.8	88.7			10.7
	Microcystin HtyR	105	93.0	94.5			1.54
	Microcystin LA	88.6	85.0	84.2			0.952
	Microcystin LF	122	98.5	108			9.14
	Microcystin LR	101	96.5	97.9			1.31
	Microcystin LW	110	100	95.3			4.99
	Microcystin LY	98.5	99.8	95.4			4.51
	Microcystin RR	105	91.8	90.8			1.11
	Microcystin WR	101	93.5	88.0			6.07
	Microcystin YR	102	92.7	91.7			1.12
	Nodularin-R	112	99.3	93.3			6.21

Reference Method Descriptions

Method	Description	Associated Samples
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2278585

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	09/28/2021	09/28/2021 12:00	Manjita Shrestha	09/28/2021 20:35	Manjita Shrestha	2278585