Chemical Analysis Report

WQAP-2021-05-05-02

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

Event Description: **Lee County Bloom Response**
Request ID: **RQ-2021-04-19-55**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 21-MAY-2021 10:39

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: Davis Boat Ramp **Collection Date/Time: 05/04/2021 09:20**

Field ID: Davis Boat Ramp Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2245007	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P397659	
		Cylindrospermopsin	0.10	U	ug/L	P397659	
		Desmethyl microcystin LR	0.25	U	ug/L	P397659	
		Microcystin HilR**	0.25	U	ug/L	P397659	
		Microcystin HtyR**	0.25	U	ug/L	P397659	
		Microcystin LA	0.10	U	ug/L	P397659	
		Microcystin LF	0.10	U	ug/L	P397659	
		Microcystin LR	0.25	U	ug/L	P397659	
		Microcystin LW	0.25	U	ug/L	P397659	
		Microcystin LY	0.10	UJ	ug/L	P397659	LCS
		Microcystin RR	0.10	U	ug/L	P397659	
		Microcystin WR	0.50	U	ug/L	P397659	
		Microcystin YR	0.25	U	ug/L	P397659	
		Nodularin-R**	0.10	U	ug/L	P397659	
2245012	EPA 350.1 Rev. 2.0	Ammonia-N	0.013		mg N/L	P398216	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P397973	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.01	I	mg N/L	P397741	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P397896	
2245013	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.066		mg P/L	P397689	

Ref. Method and Comment:
EPA 8321B: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398216

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397973

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397741

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397896

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397689

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

Reference Method: EPA 8321B
Batch ID: P397659

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 350.1 Rev. 2.0
Batch ID: P398216

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397973

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397741

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397896

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397689

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	100		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P397659

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	128		P	40 - 150
Cylindrospermopsin	123		P	40 - 150
Desmethyl microcystin LR	120		P	40 - 150
Microcystin HilR	117		P	40 - 150
Microcystin HtyR	116		P	40 - 150
Microcystin LA	126		P	40 - 150
Microcystin LF	123		P	40 - 150
Microcystin LR	118		P	40 - 150
Microcystin LW	145		P	40 - 150
Microcystin LY	158		F	40 - 150
Microcystin RR	117		P	40 - 150
Microcystin WR	122		P	40 - 150
Microcystin YR	121		P	40 - 150
Nodularin-R	110		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398216

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244980	Ammonia-N	98.6	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397973

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245012	Kjeldahl Nitrogen	99.1	92.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397741

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244980	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397896

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244970	Total-P	107	108	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397689

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245009	O-Phosphate-P	98.0	98.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P397659

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2244674	Anatoxin-a	134	125	P/P	40 - 150
2244674	Cylindrospermopsin	117	111	P/P	40 - 150
2244674	Desmethyl microcystin LR	118	114	P/P	40 - 150
2244674	Microcystin HilR	125	112	P/P	40 - 150
2244674	Microcystin HtyR	110	108	P/P	40 - 150
2244674	Microcystin LA	120	116	P/P	40 - 150
2244674	Microcystin LF	118	111	P/P	40 - 150
2244674	Microcystin LR	125	110	P/P	40 - 150
2244674	Microcystin LW	128	113	P/P	40 - 150
2244674	Microcystin LY	144	141	P/P	40 - 150
2244674	Microcystin RR	117	110	P/P	40 - 150
2244674	Microcystin WR	119	115	P/P	40 - 150
2244674	Microcystin YR	119	106	P/P	40 - 150
2244674	Nodularin-R	113	109	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398216

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244980	Ammonia-N	0.788	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P397973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245012	Kjeldahl Nitrogen	3.53	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397741

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244980	NO2NO3-N	0.306	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P397896

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244970	Total-P	0.318	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397689

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245009	O-Phosphate-P	0.400	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P397659

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2244674	Anatoxin-a	6.81	Spike	P	0 - 30
2244674	Cylindrospermopsin	5.15	Spike	P	0 - 30
2244674	Desmethyl microcystin LR	3.76	Spike	P	0 - 30
2244674	Microcystin HilR	10.4	Spike	P	0 - 30
2244674	Microcystin HtyR	1.98	Spike	P	0 - 30
2244674	Microcystin LA	3.42	Spike	P	0 - 30
2244674	Microcystin LF	6.20	Spike	P	0 - 30
2244674	Microcystin LR	11.9	Spike	P	0 - 30
2244674	Microcystin LW	12.0	Spike	P	0 - 30
2244674	Microcystin LY	2.13	Spike	P	0 - 30
2244674	Microcystin RR	6.41	Spike	P	0 - 30
2244674	Microcystin WR	3.26	Spike	P	0 - 30
2244674	Microcystin YR	12.2	Spike	P	0 - 30
2244674	Nodularin-R	3.49	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: 2245007
Field Sample ID: Davis Boat Ramp

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	119	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	92.3	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A105193
Included Lab Sample IDs: 2245013

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	101	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A105198
Included Lab Sample IDs: 2245007

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	125	125	P/P	50 - 160
Cylindrospermopsin	115	118	P/P	50 - 160
Desmethyl microcystin LR	116	118	P/P	50 - 160
Microcystin HilR	115	121	P/P	50 - 160
Microcystin HtyR	108	111	P/P	50 - 160
Microcystin LA	117	124	P/P	50 - 160
Microcystin LF	129	125	P/P	50 - 160
Microcystin LR	123	108	P/P	50 - 160
Microcystin LW	142	130	P/P	50 - 160
Microcystin LY	146	143	P/P	50 - 160
Microcystin RR	106	116	P/P	50 - 160
Microcystin WR	114	116	P/P	50 - 160
Microcystin YR	107	112	P/P	50 - 160
Nodularin-R	99.7	110	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A105217
Included Lab Sample IDs: 2245012

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A105313
Included Lab Sample IDs: 2245012

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105430
Included Lab Sample IDs: 2245012

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.3	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105442
Included Lab Sample IDs: 2245012

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.9	94.1	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	97.8	98.6	97.6			0.788
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.5	99.1	92.5			3.53
EPA 353.2 Rev. 2.0	NO2NO3-N	103	100	100			0.306
EPA 365.1 Rev. 2.0	Total-P	110	107	108			0.318
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	98.0	98.6			0.400
EPA 8321B	Anatoxin-a	128	134	125			6.81
	Cylindrospermopsin	123	117	111			5.15
	Desmethyl microcystin LR	120	118	114			3.76
	Microcystin HilR	117	125	112			10.4
	Microcystin HtyR	116	110	108			1.98
	Microcystin LA	126	120	116			3.42
	Microcystin LF	123	118	111			6.20
	Microcystin LR	118	125	110			11.9
	Microcystin LW	145	128	113			12.0
	Microcystin LY	158	144	141			2.13
	Microcystin RR	117	117	110			6.41
	Microcystin WR	122	119	115			3.26
	Microcystin YR	121	119	106			12.2
	Nodularin-R	110	113	109			3.49

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2245012
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2245012
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2245012
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2245012
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2245013
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2245007

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	05/05/2021			05/14/2021 12:08	Ping Hua	2245012
EPA 351.2 Rev. 2.0	05/05/2021	05/11/2021 13:04	Benjamin T. Nordmann	05/14/2021 14:18	Virginia P. Brown	2245012
EPA 353.2 Rev. 2.0	05/05/2021			05/06/2021 11:06	Beverly Y. Sanders	2245012
EPA 365.1 Rev. 2.0	05/05/2021	05/10/2021 14:35	Yen Ta	05/11/2021 10:02	Shengyu Ding	2245012
EPA 365.1 Rev. 2.0 dissolved	05/05/2021			05/05/2021 14:51	Patrick M. Roche	2245013
EPA 8321B	05/05/2021	05/05/2021 11:30	Pramila Ghimire	05/05/2021 14:40	Pramila Ghimire	2245007