

Chemical Analysis Report

WQAP-2020-12-30-01

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

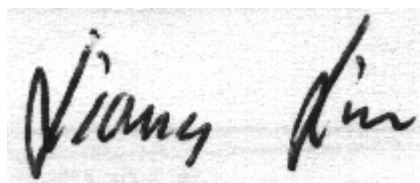
Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2020-03-23-45**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Jordan Skaggs

For additional information please contact
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Dr. rer. nat. Bettina Steinbock
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Phone (850) 245-8085

Certified by: Liang Lin, Environmental Administrator

Date Certified: 19-JAN-2021 14:36

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

NON-CONFORMANCE REPORT INCLUDED

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: 12/28/2020 15:50

Field ID: Lake_Melva

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2216084	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P391864	
		Cylindrospermopsin**	0.25	U	ug/L	P391864	
		Desmethyl microcystin LR**	0.25	U	ug/L	P391864	
		Microcystin LA**	0.25	U	ug/L	P391864	
		Microcystin LF**	0.25	U	ug/L	P391864	
		Microcystin LR**	3.7		ug/L	P391864	
		Microcystin LW**	0.25	UJ	ug/L	P391864	CCV
		Microcystin LY**	0.25	U	ug/L	P391864	
		Microcystin RR**	0.25	U	ug/L	P391864	
		Microcystin WR**	0.50	U	ug/L	P391864	
		Microcystin YR**	0.25	U	ug/L	P391864	
2216087	EPA 350.1 Rev. 2.0	Ammonia-N	0.034		mg N/L	P391884	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.68	J	mg N/L	P391937	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.018		mg N/L	P391900	
	EPA 365.1 Rev. 2.0	Total-P	0.037		mg P/L	P391914	
2216088	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P391874	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Refer to the Lab Analysis Report for an explanation of QC Codes.

EPA 365.1 Rev. 2.0: Total-P: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Non-Conformance Report

NCR ID: 8577

Event(s)

WQAP-2020-12-30-01

Job(s)

Sample(s)

Test(s)

NCR Type: SHIPPING/RECEIVING

NCR Category: Samples arrived late

Observation: Samples arrived one or more days late by FedEx, samples received within the acceptable temperature range.

Resolution: Samples will be qualified as appropriate.

The algae were not degraded and were able to be analyzed. The result will not be qualified.-AGR

Authorized by/Date: Kerry Tate, Ph.D. 1/4/2021

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.

Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391884

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391937

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391900

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391914

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391874

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

Reference Method: EPA 8321B
Batch ID: P391864

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 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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391884

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391937

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391900

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	98.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391914

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391874

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

Reference Method: EPA 8321B
Batch ID: P391864

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	73.2		P	40 - 150
Cylindrospermopsin	83.5		P	40 - 150
Desmethyl microcystin LR	116		P	40 - 150
Microcystin LA	118		P	40 - 150
Microcystin LF	74.9		P	40 - 150
Microcystin LR	98.1		P	40 - 150
Microcystin LW	54.9		P	40 - 150
Microcystin LY	86.6		P	40 - 150
Microcystin RR	86.2		P	40 - 150
Microcystin WR	84.4		P	40 - 150
Microcystin YR	64.5		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391884

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2216087	Ammonia-N	96.8	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391937

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2216087	Kjeldahl Nitrogen	112	101	F/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391900

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2216073	NO2NO3-N	95.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391874

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2216088	O-Phosphate-P	105	106	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P391864

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2216084	Anatoxin-a	84.2	76.5	P/P	40 - 150
2216084	Cylindrospermopsin	95.5	88.4	P/P	40 - 150
2216084	Desmethyl microcystin LR	126	125	P/P	40 - 150
2216084	Microcystin LA	137	136	P/P	40 - 150
2216084	Microcystin LF	88.5	93.2	P/P	40 - 150
2216084	Microcystin LR	103	102	P/P	40 - 150
2216084	Microcystin LW	64.4	56.8	P/P	40 - 150
2216084	Microcystin LY	101	97.6	P/P	40 - 150
2216084	Microcystin RR	97.2	93.0	P/P	40 - 150
2216084	Microcystin WR	103	104	P/P	40 - 150
2216084	Microcystin YR	73.4	73.2	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P391884

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216087	Ammonia-N	0.121	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P391937

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216087	Kjeldahl Nitrogen	6.66	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P391900

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216073	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P391914

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216026	Total-P	2.66	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P391874

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216088	O-Phosphate-P	0.663	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P391864

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2216084	Anatoxin-a	9.64	Spike	P	0 - 30
2216084	Cylindrospermopsin	7.69	Spike	P	0 - 30
2216084	Desmethyl microcystin LR	0.669	Spike	P	0 - 30
2216084	Microcystin LA	0.451	Spike	P	0 - 30
2216084	Microcystin LF	5.19	Spike	P	0 - 30
2216084	Microcystin LR	0.816	Spike	P	0 - 30
2216084	Microcystin LW	12.5	Spike	P	0 - 30
2216084	Microcystin LY	3.65	Spike	P	0 - 30
2216084	Microcystin RR	4.38	Spike	P	0 - 30
2216084	Microcystin WR	0.453	Spike	P	0 - 30
2216084	Microcystin YR	0.183	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2216084

Field Sample ID: Lake_Melva

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	108	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	95.3	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A102839
Included Lab Sample IDs: 2216084

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	74.0	70.9	P/P	50 - 160
Cylindrospermopsin	93.3	93.7	P/P	60 - 160
Desmethyl microcystin LR	102	117	P/P	60 - 160
Microcystin LA	119	130	P/P	50 - 160
Microcystin LF	85.5	85.4	P/P	50 - 160
Microcystin LR	101	93.6	P/P	60 - 160
Microcystin LW	57.0*	61.2	F/P	60 - 160
Microcystin LY	93.5	90.5	P/P	60 - 160
Microcystin RR	81.9	94.9	P/P	60 - 160
Microcystin WR	105	94.3	P/P	60 - 160
Microcystin YR	74.7	72.1	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A102840
Included Lab Sample IDs: 2216088

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A102851
Included Lab Sample IDs: 2216087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.5	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A102857
Included Lab Sample IDs: 2216087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A102901
Included Lab Sample IDs: 2216087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A102905
Included Lab Sample IDs: 2216087

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.1	96.4	P/P	90 - 110

* 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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	101	96.8	97.0			0.121
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	112	101			6.66
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	95.0				0.0
EPA 365.1 Rev. 2.0	Total-P	100					2.66
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	105	106			0.663
EPA 8321B	Anatoxin-a	73.2	84.2	76.5			9.64
	Cylindrospermopsin	83.5	95.5	88.4			7.69
	Desmethyl microcystin LR	116	126	125			0.669
	Microcystin LA	118	137	136			0.451
	Microcystin LF	74.9	88.5	93.2			5.19
	Microcystin LR	98.1	103	102			0.816
	Microcystin LW	54.9	64.4	56.8			12.5
	Microcystin LY	86.6	101	97.6			3.65
	Microcystin RR	86.2	97.2	93.0			4.38
	Microcystin WR	84.4	103	104			0.453
	Microcystin YR	64.5	73.4	73.2			0.183

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2216087
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2216087
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2216087
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2216087
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2216088
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2216084

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	12/30/2020			01/03/2021 14:59	Ping Hua	2216087
EPA 351.2 Rev. 2.0	12/30/2020	01/04/2021 15:35	David Boose	01/06/2021 13:57	Virginia P. Brown	2216087
EPA 353.2 Rev. 2.0	12/30/2020			01/04/2021 09:20	Beverly Y. Sanders	2216087
EPA 365.1 Rev. 2.0	12/30/2020	01/04/2021 13:12	Yen Ta	01/06/2021 11:42	Shengyu Wang	2216087
EPA 365.1 Rev. 2.0 dissolved	12/30/2020			12/30/2020 14:34	Blanca Fach	2216088
EPA 8321B	12/30/2020	12/30/2020 12:00	Pramila Ghimire	12/30/2020 14:41	Pramila Ghimire	2216084