

Chemical Analysis Report

WQAP-2022-06-02-01

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-2022-01-31-59**
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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Certified by: Colin Wright, Program Administrator

Date Certified: 21-JUN-2022 09:21



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 Marian - South of Boat Ramp

Collection Date/Time: 06/01/2022 13:00

Field ID: SEHAB0078

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2331202	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P404604	
		Cylindrospermopsin	0.10	U	ug/L	P404604	
		Desmethyl microcystin LR	0.25	U	ug/L	P404604	
		Microcystin HilR**	0.25	U	ug/L	P404604	
		Microcystin HtyR**	0.25	U	ug/L	P404604	
		Microcystin LA	1.5		ug/L	P404604	
		Microcystin LF	0.26	I	ug/L	P404604	
		Microcystin LR	3.5		ug/L	P404604	
		Microcystin LW	0.25	U	ug/L	P404604	
		Microcystin LY	1.2		ug/L	P404604	
		Microcystin RR	0.23	I	ug/L	P404604	
		Microcystin WR	0.50	U	ug/L	P404604	
		Microcystin YR	0.25	U	ug/L	P404604	
		Nodularin-R**	0.10	U	ug/L	P404604	
2331203	EPA 350.1 Rev. 2.0	Ammonia-N	0.011	Y	mg N/L	P415172	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.4	Y	mg N/L	P414744	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	UY	mg N/L	P414818	
	EPA 365.1 Rev. 2.0	Total-P	0.17	Y	mg P/L	P414749	
2331204	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P414705	MS

Ref. Method and Comment:

EPA 350.1 Rev. 2.0: The sample was received unpreserved: pH > 2. Sample preserved in laboratory.

EPA 351.2 Rev. 2.0: The sample was received unpreserved: pH > 2. Sample preserved in laboratory.

EPA 353.2 Rev. 2.0: The sample was received unpreserved: pH > 2. Sample preserved in laboratory.

EPA 365.1 Rev. 2.0: Total-P: The sample was received unpreserved: pH > 2. Sample preserved in laboratory.

Non-Conformance Report

NCR ID: 9409

Event(s)

WQAP-2022-06-02-01

Job(s)

TLH-2022-06-02-11

Sample(s)

2331203

Test(s)

NCR Type: SHIPPING/RECEIVING

NCR Category: Preservation Not Intact

Observation: Sample not preserved to pH < 2.

Resolution: Sample preserved in the laboratory with sulfuric acid on 06/02/2022 at 10:45
H2SO4 Lot# 131766 | Expiration Date: 11/19/2022
Data will be qualified as appropriate.

Authorized by/Date: Kyle Klug 6/7/2022

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: P415172

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414744

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P414818

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414749

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414705

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

Reference Method: EPA 8321B
Batch ID: P404604

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 HIR	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: P415172

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P414744

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	105		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P414818

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P414749

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P414705

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P404604

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	122		P	40 - 150
Cylindrospermopsin	107		P	40 - 150
Desmethyl microcystin LR	111		P	40 - 150
Microcystin HIR	106		P	40 - 150
Microcystin HtyR	99.1		P	40 - 150
Microcystin LA	111		P	40 - 150
Microcystin LF	75.2		P	40 - 150
Microcystin LR	97.7		P	40 - 150
Microcystin LW	85.8		P	40 - 150
Microcystin LY	114		P	40 - 150
Microcystin RR	104		P	40 - 150
Microcystin WR	89.7		P	40 - 150
Microcystin YR	100		P	40 - 150
Nodularin-R	102		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P415172

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330766	Ammonia-N	96.6	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P414744

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331442	Kjeldahl Nitrogen	109	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P414818

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331203	NO2NO3-N	101	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P414749

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330101	Total-P	109	111	P/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P414705

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2331204	O-Phosphate-P	102	103	P/P	90 - 110

Reference Method: EPA 8321B

Batch ID: P404604

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2330764	Anatoxin-a	119	111	P/P	40 - 150
2330764	Cylindrospermopsin	98.4	94.7	P/P	40 - 150
2330764	Desmethyl microcystin LR	110	108	P/P	40 - 150
2330764	Microcystin HiLR	119	116	P/P	40 - 150
2330764	Microcystin HtyR	101	93.4	P/P	40 - 150
2330764	Microcystin LA	114	101	P/P	40 - 150
2330764	Microcystin LF	91.0	88.6	P/P	40 - 150
2330764	Microcystin LR	102	101	P/P	40 - 150
2330764	Microcystin LW	88.4	68.4	P/P	40 - 150
2330764	Microcystin LY	91.0	103	P/P	40 - 150
2330764	Microcystin RR	105	101	P/P	40 - 150
2330764	Microcystin WR	101	87.1	P/P	40 - 150
2330764	Microcystin YR	104	96.2	P/P	40 - 150
2330764	Nodularin-R	104	97.5	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P415172

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330766	Ammonia-N	1.53	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P414744

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331442	Kjeldahl Nitrogen	3.45	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P414818

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331203	NO2NO3-N	3.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P414749

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330101	Total-P	1.81	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P414705

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2331204	O-Phosphate-P	0.878	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P404604

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2330764	Anatoxin-a	7.11	Spike	P	0 - 30
2330764	Cylindrospermopsin	3.80	Spike	P	0 - 30
2330764	Desmethyl microcystin LR	2.32	Spike	P	0 - 30
2330764	Microcystin HtIR	2.76	Spike	P	0 - 30
2330764	Microcystin HtyR	8.00	Spike	P	0 - 30
2330764	Microcystin LA	11.5	Spike	P	0 - 30
2330764	Microcystin LF	2.61	Spike	P	0 - 30
2330764	Microcystin LR	1.02	Spike	P	0 - 30
2330764	Microcystin LW	25.5	Spike	P	0 - 30
2330764	Microcystin LY	12.7	Spike	P	0 - 30
2330764	Microcystin RR	3.94	Spike	P	0 - 30
2330764	Microcystin WR	15.2	Spike	P	0 - 30
2330764	Microcystin YR	7.29	Spike	P	0 - 30
2330764	Nodularin-R	6.56	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: 2331202
Field Sample ID: SEHAB0078

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	99.0	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A112579
Included Lab Sample IDs: 2331202

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	105	106	P/P	50 - 160
Cylindrospermopsin	89.7	84.3	P/P	60 - 160
Desmethyl microcystin LR	93.7	93.7	P/P	60 - 160
Microcystin H1R	106	100	P/P	60 - 160
Microcystin HtyR	95.0	88.6	P/P	60 - 160
Microcystin LA	87.4	94.9	P/P	50 - 160
Microcystin LF	72.5	80.2	P/P	60 - 160
Microcystin LR	88.9	91.0	P/P	60 - 160
Microcystin LW	75.2	87.3	P/P	60 - 160
Microcystin LY	90.5	101	P/P	60 - 160
Microcystin RR	94.7	94.0	P/P	60 - 160
Microcystin WR	94.5	91.6	P/P	60 - 160
Microcystin YR	86.6	89.5	P/P	60 - 160
Nodularin-R	96.5	92.2	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A112594
Included Lab Sample IDs: 2331204

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.8	98.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A112645
Included Lab Sample IDs: 2331203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A112647
Included Lab Sample IDs: 2331203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A112745
Included Lab Sample IDs: 2331203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	106	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A112817
Included Lab Sample IDs: 2331203

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	94.5	94.6	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 SMP	MS
			LCS			
EPA 350.1 Rev. 2.0	Ammonia-N	95.4	96.6	98.2		1.53
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	109	104		3.45
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	101	98.0		3.02
EPA 365.1 Rev. 2.0	Total-P	108	109	111		1.81
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.9	102	103		0.878
EPA 8321B	Anatoxin-a	122	119	111		7.11
	Cylindrospermopsin	107	98.4	94.7		3.80
	Desmethyl microcystin LR	111	110	108		2.32
	Microcystin HiLR	106	119	116		2.76
	Microcystin HtyR	99.1	101	93.4		8.00
	Microcystin LA	111	114	101		11.5
	Microcystin LF	75.2	91.0	88.6		2.61
	Microcystin LR	97.7	102	101		1.02
	Microcystin LW	85.8	88.4	68.4		25.5
	Microcystin LY	114	91.0	103		12.7
	Microcystin RR	104	105	101		3.94
	Microcystin WR	89.7	101	87.1		15.2
	Microcystin YR	100	104	96.2		7.29
	Nodularin-R	102	104	97.5		6.56

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2331203
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2331203
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2331203
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2331203
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2331204
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2331202

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	06/02/2022			06/14/2022 11:59	Judith K. Clark	2331203
EPA 351.2 Rev. 2.0	06/02/2022	06/08/2022 11:39	Samantha L Bates	06/10/2022 11:47	Alexandra J Mattheus	2331203
EPA 353.2 Rev. 2.0	06/02/2022			06/06/2022 17:49	Touraj Touran	2331203
EPA 365.1 Rev. 2.0	06/02/2022	06/06/2022 15:34	Adam P Silver	06/07/2022 10:52	James L Waggeberby	2331203
EPA 365.1 Rev. 2.0 dissolved	06/02/2022			06/02/2022 17:02	Nathaniel J Jones	2331204
EPA 8321B	06/02/2022	06/02/2022 12:00	Manjita Shrestha	06/02/2022 23:42	Manjita Shrestha	2331202