Chemical Analysis Report

WQAP-2021-05-06-03

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

Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2021-03-29-07**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2295 Victoria AVE
Suite 364
Fort Myers, FL 33901
Attn: Kirby Wolfe

For additional information please contact
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Certified by: Colin Wright, Program Administrator

Date Certified: 21-MAY-2021 10:40

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 Okeechobee - Clewiston Boat Ramp **Collection Date/Time: 05/04/2021 11:45**

Field ID: HAB-SD050421-001 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2245613	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P397735	
		Cylindrospermopsin	0.10	U	ug/L	P397735	
		Desmethyl microcystin LR	0.25	U	ug/L	P397735	
		Microcystin HilR**	0.25	U	ug/L	P397735	
		Microcystin HtyR**	0.25	U	ug/L	P397735	
		Microcystin LA	0.10	U	ug/L	P397735	
		Microcystin LF	0.10	U	ug/L	P397735	
		Microcystin LR	6.6		ug/L	P397735	
		Microcystin LW	0.25	U	ug/L	P397735	
		Microcystin LY	0.10	U	ug/L	P397735	
		Microcystin RR	0.10	U	ug/L	P397735	
		Microcystin WR	0.50	U	ug/L	P397735	
		Microcystin YR	0.25	U	ug/L	P397735	
		Nodularin-R**	0.10	U	ug/L	P397735	
2245614	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P398214	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.2		mg N/L	P398107	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.020		mg N/L	P397818	
	EPA 365.1 Rev. 2.0	Total-P	0.12		mg P/L	P398137	
2245615	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.050	Q	mg P/L	P397778	

Ref. Method and Comment:
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired upon receipt.

Non-Conformance Report

NCR ID: 8816

Event(s)	Job(s)	Sample(s)	Test(s)
WQAP-2021-05-06-03			

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.

Resolution: Samples will be qualified as appropriate.

Authorized by/Date: Kerry Tate, Ph.D. 5/7/2021

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: P398214

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398107

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397818

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398137

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397778

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

Reference Method: EPA 8321B
Batch ID: P397735

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: P398214

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398107

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: P397818

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: P398137

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397778

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

Reference Method: EPA 8321B
Batch ID: P397735

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	122		P	40 - 150
Cylindrospermopsin	124		P	40 - 150
Desmethyl microcystin LR	112		P	40 - 150
Microcystin HilR	116		P	40 - 150
Microcystin HtyR	119		P	40 - 150
Microcystin LA	123		P	40 - 150
Microcystin LF	119		P	40 - 150
Microcystin LR	104		P	40 - 150
Microcystin LW	135		P	40 - 150
Microcystin LY	142		P	40 - 150
Microcystin RR	113		P	40 - 150
Microcystin WR	125		P	40 - 150
Microcystin YR	108		P	40 - 150
Nodularin-R	106		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398214

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245590	Ammonia-N	96.0	98.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398107

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245619	Kjeldahl Nitrogen	102	95.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397818

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245571	NO2NO3-N	99.8	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398137

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245614	Total-P	100	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397778

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245583	O-Phosphate-P	95.6	97.2	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P397735

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2245568	Anatoxin-a	129	128	P/P	40 - 150
2245568	Cylindrospermopsin	116	117	P/P	40 - 150
2245568	Desmethyl microcystin LR	118	117	P/P	40 - 150
2245568	Microcystin HilR	122	119	P/P	40 - 150
2245568	Microcystin HtyR	115	116	P/P	40 - 150
2245568	Microcystin LA	125	120	P/P	40 - 150
2245568	Microcystin LF	126	117	P/P	40 - 150
2245568	Microcystin LR	113	112	P/P	40 - 150
2245568	Microcystin LW	117	123	P/P	40 - 150
2245568	Microcystin LY	146	133	P/P	40 - 150
2245568	Microcystin RR	116	116	P/P	40 - 150
2245568	Microcystin WR	129	121	P/P	40 - 150
2245568	Microcystin YR	113	114	P/P	40 - 150
2245568	Nodularin-R	121	126	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P398214

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245590	Ammonia-N	1.79	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P398107

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245619	Kjeldahl Nitrogen	5.11	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P397818

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245571	NO2NO3-N	0.962	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P398137

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245614	Total-P	3.01	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P397778

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245583	O-Phosphate-P	1.66	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P397735

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2245568	Anatoxin-a	0.816	Spike	P	0 - 30
2245568	Cylindrospermopsin	0.0881	Spike	P	0 - 30
2245568	Desmethyl microcystin LR	0.102	Spike	P	0 - 30
2245568	Microcystin HilR	2.60	Spike	P	0 - 30
2245568	Microcystin HtyR	0.533	Spike	P	0 - 30
2245568	Microcystin LA	4.31	Spike	P	0 - 30
2245568	Microcystin LF	6.70	Spike	P	0 - 30
2245568	Microcystin LR	1.36	Spike	P	0 - 30
2245568	Microcystin LW	4.39	Spike	P	0 - 30
2245568	Microcystin LY	9.41	Spike	P	0 - 30
2245568	Microcystin RR	0.679	Spike	P	0 - 30
2245568	Microcystin WR	6.30	Spike	P	0 - 30
2245568	Microcystin YR	0.779	Spike	P	0 - 30
2245568	Nodularin-R	3.44	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: 2245613
Field Sample ID: HAB-SD050421-001

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	90.6	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	54.5	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A105228
Included Lab Sample IDs: 2245615

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A105238
Included Lab Sample IDs: 2245613

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	128	130	P/P	50 - 160
Cylindrospermopsin	123	125	P/P	50 - 160
Desmethyl microcystin LR	122	115	P/P	50 - 160
Microcystin HilR	121	123	P/P	50 - 160
Microcystin HtyR	119	117	P/P	50 - 160
Microcystin LA	139	132	P/P	50 - 160
Microcystin LF	119	132	P/P	50 - 160
Microcystin LR	116	123	P/P	50 - 160
Microcystin LW	126	138	P/P	50 - 160
Microcystin LY	145	144	P/P	50 - 160
Microcystin RR	117	117	P/P	50 - 160
Microcystin WR	123	118	P/P	50 - 160
Microcystin YR	114	107	P/P	50 - 160
Nodularin-R	110	109	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A105247
Included Lab Sample IDs: 2245614

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A105413
Included Lab Sample IDs: 2245614

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	100	97.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A105429
Included Lab Sample IDs: 2245614

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	98.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A105432
Included Lab Sample IDs: 2245614

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	101	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	99.2	96.0	98.2			1.79
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.5	102	95.7			5.11
EPA 353.2 Rev. 2.0	NO2NO3-N	100	99.8	98.8			0.962
EPA 365.1 Rev. 2.0	Total-P	103	100	104			3.01
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.0	95.6	97.2			1.66
EPA 8321B	Anatoxin-a	122	129	128			0.816
	Cylindrospermopsin	124	116	117			0.0881
	Desmethyl microcystin LR	112	118	117			0.102
	Microcystin HilR	116	122	119			2.60
	Microcystin HtyR	119	115	116			0.533
	Microcystin LA	123	125	120			4.31
	Microcystin LF	119	126	117			6.70
	Microcystin LR	104	113	112			1.36
	Microcystin LW	135	117	123			4.39
	Microcystin LY	142	146	133			9.41
	Microcystin RR	113	116	116			0.679
	Microcystin WR	125	129	121			6.30
	Microcystin YR	108	113	114			0.779
	Nodularin-R	106	121	126			3.44

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2245614
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2245614
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2245614
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2245614
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2245615
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2245613

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	05/06/2021			05/14/2021 12:17	Roberta Tatti	2245614
EPA 351.2 Rev. 2.0	05/06/2021	05/12/2021 13:47	Benjamin T. Nordmann	05/13/2021 13:52	Virginia P. Brown	2245614
EPA 353.2 Rev. 2.0	05/06/2021			05/07/2021 10:53	Beverly Y. Sanders	2245614
EPA 365.1 Rev. 2.0	05/06/2021	05/13/2021 14:14	Yen Ta	05/14/2021 12:29	Shengyu Ding	2245614
EPA 365.1 Rev. 2.0 dissolved	05/06/2021			05/06/2021 14:11	Blanca Fach	2245615
EPA 8321B	05/06/2021	05/06/2021 11:45	Pramila Ghimire	05/06/2021 17:01	Pramila Ghimire	2245613