Chemical Analysis Report

WQAP-2021-03-01-01

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-2020-08-31-26**
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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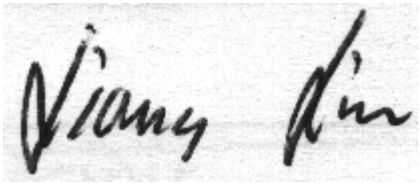
Certified by: Liang Lin, Environmental Administrator

Date Certified: 23-MAR-2021 16:59



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: Sanibel Slough @ Middle Gulf Dr. **Collection Date/Time: 02/25/2021 09:40**

Field ID: SD-HAB-022521 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2228184	EPA 8321B	Anatoxin-a	0.25	UY	ug/L	P394403	
		Cylindrospermopsin	0.25	UY	ug/L	P394403	
		Desmethyl microcystin LR	0.25	UY	ug/L	P394403	
		Microcystin HilR**	0.25	UY	ug/L	P394403	
		Microcystin HtyR**	0.25	UY	ug/L	P394403	
		Microcystin LA	0.25	UY	ug/L	P394403	
		Microcystin LF	0.25	UY	ug/L	P394403	
		Microcystin LR	0.25	UY	ug/L	P394403	
		Microcystin LW	0.25	UY	ug/L	P394403	
		Microcystin LY	0.25	UY	ug/L	P394403	
		Microcystin RR	0.25	UY	ug/L	P394403	
		Microcystin WR	0.50	UY	ug/L	P394403	
		Microcystin YR	0.25	UY	ug/L	P394403	
2228185	EPA 350.1 Rev. 2.0	Ammonia-N	0.010	Y	mg N/L	P394443	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.5	Y	mg N/L	P394540	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	UY	mg N/L	P394458	
	EPA 365.1 Rev. 2.0	Total-P	0.19	Y	mg P/L	P394472	
2228186	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I YQ	mg P/L	P394379	

Ref. Method and Comment:
EPA 8321B: Y - Sample was received with inadequate sample preservation; see NCR report.
EPA 350.1 Rev. 2.0: Sample temperature was outside the acceptable range when received at the laboratory.
EPA 351.2 Rev. 2.0: Sample temperature was outside the acceptable range when received at the laboratory.
EPA 353.2 Rev. 2.0: Sample temperature was outside the acceptable range when received at the laboratory.
EPA 365.1 Rev. 2.0: Total-P: Sample temperature was outside the acceptable range when received at the laboratory.
EPA 365.1 Rev. 2.0 dissolved: O-Phosphate-P: The sample expired prior to receipt. Sample temperature was outside the acceptable range when received at the laboratory.

Non-Conformance Report

NCR ID: 8698

Event(s)	Job(s)	Sample(s)	Test(s)
WQAP-2021-03-01-01			

NCR Type: SHIPPING/RECEIVING **NCR Category: Samples arrived late**

Observation: Samples arrived one or more days late by FedEx, samples received outside 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. 3/4/2021

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: P394443

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394540

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394458

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394472

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394379

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

Reference Method: EPA 8321B
Batch ID: P394403

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 HilR	0.25	U	ug/L
Microcystin HtyR	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: P394443

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394540

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394458

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394472

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394379

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.3		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P394403

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	129		P	40 - 150
Cylindrospermopsin	122		P	40 - 150
Desmethyl microcystin LR	106		P	40 - 150
Microcystin HilR	119		P	40 - 150
Microcystin HtyR	114		P	40 - 150
Microcystin LA	108		P	40 - 150
Microcystin LF	128		P	40 - 150
Microcystin LR	94.5		P	40 - 150
Microcystin LW	134		P	40 - 150
Microcystin LY	117		P	40 - 150
Microcystin RR	109		P	40 - 150
Microcystin WR	116		P	40 - 150
Microcystin YR	101		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394443

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227999	Ammonia-N	96.2	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394540

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227999	Kjeldahl Nitrogen	108	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227999	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394472

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227935	Total-P	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394379

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2228186	O-Phosphate-P	97.2	97.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P394403

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2227911	Anatoxin-a	125	124	P/P	40 - 150
2227911	Cylindrospermopsin	108	115	P/P	40 - 150
2227911	Desmethyl microcystin LR	101	103	P/P	40 - 150
2227911	Microcystin HilR	111	119	P/P	40 - 150
2227911	Microcystin HtyR	105	114	P/P	40 - 150
2227911	Microcystin LA	104	102	P/P	40 - 150
2227911	Microcystin LF	103	109	P/P	40 - 150
2227911	Microcystin LR	94.0	92.3	P/P	40 - 150
2227911	Microcystin LW	124	132	P/P	40 - 150
2227911	Microcystin LY	103	107	P/P	40 - 150
2227911	Microcystin RR	105	112	P/P	40 - 150
2227911	Microcystin WR	109	123	P/P	40 - 150
2227911	Microcystin YR	99.1	96.8	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P394443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227999	Ammonia-N	1.37	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P394540

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227999	Kjeldahl Nitrogen	1.16	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P394458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227999	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P394472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227935	Total-P	0.278	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P394379

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2228186	O-Phosphate-P	0.0961	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P394403

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2227911	Anatoxin-a	0.601	Spike	P	0 - 30
2227911	Cylindrospermopsin	6.28	Spike	P	0 - 30
2227911	Desmethyl microcystin LR	1.68	Spike	P	0 - 30
2227911	Microcystin HilR	6.73	Spike	P	0 - 30
2227911	Microcystin HtyR	8.29	Spike	P	0 - 30
2227911	Microcystin LA	2.10	Spike	P	0 - 30
2227911	Microcystin LF	5.55	Spike	P	0 - 30
2227911	Microcystin LR	1.78	Spike	P	0 - 30
2227911	Microcystin LW	6.41	Spike	P	0 - 30
2227911	Microcystin LY	4.48	Spike	P	0 - 30
2227911	Microcystin RR	7.02	Spike	P	0 - 30
2227911	Microcystin WR	11.5	Spike	P	0 - 30
2227911	Microcystin YR	2.42	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2228184
Field Sample ID: SD-HAB-022521

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	91.8	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	83.4	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A103845
Included Lab Sample IDs: 2228186

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	99.2	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A103862
Included Lab Sample IDs: 2228184

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	127	127	P/P	50 - 160
Cylindrospermopsin	117	122	P/P	60 - 160
Desmethyl microcystin LR	98.9	107	P/P	60 - 160
Microcystin HilR	119	120	P/P	60 - 160
Microcystin HtyR	119	110	P/P	60 - 160
Microcystin LA	102	114	P/P	50 - 160
Microcystin LF	130	116	P/P	50 - 160
Microcystin LR	93.5	94.1	P/P	60 - 160
Microcystin LW	147	134	P/P	60 - 160
Microcystin LY	117	114	P/P	60 - 160
Microcystin RR	108	109	P/P	60 - 160
Microcystin WR	123	118	P/P	60 - 160
Microcystin YR	104	91.8	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A103867
Included Lab Sample IDs: 2228185

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.1	99.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A103879
Included Lab Sample IDs: 2228185

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: A103912
Included Lab Sample IDs: 2228185

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A103966
Included Lab Sample IDs: 2228185

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	104	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	98.8	96.2	97.6			1.37
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	108	109			1.16
EPA 353.2 Rev. 2.0	NO2NO3-N	101	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	104	102	101			0.278
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.3	97.2	97.3			0.0961
EPA 8321B	Anatoxin-a	129	125	124			0.601
	Cylindrospermopsin	122	108	115			6.28
	Desmethyl microcystin LR	106	101	103			1.68
	Microcystin HilR	119	111	119			6.73
	Microcystin HtyR	114	105	114			8.29
	Microcystin LA	108	104	102			2.10
	Microcystin LF	128	103	109			5.55
	Microcystin LR	94.5	94.0	92.3			1.78
	Microcystin LW	134	124	132			6.41
	Microcystin LY	117	103	107			4.48
	Microcystin RR	109	105	112			7.02
	Microcystin WR	116	109	123			11.5
	Microcystin YR	101	99.1	96.8			2.42

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2228185
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2228185
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2228185
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2228185
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2228186
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2228184

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	03/01/2021			03/03/2021 17:35	Ping Hua	2228185
EPA 351.2 Rev. 2.0	03/01/2021	03/05/2021 12:30	Benjamin T. Nordmann	03/09/2021 12:21	Virginia P. Brown	2228185
EPA 353.2 Rev. 2.0	03/01/2021			03/04/2021 09:49	Beverly Y. Sanders	2228185
EPA 365.1 Rev. 2.0	03/01/2021	03/04/2021 12:20	Shengyu Ding	03/05/2021 11:28	Shengyu Ding	2228185
EPA 365.1 Rev. 2.0 dissolved	03/01/2021			03/02/2021 15:28	Lipi Saha	2228186
EPA 8321B	03/01/2021	03/03/2021 09:00	Pramila Ghimire	03/03/2021 12:35	Pramila Ghimire	2228184