

Chemical Analysis Report

WQAP-2022-01-28-04

Florida Department of Environmental Protection
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Overflow Analyses Performed By:
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DOH Accreditation Not NELAC Certified

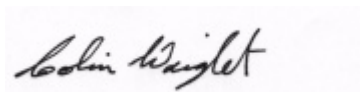
Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2021-07-12-37**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 05-APR-2022 11:29



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, Overflow 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: Caloosahatchee River-Upstream Cape Coral Bridge

Collection Date/Time: 01/27/2022 08:50

Field ID: HAB-SD-012722-0850

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2302327	SOP 67 (Greenwater)	Lyngbyatoxin-a (LA)**	0.1	UQ	ng/mL		
		Aplysiatoxin (AT)**	0.1	UJQ	ng/mL		
		Debromoaplysiatoxin (DAT)**	0.3	UQ	ng/mL		
2302328	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P409130	
		Cylindrospermopsin	0.10	U	ug/L	P409130	
		Desmethyl microcystin LR	0.25	U	ug/L	P409130	
		Microcystin HILR**	0.25	U	ug/L	P409130	
		Microcystin HtyR**	0.25	U	ug/L	P409130	
		Microcystin LA	0.10	U	ug/L	P409130	
		Microcystin LF	0.10	U	ug/L	P409130	
		Microcystin LR	0.25	U	ug/L	P409130	
		Microcystin LW	0.25	U	ug/L	P409130	
		Microcystin LY	0.10	U	ug/L	P409130	
		Microcystin RR	0.10	U	ug/L	P409130	
		Microcystin WR	0.50	U	ug/L	P409130	
		Microcystin YR	0.25	U	ug/L	P409130	
		Nodularin-R**	0.10	U	ug/L	P409130	
2302329	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P409350	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P409238	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.056		mg N/L	P409318	
	EPA 365.1 Rev. 2.0	Total-P	0.064		mg P/L	P409182	
2302330	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.047		mg P/L	P409158	

Ref. Method and Comment:

SOP 67 (Greenwater): The Matrix Spike Recovery of Aplysiatoxin (AT) was outside control limits. The sample was extracted 1 day beyond the 10-day hold time. GreenWater determines MDLs for each run by calculating a signal to noise ratio of 3.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409350

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409238

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409318

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409182

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409158

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

Reference Method: EPA 8321B
Batch ID: P409130

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: P409350

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409238

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409318

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: P409182

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409158

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

Reference Method: EPA 8321B
Batch ID: P409130

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	70.7		P	40 - 150
Cylindrospermopsin	103		P	40 - 150
Desmethyl microcystin LR	88.3		P	40 - 150
Microcystin HIR	88.0		P	40 - 150
Microcystin HtyR	83.5		P	40 - 150
Microcystin LA	101		P	40 - 150
Microcystin LF	80.6		P	40 - 150
Microcystin LR	76.4		P	40 - 150
Microcystin LW	76.4		P	40 - 150
Microcystin LY	79.2		P	40 - 150
Microcystin RR	104		P	40 - 150
Microcystin WR	77.1		P	40 - 150
Microcystin YR	70.5		P	40 - 150
Nodularin-R	96.0		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P409350

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302048	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P409238

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302350	Kjeldahl Nitrogen	102	96.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P409318

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302049	NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P409182

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302264	Total-P	98.9	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P409158

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302351	O-Phosphate-P	99.7	100	P/P	90 - 110

Reference Method: EPA 8321B

Batch ID: P409130

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2302283	Anatoxin-a	129	135	P/P	40 - 150
2302283	Cylindrospermopsin	118	123	P/P	40 - 150
2302283	Desmethyl microcystin LR	107	114	P/P	40 - 150
2302283	Microcystin HiLR	103	104	P/P	40 - 150
2302283	Microcystin HtyR	98.0	100	P/P	40 - 150
2302283	Microcystin LA	103	97.5	P/P	40 - 150
2302283	Microcystin LF	79.9	84.1	P/P	40 - 150
2302283	Microcystin LR	95.0	99.2	P/P	40 - 150
2302283	Microcystin LW	74.5	78.4	P/P	40 - 150
2302283	Microcystin LY	79.6	80.6	P/P	40 - 150
2302283	Microcystin RR	113	112	P/P	40 - 150
2302283	Microcystin WR	90.8	87.4	P/P	40 - 150
2302283	Microcystin YR	85.1	88.3	P/P	40 - 150
2302283	Nodularin-R	108	113	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P409350

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302048	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P409238

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302350	Kjeldahl Nitrogen	4.02	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P409318

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302049	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P409182

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302264	Total-P	1.16	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P409158

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302351	O-Phosphate-P	0.558	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P409130

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2302283	Anatoxin-a	4.33	Spike	P	0 - 30
2302283	Cylindrospermopsin	4.40	Spike	P	0 - 30
2302283	Desmethyl microcystin LR	6.08	Spike	P	0 - 30
2302283	Microcystin H1R	0.917	Spike	P	0 - 30
2302283	Microcystin HtyR	2.38	Spike	P	0 - 30
2302283	Microcystin LA	5.72	Spike	P	0 - 30
2302283	Microcystin LF	5.12	Spike	P	0 - 30
2302283	Microcystin LR	4.37	Spike	P	0 - 30
2302283	Microcystin LW	5.17	Spike	P	0 - 30
2302283	Microcystin LY	1.28	Spike	P	0 - 30
2302283	Microcystin RR	0.563	Spike	P	0 - 30
2302283	Microcystin WR	3.87	Spike	P	0 - 30
2302283	Microcystin YR	3.74	Spike	P	0 - 30
2302283	Nodularin-R	4.79	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: 2302328
Field Sample ID: HAB-SD-012722-0850

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	40.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A110106

Included Lab Sample IDs: 2302330

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A110171

Included Lab Sample IDs: 2302329

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A110182

Included Lab Sample IDs: 2302329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	99.6	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A110221

Included Lab Sample IDs: 2302328

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	110	111	P/P	50 - 160
Cylindrospermopsin	105	104	P/P	60 - 160
Desmethyl microcystin LR	90.1	91.7	P/P	60 - 160
Microcystin HILR	91.7	88.3	P/P	60 - 160
Microcystin HtyR	87.8	80.4	P/P	60 - 160
Microcystin LA	105	98.8	P/P	50 - 160
Microcystin LF	86.4	78.7	P/P	60 - 160
Microcystin LR	88.2	77.8	P/P	60 - 160
Microcystin LW	78.9	73.8	P/P	60 - 160
Microcystin LY	87.1	71.1	P/P	60 - 160
Microcystin RR	98.1	105	P/P	60 - 160
Microcystin WR	79.9	75.2	P/P	60 - 160
Microcystin YR	79.9	67.5	P/P	60 - 160
Nodularin-R	95.5	93.6	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110239

Included Lab Sample IDs: 2302329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.0	98.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A110283

Included Lab Sample IDs: 2302329

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	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	MS
EPA 350.1 Rev. 2.0	Ammonia-N	99.4	102	102		0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.5	102	96.7		4.02
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	100	100		0.0
EPA 365.1 Rev. 2.0	Total-P	102	98.9	100		1.16
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.2	99.7	100		0.558
EPA 8321B	Anatoxin-a	70.7	129	135		4.33
	Cylindrospermopsin	103	118	123		4.40
	Desmethyl microcystin LR	88.3	107	114		6.08
	Microcystin HiLR	88.0	103	104		0.917
	Microcystin HtyR	83.5	98.0	100		2.38
	Microcystin LA	101	103	97.5		5.72
	Microcystin LF	80.6	79.9	84.1		5.12
	Microcystin LR	76.4	95.0	99.2		4.37
	Microcystin LW	76.4	74.5	78.4		5.17
	Microcystin LY	79.2	79.6	80.6		1.28
	Microcystin RR	104	113	112		0.563
	Microcystin WR	77.1	90.8	87.4		3.87
	Microcystin YR	70.5	85.1	88.3		3.74
	Nodularin-R	96.0	108	113		4.79

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2302329
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2302329
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2302329
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2302329
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2302330
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2302328
SOP 67 (Greenwater)	Algal Dermatotoxins by LC/MS/MS using Greenwater Laboratory	2302327

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	01/28/2022			02/02/2022 14:21	Ping Hua	2302329
EPA 351.2 Rev. 2.0	01/28/2022	02/02/2022 10:16	Alexandra J Mattheus	02/04/2022 10:01	Alexandra J Mattheus	2302329
EPA 353.2 Rev. 2.0	01/28/2022			02/02/2022 10:23	Beverly Y. Sanders	2302329
EPA 365.1 Rev. 2.0	01/28/2022	02/01/2022 11:50	Simonne.V. Calhoun	02/08/2022 11:51	Shengyu Ding	2302329
EPA 365.1 Rev. 2.0 dissolved	01/28/2022			01/28/2022 15:26	James L Waggerby	2302330
EPA 8321B	01/28/2022	02/03/2022 08:30	Manjita Shrestha	02/03/2022 13:48	Manjita Shrestha	2302328
SOP 67 (Greenwater)	01/28/2022	02/07/2022 13:00	GreenWater Labs	02/10/2022 12:46	GreenWater Labs	2302327