Chemical Analysis Report

WQAP-2022-02-10-02

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2021-12-27-03**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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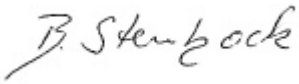
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 25-FEB-2022 19:15



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: Cypress Lake - West Lobe **Collection Date/Time: 02/09/2022 11:45**

Field ID: HABOC0007_CypressLake1 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2304830	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P409676	
		Cylindrospermopsin	0.10	U	ug/L	P409676	
		Desmethyl microcystin LR	0.25	U	ug/L	P409676	
		Microcystin HilR**	0.25	U	ug/L	P409676	
		Microcystin HtyR**	0.25	U	ug/L	P409676	
		Microcystin LA	0.10	U	ug/L	P409676	
		Microcystin LF	0.10	U	ug/L	P409676	
		Microcystin LR	0.25	U	ug/L	P409676	
		Microcystin LW	0.25	U	ug/L	P409676	
		Microcystin LY	0.10	U	ug/L	P409676	
		Microcystin RR	0.10	U	ug/L	P409676	
		Microcystin WR	0.50	U	ug/L	P409676	
		Microcystin YR	0.25	U	ug/L	P409676	
		Nodularin-R**	0.10	U	ug/L	P409676	
2304839	EPA 350.1 Rev. 2.0	Ammonia-N	0.014		mg N/L	P409953	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.57		mg N/L	P409965	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P409843	
	EPA 365.1 Rev. 2.0	Total-P	0.013		mg P/L	P409777	
2304840	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P409692	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409953

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409965

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409843

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409777

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409692

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

Reference Method: EPA 8321B
Batch ID: P409676

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: P409953

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409965

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.3		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409843

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409777

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: P409692

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

Reference Method: EPA 8321B
Batch ID: P409676

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	101		P	40 - 150
Cylindrospermopsin	110		P	40 - 150
Desmethyl microcystin LR	96.0		P	40 - 150
Microcystin HilR	100		P	40 - 150
Microcystin HtyR	101		P	40 - 150
Microcystin LA	97.3		P	40 - 150
Microcystin LF	91.6		P	40 - 150
Microcystin LR	101		P	40 - 150
Microcystin LW	75.1		P	40 - 150
Microcystin LY	93.4		P	40 - 150
Microcystin RR	110		P	40 - 150
Microcystin WR	80.7		P	40 - 150
Microcystin YR	96.5		P	40 - 150
Nodularin-R	110		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409953

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304766	Ammonia-N	98.2	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409965

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304766	Kjeldahl Nitrogen	96.8	94.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409843

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304820	NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409777

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304843	Total-P	105	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409692

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304770	O-Phosphate-P	101	103	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P409676

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2304727	Anatoxin-a	106	114	P/P	40 - 150
2304727	Cylindrospermopsin	107	112	P/P	40 - 150
2304727	Desmethyl microcystin LR	96.1	110	P/P	40 - 150
2304727	Microcystin HilR	102	108	P/P	40 - 150
2304727	Microcystin HtyR	100	108	P/P	40 - 150
2304727	Microcystin LA	96.4	101	P/P	40 - 150
2304727	Microcystin LF	73.3	81.3	P/P	40 - 150
2304727	Microcystin LR	97.5	99.0	P/P	40 - 150
2304727	Microcystin LW	64.5	73.7	P/P	40 - 150
2304727	Microcystin LY	90.0	95.0	P/P	40 - 150
2304727	Microcystin RR	104	108	P/P	40 - 150
2304727	Microcystin WR	85.1	90.7	P/P	40 - 150
2304727	Microcystin YR	101	103	P/P	40 - 150
2304727	Nodularin-R	106	114	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409953

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304766	Ammonia-N	1.06	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P409965

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304766	Kjeldahl Nitrogen	1.91	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P409843

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304820	NO2NO3-N	0.976	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P409777

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304843	Total-P	1.36	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P409692

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304770	O-Phosphate-P	1.18	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P409676

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2304727	Anatoxin-a	7.39	Spike	P	0 - 30
2304727	Cylindrospermopsin	5.22	Spike	P	0 - 30
2304727	Desmethyl microcystin LR	13.2	Spike	P	0 - 30
2304727	Microcystin HilR	5.24	Spike	P	0 - 30
2304727	Microcystin HtyR	7.57	Spike	P	0 - 30
2304727	Microcystin LA	4.95	Spike	P	0 - 30
2304727	Microcystin LF	10.3	Spike	P	0 - 30
2304727	Microcystin LR	1.48	Spike	P	0 - 30
2304727	Microcystin LW	13.2	Spike	P	0 - 30
2304727	Microcystin LY	5.45	Spike	P	0 - 30
2304727	Microcystin RR	3.52	Spike	P	0 - 30
2304727	Microcystin WR	6.32	Spike	P	0 - 30
2304727	Microcystin YR	2.15	Spike	P	0 - 30
2304727	Nodularin-R	6.83	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: 2304830
Field Sample ID: HABOC0007_CypressLake1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	52.9	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A110338
Included Lab Sample IDs: 2304840

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.1	100	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A110341
Included Lab Sample IDs: 2304830

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	93.3	95.8	P/P	50 - 160
Cylindrospermopsin	104	99.9	P/P	60 - 160
Desmethyl microcystin LR	97.2	92.5	P/P	60 - 160
Microcystin HilR	89.6	95.8	P/P	60 - 160
Microcystin HtyR	99.2	97.1	P/P	60 - 160
Microcystin LA	101	99.3	P/P	50 - 160
Microcystin LF	86.1	81.0	P/P	60 - 160
Microcystin LR	99.2	88.0	P/P	60 - 160
Microcystin LW	84.5	76.8	P/P	60 - 160
Microcystin LY	93.0	81.1	P/P	60 - 160
Microcystin RR	103	103	P/P	60 - 160
Microcystin WR	86.4	84.4	P/P	60 - 160
Microcystin YR	86.5	82.0	P/P	60 - 160
Nodularin-R	96.4	100	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A110411
Included Lab Sample IDs: 2304839

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A110454
Included Lab Sample IDs: 2304839

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.6	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A110489
Included Lab Sample IDs: 2304839

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A110537
Included Lab Sample IDs: 2304839

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.6	94.1	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	99.8	98.2	99.6			1.06
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.3	96.8	94.5			1.91
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	103			0.976
EPA 365.1 Rev. 2.0	Total-P	102	105	107			1.36
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	101	103			1.18
EPA 8321B	Anatoxin-a	101	106	114			7.39
	Cylindrospermopsin	110	107	112			5.22
	Desmethyl microcystin LR	96.0	96.1	110			13.2
	Microcystin HilR	100	102	108			5.24
	Microcystin HtyR	101	100	108			7.57
	Microcystin LA	97.3	96.4	101			4.95
	Microcystin LF	91.6	73.3	81.3			10.3
	Microcystin LR	101	97.5	99.0			1.48
	Microcystin LW	75.1	64.5	73.7			13.2
	Microcystin LY	93.4	90.0	95.0			5.45
	Microcystin RR	110	104	108			3.52
	Microcystin WR	80.7	85.1	90.7			6.32
	Microcystin YR	96.5	101	103			2.15
	Nodularin-R	110	106	114			6.83

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2304839
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2304839
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2304839
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2304839
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2304840
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2304830

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	02/10/2022			02/16/2022 14:05	Ping Hua	2304839
EPA 351.2 Rev. 2.0	02/10/2022	02/18/2022 10:12	Samantha L Bates	02/22/2022 11:36	Alexandra J Mattheus	2304839
EPA 353.2 Rev. 2.0	02/10/2022			02/15/2022 11:36	Beverly Y. Sanders	2304839
EPA 365.1 Rev. 2.0	02/10/2022	02/15/2022 14:20	Simonne.V. Calhoun	02/18/2022 13:35	Shengyu Ding	2304839
EPA 365.1 Rev. 2.0 dissolved	02/10/2022			02/10/2022 14:50	James L Waggerby	2304840
EPA 8321B	02/10/2022	02/10/2022 12:30	Manjita Shrestha	02/10/2022 18:54	Manjita Shrestha	2304830