

Chemical Analysis Report

WQAP-2022-04-27-01

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-2022-04-18-43**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd. Suite 232
Orlando, FL 32803
Attn: Matt Bearden

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 19-MAY-2022 10:14

A handwritten signature in black ink, appearing to read "Liang Lin", on a light-colored background.

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: Alexander Spring - DS of vent

Collection Date/Time: 04/26/2022 11:18

Field ID: HABCE0119_AlexanderSpring

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2322207	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P412946	
		Cylindrospermopsin	0.10	U	ug/L	P412946	
		Desmethyl microcystin LR	0.25	U	ug/L	P412946	
		Microcystin HIR**	0.25	U	ug/L	P412946	
		Microcystin HtyR**	0.25	U	ug/L	P412946	
		Microcystin LA	0.10	U	ug/L	P412946	
		Microcystin LF	0.10	U	ug/L	P412946	
		Microcystin LR	0.25	U	ug/L	P412946	
		Microcystin LW	0.25	U	ug/L	P412946	
		Microcystin LY	0.10	U	ug/L	P412946	
		Microcystin RR	0.10	U	ug/L	P412946	
		Microcystin WR	0.50	U	ug/L	P412946	
		Microcystin YR	0.25	U	ug/L	P412946	
		Nodularin-R**	0.10	U	ug/L	P412946	
2322208	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P413070	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P413442	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.041		mg N/L	P413288	
	EPA 365.1 Rev. 2.0	Total-P	0.046		mg P/L	P413232	
2322209	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.047		mg P/L	P413020	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P413070

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413442

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413288

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413232

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P413020

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

Reference Method: EPA 8321B
Batch ID: P412946

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: P413070

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P413442

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P413288

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P413232

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.7		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P413020

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P412946

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	108		P	40 - 150
Cylindrospermopsin	94.6		P	40 - 150
Desmethyl microcystin LR	97.1		P	40 - 150
Microcystin HIR	98.5		P	40 - 150
Microcystin HtyR	117		P	40 - 150
Microcystin LA	96.4		P	40 - 150
Microcystin LF	91.1		P	40 - 150
Microcystin LR	98.3		P	40 - 150
Microcystin LW	118		P	40 - 150
Microcystin LY	103		P	40 - 150
Microcystin RR	98.4		P	40 - 150
Microcystin WR	90.8		P	40 - 150
Microcystin YR	96.7		P	40 - 150
Nodularin-R	95.8		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P413070

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2322208	Ammonia-N	99.6	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P413288

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2322267	NO2NO3-N	97.2	98.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P413232

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2322171	Total-P	99.5	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P413020

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2322209	O-Phosphate-P	98.0	99.2	P/P	90 - 110

Reference Method: EPA 8321B

Batch ID: P412946

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2321454	Anatoxin-a	104	104	P/P	40 - 150
2321454	Cylindrospermopsin	95.4	98.7	P/P	40 - 150
2321454	Desmethyl microcystin LR	107	107	P/P	40 - 150
2321454	Microcystin HilR	108	107	P/P	40 - 150
2321454	Microcystin HtyR	113	112	P/P	40 - 150
2321454	Microcystin LA	89.3	101	P/P	40 - 150
2321454	Microcystin LF	80.4	63.5	P/P	40 - 150
2321454	Microcystin LR	110	111	P/P	40 - 150
2321454	Microcystin LW	103	94.5	P/P	40 - 150
2321454	Microcystin LY	96.4	102	P/P	40 - 150
2321454	Microcystin RR	103	99.4	P/P	40 - 150
2321454	Microcystin WR	95.2	110	P/P	40 - 150
2321454	Microcystin YR	100	107	P/P	40 - 150
2321454	Nodularin-R	97.1	97.9	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P413070

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2322208	Ammonia-N	0.800	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P413442

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2319209	Kjeldahl Nitrogen	13.7	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P413288

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2322267	NO2NO3-N	1.21	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P413232

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2322171	Total-P	0.294	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P413020

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2322209	O-Phosphate-P	0.823	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P412946

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2321454	Anatoxin-a	0.0181	Spike	P	0 - 30
2321454	Cylindrospermopsin	3.43	Spike	P	0 - 30
2321454	Desmethyl microcystin LR	0.0997	Spike	P	0 - 30
2321454	Microcystin HtIR	1.03	Spike	P	0 - 30
2321454	Microcystin HtyR	0.949	Spike	P	0 - 30
2321454	Microcystin LA	8.93	Spike	P	0 - 30
2321454	Microcystin LF	23.5	Spike	P	0 - 30
2321454	Microcystin LR	0.724	Spike	P	0 - 30
2321454	Microcystin LW	8.99	Spike	P	0 - 30
2321454	Microcystin LY	6.05	Spike	P	0 - 30
2321454	Microcystin RR	3.21	Spike	P	0 - 30
2321454	Microcystin WR	13.3	Spike	P	0 - 30
2321454	Microcystin YR	6.02	Spike	P	0 - 30
2321454	Nodularin-R	0.773	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: 2322207

Field Sample ID: HABCE0119_AlexanderSpring

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	67.6	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A111750

Included Lab Sample IDs: 2322209

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	99.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A111765

Included Lab Sample IDs: 2322208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.8	97.3	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A111782

Included Lab Sample IDs: 2322207

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	101	108	P/P	50 - 160
Cylindrospermopsin	93.4	117	P/P	50 - 160
Desmethyl microcystin LR	84.9	84.9	P/P	50 - 160
Microcystin HILR	92.0	92.3	P/P	50 - 160
Microcystin HtyR	96.8	101	P/P	50 - 160
Microcystin LA	89.0	86.8	P/P	50 - 160
Microcystin LF	92.3	71.7	P/P	50 - 160
Microcystin LR	101	92.8	P/P	50 - 160
Microcystin LW	92.5	75.1	P/P	50 - 160
Microcystin LY	92.4	92.3	P/P	50 - 160
Microcystin RR	92.0	95.5	P/P	50 - 160
Microcystin WR	105	80.5	P/P	50 - 160
Microcystin YR	88.1	94.2	P/P	50 - 160
Nodularin-R	93.3	94.4	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A111878

Included Lab Sample IDs: 2322208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	97.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A111944

Included Lab Sample IDs: 2322208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A112015

Included Lab Sample IDs: 2322208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	96.9	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	95.6	99.6	100			0.800
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8					13.7
EPA 353.2 Rev. 2.0	NO2NO3-N	98.0	97.2	98.7			1.21
EPA 365.1 Rev. 2.0	Total-P	99.7	99.5	99.8			0.294
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.9	98.0	99.2			0.823
EPA 8321B	Anatoxin-a	108	104	104			0.0181
	Cylindrospermopsin	94.6	95.4	98.7			3.43
	Desmethyl microcystin LR	97.1	107	107			0.0997
	Microcystin HiLR	98.5	108	107			1.03
	Microcystin HtyR	117	113	112			0.949
	Microcystin LA	96.4	89.3	101			8.93
	Microcystin LF	91.1	80.4	63.5			23.5
	Microcystin LR	98.3	110	111			0.724
	Microcystin LW	118	103	94.5			8.99
	Microcystin LY	103	96.4	102			6.05
	Microcystin RR	98.4	103	99.4			3.21
	Microcystin WR	90.8	95.2	110			13.3
	Microcystin YR	96.7	100	107			6.02
	Nodularin-R	95.8	97.1	97.9			0.773

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2322208
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2322208
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2322208
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2322208
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2322209
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2322207

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	04/27/2022			04/28/2022 14:52	Judith K. Clark	2322208
EPA 351.2 Rev. 2.0	04/27/2022	05/06/2022 09:53	Samantha L Bates	05/09/2022 16:24	Samantha L Bates	2322208
EPA 353.2 Rev. 2.0	04/27/2022			05/03/2022 13:28	Nathaniel J Jones	2322208
EPA 365.1 Rev. 2.0	04/27/2022	05/03/2022 16:15	Simonne.V. Calhoun	05/05/2022 14:44	James L Waggerby	2322208
EPA 365.1 Rev. 2.0 dissolved	04/27/2022			04/27/2022 15:38	Nathaniel J Jones	2322209
EPA 8321B	04/27/2022	04/28/2022 10:00	Manjita Shrestha	04/28/2022 15:47	Manjita Shrestha	2322207