

Chemical Analysis Report

WQAP-2021-10-27-02

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-2021-10-18-57**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

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Certified by: Colin Wright, Program Administrator

Date Certified: 19-NOV-2021 15:11

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular 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: Lake Emerald - SE Park Shore

Collection Date/Time: 10/26/2021 12:15

Field ID: HABCE0088_LakeEmerald

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2286244	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P405661	
		Cylindrospermopsin	0.10	U	ug/L	P405661	
		Desmethyl microcystin LR	0.25	U	ug/L	P405661	
		Microcystin HIR**	0.25	U	ug/L	P405661	
		Microcystin HtyR**	0.25	U	ug/L	P405661	
		Microcystin LA	0.10	U	ug/L	P405661	
		Microcystin LF	0.10	U	ug/L	P405661	
		Microcystin LR	0.41	I	ug/L	P405661	
		Microcystin LW	0.25	U	ug/L	P405661	
		Microcystin LY	0.10	U	ug/L	P405661	
		Microcystin RR	0.10	U	ug/L	P405661	
		Microcystin WR	0.50	U	ug/L	P405661	
		Microcystin YR	0.25	U	ug/L	P405661	
		Nodularin-R**	0.10	U	ug/L	P405661	
2286252	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P405860	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.77		mg N/L	P406006	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P405756	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P405868	
2286254	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P405678	

Sample Location: Lake Copeland - SE Corner

Collection Date/Time: 10/26/2021 11:21

Field ID: HABCE0093_LakeCopeland 1

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2286245	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P405661	
		Cylindrospermopsin	0.10	U	ug/L	P405661	
		Desmethyl microcystin LR	0.25	U	ug/L	P405661	
		Microcystin HIR**	0.25	U	ug/L	P405661	
		Microcystin HtyR**	0.25	U	ug/L	P405661	
		Microcystin LA	0.10	U	ug/L	P405661	
		Microcystin LF	0.10	U	ug/L	P405661	
		Microcystin LR	0.25	U	ug/L	P405661	
		Microcystin LW	0.25	U	ug/L	P405661	
		Microcystin LY	0.10	U	ug/L	P405661	
		Microcystin RR	0.10	U	ug/L	P405661	
		Microcystin WR	0.50	U	ug/L	P405661	
		Microcystin YR	0.25	U	ug/L	P405661	
		Nodularin-R**	0.10	U	ug/L	P405661	
2286253	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P405860	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P406006	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P405756	
	EPA 365.1 Rev. 2.0	Total-P	0.046		mg P/L	P405868	
2286255	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P405678	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P405860

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P406006

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P405756

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P405868

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P405678

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

Reference Method: EPA 8321B
Batch ID: P405661

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: P405860

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: P406006

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: P405756

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: P405868

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: P405678

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

Reference Method: EPA 8321B
Batch ID: P405661

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	117		P	40 - 150
Cylindrospermopsin	111		P	40 - 150
Desmethyl microcystin LR	133		P	40 - 150
Microcystin HIR	110		P	40 - 150
Microcystin HtyR	105		P	40 - 150
Microcystin LA	114		P	40 - 150
Microcystin LF	107		P	40 - 150
Microcystin LR	132		P	40 - 150
Microcystin LW	110		P	40 - 150
Microcystin LY	121		P	40 - 150
Microcystin RR	110		P	40 - 150
Microcystin WR	115		P	40 - 150
Microcystin YR	115		P	40 - 150
Nodularin-R	115		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P405860

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286252	Ammonia-N	96.8	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P406006

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286252	Kjeldahl Nitrogen	101	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P405756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286104	NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P405868

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286393	Total-P	108	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P405678

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286254	O-Phosphate-P	96.4	96.0	P/P	90 - 110

Reference Method: EPA 8321B

Batch ID: P405661

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2286179	Anatoxin-a	110	115	P/P	40 - 150
2286179	Cylindrospermopsin	84.5	86.3	P/P	40 - 150
2286179	Desmethyl microcystin LR	118	114	P/P	40 - 150
2286179	Microcystin HiLR	93.1	98.4	P/P	40 - 150
2286179	Microcystin HtyR	84.8	91.6	P/P	40 - 150
2286179	Microcystin LA	89.0	95.5	P/P	40 - 150
2286179	Microcystin LF	87.0	91.0	P/P	40 - 150
2286179	Microcystin LR	112	116	P/P	40 - 150
2286179	Microcystin LW	86.5	85.6	P/P	40 - 150
2286179	Microcystin LY	102	107	P/P	40 - 150
2286179	Microcystin RR	95.7	104	P/P	40 - 150
2286179	Microcystin WR	86.5	94.1	P/P	40 - 150
2286179	Microcystin YR	93.1	105	P/P	40 - 150
2286179	Nodularin-R	100	108	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P405860

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286252	Ammonia-N	0.748	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P406006

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286252	Kjeldahl Nitrogen	0.202	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P405756

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286104	NO2NO3-N	0.501	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P405868

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286393	Total-P	2.12	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P405678

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286254	O-Phosphate-P	0.416	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P405661

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2286179	Anatoxin-a	4.56	Spike	P	0 - 30
2286179	Cylindrospermopsin	2.08	Spike	P	0 - 30
2286179	Desmethyl microcystin LR	3.32	Spike	P	0 - 30
2286179	Microcystin H1LR	5.56	Spike	P	0 - 30
2286179	Microcystin HtyR	7.72	Spike	P	0 - 30
2286179	Microcystin LA	7.01	Spike	P	0 - 30
2286179	Microcystin LF	4.53	Spike	P	0 - 30
2286179	Microcystin LR	3.87	Spike	P	0 - 30
2286179	Microcystin LW	1.05	Spike	P	0 - 30
2286179	Microcystin LY	4.69	Spike	P	0 - 30
2286179	Microcystin RR	8.04	Spike	P	0 - 30
2286179	Microcystin WR	8.41	Spike	P	0 - 30
2286179	Microcystin YR	12.0	Spike	P	0 - 30
2286179	Nodularin-R	7.35	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: 2286244

Field Sample ID: HABCE0088_LakeEmerald

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	99.8	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	118	P	30 - 160

Lab Sample ID: 2286245

Field Sample ID: HABCE0093_LakeCopeland 1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	96.0	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	86.2	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A108565

Included Lab Sample IDs: 2286254, 2286255

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.7	97.9	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A108598

Included Lab Sample IDs: 2286244, 2286245

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	98.5	97.0	P/P	50 - 160
Cylindrospermopsin	85.0	81.8	P/P	50 - 160
Desmethyl microcystin LR	96.7	107	P/P	50 - 160
Microcystin HIR	79.5	88.6	P/P	50 - 160
Microcystin HtyR	81.2	80.2	P/P	50 - 160
Microcystin LA	85.8	90.6	P/P	50 - 160
Microcystin LF	82.9	85.0	P/P	50 - 160
Microcystin LR	99.1	103	P/P	50 - 160
Microcystin LW	83.8	87.1	P/P	50 - 160
Microcystin LY	88.8	95.9	P/P	50 - 160
Microcystin RR	81.3	79.8	P/P	50 - 160
Microcystin WR	82.3	92.2	P/P	50 - 160
Microcystin YR	86.3	91.0	P/P	50 - 160
Nodularin-R	83.6	86.9	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A108614

Included Lab Sample IDs: 2286252, 2286253

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A108662

Included Lab Sample IDs: 2286252, 2286253

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.7	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A108721

Included Lab Sample IDs: 2286252, 2286253

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.8	97.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A108742

Included Lab Sample IDs: 2286252, 2286253

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	105	P/P	90 - 110
Kjeldahl Nitrogen	105	95.3	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	96.8	97.6			0.748
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	101	100			0.202
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	100	99.5			0.501
EPA 365.1 Rev. 2.0	Total-P	103	108	105			2.12
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.3	96.4	96.0			0.416
EPA 8321B	Anatoxin-a	117	110	115			4.56
	Cylindrospermopsin	111	84.5	86.3			2.08
	Desmethyl microcystin LR	133	118	114			3.32
	Microcystin HiLR	110	93.1	98.4			5.56
	Microcystin HtyR	105	84.8	91.6			7.72
	Microcystin LA	114	89.0	95.5			7.01
	Microcystin LF	107	87.0	91.0			4.53
	Microcystin LR	132	112	116			3.87
	Microcystin LW	110	86.5	85.6			1.05
	Microcystin LY	121	102	107			4.69
	Microcystin RR	110	95.7	104			8.04
	Microcystin WR	115	86.5	94.1			8.41
	Microcystin YR	115	93.1	105			12.0
	Nodularin-R	115	100	108			7.35

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2286252, 2286253
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2286252, 2286253
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2286252, 2286253
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2286252, 2286253
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2286254, 2286255
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2286244, 2286245

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	10/27/2021			11/02/2021 12:52	Ping Hua	2286252
	10/27/2021			11/02/2021 13:00	Ping Hua	2286253
EPA 351.2 Rev. 2.0	10/27/2021	11/04/2021 12:43	Benjamin T. Nordmann	11/05/2021 10:11	Alexandra J Mattheus	2286252
	10/27/2021	11/04/2021 12:43	Benjamin T. Nordmann	11/05/2021 10:19	Alexandra J Mattheus	2286253
EPA 353.2 Rev. 2.0	10/27/2021			10/29/2021 10:04	Beverly Y. Sanders	2286252
	10/27/2021			10/29/2021 10:05	Beverly Y. Sanders	2286253
EPA 365.1 Rev. 2.0	10/27/2021	11/02/2021 16:18	Simonne.V. Calhoun	11/04/2021 14:05	Lipi Saha	2286252
	10/27/2021	11/02/2021 16:18	Simonne.V. Calhoun	11/04/2021 14:06	Lipi Saha	2286253
EPA 365.1 Rev. 2.0 dissolved	10/27/2021			10/27/2021 14:30	James L Waggeberby	2286254
	10/27/2021			10/27/2021 14:33	James L Waggeberby	2286255
EPA 8321B	10/27/2021	10/28/2021 12:00	Manjita Shrestha	10/28/2021 17:53	Manjita Shrestha	2286244
	10/27/2021	10/28/2021 12:00	Manjita Shrestha	10/28/2021 18:10	Manjita Shrestha	2286245