Chemical Analysis Report

WQAP-2021-09-15-01

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-2021-08-30-53**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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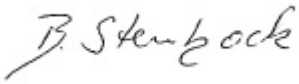
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 07-OCT-2021 18:11



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 Copeland - SE Corner **Collection Date/Time: 09/14/2021 12:30**

Field ID: HABCE0093_LakeCopeland Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2276136	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P403717	
		Cylindrospermopsin	0.10	U	ug/L	P403717	
		Desmethyl microcystin LR	0.25	U	ug/L	P403717	
		Microcystin HilR**	0.25	U	ug/L	P403717	
		Microcystin HtyR**	0.25	U	ug/L	P403717	
		Microcystin LA	0.10	U	ug/L	P403717	
		Microcystin LF	0.10	U	ug/L	P403717	MS
		Microcystin LR	0.25	U	ug/L	P403717	
		Microcystin LW	0.25	U	ug/L	P403717	
		Microcystin LY	0.10	U	ug/L	P403717	MS
		Microcystin RR	0.10	U	ug/L	P403717	
		Microcystin WR	0.50	U	ug/L	P403717	
		Microcystin YR	0.25	U	ug/L	P403717	
		Nodularin-R**	0.10	U	ug/L	P403717	
2276137	EPA 350.1 Rev. 2.0	Ammonia-N	0.005	I	mg N/L	P403923	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P403935	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P403915	
	EPA 365.1 Rev. 2.0	Total-P	0.045		mg P/L	P403800	
2276138	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P403779	

Ref. Method and Comment:
EPA 365.1 Rev. 2.0: Total-P: 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: P403923

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403935

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403915

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403800

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403779

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

Reference Method: EPA 8321B
Batch ID: P403717

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: P403923

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403935

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	92.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403915

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403800

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: P403779

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

Reference Method: EPA 8321B
Batch ID: P403717

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	80.4		P	40 - 150
Cylindrospermopsin	116		P	40 - 150
Desmethyl microcystin LR	94.8		P	40 - 150
Microcystin HilR	107		P	40 - 150
Microcystin HtyR	115		P	40 - 150
Microcystin LA	142		P	40 - 150
Microcystin LF	147		P	40 - 150
Microcystin LR	121		P	40 - 150
Microcystin LW	124		P	40 - 150
Microcystin LY	145		P	40 - 150
Microcystin RR	135		P	40 - 150
Microcystin WR	92.8		P	40 - 150
Microcystin YR	101		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: P403923

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276073	Ammonia-N	95.0	95.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403935

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276504	Kjeldahl Nitrogen	103	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403915

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276137	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403779

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2276138	O-Phosphate-P	97.6	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P403717

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2275907	Anatoxin-a	97.0	97.5	P/P	40 - 150
2275907	Cylindrospermopsin	126	127	P/P	40 - 150
2275907	Desmethyl microcystin LR	105	105	P/P	40 - 150
2275907	Microcystin HilR	116	120	P/P	40 - 150
2275907	Microcystin HtyR	116	120	P/P	40 - 150
2275907	Microcystin LA	142	144	P/P	40 - 150
2275907	Microcystin LF	158	150	F/F	40 - 150
2275907	Microcystin LR	130	131	P/P	40 - 150
2275907	Microcystin LW	129	128	P/P	40 - 150
2275907	Microcystin LY	150	153	P/F	40 - 150
2275907	Microcystin RR	147	139	P/P	40 - 150
2275907	Microcystin WR	96.2	96.3	P/P	40 - 150
2275907	Microcystin YR	111	108	P/P	40 - 150
2275907	Nodularin-R	131	128	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403923

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276073	Ammonia-N	0.201	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403935

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276504	Kjeldahl Nitrogen	3.66	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403915

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276137	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403800

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275908	Total-P	0.831	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403779

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2276138	O-Phosphate-P	1.93	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P403717

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2275907	Anatoxin-a	0.434	Spike	P	0 - 30
2275907	Cylindrospermopsin	0.958	Spike	P	0 - 30
2275907	Desmethyl microcystin LR	0.481	Spike	P	0 - 30
2275907	Microcystin HilR	3.13	Spike	P	0 - 30
2275907	Microcystin HtyR	4.00	Spike	P	0 - 30
2275907	Microcystin LA	1.72	Spike	P	0 - 30
2275907	Microcystin LF	5.23	Spike	P	0 - 30
2275907	Microcystin LR	0.354	Spike	P	0 - 30
2275907	Microcystin LW	0.457	Spike	P	0 - 30
2275907	Microcystin LY	1.85	Spike	P	0 - 30
2275907	Microcystin RR	5.44	Spike	P	0 - 30
2275907	Microcystin WR	0.152	Spike	P	0 - 30
2275907	Microcystin YR	3.26	Spike	P	0 - 30
2275907	Nodularin-R	2.30	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: 2276136
Field Sample ID: HABCE0093_LakeCopeland

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	98.1	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	86.6	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A107808
Included Lab Sample IDs: 2276138

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

Reference Method: EPA 8321B
Run ID: A107824
Included Lab Sample IDs: 2276136

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	71.5	69.4	P/P	50 - 160
Cylindrospermopsin	108	109	P/P	50 - 160
Desmethyl microcystin LR	81.4	84.5	P/P	50 - 160
Microcystin HilR	95.8	94.5	P/P	50 - 160
Microcystin HtyR	103	102	P/P	50 - 160
Microcystin LA	129	131	P/P	50 - 160
Microcystin LF	137	129	P/P	50 - 160
Microcystin LR	106	105	P/P	50 - 160
Microcystin LW	112	107	P/P	50 - 160
Microcystin LY	132	123	P/P	50 - 160
Microcystin RR	124	123	P/P	50 - 160
Microcystin WR	78.3	80.3	P/P	50 - 160
Microcystin YR	92.0	94.0	P/P	50 - 160
Nodularin-R	105	102	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A107882
Included Lab Sample IDs: 2276137

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A107885
Included Lab Sample IDs: 2276137

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.3	96.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A107901
Included Lab Sample IDs: 2276137

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	109	108	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A107906
Included Lab Sample IDs: 2276137

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.9	99.0	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	96.4	95.0	95.2			0.201
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	92.8	103	109			3.66
EPA 353.2 Rev. 2.0	NO2NO3-N	104	104	104			0.0
EPA 365.1 Rev. 2.0	Total-P	102					0.831
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.7	97.6	99.5			1.93
EPA 8321B	Anatoxin-a	80.4	97.0	97.5			0.434
	Cylindrospermopsin	116	126	127			0.958
	Desmethyl microcystin LR	94.8	105	105			0.481
	Microcystin HilR	107	116	120			3.13
	Microcystin HtyR	115	116	120			4.00
	Microcystin LA	142	142	144			1.72
	Microcystin LF	147	158	150			5.23
	Microcystin LR	121	130	131			0.354
	Microcystin LW	124	129	128			0.457
	Microcystin LY	145	150	153			1.85
	Microcystin RR	135	147	139			5.44
	Microcystin WR	92.8	96.2	96.3			0.152
	Microcystin YR	101	111	108			3.26
	Nodularin-R	110	131	128			2.30

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2276137
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2276137
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2276137
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2276137
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2276138
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2276136

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	09/15/2021			09/20/2021 13:06	Ping Hua	2276137
EPA 351.2 Rev. 2.0	09/15/2021	09/20/2021 17:00	Benjamin T. Nordmann	09/21/2021 12:53	Alexandra J Mattheus	2276137
EPA 353.2 Rev. 2.0	09/15/2021			09/20/2021 10:27	Beverly Y. Sanders	2276137
EPA 365.1 Rev. 2.0	09/15/2021	09/16/2021 15:28	Simonne.V. Calhoun	09/20/2021 15:33	Virginia P. Brown	2276137
EPA 365.1 Rev. 2.0 dissolved	09/15/2021			09/15/2021 14:14	James L Waggerby	2276138
EPA 8321B	09/15/2021	09/16/2021 08:00	Manjita Shrestha	09/16/2021 11:38	Manjita Shrestha	2276136