Chemical Analysis Report

WQAP-2022-11-18-04

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-10-03-59**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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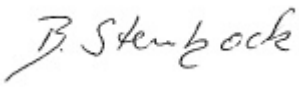
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 09-DEC-2022 17:33



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: Starke Lake - Boat Ramp **Collection Date/Time: 11/17/2022 11:38**

Field ID: HABCE0143_StarkeLake Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2370830	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P422554	
		Cylindrospermopsin	0.10	U	ug/L	P422553	
		Desmethyl microcystin LR	0.25	U	ug/L	P422553	
		Microcystin HilR	0.25	U	ug/L	P422553	
		Microcystin HtyR	0.25	U	ug/L	P422553	
		Microcystin LA	0.10	U	ug/L	P422553	
		Microcystin LF	0.10	U	ug/L	P422553	
		Microcystin LR	0.25	U	ug/L	P422553	
		Microcystin LW	0.25	U	ug/L	P422553	
		Microcystin LY	0.10	U	ug/L	P422553	
		Microcystin RR	0.10	U	ug/L	P422553	
		Microcystin WR	0.50	U	ug/L	P422553	
		Microcystin YR	0.25	U	ug/L	P422553	
		Nodularin-R	0.10	U	ug/L	P422553	
2370834	EPA 350.1 Rev. 2.0	Ammonia-N	0.14		mg N/L	P423159	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P422773	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.30		mg N/L	P422664	
	EPA 365.1 Rev. 2.0	Total-P	0.079		mg P/L	P422684	
2370835	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P422585	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423159

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422773

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422664

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422684

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422585

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

Reference Method: EPA 8321B
Batch ID: P422553

Component	Result	Code	Units
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

Reference Method: EPA 8321B
Batch ID: P422554

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423159

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	93.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422773

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422664

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422684

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422585

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

Reference Method: EPA 8321B
Batch ID: P422553

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	109		P	40 - 150
Desmethyl microcystin LR	113		P	40 - 150
Microcystin HilR	113		P	40 - 150
Microcystin HtyR	122		P	40 - 150
Microcystin LA	119		P	40 - 150
Microcystin LF	120		P	40 - 150
Microcystin LR	115		P	40 - 150
Microcystin LW	129		P	40 - 150
Microcystin LY	126		P	40 - 150
Microcystin RR	109		P	40 - 150
Microcystin WR	115		P	40 - 150
Microcystin YR	124		P	40 - 150
Nodularin-R	112		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P422554

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	104		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423159

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370803	Ammonia-N	94.0	95.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422773

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370805	Kjeldahl Nitrogen	91.9	95.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422664

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370804	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422684

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370832	Total-P	104	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422585

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370849	O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P422553

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370796	Cylindrospermopsin	108	102	P/P	40 - 150
2370796	Desmethyl microcystin LR	124	116	P/P	40 - 150
2370796	Microcystin HilR	120	116	P/P	40 - 150
2370796	Microcystin HtyR	117	114	P/P	40 - 150
2370796	Microcystin LA	113	108	P/P	40 - 150
2370796	Microcystin LF	114	112	P/P	40 - 150
2370796	Microcystin LR	126	119	P/P	40 - 150
2370796	Microcystin LW	115	118	P/P	40 - 150
2370796	Microcystin LY	113	104	P/P	40 - 150
2370796	Microcystin RR	102	102	P/P	40 - 150
2370796	Microcystin WR	112	116	P/P	40 - 150
2370796	Microcystin YR	134	128	P/P	40 - 150
2370796	Nodularin-R	116	113	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P422554

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2370796	Anatoxin-a	93.2	93.4	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423159

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370803	Ammonia-N	1.42	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P422773

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370805	Kjeldahl Nitrogen	2.11	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P422664

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370804	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P422684

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370832	Total-P	0.818	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P422585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370849	O-Phosphate-P	0.987	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P422553

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370796	Cylindrospermopsin	6.11	Spike	P	0 - 30
2370796	Desmethyl microcystin LR	6.48	Spike	P	0 - 30
2370796	Microcystin HilR	3.04	Spike	P	0 - 30
2370796	Microcystin HtyR	2.43	Spike	P	0 - 30
2370796	Microcystin LA	5.12	Spike	P	0 - 30
2370796	Microcystin LF	1.51	Spike	P	0 - 30
2370796	Microcystin LR	5.25	Spike	P	0 - 30
2370796	Microcystin LW	2.93	Spike	P	0 - 30
2370796	Microcystin LY	7.59	Spike	P	0 - 30
2370796	Microcystin RR	0.189	Spike	P	0 - 30
2370796	Microcystin WR	3.26	Spike	P	0 - 30
2370796	Microcystin YR	4.26	Spike	P	0 - 30
2370796	Nodularin-R	2.30	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P422554

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2370796	Anatoxin-a	0.200	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Surrogates

Lab Sample ID: 2370830
Field Sample ID: HABCE0143_StarkeLake

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	133	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	58.6	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A116032
Included Lab Sample IDs: 2370835

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

Reference Method: EPA 8321B
Run ID: A116046
Included Lab Sample IDs: 2370830

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	71.7	71.7	P/P	60 - 160

Reference Method: EPA 8321B
Run ID: A116049
Included Lab Sample IDs: 2370830

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	125	122	P/P	60 - 160
Desmethyl microcystin LR	125	122	P/P	60 - 160
Microcystin HilR	128	133	P/P	60 - 160
Microcystin HtyR	130	134	P/P	60 - 160
Microcystin LA	135	127	P/P	60 - 160
Microcystin LF	128	132	P/P	60 - 160
Microcystin LR	122	130	P/P	60 - 160
Microcystin LW	142	143	P/P	60 - 160
Microcystin LY	128	128	P/P	60 - 160
Microcystin RR	113	120	P/P	60 - 160
Microcystin WR	131	137	P/P	60 - 160
Microcystin YR	140	142	P/P	60 - 160
Nodularin-R	124	124	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A116065
Included Lab Sample IDs: 2370834

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116090
Included Lab Sample IDs: 2370834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A116198
Included Lab Sample IDs: 2370834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	95.4	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A116280
Included Lab Sample IDs: 2370834

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.2	97.0	P/P	90 - 110

* 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	93.0	94.0	95.6			1.42
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.4	91.9	95.7			2.11
EPA 353.2 Rev. 2.0	NO2NO3-N	103	103	102			0.487
EPA 365.1 Rev. 2.0	Total-P	107	104	105			0.818
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.0	101	102			0.987
EPA 8321B	Anatoxin-a	104	93.2	93.4			0.200
	Cylindrospermopsin	109	108	102			6.11
	Desmethyl microcystin LR	113	124	116			6.48
	Microcystin HilR	113	120	116			3.04
	Microcystin HtyR	122	117	114			2.43
	Microcystin LA	119	113	108			5.12
	Microcystin LF	120	114	112			1.51
	Microcystin LR	115	126	119			5.25
	Microcystin LW	129	115	118			2.93
	Microcystin LY	126	113	104			7.59
	Microcystin RR	109	102	102			0.189
	Microcystin WR	115	112	116			3.26
	Microcystin YR	124	134	128			4.26
	Nodularin-R	112	116	113			2.30

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2370834
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2370834
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2370834
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2370834
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2370835
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2370830
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2370830

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	11/18/2022			12/06/2022 11:59	Ping Hua	2370834
EPA 351.2 Rev. 2.0	11/18/2022	11/28/2022 13:20	Simonne.V. Calhoun	11/30/2022 16:11	Judith K. Clark	2370834
EPA 353.2 Rev. 2.0	11/18/2022			11/21/2022 10:23	Beverly Y. Sanders	2370834
EPA 365.1 Rev. 2.0	11/18/2022	11/21/2022 15:27	Adam P Silver	11/22/2022 10:39	James L Waggerby	2370834
EPA 365.1 Rev. 2.0 dissolved	11/18/2022			11/18/2022 14:17	Elise M. Gillis	2370835
EPA 8321B	11/18/2022	11/18/2022 11:45	Manjita Shrestha	11/20/2022 13:11	Umesh Chiluwal	2370830
	11/18/2022	11/20/2022 09:30	Umesh Chiluwal	11/20/2022 15:00	Umesh Chiluwal	2370830