

Chemical Analysis Report

WQAP-2023-03-24-06

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-03-27-15**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Chris Bowen, Environmental Administrator

Date Certified: 10-APR-2023 10:35



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 Cherokee - SE Shore

Collection Date/Time: 03/23/2023 12:16

Field ID: HABCE0187_LakeCherokee

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2396265	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P427629	
		Cylindrospermopsin	0.10	U	ug/L	P427630	
		Desmethyl microcystin LR	0.25	U	ug/L	P427630	
		Microcystin HILR	0.25	U	ug/L	P427630	
		Microcystin HtyR	0.25	U	ug/L	P427630	
		Microcystin LA	0.10	U	ug/L	P427630	
		Microcystin LF	0.10	U	ug/L	P427630	
		Microcystin LR	0.25	U	ug/L	P427630	
		Microcystin LW	0.25	U	ug/L	P427630	
		Microcystin LY	0.10	U	ug/L	P427630	
		Microcystin RR	0.10	U	ug/L	P427630	
		Microcystin WR	0.50	U	ug/L	P427630	
		Neosaxitoxin	0.50	U	ug/L	P427629	
		Microcystin YR	0.25	U	ug/L	P427630	
		Saxitoxin	0.50	U	ug/L	P427629	
		Nodularin-R	0.10	U	ug/L	P427630	
2396266	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P427761	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.094	I	mg N/L	P427792	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P427973	
	EPA 365.1 Rev. 2.0	Total-P	0.054		mg P/L	P427690	
2396267	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P427642	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427761

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427792

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427973

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427690

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427642

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

Reference Method: EPA 8321B
Batch ID: P427629

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Reference Method: EPA 8321B
Batch ID: P427630

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1LR	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: P427761

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427792

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	96.6		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427973

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: P427690

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: P427642

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.6		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P427629

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	63.3		P	40 - 150
Neosaxitoxin	78.1		P	40 - 150
Saxitoxin	67.5		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P427630

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	71.4		P	40 - 150
Desmethyl microcystin LR	81.9		P	40 - 150
Microcystin H11R	85.6		P	40 - 150
Microcystin HtyR	72.6		P	40 - 150
Microcystin LA	71.5		P	40 - 150
Microcystin LF	77.5		P	40 - 150
Microcystin LR	84.8		P	40 - 150
Microcystin LW	84.7		P	40 - 150
Microcystin LY	76.3		P	40 - 150
Microcystin RR	74.3		P	40 - 150
Microcystin WR	79.2		P	40 - 150
Microcystin YR	62.1		P	40 - 150
Nodularin-R	73.6		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427761

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396199	Ammonia-N	99.8	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427792

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396282	Kjeldahl Nitrogen	106	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427973

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396199	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427690

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396243	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396201	O-Phosphate-P	90.4	91.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P427629

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396155	Anatoxin-a	60.0	60.4	P/P	40 - 150
2396155	Neosaxitoxin	67.7	68.3	P/P	40 - 150
2396155	Saxitoxin	62.1	61.9	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P427630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2396155	Cylindrospermopsin	65.3	71.4	P/P	40 - 150
2396155	Desmethyl microcystin LR	89.0	101	P/P	40 - 150
2396155	Microcystin H1R	83.9	90.1	P/P	40 - 150
2396155	Microcystin HtyR	73.6	80.0	P/P	40 - 150
2396155	Microcystin LA	76.2	77.1	P/P	40 - 150
2396155	Microcystin LF	82.6	101	P/P	40 - 150
2396155	Microcystin LR	86.4	88.3	P/P	40 - 150
2396155	Microcystin LW	91.0	97.2	P/P	40 - 150
2396155	Microcystin LY	74.9	75.1	P/P	40 - 150
2396155	Microcystin RR	71.0	78.2	P/P	40 - 150
2396155	Microcystin WR	82.5	84.0	P/P	40 - 150
2396155	Microcystin YR	62.9	65.8	P/P	40 - 150
2396155	Nodularin-R	74.9	74.4	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427761

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396199	Ammonia-N	2.14	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427792

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396282	Kjeldahl Nitrogen	4.94	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396199	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427690

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396243	Total-P	0.138	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396201	O-Phosphate-P	1.54	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P427629

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396155	Anatoxin-a	0.686	Spike	P	0 - 30
2396155	Neosaxitoxin	0.847	Spike	P	0 - 30
2396155	Saxitoxin	0.328	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P427630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396155	Cylindrospermopsin	8.91	Spike	P	0 - 30
2396155	Desmethyl microcystin LR	12.7	Spike	P	0 - 30
2396155	Microcystin HiLR	7.13	Spike	P	0 - 30
2396155	Microcystin HtyR	8.43	Spike	P	0 - 30
2396155	Microcystin LA	0.975	Spike	P	0 - 30
2396155	Microcystin LF	20.4	Spike	P	0 - 30
2396155	Microcystin LR	2.04	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P427630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2396155	Microcystin LW	6.65	Spike	P	0 - 30
2396155	Microcystin LY	0.297	Spike	P	0 - 30
2396155	Microcystin RR	9.65	Spike	P	0 - 30
2396155	Microcystin WR	1.77	Spike	P	0 - 30
2396155	Microcystin YR	4.43	Spike	P	0 - 30
2396155	Nodularin-R	0.702	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2396265

Field Sample ID: HABCE0187_LakeCherokee

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	61.4	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	56.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A118187

Included Lab Sample IDs: 2396267

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.7	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A118213

Included Lab Sample IDs: 2396265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	79.4	80.4	P/P	50 - 160
Desmethyl microcystin LR	91.6	101	P/P	50 - 160
Microcystin HtR	98.7	95.7	P/P	50 - 160
Microcystin HtyR	84.1	85.1	P/P	50 - 160
Microcystin LA	86.2	89.4	P/P	50 - 160
Microcystin LF	82.1	88.6	P/P	50 - 160
Microcystin LR	95.5	96.8	P/P	50 - 160
Microcystin LW	93.1	93.6	P/P	50 - 160
Microcystin LY	78.9	90.2	P/P	50 - 160
Microcystin RR	86.7	87.3	P/P	50 - 160
Microcystin WR	96.2	99.9	P/P	50 - 160
Microcystin YR	74.1	74.2	P/P	50 - 160
Nodularin-R	85.2	88.2	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A118214

Included Lab Sample IDs: 2396265

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	60.1	60.3	P/P	50 - 160
Neosaxitoxin	70.8	67.7	P/P	50 - 160
Saxitoxin	62.1	60.8	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A118235

Included Lab Sample IDs: 2396266

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	99.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A118236

Included Lab Sample IDs: 2396266

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A118342

Included Lab Sample IDs: 2396266

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	102	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A118347

Included Lab Sample IDs: 2396266

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	107	106	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 SMP	MS
			LCS			
EPA 350.1 Rev. 2.0	Ammonia-N	99.2	99.8	103		2.14
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	96.6	106	98.2		4.94
EPA 353.2 Rev. 2.0	NO2NO3-N	102	103	102		0.487
EPA 365.1 Rev. 2.0	Total-P	99.7	102	102		0.138
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.6	90.4	91.8		1.54
EPA 8321B	Anatoxin-a	63.3	60.0	60.4		0.686
	Cylindrospermopsin	71.4	65.3	71.4		8.91
	Desmethyl microcystin LR	81.9	89.0	101		12.7
	Microcystin HiLR	85.6	83.9	90.1		7.13
	Microcystin HtyR	72.6	73.6	80.0		8.43
	Microcystin LA	71.5	76.2	77.1		0.975
	Microcystin LF	77.5	82.6	101		20.4
	Microcystin LR	84.8	86.4	88.3		2.04
	Microcystin LW	84.7	91.0	97.2		6.65
	Microcystin LY	76.3	74.9	75.1		0.297
	Microcystin RR	74.3	71.0	78.2		9.65
	Microcystin WR	79.2	82.5	84.0		1.77
	Microcystin YR	62.1	62.9	65.8		4.43
	Neosaxitoxin	78.1	67.7	68.3		0.847
	Nodularin-R	73.6	74.9	74.4		0.702
	Saxitoxin	67.5	62.1	61.9		0.328

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2396266
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2396266
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2396266
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2396266
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2396267
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2396265
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2396265

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	03/24/2023			03/28/2023 13:08	Khloe J Berg	2396266
EPA 351.2 Rev. 2.0	03/24/2023	03/30/2023 12:39	Simonne.V. Calhoun	04/03/2023 13:32	Samantha L Bates	2396266
EPA 353.2 Rev. 2.0	03/24/2023			04/03/2023 10:17	Beverly Y. Sanders	2396266
EPA 365.1 Rev. 2.0	03/24/2023	03/27/2023 01:30	Alexis Price	03/28/2023 14:09	James L Waggeberby	2396266
EPA 365.1 Rev. 2.0 dissolved	03/24/2023			03/24/2023 15:03	Elise M. Gillis	2396267
EPA 8321B	03/24/2023	03/27/2023 09:00	Manjita Shrestha	03/27/2023 18:40	Manjita Shrestha	2396265
	03/24/2023	03/27/2023 09:00	Manjita Shrestha	03/28/2023 00:20	Manjita Shrestha	2396265