Chemical Analysis Report

WQAP-2023-05-05-03

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-04-24-31**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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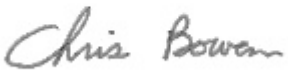
Date Certified: 18-MAY-2023 14:53



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: Caywood Pond - SW Dock **Collection Date/Time: 05/04/2023 10:08**

Field ID: HABCE0193_CaywoodPond Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2405997	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P429447	
		Cylindrospermopsin	0.10	U	ug/L	P429446	
		Desmethyl microcystin LR	0.25	U	ug/L	P429446	
		Microcystin HilR	0.25	U	ug/L	P429446	
		Microcystin HtyR	0.25	U	ug/L	P429446	
		Microcystin LA	0.10	U	ug/L	P429446	
		Microcystin LF	0.10	U	ug/L	P429446	
		Microcystin LR	1.6		ug/L	P429446	
		Microcystin LW	0.25	U	ug/L	P429446	
		Microcystin LY	0.10	U	ug/L	P429446	
		Microcystin RR	0.10	U	ug/L	P429446	
		Microcystin WR	0.50	U	ug/L	P429446	
		Neosaxitoxin	1.7	I	ug/L	P429447	
		Microcystin YR	0.25	U	ug/L	P429446	
		Saxitoxin	0.50	I	ug/L	P429447	
		Nodularin-R	0.10	U	ug/L	P429446	
2405998	EPA 350.1 Rev. 2.0	Ammonia-N	0.080		mg N/L	P429611	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P429574	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.011		mg N/L	P429813	
	EPA 365.1 Rev. 2.0	Total-P	0.058		mg P/L	P429538	
2405999	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P429498	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429611

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429574

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429813

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429538

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429498

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

Reference Method: EPA 8321B
Batch ID: P429446

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: P429447

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429611

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429574

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	108		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429813

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429538

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: P429498

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

Reference Method: EPA 8321B
Batch ID: P429446

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	95.2		P	40 - 150
Desmethyl microcystin LR	97.9		P	40 - 150
Microcystin HilR	98.0		P	40 - 150
Microcystin HtyR	88.7		P	40 - 150
Microcystin LA	87.0		P	40 - 150
Microcystin LF	84.5		P	40 - 150
Microcystin LR	84.4		P	40 - 150
Microcystin LW	85.5		P	40 - 150
Microcystin LY	86.7		P	40 - 150
Microcystin RR	96.2		P	40 - 150
Microcystin WR	89.0		P	40 - 150
Microcystin YR	90.9		P	40 - 150
Nodularin-R	92.3		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429447

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	104		P	40 - 150
Neosaxitoxin	84.7		P	40 - 150
Saxitoxin	82.9		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429611

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2405983	Ammonia-N	98.4	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429574

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2405985	Kjeldahl Nitrogen	99.9	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429813

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2405950	NO2NO3-N	105	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429538

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2405998	Total-P	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429498

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2405953	O-Phosphate-P	96.7	95.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P429446

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2405932	Cylindrospermopsin	94.1	91.2	P/P	40 - 150
2405932	Desmethyl microcystin LR	94.3	99.4	P/P	40 - 150
2405932	Microcystin HilR	95.3	104	P/P	40 - 150
2405932	Microcystin HtyR	92.6	94.8	P/P	40 - 150
2405932	Microcystin LA	102	98.4	P/P	40 - 150
2405932	Microcystin LF	92.1	85.9	P/P	40 - 150
2405932	Microcystin LR	96.3	95.5	P/P	40 - 150
2405932	Microcystin LW	78.8	67.4	P/P	40 - 150
2405932	Microcystin LY	92.0	104	P/P	40 - 150
2405932	Microcystin RR	102	102	P/P	40 - 150
2405932	Microcystin WR	87.1	92.3	P/P	40 - 150
2405932	Microcystin YR	90.2	101	P/P	40 - 150
2405932	Nodularin-R	91.4	98.8	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429447

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2405932	Anatoxin-a	102	102	P/P	40 - 150
2405932	Neosaxitoxin	69.5	70.1	P/P	40 - 150
2405932	Saxitoxin	72.3	72.3	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429611

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2405983	Ammonia-N	1.13	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429574

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2405985	Kjeldahl Nitrogen	2.21	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429813

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2405950	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429538

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2405998	Total-P	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429498

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2405953	O-Phosphate-P	1.14	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P429446

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2405932	Cylindrospermopsin	3.09	Spike	P	0 - 30
2405932	Desmethyl microcystin LR	5.28	Spike	P	0 - 30
2405932	Microcystin HilR	8.82	Spike	P	0 - 30
2405932	Microcystin HtyR	2.37	Spike	P	0 - 30
2405932	Microcystin LA	3.52	Spike	P	0 - 30
2405932	Microcystin LF	7.02	Spike	P	0 - 30
2405932	Microcystin LR	0.817	Spike	P	0 - 30
2405932	Microcystin LW	15.5	Spike	P	0 - 30
2405932	Microcystin LY	12.1	Spike	P	0 - 30
2405932	Microcystin RR	0.561	Spike	P	0 - 30
2405932	Microcystin WR	5.80	Spike	P	0 - 30
2405932	Microcystin YR	11.0	Spike	P	0 - 30
2405932	Nodularin-R	7.71	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P429447

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2405932	Anatoxin-a	0.149	Spike	P	0 - 30
2405932	Neosaxitoxin	0.823	Spike	P	0 - 30
2405932	Saxitoxin	0.0127	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2405997
Field Sample ID: HABCE0193_CaywoodPond

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	77.1	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	38.4	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A118988
Included Lab Sample IDs: 2405999

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	98.7	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A119018
Included Lab Sample IDs: 2405997

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	102	101	P/P	50 - 160
Desmethyl microcystin LR	111	101	P/P	50 - 160
Microcystin HilR	102	98.0	P/P	50 - 160
Microcystin HtyR	102	102	P/P	50 - 160
Microcystin LA	111	109	P/P	50 - 160
Microcystin LF	84.7	83.5	P/P	50 - 160
Microcystin LR	104	97.2	P/P	50 - 160
Microcystin LW	87.4	90.4	P/P	50 - 160
Microcystin LY	95.5	109	P/P	50 - 160
Microcystin RR	100	99.3	P/P	50 - 160
Microcystin WR	102	104	P/P	50 - 160
Microcystin YR	94.6	93.8	P/P	50 - 160
Nodularin-R	98.2	95.8	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A119020
Included Lab Sample IDs: 2405997

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	93.5	88.9	P/P	50 - 160
Neosaxitoxin	73.8	71.4	P/P	50 - 160
Saxitoxin	76.8	75.4	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A119038
Included Lab Sample IDs: 2405998

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A119045
Included Lab Sample IDs: 2405998

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.6	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A119075
Included Lab Sample IDs: 2405998

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	96.7	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A119129
Included Lab Sample IDs: 2405998

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	104	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	96.6	98.4	99.6			1.13
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	99.9	103			2.21
EPA 353.2 Rev. 2.0	NO2NO3-N	106	105	105			0.0
EPA 365.1 Rev. 2.0	Total-P	102	104	104			0.0
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	96.7	95.6			1.14
EPA 8321B	Anatoxin-a	104	102	102			0.149
	Cylindrospermopsin	95.2	94.1	91.2			3.09
	Desmethyl microcystin LR	97.9	94.3	99.4			5.28
	Microcystin HilR	98.0	95.3	104			8.82
	Microcystin HtyR	88.7	92.6	94.8			2.37
	Microcystin LA	87.0	102	98.4			3.52
	Microcystin LF	84.5	92.1	85.9			7.02
	Microcystin LR	84.4	96.3	95.5			0.817
	Microcystin LW	85.5	78.8	67.4			15.5
	Microcystin LY	86.7	92.0	104			12.1
	Microcystin RR	96.2	102	102			0.561
	Microcystin WR	89.0	87.1	92.3			5.80
	Microcystin YR	90.9	90.2	101			11.0
	Neosaxitoxin	84.7	69.5	70.1			0.823
	Nodularin-R	92.3	91.4	98.8			7.71
	Saxitoxin	82.9	72.3	72.3			0.0127

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2405998
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2405998
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2405998
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2405998
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2405999
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2405997
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2405997

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	05/05/2023			05/09/2023 11:33	Khloe J Berg	2405998
EPA 351.2 Rev. 2.0	05/05/2023	05/09/2023 12:02	Dana G. Hughes	05/10/2023 15:25	Samantha L Bates	2405998
EPA 353.2 Rev. 2.0	05/05/2023			05/12/2023 10:16	Beverly Y. Sanders	2405998
EPA 365.1 Rev. 2.0	05/05/2023	05/08/2023 13:00	Alexis Price	05/09/2023 11:39	Simonne.V. Calhoun	2405998
EPA 365.1 Rev. 2.0 dissolved	05/05/2023			05/05/2023 15:36	Chandler E Cox	2405999
EPA 8321B	05/05/2023	05/08/2023 09:00	Manjita Shrestha	05/08/2023 17:05	Manjita Shrestha	2405997
	05/05/2023	05/08/2023 09:00	Manjita Shrestha	05/08/2023 22:45	Manjita Shrestha	2405997