

Chemical Analysis Report

WQAP-2022-12-08-02

Florida DEP Laboratory
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Tallahassee, FL 32399-2400
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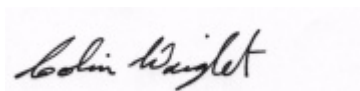
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-10-17-28**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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3319 Maguire Blvd. Suite 232
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Certified by: Colin Wright, Program Administrator

Date Certified: 22-DEC-2022 09:32

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light pink 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 Beauclair - Near boat ramp

Collection Date/Time: 12/07/2022 12:15

Field ID: HABCE0153

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2373826	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P423259	
		Cylindrospermopsin	0.10	U	ug/L	P423258	
		Desmethyl microcystin LR	0.25	U	ug/L	P423258	
		Microcystin HILR	0.25	U	ug/L	P423258	
		Microcystin HtyR	0.25	U	ug/L	P423258	
		Microcystin LA	0.10	U	ug/L	P423258	
		Microcystin LF	0.10	U	ug/L	P423258	
		Microcystin LR	0.25	U	ug/L	P423258	
		Microcystin LW	0.25	U	ug/L	P423258	
		Microcystin LY	0.10	U	ug/L	P423258	
		Microcystin RR	0.10	U	ug/L	P423258	
		Microcystin WR	0.50	U	ug/L	P423258	
		Neosaxitoxin	0.50	U	ug/L	P423259	
		Microcystin YR	0.25	U	ug/L	P423258	
		Saxitoxin	0.50	U	ug/L	P423259	
		Nodularin-R	0.10	U	ug/L	P423258	
2373827	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P423780	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P423414	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.059		mg N/L	P423357	
	EPA 365.1 Rev. 2.0	Total-P	0.028		mg P/L	P423353	
2373828	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P423293	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423780

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423414

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423357

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423353

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423293

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

Reference Method: EPA 8321B
Batch ID: P423258

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

Reference Method: EPA 8321B
Batch ID: P423259

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: P423780

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423414

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423357

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: P423353

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423293

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

Reference Method: EPA 8321B
Batch ID: P423258

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	88.4		P	40 - 150
Desmethyl microcystin LR	97.5		P	40 - 150
Microcystin H1R	91.2		P	40 - 150
Microcystin HtyR	92.0		P	40 - 150
Microcystin LA	104		P	40 - 150
Microcystin LF	124		P	40 - 150
Microcystin LR	102		P	40 - 150
Microcystin LW	119		P	40 - 150
Microcystin LY	96.9		P	40 - 150
Microcystin RR	92.3		P	40 - 150
Microcystin WR	91.4		P	40 - 150
Microcystin YR	97.5		P	40 - 150
Nodularin-R	87.8		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P423259

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	93.2		P	40 - 150
Neosaxitoxin	114		P	40 - 150
Saxitoxin	97.7		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423780

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373820	Ammonia-N	100	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423414

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373827	Kjeldahl Nitrogen	95.7	98.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423357

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373827	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423353

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373787	Total-P	102	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423293

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373924	O-Phosphate-P	96.0	96.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P423258

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373730	Cylindrospermopsin	87.4	88.0	P/P	40 - 150
2373730	Desmethyl microcystin LR	107	113	P/P	40 - 150
2373730	Microcystin HiLR	96.4	101	P/P	40 - 150
2373730	Microcystin HtyR	97.5	104	P/P	40 - 150
2373730	Microcystin LA	98.5	120	P/P	40 - 150
2373730	Microcystin LF	119	140	P/P	40 - 150
2373730	Microcystin LR	109	112	P/P	40 - 150
2373730	Microcystin LW	86.5	109	P/P	40 - 150
2373730	Microcystin LY	114	112	P/P	40 - 150
2373730	Microcystin RR	91.8	95.6	P/P	40 - 150
2373730	Microcystin WR	95.2	102	P/P	40 - 150
2373730	Microcystin YR	107	112	P/P	40 - 150
2373730	Nodularin-R	93.5	99.0	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P423259

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373730	Anatoxin-a	90.7	96.6	P/P	40 - 150
2373730	Neosaxitoxin	68.5	68.8	P/P	40 - 150
2373730	Saxitoxin	54.5	57.2	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P423780

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373820	Ammonia-N	4.00	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P423414

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373827	Kjeldahl Nitrogen	1.48	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P423357

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373827	NO2NO3-N	0.384	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P423353

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373787	Total-P	1.99	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P423293

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373924	O-Phosphate-P	0.623	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P423258

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373730	Cylindrospermopsin	0.672	Spike	P	0 - 30
2373730	Desmethyl microcystin LR	5.43	Spike	P	0 - 30
2373730	Microcystin H1LR	5.07	Spike	P	0 - 30
2373730	Microcystin HtyR	6.11	Spike	P	0 - 30
2373730	Microcystin LA	20.1	Spike	P	0 - 30
2373730	Microcystin LF	16.2	Spike	P	0 - 30
2373730	Microcystin LR	2.89	Spike	P	0 - 30
2373730	Microcystin LW	23.2	Spike	P	0 - 30
2373730	Microcystin LY	2.13	Spike	P	0 - 30
2373730	Microcystin RR	4.05	Spike	P	0 - 30
2373730	Microcystin WR	6.47	Spike	P	0 - 30
2373730	Microcystin YR	4.12	Spike	P	0 - 30
2373730	Nodularin-R	5.70	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P423259

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373730	Anatoxin-a	6.32	Spike	P	0 - 30
2373730	Neosaxitoxin	0.488	Spike	P	0 - 30
2373730	Saxitoxin	4.89	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2373826
Field Sample ID: HABCE0153

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	92.8	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	56.3	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A116334

Included Lab Sample IDs: 2373828

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	101	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A116342

Included Lab Sample IDs: 2373826

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	92.6	93.2	P/P	50 - 160
Desmethyl microcystin LR	108	110	P/P	50 - 160
Microcystin HtR	97.4	104	P/P	50 - 160
Microcystin HtyR	99.9	102	P/P	50 - 160
Microcystin LA	119	112	P/P	50 - 160
Microcystin LF	150	140	P/P	50 - 160
Microcystin LR	108	109	P/P	50 - 160
Microcystin LW	124	124	P/P	50 - 160
Microcystin LY	123	99.2	P/P	50 - 160
Microcystin RR	97.1	97.7	P/P	50 - 160
Microcystin WR	103	102	P/P	50 - 160
Microcystin YR	104	108	P/P	50 - 160
Nodularin-R	99.4	101	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A116343

Included Lab Sample IDs: 2373826

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	90.5	78.2	P/P	50 - 160
Neosaxitoxin	114	83.3	P/P	50 - 160
Saxitoxin	94.2	78.9	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A116352

Included Lab Sample IDs: 2373827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A116391

Included Lab Sample IDs: 2373827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A116447

Included Lab Sample IDs: 2373827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	95.9	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A116577

Included Lab Sample IDs: 2373827

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	98.0	100	105			4.00
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	95.7	98.1			1.48
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	101	100			0.384
EPA 365.1 Rev. 2.0	Total-P	105	102	104			1.99
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	96.0	96.6			0.623
EPA 8321B	Anatoxin-a	93.2	90.7	96.6			6.32
	Cylindrospermopsin	88.4	87.4	88.0			0.672
	Desmethyl microcystin LR	97.5	107	113			5.43
	Microcystin HiLR	91.2	96.4	101			5.07
	Microcystin HtyR	92.0	97.5	104			6.11
	Microcystin LA	104	98.5	120			20.1
	Microcystin LF	124	119	140			16.2
	Microcystin LR	102	109	112			2.89
	Microcystin LW	119	86.5	109			23.2
	Microcystin LY	96.9	114	112			2.13
	Microcystin RR	92.3	91.8	95.6			4.05
	Microcystin WR	91.4	95.2	102			6.47
	Microcystin YR	97.5	107	112			4.12
	Neosaxitoxin	114	68.5	68.8			0.488
	Nodularin-R	87.8	93.5	99.0			5.70
	Saxitoxin	97.7	54.5	57.2			4.89

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2373827
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2373827
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2373827
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2373827
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2373828
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2373826
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2373826

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	12/08/2022			12/20/2022 13:43	Judith K. Clark	2373827
EPA 351.2 Rev. 2.0	12/08/2022	12/13/2022 13:13	Samantha L Bates	12/14/2022 16:59	Samantha L Bates	2373827
EPA 353.2 Rev. 2.0	12/08/2022			12/09/2022 10:09	Beverly Y. Sanders	2373827
EPA 365.1 Rev. 2.0	12/08/2022	12/09/2022 15:40	Adam P Silver	12/12/2022 13:55	Simonne.V. Calhoun	2373827
EPA 365.1 Rev. 2.0 dissolved	12/08/2022			12/08/2022 14:53	Elise M. Gillis	2373828
EPA 8321B	12/08/2022	12/08/2022 13:00	Manjita Shrestha	12/08/2022 20:50	Manjita Shrestha	2373826
	12/08/2022	12/08/2022 13:00	Manjita Shrestha	12/09/2022 06:41	Manjita Shrestha	2373826