

Chemical Analysis Report

WQAP-2023-06-22-04

Florida DEP Laboratory
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Tallahassee, FL 32399-2400
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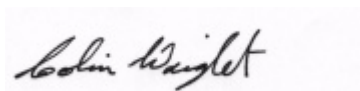
Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2023-03-27-45**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Jordan Skaggs

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Certified by: Colin Wright, Program Administrator

Date Certified: 10-JUL-2023 09:52

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light blue 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 Marian - Boat Ramp

Collection Date/Time: 06/21/2023 09:45

Field ID: SEHAB0089

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2419318	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P431620	
		Cylindrospermopsin	0.10	U	ug/L	P431613	
		Desmethyl microcystin LR	0.25	U	ug/L	P431613	
		Microcystin HILR	0.25	U	ug/L	P431613	
		Microcystin HtyR	0.25	U	ug/L	P431613	
		Microcystin LA	1.2		ug/L	P431613	
		Microcystin LF	0.10	U	ug/L	P431613	
		Microcystin LR	1.0		ug/L	P431613	
		Microcystin LW	0.25	U	ug/L	P431613	
		Microcystin LY	0.36	I	ug/L	P431613	
		Microcystin RR	0.11	I	ug/L	P431613	
		Microcystin WR	0.50	U	ug/L	P431613	
		Neosaxitoxin	0.50	U	ug/L	P431620	
		Microcystin YR	0.25	U	ug/L	P431613	
		Saxitoxin	0.50	U	ug/L	P431620	
		Nodularin-R	0.10	U	ug/L	P431613	
2419319	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P431800	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.1		mg N/L	P431798	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P431998	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P431780	
2419320	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P431657	

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: P431800

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431798

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431998

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431780

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431657

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

Reference Method: EPA 8321B
Batch ID: P431613

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: P431620

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: P431800

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431798

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431998

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: P431780

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431657

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

Reference Method: EPA 8321B
Batch ID: P431613

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	95.1		P	40 - 160
Desmethyl microcystin LR	91.8		P	40 - 160
Microcystin H1R	94.9		P	40 - 160
Microcystin HtyR	86.7		P	40 - 160
Microcystin LA	88.2		P	40 - 160
Microcystin LF	87.9		P	40 - 160
Microcystin LR	85.1		P	40 - 160
Microcystin LW	87.0		P	40 - 160
Microcystin LY	84.2		P	40 - 160
Microcystin RR	95.2		P	40 - 160
Microcystin WR	96.2		P	40 - 160
Microcystin YR	81.1		P	40 - 160
Nodularin-R	88.4		P	40 - 160

Reference Method: EPA 8321B
Batch ID: P431620

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	81.4		P	40 - 150
Neosaxitoxin	81.1		P	40 - 150
Saxitoxin	83.3		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431800

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419273	Ammonia-N	96.6	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431798

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419434	Kjeldahl Nitrogen	106	110	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P431998

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419319	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431657

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419432	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P431613

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2418959	Cylindrospermopsin	98.6	93.9	P/P	40 - 160
2418959	Desmethyl microcystin LR	99.9	93.5	P/P	40 - 160
2418959	Microcystin HilR	100	96.5	P/P	40 - 160
2418959	Microcystin HtyR	97.3	93.2	P/P	40 - 160
2418959	Microcystin LA	94.7	85.3	P/P	40 - 160
2418959	Microcystin LF	96.1	96.2	P/P	40 - 160
2418959	Microcystin LR	90.9	86.0	P/P	40 - 160
2418959	Microcystin LW	88.3	84.2	P/P	40 - 160
2418959	Microcystin LY	86.1	82.8	P/P	40 - 160
2418959	Microcystin RR	99.9	95.0	P/P	40 - 160
2418959	Microcystin WR	106	103	P/P	40 - 160
2418959	Microcystin YR	87.7	78.9	P/P	40 - 160
2418959	Nodularin-R	94.4	90.3	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P431620

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2418959	Anatoxin-a	91.9	91.3	P/P	40 - 150
2418959	Neosaxitoxin	76.0	75.0	P/P	40 - 150
2418959	Saxitoxin	44.8	41.7	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P431800

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419273	Ammonia-N	2.59	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P431798

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419434	Kjeldahl Nitrogen	2.73	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P431998

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419319	NO2NO3-N	0.980	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P431780

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419401	Total-P	1.15	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P431657

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419432	O-Phosphate-P	0.399	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P431613

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2418959	Cylindrospermopsin	4.84	Spike	P	0 - 30
2418959	Desmethyl microcystin LR	6.62	Spike	P	0 - 30
2418959	Microcystin H1LR	3.75	Spike	P	0 - 30
2418959	Microcystin HtyR	4.33	Spike	P	0 - 30
2418959	Microcystin LA	10.4	Spike	P	0 - 30
2418959	Microcystin LF	0.201	Spike	P	0 - 30
2418959	Microcystin LR	5.47	Spike	P	0 - 30
2418959	Microcystin LW	4.71	Spike	P	0 - 30
2418959	Microcystin LY	3.95	Spike	P	0 - 30
2418959	Microcystin RR	5.04	Spike	P	0 - 30
2418959	Microcystin WR	3.53	Spike	P	0 - 30
2418959	Microcystin YR	10.6	Spike	P	0 - 30
2418959	Nodularin-R	4.44	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P431620

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2418959	Anatoxin-a	0.658	Spike	P	0 - 30
2418959	Neosaxitoxin	1.35	Spike	P	0 - 30
2418959	Saxitoxin	7.07	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2419318
Field Sample ID: SEHAB0089

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	86.5	P	30 - 160
EPA 8321B	Saxitoxin-15N7	78.6	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A119976

Included Lab Sample IDs: 2419320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	98.0	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A119980

Included Lab Sample IDs: 2419318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	84.4	82.8	P/P	50 - 160
Neosaxitoxin	78.2	77.9	P/P	50 - 160
Saxitoxin	81.3	80.9	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A119981

Included Lab Sample IDs: 2419318

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	95.1	98.0	P/P	60 - 160
Desmethyl microcystin LR	94.8	94.7	P/P	50 - 160
Microcystin HIIIR	89.1	98.4	P/P	60 - 160
Microcystin HtyR	87.1	90.4	P/P	60 - 160
Microcystin LA	87.5	93.4	P/P	50 - 160
Microcystin LF	75.6	72.8	P/P	60 - 160
Microcystin LR	91.1	90.4	P/P	60 - 160
Microcystin LW	73.3	73.2	P/P	60 - 160
Microcystin LY	81.0	88.6	P/P	60 - 160
Microcystin RR	96.0	100	P/P	60 - 160
Microcystin WR	93.9	93.2	P/P	60 - 160
Microcystin YR	82.9	80.9	P/P	60 - 160
Nodularin-R	88.4	95.0	P/P	60 - 160

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A120041

Included Lab Sample IDs: 2419319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.9	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A120065

Included Lab Sample IDs: 2419319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.7	90.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A120076

Included Lab Sample IDs: 2419319

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

Quality Assurance Report

Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A120095

Included Lab Sample IDs: 2419319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	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	MS		
EPA 350.1 Rev. 2.0	Ammonia-N	94.8	96.6	100		2.59
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	107	106	110		2.73
EPA 353.2 Rev. 2.0	NO2NO3-N	104	102	102		0.980
EPA 365.1 Rev. 2.0	Total-P	98.1				1.15
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	100	100		0.399
EPA 8321B	Anatoxin-a	81.4	91.9	91.3		0.658
	Cylindrospermopsin	95.1	98.6	93.9		4.84
	Desmethyl microcystin LR	91.8	99.9	93.5		6.62
	Microcystin HiLR	94.9	100	96.5		3.75
	Microcystin HtyR	86.7	97.3	93.2		4.33
	Microcystin LA	88.2	94.7	85.3		10.4
	Microcystin LF	87.9	96.1	96.2		0.201
	Microcystin LR	85.1	90.9	86.0		5.47
	Microcystin LW	87.0	88.3	84.2		4.71
	Microcystin LY	84.2	86.1	82.8		3.95
	Microcystin RR	95.2	99.9	95.0		5.04
	Microcystin WR	96.2	106	103		3.53
	Microcystin YR	81.1	87.7	78.9		10.6
	Neosaxitoxin	81.1	76.0	75.0		1.35
	Nodularin-R	88.4	94.4	90.3		4.44
	Saxitoxin	83.3	44.8	41.7		7.07

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2419319
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2419319
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2419319
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2419319
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2419320
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2419318
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2419318

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	06/22/2023			06/26/2023 11:29	Khloe J Berg	2419319
EPA 351.2 Rev. 2.0	06/22/2023	06/27/2023 10:05	Dana G. Hughes	06/28/2023 09:49	Ping Hua	2419319
EPA 353.2 Rev. 2.0	06/22/2023			06/29/2023 11:12	Beverly Y. Sanders	2419319
EPA 365.1 Rev. 2.0	06/22/2023	06/27/2023 13:15	Simonne.V. Calhoun	06/28/2023 14:22	Simonne.V. Calhoun	2419319
EPA 365.1 Rev. 2.0 dissolved	06/22/2023			06/22/2023 14:52	Elise M. Gillis	2419320
EPA 8321B	06/22/2023	06/22/2023 12:00	Touraj Touran	06/22/2023 18:48	Touraj Touran	2419318
	06/22/2023	06/22/2023 12:00	Touraj Touran	06/23/2023 08:50	Touraj Touran	2419318