

Chemical Analysis Report

WQAP-2023-03-10-03

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

Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2022-10-10-38**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Certified by: Chris Bowen, Environmental Administrator

Date Certified: 28-MAR-2023 12:58



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 Placid-Boat Ramp

Collection Date/Time: 03/09/2023 11:15

Field ID: HAB-SD-030923-1115

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2393448	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P427032	
		Cylindrospermopsin	0.10	U	ug/L	P427030	
		Desmethyl microcystin LR	0.25	U	ug/L	P427030	
		Microcystin HILR	0.25	U	ug/L	P427030	
		Microcystin HtyR	0.25	U	ug/L	P427030	
		Microcystin LA	0.24	I	ug/L	P427030	
		Microcystin LF	0.10	U	ug/L	P427030	
		Microcystin LR	0.25	U	ug/L	P427030	MS
		Microcystin LW	0.25	U	ug/L	P427030	
		Microcystin LY	0.10	U	ug/L	P427030	
		Microcystin RR	0.10	U	ug/L	P427030	
		Microcystin WR	0.50	U	ug/L	P427030	
		Neosaxitoxin	0.50	U	ug/L	P427032	
		Microcystin YR	0.25	U	ug/L	P427030	MS
		Saxitoxin	0.50	U	ug/L	P427032	
		Nodularin-R	0.10	U	ug/L	P427030	MS
2393449	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P427080	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.79		mg N/L	P427252	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P427288	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P427225	
2393450	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P427023	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427080

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427252

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427288

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427225

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427023

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

Reference Method: EPA 8321B
Batch ID: P427030

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: P427032

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: P427080

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427252

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427288

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427225

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427023

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

Reference Method: EPA 8321B
Batch ID: P427030

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	89.4		P	40 - 150
Desmethyl microcystin LR	83.3		P	40 - 150
Microcystin H1R	92.2		P	40 - 150
Microcystin HtyR	96.0		P	40 - 150
Microcystin LA	108		P	40 - 150
Microcystin LF	102		P	40 - 150
Microcystin LR	93.9		P	40 - 150
Microcystin LW	108		P	40 - 150
Microcystin LY	110		P	40 - 150
Microcystin RR	90.8		P	40 - 150
Microcystin WR	92.4		P	40 - 150
Microcystin YR	98.0		P	40 - 150
Nodularin-R	93.9		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P427032

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	66.3		P	40 - 150
Neosaxitoxin	94.1		P	40 - 150
Saxitoxin	71.5		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427080

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393222	Ammonia-N	98.6	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427252

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393521	Kjeldahl Nitrogen	95.1	96.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427288

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393425	NO2NO3-N	103	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427225

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393375	Total-P	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427023

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393450	O-Phosphate-P	95.0	95.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P427030

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393359	Cylindrospermopsin	90.6	96.3	P/P	40 - 150
2393359	Desmethyl microcystin LR	125	132	P/P	40 - 150
2393359	Microcystin HiLR	136	142	P/P	40 - 150
2393359	Microcystin HtyR	140	149	P/P	40 - 150
2393359	Microcystin LA	102	109	P/P	40 - 150
2393359	Microcystin LF	118	98.3	P/P	40 - 150
2393359	Microcystin LR	158	169	F/F	40 - 150
2393359	Microcystin LW	91.0	108	P/P	40 - 150
2393359	Microcystin LY	117	115	P/P	40 - 150
2393359	Microcystin RR	91.4	96.2	P/P	40 - 150
2393359	Microcystin WR	124	124	P/P	40 - 150
2393359	Microcystin YR	158	161	F/F	40 - 150
2393359	Nodularin-R	145	164	P/F	40 - 150

Reference Method: EPA 8321B
Batch ID: P427032

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2393359	Anatoxin-a	68.9	72.5	P/P	40 - 150
2393359	Neosaxitoxin	78.6	84.4	P/P	40 - 150
2393359	Saxitoxin	64.5	68.0	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P427080

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393222	Ammonia-N	1.41	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P427252

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393521	Kjeldahl Nitrogen	0.728	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P427288

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393425	NO2NO3-N	0.487	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P427225

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393375	Total-P	1.45	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P427023

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393450	O-Phosphate-P	0.839	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P427030

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393359	Cylindrospermopsin	6.11	Spike	P	0 - 30
2393359	Desmethyl microcystin LR	5.78	Spike	P	0 - 30
2393359	Microcystin H1LR	4.29	Spike	P	0 - 30
2393359	Microcystin HtyR	6.45	Spike	P	0 - 30
2393359	Microcystin LA	6.57	Spike	P	0 - 30
2393359	Microcystin LF	18.0	Spike	P	0 - 30
2393359	Microcystin LR	6.45	Spike	P	0 - 30
2393359	Microcystin LW	17.5	Spike	P	0 - 30
2393359	Microcystin LY	1.86	Spike	P	0 - 30
2393359	Microcystin RR	5.10	Spike	P	0 - 30
2393359	Microcystin WR	0.0327	Spike	P	0 - 30
2393359	Microcystin YR	1.57	Spike	P	0 - 30
2393359	Nodularin-R	12.3	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P427032

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2393359	Anatoxin-a	5.02	Spike	P	0 - 30
2393359	Neosaxitoxin	7.12	Spike	P	0 - 30
2393359	Saxitoxin	5.30	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2393448
Field Sample ID: HAB-SD-030923-1115

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	92.9	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	76.3	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A117937

Included Lab Sample IDs: 2393450

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	99.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A117961

Included Lab Sample IDs: 2393449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.4	97.7	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A117967

Included Lab Sample IDs: 2393448

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	89.1	89.8	P/P	50 - 160
Desmethyl microcystin LR	81.8	82.7	P/P	50 - 160
Microcystin H1R	90.8	92.3	P/P	50 - 160
Microcystin HtyR	90.6	92.3	P/P	50 - 160
Microcystin LA	90.3	91.3	P/P	50 - 160
Microcystin LF	107	91.2	P/P	50 - 160
Microcystin LR	92.8	91.6	P/P	50 - 160
Microcystin LW	94.8	109	P/P	50 - 160
Microcystin LY	101	118	P/P	50 - 160
Microcystin RR	88.7	90.9	P/P	50 - 160
Microcystin WR	91.3	102	P/P	50 - 160
Microcystin YR	96.3	101	P/P	50 - 160
Nodularin-R	90.6	89.4	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A117970

Included Lab Sample IDs: 2393448

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	65.0	63.3	P/P	50 - 160
Neosaxitoxin	89.3	83.7	P/P	50 - 160
Saxitoxin	70.7	68.9	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A118051

Included Lab Sample IDs: 2393449

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A118063

Included Lab Sample IDs: 2393449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.1	105	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A118064

Included Lab Sample IDs: 2393449

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	101	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
EPA 350.1 Rev. 2.0	Ammonia-N	97.0	98.6	100		1.41
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	95.1	96.5		0.728
EPA 353.2 Rev. 2.0	NO2NO3-N	100	103	102		0.487
EPA 365.1 Rev. 2.0	Total-P	99.8	102	100		1.45
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.0	95.0	95.8		0.839
EPA 8321B	Anatoxin-a	66.3	68.9	72.5		5.02
	Cylindrospermopsin	89.4	90.6	96.3		6.11
	Desmethyl microcystin LR	83.3	125	132		5.78
	Microcystin HiLR	92.2	136	142		4.29
	Microcystin HtyR	96.0	140	149		6.45
	Microcystin LA	108	102	109		6.57
	Microcystin LF	102	118	98.3		18.0
	Microcystin LR	93.9	158	169		6.45
	Microcystin LW	108	91.0	108		17.5
	Microcystin LY	110	117	115		1.86
	Microcystin RR	90.8	91.4	96.2		5.10
	Microcystin WR	92.4	124	124		0.0327
	Microcystin YR	98.0	158	161		1.57
	Neosaxitoxin	94.1	78.6	84.4		7.12
	Nodularin-R	93.9	145	164		12.3
	Saxitoxin	71.5	64.5	68.0		5.30

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2393449
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2393449
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2393449
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2393449
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2393450
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2393448
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2393448

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	03/10/2023			03/13/2023 12:33	Khloe J Berg	2393449
EPA 351.2 Rev. 2.0	03/10/2023	03/16/2023 15:00	Simonne.V. Calhoun	03/17/2023 13:05	Judith K. Clark	2393449
EPA 353.2 Rev. 2.0	03/10/2023			03/17/2023 09:50	Beverly Y. Sanders	2393449
EPA 365.1 Rev. 2.0	03/10/2023	03/16/2023 16:36	Adam P Silver	03/17/2023 16:57	James L Waggeberby	2393449
EPA 365.1 Rev. 2.0 dissolved	03/10/2023			03/10/2023 15:34	Elise M. Gillis	2393450
EPA 8321B	03/10/2023	03/10/2023 15:58	Manjita Shrestha	03/13/2023 16:18	Manjita Shrestha	2393448
	03/10/2023	03/10/2023 15:58	Manjita Shrestha	03/13/2023 20:52	Manjita Shrestha	2393448