Chemical Analysis Report

WQAP-2022-12-06-01

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

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2022-08-29-42**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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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: 12/05/2022 12:30**

Field ID: SEHAB0089 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2372817	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P423141	
		Cylindrospermopsin	0.10	U	ug/L	P423140	
		Desmethyl microcystin LR	0.25	U	ug/L	P423140	
		Microcystin HilR	0.25	U	ug/L	P423140	
		Microcystin HtyR	0.25	U	ug/L	P423140	
		Microcystin LA	1.2		ug/L	P423140	
		Microcystin LF	0.16	I	ug/L	P423140	
		Microcystin LR	1.8		ug/L	P423140	
		Microcystin LW	0.25	U	ug/L	P423140	
		Microcystin LY	0.37	I	ug/L	P423140	
		Microcystin RR	0.18	I	ug/L	P423140	
		Microcystin WR	0.50	U	ug/L	P423140	
		Neosaxitoxin	0.50	U	ug/L	P423141	
		Microcystin YR	0.25	U	ug/L	P423140	
		Saxitoxin	0.50	U	ug/L	P423141	
		Nodularin-R	0.10	U	ug/L	P423140	
2372818	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P423378	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P423280	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P423205	
	EPA 365.1 Rev. 2.0	Total-P	0.18		mg P/L	P423266	
2372819	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.039		mg P/L	P423178	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423378

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423280

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423205

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423266

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423178

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

Reference Method: EPA 8321B
Batch ID: P423140

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: P423141

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: P423378

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: P423280

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	104		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423205

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423266

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423178

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

Reference Method: EPA 8321B
Batch ID: P423140

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	90.8		P	40 - 150
Desmethyl microcystin LR	96.5		P	40 - 150
Microcystin HilR	88.5		P	40 - 150
Microcystin HtyR	92.2		P	40 - 150
Microcystin LA	99.2		P	40 - 150
Microcystin LF	107		P	40 - 150
Microcystin LR	96.5		P	40 - 150
Microcystin LW	78.9		P	40 - 150
Microcystin LY	95.1		P	40 - 150
Microcystin RR	93.6		P	40 - 150
Microcystin WR	80.7		P	40 - 150
Microcystin YR	101		P	40 - 150
Nodularin-R	92.7		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P423141

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	101		P	40 - 150
Neosaxitoxin	118		P	40 - 150
Saxitoxin	96.2		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423378

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2372826	Ammonia-N	95.4	95.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2372746	Kjeldahl Nitrogen	100	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423205

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2372790	NO2NO3-N	95.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423266

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2372826	Total-P	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423178

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2373002	O-Phosphate-P	96.8	96.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P423140

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2372449	Cylindrospermopsin	84.9	89.3	P/P	40 - 150
2372449	Desmethyl microcystin LR	107	109	P/P	40 - 150
2372449	Microcystin HilR	92.1	97.4	P/P	40 - 150
2372449	Microcystin HtyR	89.7	101	P/P	40 - 150
2372449	Microcystin LA	105	104	P/P	40 - 150
2372449	Microcystin LF	116	126	P/P	40 - 150
2372449	Microcystin LR	104	109	P/P	40 - 150
2372449	Microcystin LW	98.3	88.5	P/P	40 - 150
2372449	Microcystin LY	106	103	P/P	40 - 150
2372449	Microcystin RR	91.4	95.6	P/P	40 - 150
2372449	Microcystin WR	88.0	97.9	P/P	40 - 150
2372449	Microcystin YR	99.1	102	P/P	40 - 150
2372449	Nodularin-R	89.8	95.7	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P423141

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2372449	Anatoxin-a	105	103	P/P	40 - 150
2372449	Neosaxitoxin	96.7	95.4	P/P	40 - 150
2372449	Saxitoxin	82.1	82.4	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P423378

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2372826	Ammonia-N	0.329	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P423280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2372746	Kjeldahl Nitrogen	0.737	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423205

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2372790	NO2NO3-N	0.387	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P423266

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2372826	Total-P	1.73	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423178

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2373002	O-Phosphate-P	0.0	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P423140

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2372449	Cylindrospermopsin	5.04	Spike	P	0 - 30
2372449	Desmethyl microcystin LR	2.01	Spike	P	0 - 30
2372449	Microcystin HilR	5.59	Spike	P	0 - 30
2372449	Microcystin HtyR	11.8	Spike	P	0 - 30
2372449	Microcystin LA	0.736	Spike	P	0 - 30
2372449	Microcystin LF	8.13	Spike	P	0 - 30
2372449	Microcystin LR	3.88	Spike	P	0 - 30
2372449	Microcystin LW	10.5	Spike	P	0 - 30
2372449	Microcystin LY	2.65	Spike	P	0 - 30
2372449	Microcystin RR	4.40	Spike	P	0 - 30
2372449	Microcystin WR	10.6	Spike	P	0 - 30
2372449	Microcystin YR	2.88	Spike	P	0 - 30
2372449	Nodularin-R	6.45	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P423141

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2372449	Anatoxin-a	1.30	Spike	P	0 - 30
2372449	Neosaxitoxin	1.38	Spike	P	0 - 30
2372449	Saxitoxin	0.335	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2372817
Field Sample ID: SEHAB0089

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	105	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	52.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A116286
Included Lab Sample IDs: 2372819

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.4	98.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A116302
Included Lab Sample IDs: 2372818

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

Reference Method: EPA 8321B
Run ID: A116342
Included Lab Sample IDs: 2372817

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	84.3	91.2	P/P	50 - 160
Desmethyl microcystin LR	93.1	104	P/P	50 - 160
Microcystin HilR	85.6	100	P/P	50 - 160
Microcystin HtyR	86.4	98.3	P/P	50 - 160
Microcystin LA	94.8	110	P/P	50 - 160
Microcystin LF	101	134	P/P	50 - 160
Microcystin LR	96.3	107	P/P	50 - 160
Microcystin LW	95.0	102	P/P	50 - 160
Microcystin LY	93.4	107	P/P	50 - 160
Microcystin RR	91.0	96.4	P/P	50 - 160
Microcystin WR	84.8	97.8	P/P	50 - 160
Microcystin YR	90.9	105	P/P	50 - 160
Nodularin-R	87.6	101	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A116343
Included Lab Sample IDs: 2372817

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	103	89.4	P/P	50 - 160
Neosaxitoxin	112	105	P/P	50 - 160
Saxitoxin	90.3	90.6	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116350
Included Lab Sample IDs: 2372818

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.6	98.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A116356
Included Lab Sample IDs: 2372818

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.4	92.6	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A116358
Included Lab Sample IDs: 2372818

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	97.7	97.8	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	94.8	95.4	95.8			0.329
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	100	101			0.737
EPA 353.2 Rev. 2.0	NO2NO3-N	103	95.8				0.387
EPA 365.1 Rev. 2.0	Total-P	103	105	106			1.73
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	96.8	96.8			0.0
EPA 8321B	Anatoxin-a	101	105	103			1.30
	Cylindrospermopsin	90.8	84.9	89.3			5.04
	Desmethyl microcystin LR	96.5	107	109			2.01
	Microcystin HilR	88.5	92.1	97.4			5.59
	Microcystin HtyR	92.2	89.7	101			11.8
	Microcystin LA	99.2	105	104			0.736
	Microcystin LF	107	116	126			8.13
	Microcystin LR	96.5	104	109			3.88
	Microcystin LW	78.9	98.3	88.5			10.5
	Microcystin LY	95.1	106	103			2.65
	Microcystin RR	93.6	91.4	95.6			4.40
	Microcystin WR	80.7	88.0	97.9			10.6
	Microcystin YR	101	99.1	102			2.88
	Neosaxitoxin	118	96.7	95.4			1.38
	Nodularin-R	92.7	89.8	95.7			6.45
	Saxitoxin	96.2	82.1	82.4			0.335

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2372818
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2372818
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2372818
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2372818
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2372819
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2372817
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2372817

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	12/06/2022			12/09/2022 13:07	Ping Hua	2372818
EPA 351.2 Rev. 2.0	12/06/2022	12/08/2022 11:30	Simonne.V. Calhoun	12/09/2022 13:08	Judith K. Clark	2372818
EPA 353.2 Rev. 2.0	12/06/2022			12/07/2022 09:52	Beverly Y. Sanders	2372818
EPA 365.1 Rev. 2.0	12/06/2022	12/08/2022 15:42	Adam P Silver	12/09/2022 09:24	James L Waggerby	2372818
EPA 365.1 Rev. 2.0 dissolved	12/06/2022			12/06/2022 15:40	Elise M. Gillis	2372819
EPA 8321B	12/06/2022	12/08/2022 10:00	Manjita Shrestha	12/08/2022 15:46	Manjita Shrestha	2372817
	12/06/2022	12/08/2022 10:00	Manjita Shrestha	12/09/2022 02:31	Manjita Shrestha	2372817