Chemical Analysis Report

WQAP-2023-05-24-02

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

Event Description: **Algae Bloom Response NEROC-as needed**
Request ID: **RQ-2023-05-22-64**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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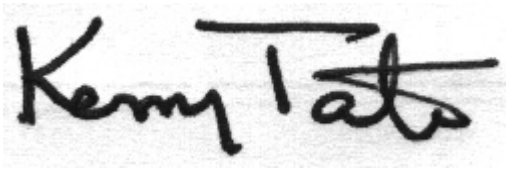
Date Certified: 14-JUN-2023 12:46



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: Rodman Reservoir Dam - East **Collection Date/Time: 05/23/2023 10:15**

Field ID: NEHAB0077 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2412319	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P430291	
		Cylindrospermopsin	0.10	U	ug/L	P430290	
		Desmethyl microcystin LR	0.25	U	ug/L	P430290	
		Microcystin HilR	0.25	U	ug/L	P430290	
		Microcystin HtyR	0.25	U	ug/L	P430290	
		Microcystin LA	0.10	U	ug/L	P430290	
		Microcystin LF	0.10	U	ug/L	P430290	
		Microcystin LR	0.25	U	ug/L	P430290	
		Microcystin LW	0.25	U	ug/L	P430290	
		Microcystin LY	0.10	U	ug/L	P430290	
		Microcystin RR	0.10	U	ug/L	P430290	
		Microcystin WR	0.50	U	ug/L	P430290	
		Neosaxitoxin	0.50	U	ug/L	P430291	
		Microcystin YR	0.25	U	ug/L	P430290	
		Saxitoxin	0.50	U	ug/L	P430291	
		Nodularin-R	0.10	U	ug/L	P430290	
2412320	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P430691	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P430395	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P430985	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P430419	
2412321	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P430346	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430691

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P430395

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P430985

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P430419

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P430346

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

Reference Method: EPA 8321B
Batch ID: P430290

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: P430291

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: P430691

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P430395

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: P430985

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: P430419

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P430346

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.5		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P430290

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	89.6		P	40 - 150
Desmethyl microcystin LR	82.4		P	40 - 150
Microcystin HilR	91.8		P	40 - 150
Microcystin HtyR	77.4		P	40 - 150
Microcystin LA	140		P	40 - 150
Microcystin LF	116		P	40 - 150
Microcystin LR	83.2		P	40 - 150
Microcystin LW	88.9		P	40 - 150
Microcystin LY	118		P	40 - 150
Microcystin RR	82.1		P	40 - 150
Microcystin WR	84.0		P	40 - 150
Microcystin YR	82.7		P	40 - 150
Nodularin-R	82.3		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P430291

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	69.6		P	40 - 150
Neosaxitoxin	64.8		P	40 - 150
Saxitoxin	74.1		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430691

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2411110	Ammonia-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P430395

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2412323	Kjeldahl Nitrogen	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P430985

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2412299	NO2NO3-N	97.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P430419

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2412323	Total-P	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P430346

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2412324	O-Phosphate-P	99.0	98.9	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P430290

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2412184	Cylindrospermopsin	85.0	88.1	P/P	40 - 150
2412184	Desmethyl microcystin LR	98.9	105	P/P	40 - 150
2412184	Microcystin HilR	109	114	P/P	40 - 150
2412184	Microcystin HtyR	90.8	96.6	P/P	40 - 150
2412184	Microcystin LA	138	138	P/P	40 - 150
2412184	Microcystin LF	118	128	P/P	40 - 150
2412184	Microcystin LR	97.6	109	P/P	40 - 150
2412184	Microcystin LW	107	95.0	P/P	40 - 150
2412184	Microcystin LY	132	135	P/P	40 - 150
2412184	Microcystin RR	93.7	99.5	P/P	40 - 150
2412184	Microcystin WR	95.0	96.4	P/P	40 - 150
2412184	Microcystin YR	101	103	P/P	40 - 150
2412184	Nodularin-R	107	106	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P430291

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2412184	Anatoxin-a	71.1	73.5	P/P	40 - 150
2412184	Neosaxitoxin	45.7	48.3	P/P	40 - 150
2412184	Saxitoxin	49.9	51.8	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P430691

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2411110	Ammonia-N	0.392	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P430395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2412323	Kjeldahl Nitrogen	1.00	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P430985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2412299	NO2NO3-N	0.202	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P430419

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2412323	Total-P	0.834	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P430346

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2412324	O-Phosphate-P	0.101	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P430290

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2412184	Cylindrospermopsin	3.63	Spike	P	0 - 30
2412184	Desmethyl microcystin LR	5.79	Spike	P	0 - 30
2412184	Microcystin HilR	3.98	Spike	P	0 - 30
2412184	Microcystin HtyR	6.19	Spike	P	0 - 30
2412184	Microcystin LA	0.169	Spike	P	0 - 30
2412184	Microcystin LF	8.49	Spike	P	0 - 30
2412184	Microcystin LR	11.4	Spike	P	0 - 30
2412184	Microcystin LW	12.1	Spike	P	0 - 30
2412184	Microcystin LY	2.81	Spike	P	0 - 30
2412184	Microcystin RR	5.99	Spike	P	0 - 30
2412184	Microcystin WR	1.44	Spike	P	0 - 30
2412184	Microcystin YR	1.78	Spike	P	0 - 30
2412184	Nodularin-R	1.03	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P430291

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2412184	Anatoxin-a	3.22	Spike	P	0 - 30
2412184	Neosaxitoxin	5.45	Spike	P	0 - 30
2412184	Saxitoxin	3.85	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2412319
Field Sample ID: NEHAB0077

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	99.6	P	30 - 160
EPA 8321B	Saxitoxin-15N7	62.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A119384
Included Lab Sample IDs: 2412321

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.8	97.4	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A119418
Included Lab Sample IDs: 2412319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	89.3	88.6	P/P	50 - 160
Desmethyl microcystin LR	78.4	92.0	P/P	50 - 160
Microcystin HilR	92.1	100	P/P	50 - 160
Microcystin HtyR	86.1	86.1	P/P	50 - 160
Microcystin LA	128	140	P/P	50 - 160
Microcystin LF	107	110	P/P	50 - 160
Microcystin LR	71.7	84.0	P/P	50 - 160
Microcystin LW	110	114	P/P	50 - 160
Microcystin LY	141	140	P/P	50 - 160
Microcystin RR	81.2	91.5	P/P	50 - 160
Microcystin WR	95.7	112	P/P	50 - 160
Microcystin YR	87.2	99.1	P/P	50 - 160
Nodularin-R	83.9	93.8	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A119419
Included Lab Sample IDs: 2412319

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	76.2	72.1	P/P	50 - 160
Neosaxitoxin	69.2	63.8	P/P	50 - 160
Saxitoxin	75.6	68.4	P/P	50 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A119470
Included Lab Sample IDs: 2412320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.0	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A119471
Included Lab Sample IDs: 2412320

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A119520
Included Lab Sample IDs: 2412320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.3	99.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A119661
Included Lab Sample IDs: 2412320

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	105	105	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	97.4	102	102			0.392
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	103	102			1.00
EPA 353.2 Rev. 2.0	NO2NO3-N	104	97.2				0.202
EPA 365.1 Rev. 2.0	Total-P	104	105	104			0.834
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.5	99.0	98.9			0.101
EPA 8321B	Anatoxin-a	69.6	71.1	73.5			3.22
	Cylindrospermopsin	89.6	85.0	88.1			3.63
	Desmethyl microcystin LR	82.4	98.9	105			5.79
	Microcystin HilR	91.8	109	114			3.98
	Microcystin HtyR	77.4	90.8	96.6			6.19
	Microcystin LA	140	138	138			0.169
	Microcystin LF	116	118	128			8.49
	Microcystin LR	83.2	97.6	109			11.4
	Microcystin LW	88.9	107	95.0			12.1
	Microcystin LY	118	132	135			2.81
	Microcystin RR	82.1	93.7	99.5			5.99
	Microcystin WR	84.0	95.0	96.4			1.44
	Microcystin YR	82.7	101	103			1.78
	Neosaxitoxin	64.8	45.7	48.3			5.45
	Nodularin-R	82.3	107	106			1.03
	Saxitoxin	74.1	49.9	51.8			3.85

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2412320
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2412320
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2412320
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2412320
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2412321
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2412319
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2412319

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	05/24/2023			06/01/2023 12:34	Khloe J Berg	2412320
EPA 351.2 Rev. 2.0	05/24/2023	05/25/2023 11:58	Dana G. Hughes	05/30/2023 12:25	Ping Hua	2412320
EPA 353.2 Rev. 2.0	05/24/2023			06/08/2023 10:19	Beverly Y. Sanders	2412320
EPA 365.1 Rev. 2.0	05/24/2023	05/25/2023 14:40	Adam P Silver	05/30/2023 13:47	Chandler E Cox	2412320
EPA 365.1 Rev. 2.0 dissolved	05/24/2023			05/24/2023 15:44	Adam P Silver	2412321
EPA 8321B	05/24/2023	05/25/2023 12:00	Touraj Touran	05/25/2023 15:14	Touraj Touran	2412319
	05/24/2023	05/25/2023 13:00	Touraj Touran	05/25/2023 23:33	Touraj Touran	2412319