

Chemical Analysis Report

SE-DIST-2023-11-15-01

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

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2023-10-23-51**
Customer: **SE-DIST**
Project ID: **BLOOM-RESP**

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

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Certified by: Colin Wright, Program Administrator

Date Certified: 05-DEC-2023 13:06

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: 11/14/2023 09:45

Field ID: SEHAB0089

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2451574	DEP SOP: NU-094-1	Color (true)	63		PCU	P437807	
2451575	EPA 350.1 Rev. 2.0	Ammonia-N	0.10		mg N/L	P438430	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.6		mg N/L	P438034	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.009	I	mg N/L	P438096	
	EPA 365.1 Rev. 2.0	Total-P	0.32		mg P/L	P438118	
2451576	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.040		mg P/L	P437832	
2451589	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P437780	
		Cylindrospermopsin	0.10	U	ug/L	P437775	
		Desmethyl microcystin LR	0.25	U	ug/L	P437775	
		Microcystin HiLR	0.25	U	ug/L	P437775	
		Microcystin HtyR	0.25	U	ug/L	P437775	
		Microcystin LA	1.3		ug/L	P437775	
		Microcystin LF	0.13	I	ug/L	P437775	
		Microcystin LR	0.95	I	ug/L	P437775	
		Microcystin LW	0.25	U	ug/L	P437775	
		Microcystin LY	0.20	I	ug/L	P437775	
		Microcystin RR	0.30	I	ug/L	P437775	
		Microcystin WR	0.50	U	ug/L	P437775	
		Neosaxitoxin	0.50	U	ug/L	P437780	
		Microcystin YR	0.25	U	ug/L	P437775	
		Saxitoxin	0.50	U	ug/L	P437780	
		Nodularin-R	0.10	U	ug/L	P437775	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P437807

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438430

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438034

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438096

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438118

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P437832

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

Reference Method: EPA 8321B
Batch ID: P437775

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

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B
Batch ID: P437780

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: DEP SOP: NU-094-1
Batch ID: P437807

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438430

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438034

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: P438096

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438118

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: P437832

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

Reference Method: EPA 8321B
Batch ID: P437775

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	107		P	40 - 150
Desmethyl microcystin LR	97.7		P	40 - 150
Microcystin H1LR	107		P	40 - 150
Microcystin HtyR	109		P	40 - 150
Microcystin LA	114		P	40 - 150
Microcystin LF	106		P	40 - 150
Microcystin LR	116		P	40 - 150
Microcystin LW	119		P	40 - 150
Microcystin LY	116		P	40 - 150
Microcystin RR	104		P	40 - 150
Microcystin WR	101		P	40 - 150
Microcystin YR	119		P	40 - 150
Nodularin-R	109		P	40 - 150

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P437780

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	91.1		P	40 - 150
Neosaxitoxin	79.6		P	40 - 150
Saxitoxin	86.7		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438430

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2451572	Ammonia-N	95.6	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438034

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2451617	Kjeldahl Nitrogen	104	97.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438096

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2451567	NO2NO3-N	99.5	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438118

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2451620	Total-P	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P437832

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2451485	O-Phosphate-P	97.5	96.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P437775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2450774	Cylindrospermopsin	102	108	P/P	40 - 150
2450774	Desmethyl microcystin LR	97.5	104	P/P	40 - 150
2450774	Microcystin HiLR	99.5	113	P/P	40 - 150
2450774	Microcystin HtyR	111	119	P/P	40 - 150
2450774	Microcystin LA	106	113	P/P	40 - 150
2450774	Microcystin LF	114	113	P/P	40 - 150
2450774	Microcystin LR	104	123	P/P	40 - 150
2450774	Microcystin LW	116	118	P/P	40 - 150
2450774	Microcystin LY	106	116	P/P	40 - 150
2450774	Microcystin RR	99.7	106	P/P	40 - 150
2450774	Microcystin WR	105	114	P/P	40 - 150
2450774	Microcystin YR	113	119	P/P	40 - 150
2450774	Nodularin-R	101	106	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P437780

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2450774	Anatoxin-a	83.1	87.0	P/P	40 - 150
2450774	Neosaxitoxin	73.8	75.3	P/P	40 - 150
2450774	Saxitoxin	85.5	88.4	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P437807

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2451570	Color (true)	0.775	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438430

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2451572	Ammonia-N	2.78	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438034

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2451617	Kjeldahl Nitrogen	5.59	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438096

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2451567	NO2NO3-N	1.00	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438118

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2451620	Total-P	0.515	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P437832

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2451485	O-Phosphate-P	1.39	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P437775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2450774	Cylindrospermopsin	5.91	Spike	P	0 - 30
2450774	Desmethyl microcystin LR	6.27	Spike	P	0 - 30
2450774	Microcystin HtIR	12.9	Spike	P	0 - 30
2450774	Microcystin HtyR	7.00	Spike	P	0 - 30
2450774	Microcystin LA	6.83	Spike	P	0 - 30
2450774	Microcystin LF	0.636	Spike	P	0 - 30
2450774	Microcystin LR	16.4	Spike	P	0 - 30
2450774	Microcystin LW	2.01	Spike	P	0 - 30
2450774	Microcystin LY	9.22	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P437775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2450774	Microcystin RR	6.15	Spike	P	0 - 30
2450774	Microcystin WR	8.57	Spike	P	0 - 30
2450774	Microcystin YR	4.58	Spike	P	0 - 30
2450774	Nodularin-R	4.21	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P437780

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2450774	Anatoxin-a	4.60	Spike	P	0 - 30
2450774	Neosaxitoxin	2.09	Spike	P	0 - 30
2450774	Saxitoxin	3.35	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2451589
Field Sample ID: SEHAB0089

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	92.6	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	140	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A122732

Included Lab Sample IDs: 2451574

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A122740

Included Lab Sample IDs: 2451576

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.2	96.0	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A122772

Included Lab Sample IDs: 2451589

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	116	114	P/P	50 - 160
Desmethyl microcystin LR	114	111	P/P	50 - 160
Microcystin HiiR	128	135	P/P	50 - 160
Microcystin HtyR	132	134	P/P	50 - 160
Microcystin LA	118	123	P/P	50 - 160
Microcystin LF	123	117	P/P	50 - 160
Microcystin LR	134	123	P/P	50 - 160
Microcystin LW	137	115	P/P	50 - 160
Microcystin LY	113	121	P/P	50 - 160
Microcystin RR	110	105	P/P	50 - 160
Microcystin WR	125	119	P/P	50 - 160
Microcystin YR	124	119	P/P	50 - 160
Nodularin-R	112	113	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A122781

Included Lab Sample IDs: 2451589

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	89.9	85.4	P/P	50 - 160
Neosaxitoxin	90.0	88.6	P/P	50 - 160
Saxitoxin	104	103	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A122849

Included Lab Sample IDs: 2451575

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A122886

Included Lab Sample IDs: 2451575

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	98.9	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A122899

Included Lab Sample IDs: 2451575

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	91.2	97.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A122988

Included Lab Sample IDs: 2451575

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.7	98.6	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	
DEP SOP: NU-094-1	Color (true)	102				0.775	
EPA 350.1 Rev. 2.0	Ammonia-N	95.8	95.6	98.8			2.78
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	104	97.2			5.59
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	99.5	100			1.00
EPA 365.1 Rev. 2.0	Total-P	104	105	106			0.515
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.5	96.0			1.39
EPA 8321B	Anatoxin-a	91.1	87.0	83.1			4.60
	Cylindrospermopsin	107	102	108			5.91
	Desmethyl microcystin LR	97.7	97.5	104			6.27
	Microcystin HiLR	107	99.5	113			12.9
	Microcystin HtyR	109	111	119			7.00
	Microcystin LA	114	106	113			6.83
	Microcystin LF	106	114	113			0.636
	Microcystin LR	116	104	123			16.4
	Microcystin LW	119	116	118			2.01
	Microcystin LY	116	106	116			9.22
	Microcystin RR	104	99.7	106			6.15
	Microcystin WR	101	105	114			8.57
	Microcystin YR	119	113	119			4.58
	Neosaxitoxin	79.6	75.3	73.8			2.09
	Nodularin-R	109	101	106			4.21
	Saxitoxin	86.7	88.4	85.5			3.35

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2451574
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2451575
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2451575
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2451575
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2451575
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2451576
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2451589
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2451589

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	11/15/2023			11/15/2023 13:18	Samantha L Bates	2451574
EPA 350.1 Rev. 2.0	11/15/2023			12/01/2023 13:05	Khloe J Berg	2451575
EPA 351.2 Rev. 2.0	11/15/2023	11/20/2023 21:15	Simonne.V. Calhoun	11/27/2023 15:49	Ping Hua	2451575
EPA 353.2 Rev. 2.0	11/15/2023			11/20/2023 11:59	Anna M. Plaviak	2451575
EPA 365.1 Rev. 2.0	11/15/2023	11/21/2023 12:58	Adam P Silver	11/27/2023 11:17	Chandler E Cox	2451575
EPA 365.1 Rev. 2.0 dissolved	11/15/2023			11/15/2023 13:58	Chandler E Cox	2451576
EPA 8321B	11/15/2023	11/16/2023 07:00	Tae K Lee	11/16/2023 11:50	Hana Lee	2451589
	11/15/2023	11/16/2023 12:00	Tae K Lee	11/16/2023 18:16	Hana Lee	2451589