

Chemical Analysis Report

CEN-DIST-2023-12-05-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-08-07-37**
Customer: **CEN-DIST**
Project ID: **BLOOM-RESP**

Send Reports to:
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3319 Maguire Blvd., Suite 232
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Certified by: Colin Wright, Program Administrator

Date Certified: 12-DEC-2023 08:24



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: Tiger Lake - Center

Collection Date/Time: 12/04/2023 11:57

Field ID: HABCE0185

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2454238	DEP SOP: NU-094-1	Color (true)	52	A	PCU	P438511	
2454239	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P438573	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P438521	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P438674	
	EPA 365.1 Rev. 2.0	Total-P	0.051		mg P/L	P438579	
2454240	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P438517	
2454241	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P438480	
		Cylindrospermopsin	0.10	U	ug/L	P438479	
		Desmethyl microcystin LR	0.25	U	ug/L	P438479	
		Microcystin HilR	0.25	U	ug/L	P438479	
		Microcystin HtyR	0.25	U	ug/L	P438479	
		Microcystin LA	0.10	U	ug/L	P438479	
		Microcystin LF	0.10	U	ug/L	P438479	
		Microcystin LR	0.45	I	ug/L	P438479	
		Microcystin LW	0.25	U	ug/L	P438479	
		Microcystin LY	0.10	U	ug/L	P438479	
		Microcystin RR	0.10	U	ug/L	P438479	
		Microcystin WR	0.50	U	ug/L	P438479	
		Neosaxitoxin	0.50	U	ug/L	P438480	
		Microcystin YR	0.25	U	ug/L	P438479	
		Saxitoxin	0.50	U	ug/L	P438480	
		Nodularin-R	0.10	U	ug/L	P438479	

Quality Assurance Report Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P438511

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438573

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438521

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438674

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438579

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P438517

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

Reference Method: EPA 8321B
Batch ID: P438479

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: P438480

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: P438511

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: P438573

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	93.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438521

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438674

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: P438579

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P438517

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.1		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P438479

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	80.4		P	40 - 150
Desmethyl microcystin LR	102		P	40 - 150
Microcystin H11R	108		P	40 - 150
Microcystin HtyR	103		P	40 - 150
Microcystin LA	100		P	40 - 150
Microcystin LF	120		P	40 - 150
Microcystin LR	108		P	40 - 150
Microcystin LW	105		P	40 - 150
Microcystin LY	100		P	40 - 150
Microcystin RR	80.8		P	40 - 150
Microcystin WR	113		P	40 - 150
Microcystin YR	109		P	40 - 150
Nodularin-R	87.5		P	40 - 150

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P438480

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	83.0		P	40 - 150
Neosaxitoxin	77.0		P	40 - 150
Saxitoxin	91.1		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438573

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2454056	Ammonia-N	92.0	94.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438521

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2454056	Kjeldahl Nitrogen	108	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438674

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2453119	NO2NO3-N	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438579

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2454269	Total-P	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P438517

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2454240	O-Phosphate-P	95.1	94.7	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P438479

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2454225	Cylindrospermopsin	92.0	88.9	P/P	40 - 150
2454225	Desmethyl microcystin LR	117	112	P/P	40 - 150
2454225	Microcystin HiLR	115	116	P/P	40 - 150
2454225	Microcystin HtyR	112	107	P/P	40 - 150
2454225	Microcystin LA	104	107	P/P	40 - 150
2454225	Microcystin LF	127	131	P/P	40 - 150
2454225	Microcystin LR	108	115	P/P	40 - 150
2454225	Microcystin LW	123	125	P/P	40 - 150
2454225	Microcystin LY	112	112	P/P	40 - 150
2454225	Microcystin RR	84.0	86.8	P/P	40 - 150
2454225	Microcystin WR	122	121	P/P	40 - 150
2454225	Microcystin YR	122	117	P/P	40 - 150
2454225	Nodularin-R	94.5	94.1	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P438480

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2454225	Anatoxin-a	93.7	95.4	P/P	40 - 150
2454225	Neosaxitoxin	56.9	56.6	P/P	40 - 150
2454225	Saxitoxin	59.2	58.5	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P438511

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2454238	Color (true)	4.16	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P438573

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2454056	Ammonia-N	1.88	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P438521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2454056	Kjeldahl Nitrogen	1.27	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P438674

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2453119	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P438579

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2454269	Total-P	0.650	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P438517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2454240	O-Phosphate-P	0.401	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P438479

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2454225	Cylindrospermopsin	3.42	Spike	P	0 - 30
2454225	Desmethyl microcystin LR	4.26	Spike	P	0 - 30
2454225	Microcystin HtIR	0.566	Spike	P	0 - 30
2454225	Microcystin HtyR	4.09	Spike	P	0 - 30
2454225	Microcystin LA	3.40	Spike	P	0 - 30
2454225	Microcystin LF	3.18	Spike	P	0 - 30
2454225	Microcystin LR	5.54	Spike	P	0 - 30
2454225	Microcystin LW	1.65	Spike	P	0 - 30
2454225	Microcystin LY	0.311	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P438479

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2454225	Microcystin RR	3.21	Spike	P	0 - 30
2454225	Microcystin WR	0.425	Spike	P	0 - 30
2454225	Microcystin YR	4.07	Spike	P	0 - 30
2454225	Nodularin-R	0.413	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P438480

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2454225	Anatoxin-a	1.81	Spike	P	0 - 30
2454225	Neosaxitoxin	0.484	Spike	P	0 - 30
2454225	Saxitoxin	1.13	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2454241
Field Sample ID: HABCE0185

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	77.9	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	128	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: NU-094-1

Run ID: A123030

Included Lab Sample IDs: 2454238

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A123031

Included Lab Sample IDs: 2454240

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.6	98.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A123057

Included Lab Sample IDs: 2454239

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	96.9	98.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A123082

Included Lab Sample IDs: 2454239

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.5	97.1	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A123083

Included Lab Sample IDs: 2454241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	90.5	94.8	P/P	50 - 160
Neosaxitoxin	87.2	90.2	P/P	50 - 160
Saxitoxin	96.8	100	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A123088

Included Lab Sample IDs: 2454239

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A123089

Included Lab Sample IDs: 2454241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	95.6	99.9	P/P	50 - 160
Desmethyl microcystin LR	117	126	P/P	50 - 160
Microcystin HILR	115	132	P/P	50 - 160
Microcystin HtyR	117	126	P/P	50 - 160
Microcystin LA	114	124	P/P	50 - 160
Microcystin LF	123	131	P/P	50 - 160
Microcystin LR	117	131	P/P	50 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A123089
Included Lab Sample IDs: 2454241

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Microcystin LW	120	127	P/P	50 - 160
Microcystin LY	113	128	P/P	50 - 160
Microcystin RR	89.3	91.8	P/P	50 - 160
Microcystin WR	119	132	P/P	50 - 160
Microcystin YR	110	128	P/P	50 - 160
Nodularin-R	97.7	101	P/P	50 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A123101
Included Lab Sample IDs: 2454239

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	109	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		LCS	Precision	MS
						SMP	
DEP SOP: NU-094-1	Color (true)	102				4.16	
EPA 350.1 Rev. 2.0	Ammonia-N	93.0	92.0	94.0			1.88
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	110	108	109			1.27
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	101	101			0.0
EPA 365.1 Rev. 2.0	Total-P	106	105	106			0.650
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.1	95.1	94.7			0.401
EPA 8321B	Anatoxin-a	83.0	93.7	95.4			1.81
	Cylindrospermopsin	80.4	92.0	88.9			3.42
	Desmethyl microcystin LR	102	117	112			4.26
	Microcystin H ₁ LR	108	115	116			0.566
	Microcystin H ₂ LR	103	112	107			4.09
	Microcystin LA	100	104	107			3.40
	Microcystin LF	120	127	131			3.18
	Microcystin LR	108	108	115			5.54
	Microcystin LW	105	123	125			1.65
	Microcystin LY	100	112	112			0.311
	Microcystin RR	80.8	84.0	86.8			3.21
	Microcystin WR	113	122	121			0.425
	Microcystin YR	109	122	117			4.07
	Neosaxitoxin	77.0	56.9	56.6			0.484
	Nodularin-R	87.5	94.5	94.1			0.413
	Saxitoxin	91.1	59.2	58.5			1.13

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2454238
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2454239
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2454239
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2454239
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2454239
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2454240
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2454241
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2454241

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	12/05/2023			12/05/2023 15:04	Chandler E Cox	2454238
EPA 350.1 Rev. 2.0	12/05/2023			12/06/2023 13:57	Ping Hua	2454239
EPA 351.2 Rev. 2.0	12/05/2023	12/06/2023 11:57	Simonne.V. Calhoun	12/07/2023 16:50	Ping Hua	2454239
EPA 353.2 Rev. 2.0	12/05/2023			12/07/2023 13:13	Fadila Guebre	2454239
EPA 365.1 Rev. 2.0	12/05/2023	12/06/2023 13:01	Adam P Silver	12/07/2023 11:36	Chandler E Cox	2454239
EPA 365.1 Rev. 2.0 dissolved	12/05/2023			12/05/2023 15:44	Elise M. Gillis	2454240
EPA 8321B	12/05/2023	12/07/2023 09:00	Tae K Lee	12/07/2023 12:07	Hana Lee	2454241
	12/05/2023	12/07/2023 09:00	Tae K Lee	12/07/2023 16:17	Hana Lee	2454241