

Chemical Analysis Report

WQAP-2022-08-11-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-07-25-05**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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Date Certified: 31-AUG-2022 17:23



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 Maitland - NE Lobe near Kayak Launch

Collection Date/Time: 08/10/2022 09:34

Field ID: HABCE0136_LakeMaitland

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2348140	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P417917	
		Cylindrospermopsin	0.10	U	ug/L	P417916	
		Desmethyl microcystin LR	0.25	U	ug/L	P417916	
		Microcystin HILR	0.25	U	ug/L	P417916	
		Microcystin HtyR	0.25	U	ug/L	P417916	
		Microcystin LA	0.10	U	ug/L	P417916	
		Microcystin LF	0.10	U	ug/L	P417916	
		Microcystin LR	0.25	U	ug/L	P417916	
		Microcystin LW	0.25	U	ug/L	P417916	
		Microcystin LY	0.10	U	ug/L	P417916	
		Microcystin RR	0.10	U	ug/L	P417916	
		Microcystin WR	0.50	U	ug/L	P417916	
		Neosaxitoxin	0.50	U	ug/L	P417917	
		Microcystin YR	0.25	U	ug/L	P417916	
		Saxitoxin	0.50	U	ug/L	P417917	
		Nodularin-R	0.10	U	ug/L	P417916	
2348141	EPA 350.1 Rev. 2.0	Ammonia-N	0.24		mg N/L	P418160	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.0		mg N/L	P418085	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.005	I	mg N/L	P418111	
	EPA 365.1 Rev. 2.0	Total-P	0.040		mg P/L	P418190	
2348142	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P417990	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418160

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418085

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418111

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418190

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P417990

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

Reference Method: EPA 8321B
Batch ID: P417916

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: P417917

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: P418160

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P418085

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

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P418111

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	95.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P418190

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P417990

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

Reference Method: EPA 8321B

Batch ID: P417916

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	89.2		P	40 - 150
Desmethyl microcystin LR	94.3		P	40 - 150
Microcystin H1R	91.0		P	40 - 150
Microcystin HtyR	99.8		P	40 - 150
Microcystin LA	92.5		P	40 - 150
Microcystin LF	102		P	40 - 150
Microcystin LR	91.6		P	40 - 150
Microcystin LW	92.1		P	40 - 150
Microcystin LY	101		P	40 - 150
Microcystin RR	94.5		P	40 - 150
Microcystin WR	96.9		P	40 - 150
Microcystin YR	85.7		P	40 - 150
Nodularin-R	90.7		P	40 - 150

Reference Method: EPA 8321B

Batch ID: P417917

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	106		P	40 - 150
Neosaxitoxin	113		P	40 - 150
Saxitoxin	107		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418160

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347938	Ammonia-N	97.4	97.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418111

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2348120	NO2NO3-N	92.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418190

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2348118	Total-P	105	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P417990

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2348305	O-Phosphate-P	98.7	99.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P417916

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347461	Cylindrospermopsin	85.2	81.4	P/P	40 - 150
2347461	Desmethyl microcystin LR	84.1	88.2	P/P	40 - 150
2347461	Microcystin HilR	86.5	85.5	P/P	40 - 150
2347461	Microcystin HtyR	85.6	86.5	P/P	40 - 150
2347461	Microcystin LA	86.8	90.4	P/P	40 - 150
2347461	Microcystin LF	88.0	91.8	P/P	40 - 150
2347461	Microcystin LR	81.5	83.0	P/P	40 - 150
2347461	Microcystin LW	88.4	90.2	P/P	40 - 150
2347461	Microcystin LY	87.0	89.0	P/P	40 - 150
2347461	Microcystin RR	90.5	92.6	P/P	40 - 150
2347461	Microcystin WR	93.1	94.4	P/P	40 - 150
2347461	Microcystin YR	78.2	78.0	P/P	40 - 150
2347461	Nodularin-R	85.7	86.7	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P417917

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2347461	Anatoxin-a	116	122	P/P	40 - 150
2347461	Neosaxitoxin	78.7	79.9	P/P	40 - 150
2347461	Saxitoxin	83.8	87.5	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P418160

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347938	Ammonia-N	0.0	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P418085

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2348227	Kjeldahl Nitrogen	4.88	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P418111

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2348120	NO2NO3-N	1.44	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P418190

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2348118	Total-P	1.35	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P417990

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2348305	O-Phosphate-P	0.344	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P417916

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347461	Cylindrospermopsin	4.51	Spike	P	0 - 30
2347461	Desmethyl microcystin LR	4.85	Spike	P	0 - 30
2347461	Microcystin H1LR	1.18	Spike	P	0 - 30
2347461	Microcystin HtyR	1.01	Spike	P	0 - 30
2347461	Microcystin LA	4.06	Spike	P	0 - 30
2347461	Microcystin LF	4.22	Spike	P	0 - 30
2347461	Microcystin LR	1.87	Spike	P	0 - 30
2347461	Microcystin LW	2.00	Spike	P	0 - 30
2347461	Microcystin LY	2.34	Spike	P	0 - 30
2347461	Microcystin RR	2.31	Spike	P	0 - 30
2347461	Microcystin WR	1.35	Spike	P	0 - 30
2347461	Microcystin YR	0.176	Spike	P	0 - 30
2347461	Nodularin-R	1.21	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P417917

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2347461	Anatoxin-a	5.03	Spike	P	0 - 30
2347461	Neosaxitoxin	1.49	Spike	P	0 - 30
2347461	Saxitoxin	4.28	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2348140

Field Sample ID: HABCE0136_LakeMaitland

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	57.8	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	102	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
Run ID: A114028
Included Lab Sample IDs: 2348140

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	112	112	P/P	50 - 160
Neosaxitoxin	116	120	P/P	50 - 160
Saxitoxin	110	112	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A114035
Included Lab Sample IDs: 2348142

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

Reference Method: EPA 8321B
Run ID: A114040
Included Lab Sample IDs: 2348140

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	97.9	95.7	P/P	50 - 160
Desmethyl microcystin LR	96.3	95.7	P/P	50 - 160
Microcystin HILR	102	102	P/P	50 - 160
Microcystin HtyR	98.3	99.1	P/P	50 - 160
Microcystin LA	98.7	99.9	P/P	50 - 160
Microcystin LF	99.6	97.0	P/P	50 - 160
Microcystin LR	87.1	89.0	P/P	50 - 160
Microcystin LW	103	103	P/P	50 - 160
Microcystin LY	91.9	94.4	P/P	50 - 160
Microcystin RR	95.4	97.8	P/P	50 - 160
Microcystin WR	107	102	P/P	50 - 160
Microcystin YR	91.3	92.8	P/P	50 - 160
Nodularin-R	92.5	92.2	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A114090
Included Lab Sample IDs: 2348141

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	95.5	95.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A114127
Included Lab Sample IDs: 2348141

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.5	99.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A114160
Included Lab Sample IDs: 2348141

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.7	98.4	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A114250

Included Lab Sample IDs: 2348141

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	102	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	96.2	97.4	97.4		0.0
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108				4.88
EPA 353.2 Rev. 2.0	NO2NO3-N	95.5	92.2			1.44
EPA 365.1 Rev. 2.0	Total-P	105	105	107		1.35
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	98.7	99.1		0.344
EPA 8321B	Anatoxin-a	106	116	122		5.03
	Cylindrospermopsin	89.2	85.2	81.4		4.51
	Desmethyl microcystin LR	94.3	84.1	88.2		4.85
	Microcystin HiLR	91.0	86.5	85.5		1.18
	Microcystin HtyR	99.8	85.6	86.5		1.01
	Microcystin LA	92.5	86.8	90.4		4.06
	Microcystin LF	102	88.0	91.8		4.22
	Microcystin LR	91.6	81.5	83.0		1.87
	Microcystin LW	92.1	88.4	90.2		2.00
	Microcystin LY	101	87.0	89.0		2.34
	Microcystin RR	94.5	90.5	92.6		2.31
	Microcystin WR	96.9	93.1	94.4		1.35
	Microcystin YR	85.7	78.2	78.0		0.176
	Neosaxitoxin	113	78.7	79.9		1.49
	Nodularin-R	90.7	85.7	86.7		1.21
	Saxitoxin	107	83.8	87.5		4.28

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2348141
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2348141
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2348141
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2348141
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2348142
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2348140
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2348140

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	08/11/2022			08/16/2022 12:51	Ping Hua	2348141
EPA 351.2 Rev. 2.0	08/11/2022	08/16/2022 13:42	Samantha L Bates	08/17/2022 13:01	Alexandra J Mattheus	2348141
EPA 353.2 Rev. 2.0	08/11/2022			08/15/2022 11:19	Beverly Y. Sanders	2348141
EPA 365.1 Rev. 2.0	08/11/2022	08/17/2022 08:50	Simonne.V. Calhoun	08/22/2022 13:09	Simonne.V. Calhoun	2348141
EPA 365.1 Rev. 2.0 dissolved	08/11/2022			08/11/2022 13:59	Elise M. Gillis	2348142
EPA 8321B	08/11/2022	08/11/2022 12:00	Manjita Shrestha	08/11/2022 20:49	Umesh Chiluwal	2348140
	08/11/2022	08/11/2022 12:00	Umesh Chiluwal	08/11/2022 21:50	Umesh Chiluwal	2348140