Chemical Analysis Report

WQAP-2022-12-21-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-12-19-33**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd. Suite 232
Orlando, FL 32803
Attn: Matt Bearden

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 11-JAN-2023 10:35

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 Pineloch - E Shore **Collection Date/Time: 12/20/2022 10:34**

Field ID: HABCE0158_LakePineloch Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2376901	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P423757	
		Cylindrospermopsin	0.10	U	ug/L	P423756	
		Desmethyl microcystin LR	0.25	U	ug/L	P423756	
		Microcystin HilR	0.25	U	ug/L	P423756	
		Microcystin HtyR	0.25	U	ug/L	P423756	
		Microcystin LA	0.10	U	ug/L	P423756	
		Microcystin LF	0.10	U	ug/L	P423756	
		Microcystin LR	0.28	I	ug/L	P423756	
		Microcystin LW	0.25	U	ug/L	P423756	
		Microcystin LY	0.10	U	ug/L	P423756	
		Microcystin RR	0.10	U	ug/L	P423756	
		Microcystin WR	0.50	U	ug/L	P423756	
		Neosaxitoxin	0.50	U	ug/L	P423757	
		Microcystin YR	0.25	U	ug/L	P423756	
		Saxitoxin	0.50	U	ug/L	P423757	
		Nodularin-R	0.10	U	ug/L	P423756	
2376902	EPA 350.1 Rev. 2.0	Ammonia-N	0.033		mg N/L	P424303	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.89		mg N/L	P424048	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P423977	
	EPA 365.1 Rev. 2.0	Total-P	0.024		mg P/L	P424109	
2376903	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P423849	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424303

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424048

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423977

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424109

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423849

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

Reference Method: EPA 8321B
Batch ID: P423756

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: P423757

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: P424303

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424048

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423977

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	107		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424109

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: P423849

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

Reference Method: EPA 8321B
Batch ID: P423756

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	116		P	40 - 150
Desmethyl microcystin LR	121		P	40 - 150
Microcystin HilR	117		P	40 - 150
Microcystin HtyR	124		P	40 - 150
Microcystin LA	101		P	40 - 150
Microcystin LF	114		P	40 - 150
Microcystin LR	130		P	40 - 150
Microcystin LW	126		P	40 - 150
Microcystin LY	106		P	40 - 150
Microcystin RR	120		P	40 - 150
Microcystin WR	118		P	40 - 150
Microcystin YR	134		P	40 - 150
Nodularin-R	111		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P423757

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	92.8		P	40 - 150
Neosaxitoxin	99.2		P	40 - 150
Saxitoxin	101		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424303

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376813	Ammonia-N	97.8	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424048

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376909	Kjeldahl Nitrogen	96.5	106	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423977

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376902	NO2NO3-N	106	106	P/P	90 - 110
2376902	NO2NO3-N	106		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424109

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376813	Total-P	105	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423849

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376903	O-Phosphate-P	97.6	97.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P423756

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376446	Cylindrospermopsin	102	106	P/P	40 - 150
2376446	Desmethyl microcystin LR	136	142	P/P	40 - 150
2376446	Microcystin HilR	121	128	P/P	40 - 150
2376446	Microcystin HtyR	126	130	P/P	40 - 150
2376446	Microcystin LA	93.8	96.5	P/P	40 - 150
2376446	Microcystin LF	104	90.5	P/P	40 - 150
2376446	Microcystin LR	144	142	P/P	40 - 150
2376446	Microcystin LW	114	119	P/P	40 - 150
2376446	Microcystin LY	110	106	P/P	40 - 150
2376446	Microcystin RR	106	106	P/P	40 - 150
2376446	Microcystin WR	122	124	P/P	40 - 150
2376446	Microcystin YR	132	144	P/P	40 - 150
2376446	Nodularin-R	116	118	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P423757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2376482	Anatoxin-a	93.7	94.1	P/P	40 - 150
2376482	Neosaxitoxin	83.4	82.0	P/P	40 - 150
2376482	Saxitoxin	78.9	74.0	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P424303

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376813	Ammonia-N	0.568	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P424048

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376909	Kjeldahl Nitrogen	6.07	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P423977

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376902	NO2NO3-N	0.0	Spike	P	0 - 15

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P424109

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376813	Total-P	0.158	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P423849

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376903	O-Phosphate-P	0.103	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P423756

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376446	Cylindrospermopsin	3.60	Spike	P	0 - 30
2376446	Desmethyl microcystin LR	4.40	Spike	P	0 - 30
2376446	Microcystin HilR	5.09	Spike	P	0 - 30
2376446	Microcystin HtyR	3.38	Spike	P	0 - 30
2376446	Microcystin LA	2.85	Spike	P	0 - 30
2376446	Microcystin LF	13.9	Spike	P	0 - 30
2376446	Microcystin LR	1.16	Spike	P	0 - 30
2376446	Microcystin LW	3.63	Spike	P	0 - 30
2376446	Microcystin LY	4.50	Spike	P	0 - 30
2376446	Microcystin RR	0.277	Spike	P	0 - 30
2376446	Microcystin WR	1.53	Spike	P	0 - 30
2376446	Microcystin YR	9.32	Spike	P	0 - 30
2376446	Nodularin-R	1.50	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P423757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2376482	Anatoxin-a	0.390	Spike	P	0 - 30
2376482	Neosaxitoxin	1.67	Spike	P	0 - 30
2376482	Saxitoxin	6.35	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2376901
Field Sample ID: HABCE0158_LakePineloch

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	115	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	93.7	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A116604
Included Lab Sample IDs: 2376901

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	81.6	78.3	P/P	50 - 160
Neosaxitoxin	92.9	82.2	P/P	50 - 160
Saxitoxin	81.3	76.3	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A116607
Included Lab Sample IDs: 2376903

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.3	100	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A116616
Included Lab Sample IDs: 2376901

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	119	119	P/P	50 - 160
Desmethyl microcystin LR	134	130	P/P	50 - 160
Microcystin HilR	128	126	P/P	50 - 160
Microcystin HtyR	125	129	P/P	50 - 160
Microcystin LA	112	118	P/P	50 - 160
Microcystin LF	130	126	P/P	50 - 160
Microcystin LR	128	129	P/P	50 - 160
Microcystin LW	134	107	P/P	50 - 160
Microcystin LY	119	110	P/P	50 - 160
Microcystin RR	116	118	P/P	50 - 160
Microcystin WR	130	130	P/P	50 - 160
Microcystin YR	130	136	P/P	50 - 160
Nodularin-R	123	124	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A116667
Included Lab Sample IDs: 2376902

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A116747
Included Lab Sample IDs: 2376902

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.0	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A116772
Included Lab Sample IDs: 2376902

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	98.2	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A116809
Included Lab Sample IDs: 2376902

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.4	98.9	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	97.0	97.8	98.4				0.568
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	96.5	106				6.07
EPA 353.2 Rev. 2.0	NO2NO3-N	107	106	106	106			0.0 RSD
EPA 365.1 Rev. 2.0	Total-P	104	105	105				0.158
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.4	97.6	97.5				0.103
EPA 8321B	Anatoxin-a	92.8	93.7	94.1				0.390
	Cylindrospermopsin	116	102	106				3.60
	Desmethyl microcystin LR	121	136	142				4.40
	Microcystin HilR	117	121	128				5.09
	Microcystin HtyR	124	126	130				3.38
	Microcystin LA	101	93.8	96.5				2.85
	Microcystin LF	114	104	90.5				13.9
	Microcystin LR	130	144	142				1.16
	Microcystin LW	126	114	119				3.63
	Microcystin LY	106	110	106				4.50
	Microcystin RR	120	106	106				0.277
	Microcystin WR	118	122	124				1.53
	Microcystin YR	134	132	144				9.32
	Neosaxitoxin	99.2	83.4	82.0				1.67
	Nodularin-R	111	116	118				1.50
	Saxitoxin	101	78.9	74.0				6.35

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2376902
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2376902
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2376902
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2376902
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2376903
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2376901
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2376901

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	12/21/2022			01/09/2023 14:27	Ping Hua	2376902
EPA 351.2 Rev. 2.0	12/21/2022	01/03/2023 13:30	Simonne.V. Calhoun	01/06/2023 10:42	Samantha L Bates	2376902
EPA 353.2 Rev. 2.0	12/21/2022			12/28/2022 11:59	Beverly Y. Sanders	2376902
EPA 365.1 Rev. 2.0	12/21/2022	01/03/2023 14:10	Adam P Silver	01/05/2023 14:30	James L Waggerby	2376902
EPA 365.1 Rev. 2.0 dissolved	12/21/2022			12/21/2022 14:59	Elise M. Gillis	2376903
EPA 8321B	12/21/2022	12/21/2022 12:00	Manjita Shrestha	12/21/2022 20:33	Manjita Shrestha	2376901
	12/21/2022	12/21/2022 12:00	Manjita Shrestha	12/22/2022 08:05	Manjita Shrestha	2376901