Chemical Analysis Report

WQAP-2022-08-25-01

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

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2022-08-08-12**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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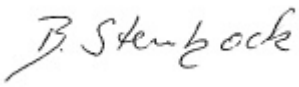
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 12-SEP-2022 16:07



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 Runnymede - Sam Pan Way **Collection Date/Time: 08/24/2022 14:28**

Field ID: HABCE0141_LakeRunnymede Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2352268	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P418570	
		Cylindrospermopsin	0.10	U	ug/L	P418569	
		Desmethyl microcystin LR	0.25	U	ug/L	P418569	
		Microcystin HilR	0.25	U	ug/L	P418569	
		Microcystin HtyR	0.25	U	ug/L	P418569	
		Microcystin LA	0.10	U	ug/L	P418569	
		Microcystin LF	0.10	U	ug/L	P418569	
		Microcystin LR	0.25	U	ug/L	P418569	
		Microcystin LW	0.25	U	ug/L	P418569	
		Microcystin LY	0.10	U	ug/L	P418569	
		Microcystin RR	0.10	U	ug/L	P418569	
		Microcystin WR	0.50	U	ug/L	P418569	
		Microcystin YR	0.25	U	ug/L	P418569	
		Nodularin-R	0.10	U	ug/L	P418569	
2352269	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P418876	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P418823	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	I	mg N/L	P418997	
	EPA 365.1 Rev. 2.0	Total-P	0.26		mg P/L	P418913	
2352270	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.16		mg P/L	P418697	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418876

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418823

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418997

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418913

Component	Result	Code	Units
Total-P	0.01	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418697

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

Reference Method: EPA 8321B
Batch ID: P418569

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: P418570

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418876

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.2		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418823

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: P418997

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	102		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418913

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: P418697

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

Reference Method: EPA 8321B
Batch ID: P418569

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	79.8		P	40 - 150
Desmethyl microcystin LR	73.2		P	40 - 150
Microcystin HilR	77.2		P	40 - 150
Microcystin HtyR	78.1		P	40 - 150
Microcystin LA	80.6		P	40 - 150
Microcystin LF	66.4		P	40 - 150
Microcystin LR	76.4		P	40 - 150
Microcystin LW	64.4		P	40 - 150
Microcystin LY	66.1		P	40 - 150
Microcystin RR	77.1		P	40 - 150
Microcystin WR	73.7		P	40 - 150
Microcystin YR	80.0		P	40 - 150
Nodularin-R	80.8		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P418570

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	75.5		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418876

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352276	Ammonia-N	97.8	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418823

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352296	Kjeldahl Nitrogen	100	96.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418997

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352281	NO2NO3-N	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418913

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352296	Total-P	106	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418697

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2352277	O-Phosphate-P	101	100	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P418569

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2351625	Cylindrospermopsin	91.4	88.2	P/P	40 - 150
2351625	Desmethyl microcystin LR	106	112	P/P	40 - 150
2351625	Microcystin HilR	129	136	P/P	40 - 150
2351625	Microcystin HtyR	108	115	P/P	40 - 150
2351625	Microcystin LA	98.8	94.2	P/P	40 - 150
2351625	Microcystin LF	77.2	82.0	P/P	40 - 150
2351625	Microcystin LR	110	115	P/P	40 - 150
2351625	Microcystin LW	94.1	98.5	P/P	40 - 150
2351625	Microcystin LY	94.5	84.8	P/P	40 - 150
2351625	Microcystin RR	102	107	P/P	40 - 150
2351625	Microcystin WR	107	115	P/P	40 - 150
2351625	Microcystin YR	110	116	P/P	40 - 150
2351625	Nodularin-R	115	118	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P418570

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2351625	Anatoxin-a	82.8	81.5	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P418876

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352276	Ammonia-N	0.948	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P418823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352296	Kjeldahl Nitrogen	1.70	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P418997

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352281	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P418913

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352296	Total-P	1.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P418697

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2352277	O-Phosphate-P	0.661	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P418569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2351625	Cylindrospermopsin	3.49	Spike	P	0 - 30
2351625	Desmethyl microcystin LR	5.15	Spike	P	0 - 30
2351625	Microcystin HilR	5.47	Spike	P	0 - 30
2351625	Microcystin HtyR	5.96	Spike	P	0 - 30
2351625	Microcystin LA	4.76	Spike	P	0 - 30
2351625	Microcystin LF	6.09	Spike	P	0 - 30
2351625	Microcystin LR	3.94	Spike	P	0 - 30
2351625	Microcystin LW	4.58	Spike	P	0 - 30
2351625	Microcystin LY	10.8	Spike	P	0 - 30
2351625	Microcystin RR	4.42	Spike	P	0 - 30
2351625	Microcystin WR	7.17	Spike	P	0 - 30
2351625	Microcystin YR	4.96	Spike	P	0 - 30
2351625	Nodularin-R	3.05	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P418570

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2351625	Anatoxin-a	1.55	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2352268
Field Sample ID: HABCE0141_LakeRunnymede

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	98.6	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	69.9	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A114331
Included Lab Sample IDs: 2352268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	88.9	86.3	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A114347
Included Lab Sample IDs: 2352270

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.1	97.9	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A114353
Included Lab Sample IDs: 2352268

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	87.8	79.2	P/P	50 - 160
Desmethyl microcystin LR	76.5	82.4	P/P	50 - 160
Microcystin HilR	84.2	84.1	P/P	50 - 160
Microcystin HtyR	83.3	86.6	P/P	50 - 160
Microcystin LA	79.6	87.7	P/P	50 - 160
Microcystin LF	77.3	73.4	P/P	50 - 160
Microcystin LR	85.2	83.5	P/P	50 - 160
Microcystin LW	73.4	74.3	P/P	50 - 160
Microcystin LY	79.7	70.0	P/P	50 - 160
Microcystin RR	79.0	80.2	P/P	50 - 160
Microcystin WR	78.4	87.1	P/P	50 - 160
Microcystin YR	77.5	79.2	P/P	50 - 160
Nodularin-R	94.0	92.9	P/P	50 - 160

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A114432
Included Lab Sample IDs: 2352269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A114482
Included Lab Sample IDs: 2352269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.1	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A114485
Included Lab Sample IDs: 2352269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A114486
Included Lab Sample IDs: 2352269

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	100	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	97.2	97.8	99.4			0.948
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	100	96.9			1.70
EPA 353.2 Rev. 2.0	NO2NO3-N	102	103	103			0.0
EPA 365.1 Rev. 2.0	Total-P	106	106	107			1.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	101	100			0.661
EPA 8321B	Anatoxin-a	75.5	82.8	81.5			1.55
	Cylindrospermopsin	79.8	91.4	88.2			3.49
	Desmethyl microcystin LR	73.2	106	112			5.15
	Microcystin HilR	77.2	129	136			5.47
	Microcystin HtyR	78.1	108	115			5.96
	Microcystin LA	80.6	98.8	94.2			4.76
	Microcystin LF	66.4	77.2	82.0			6.09
	Microcystin LR	76.4	110	115			3.94
	Microcystin LW	64.4	94.1	98.5			4.58
	Microcystin LY	66.1	94.5	84.8			10.8
	Microcystin RR	77.1	102	107			4.42
	Microcystin WR	73.7	107	115			7.17
	Microcystin YR	80.0	110	116			4.96
	Nodularin-R	80.8	115	118			3.05

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2352269
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2352269
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2352269
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2352269
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2352270
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2352268
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2352268

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	08/25/2022			08/30/2022 13:06	Ping Hua	2352269
EPA 351.2 Rev. 2.0	08/25/2022	08/30/2022 14:31	Samantha L Bates	09/01/2022 11:19	Alexandra J Mattheus	2352269
EPA 353.2 Rev. 2.0	08/25/2022			09/01/2022 11:45	Beverly Y. Sanders	2352269
EPA 365.1 Rev. 2.0	08/25/2022	08/31/2022 13:30	Adam P Silver	09/01/2022 12:11	James L Waggerby	2352269
EPA 365.1 Rev. 2.0 dissolved	08/25/2022			08/25/2022 14:44	Elise M. Gillis	2352270
EPA 8321B	08/25/2022	08/25/2022 13:00	Manjita Shrestha	08/25/2022 19:36	Manjita Shrestha	2352268
	08/25/2022	08/25/2022 13:00	Manjita Shrestha	08/25/2022 23:06	Manjita Shrestha	2352268