Chemical Analysis Report

WQAP-2021-09-02-01

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

Event Description: **Algal Bloom Response- NEROC**
Request ID: **RQ-2021-08-30-38**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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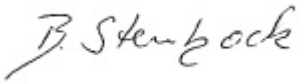
Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 28-SEP-2021 16:08



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: LSJR end of Oakvale Rd **Collection Date/Time: 09/01/2021 10:15**

Field ID: NEHAB0025 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2273224	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P403234	
		Cylindrospermopsin	0.18	I	ug/L	P403234	
		Desmethyl microcystin LR	0.25	U	ug/L	P403234	
		Microcystin HilR**	0.25	U	ug/L	P403234	
		Microcystin HtyR**	0.25	U	ug/L	P403234	
		Microcystin LA	0.10	U	ug/L	P403234	
		Microcystin LF	0.10	U	ug/L	P403234	
		Microcystin LR	0.25	U	ug/L	P403234	
		Microcystin LW	0.25	U	ug/L	P403234	
		Microcystin LY	0.10	U	ug/L	P403234	
		Microcystin RR	0.10	U	ug/L	P403234	
		Microcystin WR	0.50	U	ug/L	P403234	
		Microcystin YR	0.25	U	ug/L	P403234	
		Nodularin-R**	0.10	U	ug/L	P403234	
2273225	EPA 350.1 Rev. 2.0	Ammonia-N	0.035		mg N/L	P403363	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P403411	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.17		mg N/L	P403348	
	EPA 365.1 Rev. 2.0	Total-P	0.097		mg P/L	P403425	
2273226	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.048		mg P/L	P403336	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403363

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403411

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403348

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403425

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403336

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

Reference Method: EPA 8321B
Batch ID: P403234

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403363

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403411

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	103		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403348

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: P403425

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403336

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

Reference Method: EPA 8321B
Batch ID: P403234

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	75.2		P	40 - 150
Cylindrospermopsin	92.0		P	40 - 150
Desmethyl microcystin LR	81.3		P	40 - 150
Microcystin HilR	93.7		P	40 - 150
Microcystin HtyR	96.1		P	40 - 150
Microcystin LA	132		P	40 - 150
Microcystin LF	119		P	40 - 150
Microcystin LR	103		P	40 - 150
Microcystin LW	109		P	40 - 150
Microcystin LY	123		P	40 - 150
Microcystin RR	105		P	40 - 150
Microcystin WR	84.9		P	40 - 150
Microcystin YR	89.5		P	40 - 150
Nodularin-R	111		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403363

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273230	Ammonia-N	98.2	97.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403411

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273162	Kjeldahl Nitrogen	103	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403348

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273153	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403425

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273225	Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403336

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2273163	O-Phosphate-P	101	102	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P403234

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2272914	Anatoxin-a	86.3	91.0	P/P	40 - 150
2272914	Cylindrospermopsin	103	105	P/P	40 - 150
2272914	Desmethyl microcystin LR	80.3	86.8	P/P	40 - 150
2272914	Microcystin HilR	98.1	104	P/P	40 - 150
2272914	Microcystin HtyR	94.1	98.6	P/P	40 - 150
2272914	Microcystin LA	125	128	P/P	40 - 150
2272914	Microcystin LF	121	131	P/P	40 - 150
2272914	Microcystin LR	101	106	P/P	40 - 150
2272914	Microcystin LW	111	119	P/P	40 - 150
2272914	Microcystin LY	131	131	P/P	40 - 150
2272914	Microcystin RR	111	115	P/P	40 - 150
2272914	Microcystin WR	90.4	89.4	P/P	40 - 150
2272914	Microcystin YR	93.0	91.1	P/P	40 - 150
2272914	Nodularin-R	115	113	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P403363

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273230	Ammonia-N	0.540	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P403411

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273162	Kjeldahl Nitrogen	1.90	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P403348

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273153	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P403425

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273225	Total-P	0.397	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P403336

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2273163	O-Phosphate-P	0.295	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P403234

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2272914	Anatoxin-a	5.30	Spike	P	0 - 30
2272914	Cylindrospermopsin	1.16	Spike	P	0 - 30
2272914	Desmethyl microcystin LR	7.80	Spike	P	0 - 30
2272914	Microcystin HilR	6.07	Spike	P	0 - 30
2272914	Microcystin HtyR	4.66	Spike	P	0 - 30
2272914	Microcystin LA	2.27	Spike	P	0 - 30
2272914	Microcystin LF	8.01	Spike	P	0 - 30
2272914	Microcystin LR	4.99	Spike	P	0 - 30
2272914	Microcystin LW	7.00	Spike	P	0 - 30
2272914	Microcystin LY	0.0522	Spike	P	0 - 30
2272914	Microcystin RR	3.57	Spike	P	0 - 30
2272914	Microcystin WR	1.17	Spike	P	0 - 30
2272914	Microcystin YR	2.02	Spike	P	0 - 30
2272914	Nodularin-R	1.61	Spike	P	0 - 30

Quality Assurance Report
Precision

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2273224
Field Sample ID: NEHAB0025

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	131	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	116	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A107625
Included Lab Sample IDs: 2273226

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	101	98.4	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A107626
Included Lab Sample IDs: 2273224

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	76.8	78.7	P/P	50 - 160
Cylindrospermopsin	92.2	96.1	P/P	60 - 160
Desmethyl microcystin LR	83.7	81.7	P/P	60 - 160
Microcystin HilR	95.8	106	P/P	60 - 160
Microcystin HtyR	97.7	98.8	P/P	60 - 160
Microcystin LA	131	140	P/P	50 - 160
Microcystin LF	113	113	P/P	60 - 160
Microcystin LR	104	114	P/P	60 - 160
Microcystin LW	110	117	P/P	60 - 160
Microcystin LY	128	134	P/P	60 - 160
Microcystin RR	101	107	P/P	60 - 160
Microcystin WR	83.9	93.3	P/P	60 - 160
Microcystin YR	91.8	92.0	P/P	60 - 160
Nodularin-R	114	117	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A107639
Included Lab Sample IDs: 2273225

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A107641
Included Lab Sample IDs: 2273225

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.9	98.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A107673
Included Lab Sample IDs: 2273225

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.1	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A107694
Included Lab Sample IDs: 2273225

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

* 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	100	98.2	97.4			0.540
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	103	100			1.90
EPA 353.2 Rev. 2.0	NO2NO3-N	102	102	102			0.0
EPA 365.1 Rev. 2.0	Total-P	108	102	102			0.397
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	101	102			0.295
EPA 8321B	Anatoxin-a	75.2	86.3	91.0			5.30
	Cylindrospermopsin	92.0	103	105			1.16
	Desmethyl microcystin LR	81.3	80.3	86.8			7.80
	Microcystin HilR	93.7	98.1	104			6.07
	Microcystin HtyR	96.1	94.1	98.6			4.66
	Microcystin LA	132	125	128			2.27
	Microcystin LF	119	121	131			8.01
	Microcystin LR	103	101	106			4.99
	Microcystin LW	109	111	119			7.00
	Microcystin LY	123	131	131			0.0522
	Microcystin RR	105	111	115			3.57
	Microcystin WR	84.9	90.4	89.4			1.17
	Microcystin YR	89.5	93.0	91.1			2.02
	Nodularin-R	111	115	113			1.61

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2273225
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2273225
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2273225
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2273225
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2273226
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2273224

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	09/02/2021			09/03/2021 13:19	Ping Hua	2273225
EPA 351.2 Rev. 2.0	09/02/2021	09/08/2021 16:15	Benjamin T. Nordmann	09/09/2021 10:44	Alexandra J Mattheus	2273225
EPA 353.2 Rev. 2.0	09/02/2021			09/03/2021 09:18	Beverly Y. Sanders	2273225
EPA 365.1 Rev. 2.0	09/02/2021	09/07/2021 15:50	Simonne.V. Calhoun	09/08/2021 10:20	Shengyu Ding	2273225
EPA 365.1 Rev. 2.0 dissolved	09/02/2021			09/02/2021 16:32	James L Waggerby	2273226
EPA 8321B	09/02/2021	09/02/2021 10:30	Mohammad Ghaffari	09/02/2021 15:48	Mohammad Ghaffari	2273224