Chemical Analysis Report

WQAP-2021-09-24-02

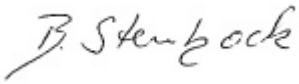
Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2021-07-19-34**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Jordan Skaggs

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: Dr. rer. nat. Bettina Steinbock, Environmental Administrator Date Certified: 15-OCT-2021 18:25



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: Bel Lido Dr **Collection Date/Time: 09/23/2021 11:00**

Field ID: SEHAB0067 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2278169	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P404155	
		Cylindrospermopsin	0.10	U	ug/L	P404155	
		Desmethyl microcystin LR	0.25	U	ug/L	P404155	
		Microcystin HilR**	0.25	U	ug/L	P404155	
		Microcystin HtyR**	0.25	U	ug/L	P404155	
		Microcystin LA	0.10	U	ug/L	P404155	
		Microcystin LF	0.10	U	ug/L	P404155	
		Microcystin LR	0.43	I	ug/L	P404155	
		Microcystin LW	0.25	U	ug/L	P404155	
		Microcystin LY	0.10	U	ug/L	P404155	
		Microcystin RR	0.11	I	ug/L	P404155	
		Microcystin WR	0.50	U	ug/L	P404155	
		Microcystin YR	0.25	U	ug/L	P404155	
		Nodularin-R**	0.10	U	ug/L	P404155	
2278170	EPA 350.1 Rev. 2.0	Ammonia-N	0.094		mg N/L	P404474	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.92		mg N/L	P404272	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.064		mg N/L	P404226	
	EPA 365.1 Rev. 2.0	Total-P	0.095		mg P/L	P404581	
2278171	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.057		mg P/L	P404184	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P404474

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P404272

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404226

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404581

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P404184

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

Reference Method: EPA 8321B
Batch ID: P404155

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: P404474

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	95.4		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P404272

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	99.1		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404226

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404581

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P404184

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

Reference Method: EPA 8321B
Batch ID: P404155

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	97.2		P	40 - 150
Cylindrospermopsin	102		P	40 - 150
Desmethyl microcystin LR	101		P	40 - 150
Microcystin HilR	102		P	40 - 150
Microcystin HtyR	102		P	40 - 150
Microcystin LA	85.4		P	40 - 150
Microcystin LF	128		P	40 - 150
Microcystin LR	105		P	40 - 150
Microcystin LW	115		P	40 - 150
Microcystin LY	91.7		P	40 - 150
Microcystin RR	101		P	40 - 150
Microcystin WR	87.4		P	40 - 150
Microcystin YR	106		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: P404474

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2278803	Ammonia-N	95.6	96.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P404272

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2277791	Kjeldahl Nitrogen	91.9	92.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404226

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2278170	NO2NO3-N	98.0	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404581

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2278209	Total-P	105	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P404184

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2278171	O-Phosphate-P	100	99.6	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P404155

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2278074	Anatoxin-a	111	109	P/P	40 - 150
2278074	Cylindrospermopsin	101	93.4	P/P	40 - 150
2278074	Desmethyl microcystin LR	103	99.8	P/P	40 - 150
2278074	Microcystin HilR	101	100	P/P	40 - 150
2278074	Microcystin HtyR	97.4	93.5	P/P	40 - 150
2278074	Microcystin LA	78.1	82.5	P/P	40 - 150
2278074	Microcystin LF	117	115	P/P	40 - 150
2278074	Microcystin LR	103	97.6	P/P	40 - 150
2278074	Microcystin LW	109	102	P/P	40 - 150
2278074	Microcystin LY	100	99.0	P/P	40 - 150
2278074	Microcystin RR	104	93.3	P/P	40 - 150
2278074	Microcystin WR	96.6	97.6	P/P	40 - 150
2278074	Microcystin YR	99.3	99.9	P/P	40 - 150
2278074	Nodularin-R	101	104	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P404474

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2278803	Ammonia-N	0.379	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P404272

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2277791	Kjeldahl Nitrogen	0.543	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P404226

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2278170	NO2NO3-N	0.384	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P404581

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2278209	Total-P	1.24	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P404184

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2278171	O-Phosphate-P	0.255	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P404155

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2278074	Anatoxin-a	2.02	Spike	P	0 - 30
2278074	Cylindrospermopsin	7.44	Spike	P	0 - 30
2278074	Desmethyl microcystin LR	3.05	Spike	P	0 - 30
2278074	Microcystin HilR	0.950	Spike	P	0 - 30
2278074	Microcystin HtyR	4.11	Spike	P	0 - 30
2278074	Microcystin LA	5.42	Spike	P	0 - 30
2278074	Microcystin LF	2.10	Spike	P	0 - 30
2278074	Microcystin LR	5.64	Spike	P	0 - 30
2278074	Microcystin LW	6.12	Spike	P	0 - 30
2278074	Microcystin LY	1.44	Spike	P	0 - 30
2278074	Microcystin RR	10.6	Spike	P	0 - 30
2278074	Microcystin WR	0.975	Spike	P	0 - 30
2278074	Microcystin YR	0.521	Spike	P	0 - 30
2278074	Nodularin-R	2.89	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: 2278169
Field Sample ID: SEHAB0067

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	98.3	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	129	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A107986
Included Lab Sample IDs: 2278171

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A108006
Included Lab Sample IDs: 2278170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	97.0	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A108038
Included Lab Sample IDs: 2278169

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	99.1	93.9	P/P	50 - 160
Cylindrospermopsin	92.8	91.5	P/P	60 - 160
Desmethyl microcystin LR	97.3	92.5	P/P	60 - 160
Microcystin HilR	96.0	95.3	P/P	60 - 160
Microcystin HtyR	97.6	89.8	P/P	60 - 160
Microcystin LA	84.9	82.1	P/P	50 - 160
Microcystin LF	108	104	P/P	60 - 160
Microcystin LR	96.2	92.9	P/P	60 - 160
Microcystin LW	102	100	P/P	60 - 160
Microcystin LY	89.4	89.5	P/P	60 - 160
Microcystin RR	87.9	84.5	P/P	60 - 160
Microcystin WR	88.7	92.2	P/P	60 - 160
Microcystin YR	90.5	86.2	P/P	60 - 160
Nodularin-R	100	98.9	P/P	60 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A108054
Included Lab Sample IDs: 2278170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.6	99.9	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A108109
Included Lab Sample IDs: 2278170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	99.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A108173
Included Lab Sample IDs: 2278170

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	101	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	95.4	95.6	96.0			0.379
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.1	91.9	92.5			0.543
EPA 353.2 Rev. 2.0	NO2NO3-N	97.5	98.0	98.5			0.384
EPA 365.1 Rev. 2.0	Total-P	103	105	103			1.24
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	100	99.6			0.255
EPA 8321B	Anatoxin-a	97.2	111	109			2.02
	Cylindrospermopsin	102	101	93.4			7.44
	Desmethyl microcystin LR	101	103	99.8			3.05
	Microcystin HilR	102	101	100			0.950
	Microcystin HtyR	102	97.4	93.5			4.11
	Microcystin LA	85.4	78.1	82.5			5.42
	Microcystin LF	128	117	115			2.10
	Microcystin LR	105	103	97.6			5.64
	Microcystin LW	115	109	102			6.12
	Microcystin LY	91.7	100	99.0			1.44
	Microcystin RR	101	104	93.3			10.6
	Microcystin WR	87.4	96.6	97.6			0.975
	Microcystin YR	106	99.3	99.9			0.521
	Nodularin-R	111	101	104			2.89

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2278170
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2278170
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2278170
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2278170
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2278171
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2278169

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	09/24/2021			10/01/2021 12:26	Ping Hua	2278170
EPA 351.2 Rev. 2.0	09/24/2021	09/28/2021 11:28	Benjamin T. Nordmann	09/29/2021 11:51	Alexandra J Mattheus	2278170
EPA 353.2 Rev. 2.0	09/24/2021			09/27/2021 10:56	Beverly Y. Sanders	2278170
EPA 365.1 Rev. 2.0	09/24/2021	10/05/2021 13:20	Simonne.V. Calhoun	10/06/2021 12:33	Lipi Saha	2278170
EPA 365.1 Rev. 2.0 dissolved	09/24/2021			09/24/2021 15:35	James L Waggerby	2278171
EPA 8321B	09/24/2021	09/28/2021 09:00	Manjita Shrestha	09/28/2021 14:11	Manjita Shrestha	2278169