Chemical Analysis Report

WQAP-2021-07-27-03

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-2021-07-05-66**
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

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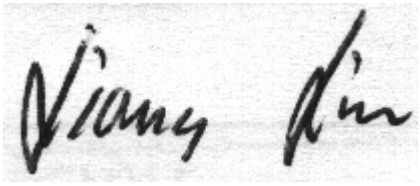
Certified by: Liang Lin, Environmental Administrator

Date Certified: 23-AUG-2021 13:39



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: Hypoluxo **Collection Date/Time: 07/26/2021 12:30**

Field ID: SEHAB0064 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2265107	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P401559	
		Cylindrospermopsin	0.10	U	ug/L	P401559	
		Desmethyl microcystin LR	0.25	U	ug/L	P401559	
		Microcystin HilR**	0.25	U	ug/L	P401559	
		Microcystin HtyR**	0.25	U	ug/L	P401559	
		Microcystin LA	0.10	U	ug/L	P401559	
		Microcystin LF	0.10	U	ug/L	P401559	
		Microcystin LR	0.25	U	ug/L	P401559	
		Microcystin LW	0.25	U	ug/L	P401559	
		Microcystin LY	0.10	U	ug/L	P401559	
		Microcystin RR	0.10	U	ug/L	P401559	
		Microcystin WR	0.50	U	ug/L	P401559	
		Microcystin YR	0.25	U	ug/L	P401559	
		Nodularin-R**	0.10	U	ug/L	P401559	
2265120	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P402121	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.60		mg N/L	P402633	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P401628	
	EPA 365.1 Rev. 2.0	Total-P	0.048		mg P/L	P402011	
2265121	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P401599	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402121

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402633

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401628

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402011

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401599

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

Reference Method: EPA 8321B
Batch ID: P401559

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: P402121

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402633

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401628

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: P402011

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: P401599

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

Reference Method: EPA 8321B
Batch ID: P401559

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	112		P	40 - 150
Cylindrospermopsin	111		P	40 - 150
Desmethyl microcystin LR	105		P	40 - 150
Microcystin HilR	98.0		P	40 - 150
Microcystin HtyR	110		P	40 - 150
Microcystin LA	123		P	40 - 150
Microcystin LF	104		P	40 - 150
Microcystin LR	103		P	40 - 150
Microcystin LW	109		P	40 - 150
Microcystin LY	97.9		P	40 - 150
Microcystin RR	118		P	40 - 150
Microcystin WR	103		P	40 - 150
Microcystin YR	90.5		P	40 - 150
Nodularin-R	114		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402121

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2264113	Ammonia-N	100	99.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402633

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265183	Kjeldahl Nitrogen	95.0	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401628

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2264981	NO2NO3-N	97.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402011

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265120	Total-P	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401599

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2265193	O-Phosphate-P	94.4	94.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P401559

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2264623	Anatoxin-a	109	117	P/P	40 - 150
2264623	Cylindrospermopsin	98.0	108	P/P	40 - 150
2264623	Desmethyl microcystin LR	91.0	108	P/P	40 - 150
2264623	Microcystin HilR	85.3	91.0	P/P	40 - 150
2264623	Microcystin HtyR	93.4	99.3	P/P	40 - 150
2264623	Microcystin LA	107	114	P/P	40 - 150
2264623	Microcystin LF	79.1	84.2	P/P	40 - 150
2264623	Microcystin LR	85.5	95.3	P/P	40 - 150
2264623	Microcystin LW	95.6	105	P/P	40 - 150
2264623	Microcystin LY	88.5	95.3	P/P	40 - 150
2264623	Microcystin RR	106	114	P/P	40 - 150
2264623	Microcystin WR	93.2	103	P/P	40 - 150
2264623	Microcystin YR	85.6	89.7	P/P	40 - 150
2264623	Nodularin-R	104	112	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P402121

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264113	Ammonia-N	1.23	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P402633

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265183	Kjeldahl Nitrogen	1.66	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P401628

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264981	NO2NO3-N	0.179	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P402011

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265120	Total-P	0.787	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P401599

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2265193	O-Phosphate-P	0.423	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P401559

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2264623	Anatoxin-a	7.31	Spike	P	0 - 30
2264623	Cylindrospermopsin	9.57	Spike	P	0 - 30
2264623	Desmethyl microcystin LR	16.9	Spike	P	0 - 30
2264623	Microcystin HilR	6.44	Spike	P	0 - 30
2264623	Microcystin HtyR	6.11	Spike	P	0 - 30
2264623	Microcystin LA	6.90	Spike	P	0 - 30
2264623	Microcystin LF	6.22	Spike	P	0 - 30
2264623	Microcystin LR	10.9	Spike	P	0 - 30
2264623	Microcystin LW	9.56	Spike	P	0 - 30
2264623	Microcystin LY	7.39	Spike	P	0 - 30
2264623	Microcystin RR	7.52	Spike	P	0 - 30
2264623	Microcystin WR	10.2	Spike	P	0 - 30
2264623	Microcystin YR	4.69	Spike	P	0 - 30
2264623	Nodularin-R	7.80	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: 2265107
Field Sample ID: SEHAB0064

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	104	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	81.5	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A106851
Included Lab Sample IDs: 2265121

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.6	97.8	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A106855
Included Lab Sample IDs: 2265107

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	111	107	P/P	50 - 160
Cylindrospermopsin	103	99.9	P/P	60 - 160
Desmethyl microcystin LR	113	108	P/P	50 - 160
Microcystin HilR	103	101	P/P	60 - 160
Microcystin HtyR	110	105	P/P	60 - 160
Microcystin LA	126	123	P/P	50 - 160
Microcystin LF	105	101	P/P	60 - 160
Microcystin LR	109	108	P/P	60 - 160
Microcystin LW	119	117	P/P	60 - 160
Microcystin LY	100	102	P/P	60 - 160
Microcystin RR	117	120	P/P	60 - 160
Microcystin WR	106	101	P/P	60 - 160
Microcystin YR	95.3	90.5	P/P	60 - 160
Nodularin-R	122	117	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A106874
Included Lab Sample IDs: 2265120

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A107092
Included Lab Sample IDs: 2265120

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.2	97.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A107098
Included Lab Sample IDs: 2265120

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	98.1	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A107354
Included Lab Sample IDs: 2265120

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.1	103	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	107	100	99.0			1.23
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	95.0	97.8			1.66
EPA 353.2 Rev. 2.0	NO2NO3-N	102	97.5				0.179
EPA 365.1 Rev. 2.0	Total-P	105	105	106			0.787
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	94.4	94.8			0.423
EPA 8321B	Anatoxin-a	112	109	117			7.31
	Cylindrospermopsin	111	98.0	108			9.57
	Desmethyl microcystin LR	105	91.0	108			16.9
	Microcystin HilR	98.0	85.3	91.0			6.44
	Microcystin HtyR	110	93.4	99.3			6.11
	Microcystin LA	123	107	114			6.90
	Microcystin LF	104	79.1	84.2			6.22
	Microcystin LR	103	85.5	95.3			10.9
	Microcystin LW	109	95.6	105			9.56
	Microcystin LY	97.9	88.5	95.3			7.39
	Microcystin RR	118	106	114			7.52
	Microcystin WR	103	93.2	103			10.2
	Microcystin YR	90.5	85.6	89.7			4.69
	Nodularin-R	114	104	112			7.80

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2265120
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2265120
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2265120
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2265120
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2265121
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2265107

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	07/27/2021			08/06/2021 13:18	Roberta Tatti	2265120
EPA 351.2 Rev. 2.0	07/27/2021	08/18/2021 14:21	Benjamin T. Nordmann	08/19/2021 10:54	Virginia P. Brown	2265120
EPA 353.2 Rev. 2.0	07/27/2021			07/28/2021 10:38	Beverly Y. Sanders	2265120
EPA 365.1 Rev. 2.0	07/27/2021	08/05/2021 15:45	Simonne.V. Calhoun	08/06/2021 12:37	Shengyu Ding	2265120
EPA 365.1 Rev. 2.0 dissolved	07/27/2021			07/27/2021 15:14	Ping Hua	2265121
EPA 8321B	07/27/2021	07/27/2021 10:45	Pramila Ghimire	07/27/2021 18:55	Pramila Ghimire	2265107