Chemical Analysis Report

WQAP-2021-06-25-04

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

Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2021-06-14-21**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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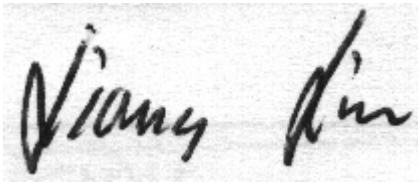
Date Certified: 20-JUL-2021 10:26



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: Orange River - Manatee Park **Collection Date/Time: 06/24/2021 10:30**

Field ID: HAB-SD-06242021-001 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2257216	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P400211	
		Cylindrospermopsin	0.10	U	ug/L	P400211	
		Desmethyl microcystin LR	0.25	U	ug/L	P400211	
		Microcystin HilR**	0.25	U	ug/L	P400211	
		Microcystin HtyR**	0.25	U	ug/L	P400211	
		Microcystin LA	0.10	U	ug/L	P400211	
		Microcystin LF	0.10	U	ug/L	P400211	
		Microcystin LR	0.31	I	ug/L	P400211	
		Microcystin LW	0.25	U	ug/L	P400211	
		Microcystin LY	0.10	U	ug/L	P400211	
		Microcystin RR	0.10	U	ug/L	P400211	
		Microcystin WR	0.50	U	ug/L	P400211	
		Microcystin YR	0.25	U	ug/L	P400211	
		Nodularin-R**	0.10	U	ug/L	P400211	
2257217	EPA 350.1 Rev. 2.0	Ammonia-N	0.064		mg N/L	P400738	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P400909	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.094		mg N/L	P400265	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P400435	
2257218	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.098		mg P/L	P400240	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400738

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400909

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400265

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400435

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400240

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

Reference Method: EPA 8321B
Batch ID: P400211

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: P400738

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400909

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: P400265

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400435

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400240

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	99.0		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P400211

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	113		P	40 - 150
Cylindrospermopsin	123		P	40 - 150
Desmethyl microcystin LR	69.3		P	40 - 150
Microcystin HilR	78.4		P	40 - 150
Microcystin HtyR	85.4		P	40 - 150
Microcystin LA	109		P	40 - 150
Microcystin LF	103		P	40 - 150
Microcystin LR	81.3		P	40 - 150
Microcystin LW	86.6		P	40 - 150
Microcystin LY	114		P	40 - 150
Microcystin RR	132		P	40 - 150
Microcystin WR	73.8		P	40 - 150
Microcystin YR	99.1		P	40 - 150
Nodularin-R	116		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400738

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2257123	Ammonia-N	95.0	95.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2257126	Kjeldahl Nitrogen	105	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2257217	NO2NO3-N	99.1	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400435

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2257170	Total-P	106	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400240

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2257101	O-Phosphate-P	95.8	96.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P400211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2257096	Anatoxin-a	124	123	P/P	40 - 150
2257096	Cylindrospermopsin	122	122	P/P	40 - 150
2257096	Desmethyl microcystin LR	74.9	75.2	P/P	40 - 150
2257096	Microcystin HilR	83.4	81.3	P/P	40 - 150
2257096	Microcystin HtyR	84.8	84.3	P/P	40 - 150
2257096	Microcystin LA	109	108	P/P	40 - 150
2257096	Microcystin LF	103	104	P/P	40 - 150
2257096	Microcystin LR	76.1	80.2	P/P	40 - 150
2257096	Microcystin LW	84.1	83.7	P/P	40 - 150
2257096	Microcystin LY	113	117	P/P	40 - 150
2257096	Microcystin RR	130	131	P/P	40 - 150
2257096	Microcystin WR	81.1	78.8	P/P	40 - 150
2257096	Microcystin YR	103	106	P/P	40 - 150
2257096	Nodularin-R	116	114	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P400738

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2257123	Ammonia-N	0.613	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P400909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2257126	Kjeldahl Nitrogen	0.161	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P400265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2257217	NO2NO3-N	0.343	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P400435

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2257170	Total-P	1.24	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P400240

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2257101	O-Phosphate-P	0.370	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P400211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2257096	Anatoxin-a	0.243	Spike	P	0 - 30
2257096	Cylindrospermopsin	0.646	Spike	P	0 - 30
2257096	Desmethyl microcystin LR	0.471	Spike	P	0 - 30
2257096	Microcystin HilR	2.52	Spike	P	0 - 30
2257096	Microcystin HtyR	0.604	Spike	P	0 - 30
2257096	Microcystin LA	1.12	Spike	P	0 - 30
2257096	Microcystin LF	0.916	Spike	P	0 - 30
2257096	Microcystin LR	4.99	Spike	P	0 - 30
2257096	Microcystin LW	0.568	Spike	P	0 - 30
2257096	Microcystin LY	3.71	Spike	P	0 - 30
2257096	Microcystin RR	0.364	Spike	P	0 - 30
2257096	Microcystin WR	2.80	Spike	P	0 - 30
2257096	Microcystin YR	3.24	Spike	P	0 - 30
2257096	Nodularin-R	2.39	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: 2257216
Field Sample ID: HAB-SD-06242021-001

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	89.9	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	73.2	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A106298
Included Lab Sample IDs: 2257218

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	99.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A106314
Included Lab Sample IDs: 2257217

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A106354
Included Lab Sample IDs: 2257216

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	114	117	P/P	50 - 160
Cylindrospermopsin	114	114	P/P	50 - 160
Desmethyl microcystin LR	69.9	70.9	P/P	50 - 160
Microcystin HilR	75.9	80.0	P/P	50 - 160
Microcystin HtyR	76.3	81.9	P/P	50 - 160
Microcystin LA	105	114	P/P	50 - 160
Microcystin LF	99.6	117	P/P	50 - 160
Microcystin LR	72.8	72.8	P/P	50 - 160
Microcystin LW	85.1	88.6	P/P	50 - 160
Microcystin LY	111	115	P/P	50 - 160
Microcystin RR	123	126	P/P	50 - 160
Microcystin WR	70.1	69.7	P/P	50 - 160
Microcystin YR	94.7	94.6	P/P	50 - 160
Nodularin-R	109	110	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A106405
Included Lab Sample IDs: 2257217

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A106531
Included Lab Sample IDs: 2257217

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.5	97.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A106622
Included Lab Sample IDs: 2257217

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.6	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	96.6	95.0	95.8			0.613
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	105	104			0.161
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	99.1	98.6			0.343
EPA 365.1 Rev. 2.0	Total-P	107	106	107			1.24
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.0	95.8	96.3			0.370
EPA 8321B	Anatoxin-a	113	124	123			0.243
	Cylindrospermopsin	123	122	122			0.646
	Desmethyl microcystin LR	69.3	74.9	75.2			0.471
	Microcystin HilR	78.4	83.4	81.3			2.52
	Microcystin HtyR	85.4	84.8	84.3			0.604
	Microcystin LA	109	109	108			1.12
	Microcystin LF	103	103	104			0.916
	Microcystin LR	81.3	76.1	80.2			4.99
	Microcystin LW	86.6	84.1	83.7			0.568
	Microcystin LY	114	113	117			3.71
	Microcystin RR	132	130	131			0.364
	Microcystin WR	73.8	81.1	78.8			2.80
	Microcystin YR	99.1	103	106			3.24
	Nodularin-R	116	116	114			2.39

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2257217
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2257217
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2257217
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2257217
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2257218
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2257216

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	06/25/2021			07/09/2021 11:30	Roberta Tatti	2257217
EPA 351.2 Rev. 2.0	06/25/2021	07/13/2021 17:46	Madeline Gruver	07/14/2021 14:17	Letuzia M De Oliveira	2257217
EPA 353.2 Rev. 2.0	06/25/2021			06/28/2021 09:43	Beverly Y. Sanders	2257217
EPA 365.1 Rev. 2.0	06/25/2021	07/01/2021 10:00	Shengyu Ding	07/01/2021 12:56	Shengyu Ding	2257217
EPA 365.1 Rev. 2.0 dissolved	06/25/2021			06/25/2021 13:53	Lipi Saha	2257218
EPA 8321B	06/25/2021	06/29/2021 10:00	Pramila Ghimire	06/29/2021 14:58	Pramila Ghimire	2257216