

Chemical Analysis Report

WQAP-2021-03-30-02

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

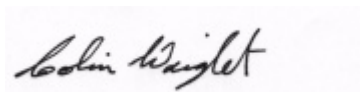
Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2021-03-15-20**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Colin Wright, Program Administrator

Date Certified: 20-APR-2021 14:33

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray rectangular background.

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 Huckleberry Canal Entrance

Collection Date/Time: 03/29/2021 11:40

Field ID: LakeHuckleberryCanalEntrance

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2234513	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P395674	
		Cylindrospermopsin	0.25	U	ug/L	P395674	
		Desmethyl microcystin LR	0.25	U	ug/L	P395674	
		Microcystin HIR**	0.25	U	ug/L	P395674	
		Microcystin HtyR**	0.25	U	ug/L	P395674	
		Microcystin LA	0.72	I	ug/L	P395674	
		Microcystin LF	0.25	U	ug/L	P395674	
		Microcystin LR	1.5		ug/L	P395674	
		Microcystin LW	0.25	U	ug/L	P395674	
		Microcystin LY	0.25	U	ug/L	P395674	
		Microcystin RR	0.27	I	ug/L	P395674	
		Microcystin WR	0.50	U	ug/L	P395674	
		Microcystin YR	0.25	U	ug/L	P395674	
		Nodularin-R**	0.25	U	ug/L	P395674	
2234514	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P395918	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.6		mg N/L	P396163	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P395707	
	EPA 365.1 Rev. 2.0	Total-P	0.098		mg P/L	P395734	
2234515	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P395680	

Ref. Method and Comment:

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395918

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P396163

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395707

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395734

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395680

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

Reference Method: EPA 8321B
Batch ID: P395674

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin HIR	0.25	U	ug/L
Microcystin HtyR	0.25	U	ug/L
Microcystin LA	0.25	U	ug/L
Microcystin LF	0.25	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.25	U	ug/L

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395918

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: P396163

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	93.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395707

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: P395734

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: P395680

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

Reference Method: EPA 8321B
Batch ID: P395674

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	65.7		P	40 - 150
Cylindrospermopsin	98.1		P	40 - 150
Desmethyl microcystin LR	90.3		P	40 - 150
Microcystin HIR	92.7		P	40 - 150
Microcystin HtyR	89.0		P	40 - 150
Microcystin LA	103		P	40 - 150
Microcystin LF	91.1		P	40 - 150
Microcystin LR	97.2		P	40 - 150
Microcystin LW	91.5		P	40 - 150
Microcystin LY	102		P	40 - 150
Microcystin RR	96.3		P	40 - 150
Microcystin WR	85.3		P	40 - 150
Microcystin YR	92.9		P	40 - 150
Nodularin-R	88.9		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P395918

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2234462	Ammonia-N	97.4	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P395707

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2234499	NO2NO3-N	95.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P395734

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2234498	Total-P	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P395680

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2234464	O-Phosphate-P	99.7	99.3	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P395674

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2233833	Anatoxin-a	107	111	P/P	40 - 150
2233833	Cylindrospermopsin	105	103	P/P	40 - 150
2233833	Desmethyl microcystin LR	109	116	P/P	40 - 150
2233833	Microcystin HilR	110	113	P/P	40 - 150
2233833	Microcystin HtyR	106	110	P/P	40 - 150
2233833	Microcystin LA	106	113	P/P	40 - 150
2233833	Microcystin LF	101	106	P/P	40 - 150
2233833	Microcystin LR	107	120	P/P	40 - 150
2233833	Microcystin LW	100	106	P/P	40 - 150
2233833	Microcystin LY	97.7	105	P/P	40 - 150
2233833	Microcystin RR	109	116	P/P	40 - 150
2233833	Microcystin WR	103	106	P/P	40 - 150
2233833	Microcystin YR	111	116	P/P	40 - 150
2233833	Nodularin-R	121	124	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P395918

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2234462	Ammonia-N	0.360	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P396163

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2235213	Kjeldahl Nitrogen	8.36	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0

Batch ID: P395707

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2234499	NO2NO3-N	0.525	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0

Batch ID: P395734

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2234498	Total-P	1.02	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Batch ID: P395680

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2234464	O-Phosphate-P	0.300	Spike	P	0 - 20

Reference Method: EPA 8321B

Batch ID: P395674

Replicated

Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2233833	Anatoxin-a	3.31	Spike	P	0 - 30
2233833	Cylindrospermopsin	1.51	Spike	P	0 - 30
2233833	Desmethyl microcystin LR	5.67	Spike	P	0 - 30
2233833	Microcystin HtIR	2.88	Spike	P	0 - 30
2233833	Microcystin HtyR	4.01	Spike	P	0 - 30
2233833	Microcystin LA	6.28	Spike	P	0 - 30
2233833	Microcystin LF	4.68	Spike	P	0 - 30
2233833	Microcystin LR	10.4	Spike	P	0 - 30
2233833	Microcystin LW	5.64	Spike	P	0 - 30
2233833	Microcystin LY	7.29	Spike	P	0 - 30
2233833	Microcystin RR	5.52	Spike	P	0 - 30
2233833	Microcystin WR	3.43	Spike	P	0 - 30
2233833	Microcystin YR	4.39	Spike	P	0 - 30
2233833	Nodularin-R	2.57	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: 2234513

Field Sample ID: LakeHuckleberryCanalEntrance

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	110	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	86.6	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A104369

Included Lab Sample IDs: 2234515

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.2	99.5	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A104384

Included Lab Sample IDs: 2234514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	100	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A104406

Included Lab Sample IDs: 2234513

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	83.9	85.0	P/P	50 - 160
Cylindrospermopsin	96.7	103	P/P	60 - 160
Desmethyl microcystin LR	91.1	89.4	P/P	60 - 160
Microcystin HII R	92.8	97.8	P/P	60 - 160
Microcystin HtyR	86.8	88.8	P/P	60 - 160
Microcystin LA	101	97.7	P/P	50 - 160
Microcystin LF	103	109	P/P	60 - 160
Microcystin LR	95.4	96.7	P/P	60 - 160
Microcystin LW	107	102	P/P	60 - 160
Microcystin LY	102	99.9	P/P	60 - 160
Microcystin RR	96.4	97.6	P/P	60 - 160
Microcystin WR	93.2	91.4	P/P	60 - 160
Microcystin YR	91.6	92.1	P/P	60 - 160
Nodularin-R	95.4	97.3	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A104422

Included Lab Sample IDs: 2234514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A104467

Included Lab Sample IDs: 2234514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.8	99.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A104649

Included Lab Sample IDs: 2234514

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	94.7	104	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	97.4	97.8			0.360
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	93.0					8.36
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.5	95.5				0.525
EPA 365.1 Rev. 2.0	Total-P	106	104	103			1.02
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.1	99.7	99.3			0.300
EPA 8321B	Anatoxin-a	65.7	107	111			3.31
	Cylindrospermopsin	98.1	105	103			1.51
	Desmethyl microcystin LR	90.3	109	116			5.67
	Microcystin HiLR	92.7	110	113			2.88
	Microcystin HtyR	89.0	106	110			4.01
	Microcystin LA	103	106	113			6.28
	Microcystin LF	91.1	101	106			4.68
	Microcystin LR	97.2	107	120			10.4
	Microcystin LW	91.5	100	106			5.64
	Microcystin LY	102	97.7	105			7.29
	Microcystin RR	96.3	109	116			5.52
	Microcystin WR	85.3	103	106			3.43
	Microcystin YR	92.9	111	116			4.39
	Nodularin-R	88.9	121	124			2.57

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2234514
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2234514
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2234514
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2234514
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2234515
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2234513

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	03/30/2021			04/04/2021 11:35	Ping Hua	2234514
EPA 351.2 Rev. 2.0	03/30/2021	04/08/2021 13:19	Benjamin T. Nordmann	04/09/2021 14:44	Virginia P. Brown	2234514
EPA 353.2 Rev. 2.0	03/30/2021			03/31/2021 08:41	Beverly Y. Sanders	2234514
EPA 365.1 Rev. 2.0	03/30/2021	03/31/2021 13:21	Yen Ta	04/01/2021 11:04	Shengyu Ding	2234514
EPA 365.1 Rev. 2.0 dissolved	03/30/2021			03/30/2021 13:50	Lipi Saha	2234515
EPA 8321B	03/30/2021	03/31/2021 09:00	Pramila Ghimire	04/01/2021 01:41	Juyoung Kim	2234513