

Chemical Analysis Report

WQAP-2023-08-17-03

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

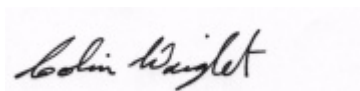
Event Description: **Algal Bloom Response - SWD**
Request ID: **RQ-2023-06-26-51**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 07-SEP-2023 08:34

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light pink 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 Hancock - South Central

Collection Date/Time: 08/16/2023 11:44

Field ID: HAB-SW-0225

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2431901	DEP SOP: NU-094-1	Color (true)	71		PCU	P433993	
2431902	EPA 350.1 Rev. 2.0	Ammonia-N	0.017		mg N/L	P434434	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	4.1	A	mg N/L	P434292	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P434569	
	EPA 365.1 Rev. 2.0	Total-P	0.24		mg P/L	P434111	
2431903	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P433983	
2431904	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P433961	
		Cylindrospermopsin	0.10	U	ug/L	P433960	
		Desmethyl microcystin LR	0.25	U	ug/L	P433960	
		Microcystin HilR	0.25	U	ug/L	P433960	
		Microcystin HtyR	0.25	U	ug/L	P433960	
		Microcystin LA	0.10	U	ug/L	P433960	
		Microcystin LF	0.10	U	ug/L	P433960	
		Microcystin LR	0.25	U	ug/L	P433960	
		Microcystin LW	0.25	U	ug/L	P433960	
		Microcystin LY	0.10	U	ug/L	P433960	
		Microcystin RR	0.10	U	ug/L	P433960	
		Microcystin WR	0.50	U	ug/L	P433960	
		Neosaxitoxin	0.50	U	ug/L	P433961	
		Microcystin YR	0.25	U	ug/L	P433960	
		Saxitoxin	0.50	U	ug/L	P433961	
		Nodularin-R	0.10	U	ug/L	P433960	

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: DEP SOP: NU-094-1
Batch ID: P433993

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434434

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434292

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434569

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434111

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433983

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

Reference Method: EPA 8321B
Batch ID: P433960

Component	Result	Code	Units
Cylindrospermopsin	0.10	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin H1LR	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

Method Blank Results

Reference Method: EPA 8321B
Batch ID: P433961

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P433993

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434434

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434292

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: P434569

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434111

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: P433983

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

Reference Method: EPA 8321B
Batch ID: P433960

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	103		P	40 - 160
Desmethyl microcystin LR	99.0		P	40 - 160
Microcystin H1LR	88.9		P	40 - 160
Microcystin HtyR	88.1		P	40 - 160
Microcystin LA	96.7		P	40 - 160
Microcystin LF	79.6		P	40 - 160
Microcystin LR	91.8		P	40 - 160
Microcystin LW	83.6		P	40 - 160
Microcystin LY	85.4		P	40 - 160
Microcystin RR	90.5		P	40 - 160
Microcystin WR	101		P	40 - 160
Microcystin YR	78.3		P	40 - 160
Nodularin-R	98.1		P	40 - 160

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P433961

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	99.7		P	40 - 150
Neosaxitoxin	116		P	40 - 150
Saxitoxin	90.8		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2431882	Ammonia-N	96.6	98.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434569

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2431768	NO2NO3-N	100	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434111

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2431908	Total-P	108	99.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433983

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2431786	O-Phosphate-P	100	99.7	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P433960

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2431736	Cylindrospermopsin	128	122	P/P	40 - 160
2431736	Desmethyl microcystin LR	101	107	P/P	40 - 160
2431736	Microcystin HilR	106	96.5	P/P	40 - 160
2431736	Microcystin HtyR	98.4	90.5	P/P	40 - 160
2431736	Microcystin LA	112	97.3	P/P	40 - 160
2431736	Microcystin LF	94.3	85.8	P/P	40 - 160
2431736	Microcystin LR	104	98.2	P/P	40 - 160
2431736	Microcystin LW	92.7	90.2	P/P	40 - 160
2431736	Microcystin LY	90.5	82.2	P/P	40 - 160
2431736	Microcystin RR	97.1	94.9	P/P	40 - 160
2431736	Microcystin WR	110	107	P/P	40 - 160
2431736	Microcystin YR	88.0	84.2	P/P	40 - 160
2431736	Nodularin-R	114	106	P/P	40 - 160

Reference Method: EPA 8321B
Batch ID: P433961

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2431736	Anatoxin-a	86.7	90.8	P/P	40 - 150
2431736	Neosaxitoxin	71.5	72.5	P/P	40 - 150
2431736	Saxitoxin	60.7	60.5	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P433993

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2431907	Color (true)	0.912	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P434434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2431882	Ammonia-N	1.19	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P434292

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2431902	Kjeldahl Nitrogen	7.78	Sample	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P434569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2431768	NO2NO3-N	2.35	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P434111

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2431908	Total-P	8.03	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P433983

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2431786	O-Phosphate-P	0.500	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P433960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2431736	Cylindrospermopsin	4.87	Spike	P	0 - 30
2431736	Desmethyl microcystin LR	5.58	Spike	P	0 - 30
2431736	Microcystin HtIR	9.19	Spike	P	0 - 30
2431736	Microcystin HtyR	8.33	Spike	P	0 - 30
2431736	Microcystin LA	14.0	Spike	P	0 - 30
2431736	Microcystin LF	9.41	Spike	P	0 - 30
2431736	Microcystin LR	5.26	Spike	P	0 - 30
2431736	Microcystin LW	2.72	Spike	P	0 - 30
2431736	Microcystin LY	9.55	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P433960

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2431736	Microcystin RR	2.24	Spike	P	0 - 30
2431736	Microcystin WR	2.87	Spike	P	0 - 30
2431736	Microcystin YR	4.34	Spike	P	0 - 30
2431736	Nodularin-R	7.60	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P433961

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2431736	Anatoxin-a	4.69	Spike	P	0 - 30
2431736	Neosaxitoxin	1.38	Spike	P	0 - 30
2431736	Saxitoxin	0.235	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2431904
Field Sample ID: HAB-SW-0225

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Anatoxin-a 13C4	83.0	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	107	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A121095

Included Lab Sample IDs: 2431903

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	97.7	97.3	P/P	90 - 110

Reference Method: DEP SOP: NU-094-1

Run ID: A121099

Included Lab Sample IDs: 2431901

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A121105

Included Lab Sample IDs: 2431904

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	115	120	P/P	60 - 160
Desmethyl microcystin LR	91.7	91.6	P/P	50 - 160
Microcystin HiiR	90.5	89.2	P/P	60 - 160
Microcystin HtyR	84.8	79.2	P/P	60 - 160
Microcystin LA	88.5	94.1	P/P	50 - 160
Microcystin LF	79.9	80.2	P/P	60 - 160
Microcystin LR	86.9	89.5	P/P	60 - 160
Microcystin LW	83.4	82.3	P/P	60 - 160
Microcystin LY	78.9	83.7	P/P	60 - 160
Microcystin RR	91.4	92.4	P/P	60 - 160
Microcystin WR	95.6	92.6	P/P	60 - 160
Microcystin YR	77.1	81.3	P/P	60 - 160
Nodularin-R	93.9	92.7	P/P	60 - 160

Reference Method: EPA 8321B

Run ID: A121106

Included Lab Sample IDs: 2431904

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	102	98.6	P/P	50 - 160
Neosaxitoxin	128	127	P/P	50 - 160
Saxitoxin	94.3	93.8	P/P	50 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A121162

Included Lab Sample IDs: 2431902

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A121249

Included Lab Sample IDs: 2431902

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	92.6	98.9	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A121289

Included Lab Sample IDs: 2431902

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

* 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		LCS	Precision	MS
						SMP	
DEP SOP: NU-094-1	Color (true)	100				0.912	
EPA 350.1 Rev. 2.0	Ammonia-N	101	96.6	98.2			1.19
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105				7.78	
EPA 353.2 Rev. 2.0	NO2NO3-N	104	100	102			2.35
EPA 365.1 Rev. 2.0	Total-P	103	108	99.8			8.03
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	100	99.7			0.500
EPA 8321B	Anatoxin-a	99.7	86.7	90.8			4.69
	Cylindrospermopsin	103	128	122			4.87
	Desmethyl microcystin LR	99.0	101	107			5.58
	Microcystin HiLR	88.9	106	96.5			9.19
	Microcystin HtyR	88.1	98.4	90.5			8.33
	Microcystin LA	96.7	112	97.3			14.0
	Microcystin LF	79.6	94.3	85.8			9.41
	Microcystin LR	91.8	104	98.2			5.26
	Microcystin LW	83.6	92.7	90.2			2.72
	Microcystin LY	85.4	90.5	82.2			9.55
	Microcystin RR	90.5	97.1	94.9			2.24
	Microcystin WR	101	110	107			2.87
	Microcystin YR	78.3	88.0	84.2			4.34
	Neosaxitoxin	116	71.5	72.5			1.38
	Nodularin-R	98.1	114	106			7.60
	Saxitoxin	90.8	60.7	60.5			0.235

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2431901
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2431902
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2431902
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2431902
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2431902
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2431903
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2431904
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2431904

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	08/17/2023			08/17/2023 15:22	Alexis Price	2431901
EPA 350.1 Rev. 2.0	08/17/2023			08/28/2023 13:28	Khloe J Berg	2431902
EPA 351.2 Rev. 2.0	08/17/2023	08/24/2023 12:32	Dana G. Hughes	08/25/2023 12:02	Samantha L Bates	2431902
EPA 353.2 Rev. 2.0	08/17/2023			09/01/2023 12:56	Anna M. Plaviak	2431902
EPA 365.1 Rev. 2.0	08/17/2023	08/21/2023 16:54	Adam P Silver	08/22/2023 10:03	James L Waggerby	2431902
EPA 365.1 Rev. 2.0 dissolved	08/17/2023			08/17/2023 12:29	Elise M. Gillis	2431903
EPA 8321B	08/17/2023	08/17/2023 13:00	Tae K Lee	08/18/2023 00:30	Hana Lee	2431904
	08/17/2023	08/17/2023 13:00	Tae K Lee	08/18/2023 04:56	Hana Lee	2431904