

Chemical Analysis Report

WQAP-2023-04-28-03

Florida DEP Laboratory
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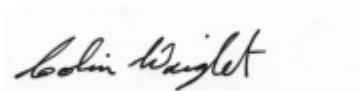
Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2023-04-10-45**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 11-MAY-2023 08:58



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: Caywood Pond - SW Dock

Collection Date/Time: 04/27/2023 09:58

Field ID: HABCE0193_CaywoodPond

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2404050	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P429125	
		Cylindrospermopsin	0.10	U	ug/L	P429124	
		Desmethyl microcystin LR	0.25	U	ug/L	P429124	
		Microcystin HILR	0.25	U	ug/L	P429124	
		Microcystin HtyR	0.25	U	ug/L	P429124	
		Microcystin LA	0.10	U	ug/L	P429124	
		Microcystin LF	0.10	U	ug/L	P429124	
		Microcystin LR	1.7		ug/L	P429124	
		Microcystin LW	0.25	U	ug/L	P429124	
		Microcystin LY	0.10	U	ug/L	P429124	
		Microcystin RR	0.10	U	ug/L	P429124	
		Microcystin WR	0.50	U	ug/L	P429124	
		Neosaxitoxin	5.8		ug/L	P429125	
		Microcystin YR	0.25	U	ug/L	P429124	
		Saxitoxin	4.2		ug/L	P429125	
		Nodularin-R	0.10	U	ug/L	P429124	
2404051	EPA 350.1 Rev. 2.0	Ammonia-N	0.30		mg N/L	P429354	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P429517	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.017		mg N/L	P429470	
	EPA 365.1 Rev. 2.0	Total-P	0.062		mg P/L	P429309	
2404052	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P429152	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429354

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429517

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429470

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429309

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429152

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

Reference Method: EPA 8321B
Batch ID: P429124

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

Reference Method: EPA 8321B
Batch ID: P429125

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: EPA 350.1 Rev. 2.0
Batch ID: P429354

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429517

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429470

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: P429309

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: P429152

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

Reference Method: EPA 8321B
Batch ID: P429124

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	73.1		P	40 - 150
Desmethyl microcystin LR	83.0		P	40 - 150
Microcystin H1R	97.0		P	40 - 150
Microcystin HtyR	99.1		P	40 - 150
Microcystin LA	116		P	40 - 150
Microcystin LF	109		P	40 - 150
Microcystin LR	96.1		P	40 - 150
Microcystin LW	114		P	40 - 150
Microcystin LY	130		P	40 - 150
Microcystin RR	88.9		P	40 - 150
Microcystin WR	113		P	40 - 150
Microcystin YR	101		P	40 - 150
Nodularin-R	95.3		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429125

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	121		P	40 - 150
Neosaxitoxin	116		P	40 - 150
Saxitoxin	99.1		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429354

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2404037	Ammonia-N	96.0	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429517

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2404051	Kjeldahl Nitrogen	101	90.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429470

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2404036	NO2NO3-N	106	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429309

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2404051	Total-P	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429152

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2404039	O-Phosphate-P	95.4	95.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P429124

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403833	Cylindrospermopsin	77.4	78.2	P/P	40 - 150
2403833	Desmethyl microcystin LR	95.9	102	P/P	40 - 150
2403833	Microcystin HiLR	104	99.4	P/P	40 - 150
2403833	Microcystin HtyR	95.9	108	P/P	40 - 150
2403833	Microcystin LA	127	125	P/P	40 - 150
2403833	Microcystin LF	130	135	P/P	40 - 150
2403833	Microcystin LR	101	106	P/P	40 - 150
2403833	Microcystin LW	126	137	P/P	40 - 150
2403833	Microcystin LY	148	137	P/P	40 - 150
2403833	Microcystin RR	88.5	85.9	P/P	40 - 150
2403833	Microcystin WR	113	110	P/P	40 - 150
2403833	Microcystin YR	108	99.1	P/P	40 - 150
2403833	Nodularin-R	86.3	89.0	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P429125

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2403833	Anatoxin-a	124	118	P/P	40 - 150
2403833	Neosaxitoxin	111	99.0	P/P	40 - 150
2403833	Saxitoxin	104	96.6	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P429354

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2404037	Ammonia-N	4.06	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P429517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2404051	Kjeldahl Nitrogen	5.81	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P429470

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2404036	NO2NO3-N	0.473	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P429309

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2404051	Total-P	0.582	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P429152

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2404039	O-Phosphate-P	0.420	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P429124

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403833	Cylindrospermopsin	1.11	Spike	P	0 - 30
2403833	Desmethyl microcystin LR	6.45	Spike	P	0 - 30
2403833	Microcystin H1LR	4.11	Spike	P	0 - 30
2403833	Microcystin HtyR	12.0	Spike	P	0 - 30
2403833	Microcystin LA	1.41	Spike	P	0 - 30
2403833	Microcystin LF	3.28	Spike	P	0 - 30
2403833	Microcystin LR	4.52	Spike	P	0 - 30
2403833	Microcystin LW	8.44	Spike	P	0 - 30
2403833	Microcystin LY	7.75	Spike	P	0 - 30
2403833	Microcystin RR	3.00	Spike	P	0 - 30
2403833	Microcystin WR	2.50	Spike	P	0 - 30
2403833	Microcystin YR	9.05	Spike	P	0 - 30
2403833	Nodularin-R	3.02	Spike	P	0 - 30

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P429125

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2403833	Anatoxin-a	5.27	Spike	P	0 - 30
2403833	Neosaxitoxin	11.3	Spike	P	0 - 30
2403833	Saxitoxin	7.13	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2404050

Field Sample ID: HABCE0193_CaywoodPond

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	84.3	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	59.8	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A118858

Included Lab Sample IDs: 2404052

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	98.1	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A118883

Included Lab Sample IDs: 2404050

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	75.7	75.4	P/P	50 - 160
Desmethyl microcystin LR	102	99.9	P/P	50 - 160
Microcystin HtR	98.9	101	P/P	50 - 160
Microcystin HtyR	102	96.8	P/P	50 - 160
Microcystin LA	123	136	P/P	50 - 160
Microcystin LF	96.1	129	P/P	50 - 160
Microcystin LR	99.6	107	P/P	50 - 160
Microcystin LW	119	114	P/P	50 - 160
Microcystin LY	123	140	P/P	50 - 160
Microcystin RR	87.2	88.4	P/P	50 - 160
Microcystin WR	112	110	P/P	50 - 160
Microcystin YR	95.8	103	P/P	50 - 160
Nodularin-R	89.3	91.8	P/P	50 - 160

Reference Method: EPA 8321B

Run ID: A118886

Included Lab Sample IDs: 2404050

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	104	97.6	P/P	50 - 160
Neosaxitoxin	94.4	96.0	P/P	50 - 160
Saxitoxin	86.9	87.8	P/P	50 - 160

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A118939

Included Lab Sample IDs: 2404051

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.6	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A118953

Included Lab Sample IDs: 2404051

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A118973

Included Lab Sample IDs: 2404051

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	103	104	P/P	90 - 110

Quality Assurance Report

Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A119052

Included Lab Sample IDs: 2404051

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.5	105	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		Precision	
					LCS	MS
EPA 350.1 Rev. 2.0	Ammonia-N	97.4	96.0	100		4.06
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	101	90.1		5.81
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	106	106		0.473
EPA 365.1 Rev. 2.0	Total-P	103	105	104		0.582
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	95.4	95.0		0.420
EPA 8321B	Anatoxin-a	121	124	118		5.27
	Cylindrospermopsin	73.1	77.4	78.2		1.11
	Desmethyl microcystin LR	83.0	95.9	102		6.45
	Microcystin HiLR	97.0	104	99.4		4.11
	Microcystin HtyR	99.1	95.9	108		12.0
	Microcystin LA	116	127	125		1.41
	Microcystin LF	109	130	135		3.28
	Microcystin LR	96.1	101	106		4.52
	Microcystin LW	114	126	137		8.44
	Microcystin LY	130	148	137		7.75
	Microcystin RR	88.9	88.5	85.9		3.00
	Microcystin WR	113	113	110		2.50
	Microcystin YR	101	108	99.1		9.05
	Neosaxitoxin	116	111	99.0		11.3
	Nodularin-R	95.3	86.3	89.0		3.02
	Saxitoxin	99.1	104	96.6		7.13

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2404051
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2404051
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2404051
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2404051
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2404052
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2404050
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2404050

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	04/28/2023			05/03/2023 14:09	Khloe J Berg	2404051
EPA 351.2 Rev. 2.0	04/28/2023	05/08/2023 15:11	Simonne.V. Calhoun	05/09/2023 14:37	Ping Hua	2404051
EPA 353.2 Rev. 2.0	04/28/2023			05/05/2023 10:21	Beverly Y. Sanders	2404051
EPA 365.1 Rev. 2.0	04/28/2023	05/03/2023 12:11	Adam P Silver	05/04/2023 09:45	James L Waggeberby	2404051
EPA 365.1 Rev. 2.0 dissolved	04/28/2023			04/28/2023 15:05	Elise M. Gillis	2404052
EPA 8321B	04/28/2023	04/28/2023 12:00	Manjita Shrestha	05/01/2023 15:02	Manjita Shrestha	2404050
	04/28/2023	04/28/2023 12:00	Manjita Shrestha	05/01/2023 21:27	Manjita Shrestha	2404050