

Chemical Analysis Report

WQAP-2022-01-14-02

Florida Department of Environmental Protection
Central Laboratory
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DOH Accreditation E31780

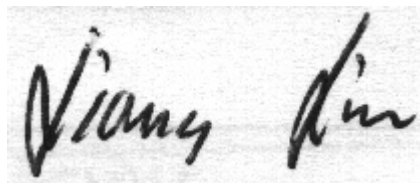
Event Description: **Algal Bloom Response -SOROC -Collier**
Request ID: **RQ-2021-12-13-19**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 31-JAN-2022 14:16

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored 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: Trafford Dock

Collection Date/Time: 01/13/2022 09:26

Field ID: Trafford Dock

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2299877	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P408583	
		Cylindrospermopsin	0.10	I	ug/L	P408583	
		Desmethyl microcystin LR	0.25	U	ug/L	P408583	
		Microcystin HIR**	0.25	U	ug/L	P408583	
		Microcystin HtyR**	0.25	U	ug/L	P408583	
		Microcystin LA	0.10	U	ug/L	P408583	
		Microcystin LF	0.10	U	ug/L	P408583	
		Microcystin LR	0.60	I	ug/L	P408583	
		Microcystin LW	0.25	U	ug/L	P408583	
		Microcystin LY	0.10	U	ug/L	P408583	
		Microcystin RR	0.10	U	ug/L	P408583	
		Microcystin WR	0.50	U	ug/L	P408583	
		Microcystin YR	0.25	U	ug/L	P408583	
		Nodularin-R**	0.10	U	ug/L	P408583	
2299880	EPA 350.1 Rev. 2.0	Ammonia-N	0.015		mg N/L	P409024	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.2		mg N/L	P408850	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P408733	
	EPA 365.1 Rev. 2.0	Total-P	0.18	J	mg P/L	P408653	MS
2299881	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P408550	

Ref. Method and Comment:

EPA 365.1 Rev. 2.0: Total-P: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409024

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408733

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408653

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408550

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

Reference Method: EPA 8321B
Batch ID: P408583

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 H1R	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: P409024

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: P408850

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408733

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: P408653

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: P408550

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

Reference Method: EPA 8321B
Batch ID: P408583

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	98.3		P	40 - 150
Cylindrospermopsin	100		P	40 - 150
Desmethyl microcystin LR	108		P	40 - 150
Microcystin HIR	96.5		P	40 - 150
Microcystin HtyR	97.8		P	40 - 150
Microcystin LA	105		P	40 - 150
Microcystin LF	108		P	40 - 150
Microcystin LR	75.5		P	40 - 150
Microcystin LW	91.7		P	40 - 150
Microcystin LY	99.0		P	40 - 150
Microcystin RR	103		P	40 - 150
Microcystin WR	94.5		P	40 - 150
Microcystin YR	100		P	40 - 150
Nodularin-R	101		P	40 - 150

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409024

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299859	Ammonia-N	98.6	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299453	Kjeldahl Nitrogen	103	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408733

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299720	NO2NO3-N	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408653

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299880	Total-P	104	110	P/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408550

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299860	O-Phosphate-P	99.8	101	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P408583

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299832	Anatoxin-a	112	110	P/P	40 - 150
2299832	Cylindrospermopsin	131	113	P/P	40 - 150
2299832	Desmethyl microcystin LR	122	133	P/P	40 - 150
2299832	Microcystin HiLR	109	109	P/P	40 - 150
2299832	Microcystin HtyR	107	113	P/P	40 - 150
2299832	Microcystin LA	109	106	P/P	40 - 150
2299832	Microcystin LF	104	94.0	P/P	40 - 150
2299832	Microcystin LR	80.8	87.0	P/P	40 - 150
2299832	Microcystin LW	92.1	91.8	P/P	40 - 150
2299832	Microcystin LY	109	94.5	P/P	40 - 150
2299832	Microcystin RR	110	107	P/P	40 - 150
2299832	Microcystin WR	97.2	97.2	P/P	40 - 150
2299832	Microcystin YR	117	107	P/P	40 - 150
2299832	Nodularin-R	110	109	P/P	40 - 150

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P409024

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299859	Ammonia-N	0.151	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P408850

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299453	Kjeldahl Nitrogen	1.21	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P408733

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299720	NO2NO3-N	0.976	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P408653

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299880	Total-P	4.34	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P408550

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299860	O-Phosphate-P	0.997	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P408583

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299832	Anatoxin-a	1.80	Spike	P	0 - 30
2299832	Cylindrospermopsin	14.5	Spike	P	0 - 30
2299832	Desmethyl microcystin LR	8.96	Spike	P	0 - 30
2299832	Microcystin H1IR	0.455	Spike	P	0 - 30
2299832	Microcystin HtyR	4.98	Spike	P	0 - 30
2299832	Microcystin LA	2.73	Spike	P	0 - 30
2299832	Microcystin LF	9.66	Spike	P	0 - 30
2299832	Microcystin LR	7.49	Spike	P	0 - 30
2299832	Microcystin LW	0.252	Spike	P	0 - 30
2299832	Microcystin LY	14.2	Spike	P	0 - 30
2299832	Microcystin RR	2.46	Spike	P	0 - 30
2299832	Microcystin WR	0.0515	Spike	P	0 - 30
2299832	Microcystin YR	8.95	Spike	P	0 - 30
2299832	Nodularin-R	0.930	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: 2299877

Field Sample ID: Trafford Dock

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	116	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	143	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A109883

Included Lab Sample IDs: 2299881

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

Reference Method: EPA 8321B

Run ID: A109943

Included Lab Sample IDs: 2299877

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	91.4	90.6	P/P	50 - 160
Cylindrospermopsin	105	107	P/P	50 - 160
Desmethyl microcystin LR	113	112	P/P	50 - 160
Microcystin HIR	92.5	91.1	P/P	50 - 160
Microcystin HtyR	102	97.5	P/P	50 - 160
Microcystin LA	93.9	103	P/P	50 - 160
Microcystin LF	115	100	P/P	50 - 160
Microcystin LR	70.7	75.2	P/P	50 - 160
Microcystin LW	101	104	P/P	50 - 160
Microcystin LY	104	92.0	P/P	50 - 160
Microcystin RR	101	99.9	P/P	50 - 160
Microcystin WR	92.9	95.5	P/P	50 - 160
Microcystin YR	99.3	98.2	P/P	50 - 160
Nodularin-R	93.9	95.3	P/P	50 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A109944

Included Lab Sample IDs: 2299880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A110004

Included Lab Sample IDs: 2299880

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A110025

Included Lab Sample IDs: 2299880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.3	96.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A110064

Included Lab Sample IDs: 2299880

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	107	106	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		LCS	Precision	MS
						SMP	
EPA 350.1 Rev. 2.0	Ammonia-N	100	98.6	98.8			0.151
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	103	104			1.21
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	104	102	103			0.976
EPA 365.1 Rev. 2.0	Total-P	107	104	110			4.34
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.3	99.8	101			0.997
EPA 8321B	Anatoxin-a	98.3	112	110			1.80
	Cylindrospermopsin	100	131	113			14.5
	Desmethyl microcystin LR	108	122	133			8.96
	Microcystin HiLR	96.5	109	109			0.455
	Microcystin HtyR	97.8	107	113			4.98
	Microcystin LA	105	109	106			2.73
	Microcystin LF	108	104	94.0			9.66
	Microcystin LR	75.5	80.8	87.0			7.49
	Microcystin LW	91.7	92.1	91.8			0.252
	Microcystin LY	99.0	109	94.5			14.2
	Microcystin RR	103	110	107			2.46
	Microcystin WR	94.5	97.2	97.2			0.0515
	Microcystin YR	100	117	107			8.95
	Nodularin-R	101	110	109			0.930

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2299880
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2299880
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2299880
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2299880
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2299881
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2299877

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	01/14/2022			01/26/2022 15:12	Ping Hua	2299880
EPA 351.2 Rev. 2.0	01/14/2022	01/24/2022 11:42	Samantha L Bates	01/25/2022 11:36	Alexandra J Mattheus	2299880
EPA 353.2 Rev. 2.0	01/14/2022			01/20/2022 12:09	Beverly Y. Sanders	2299880
EPA 365.1 Rev. 2.0	01/14/2022	01/20/2022 17:50	Simonne.V. Calhoun	01/21/2022 13:19	Shengyu Ding	2299880
EPA 365.1 Rev. 2.0 dissolved	01/14/2022			01/14/2022 14:17	Ping Hua	2299881
EPA 8321B	01/14/2022	01/19/2022 14:00	Manjita Shrestha	01/20/2022 04:20	Manjita Shrestha	2299877