Chemical Analysis Report

WQAP-2023-06-27-01

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

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2023-03-27-45**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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2199 South Rock Road
Fort Pierce, FL 34945
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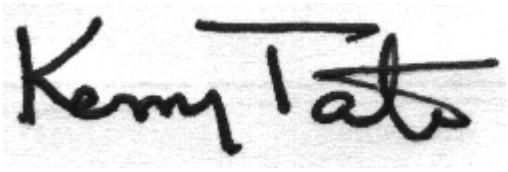
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 11-JUL-2023 08:00



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: Coral Gables Canal at Riviera Drive **Collection Date/Time: 06/26/2023 11:00**

Field ID: SEHAB0094 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2419876	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P431791	
		Cylindrospermopsin	0.10	U	ug/L	P431790	
		Desmethyl microcystin LR	0.25	U	ug/L	P431790	
		Microcystin HilR	0.25	U	ug/L	P431790	
		Microcystin HtyR	0.25	U	ug/L	P431790	
		Microcystin LA	0.10	U	ug/L	P431790	
		Microcystin LF	0.10	U	ug/L	P431790	
		Microcystin LR	0.25	U	ug/L	P431790	
		Microcystin LW	0.25	U	ug/L	P431790	
		Microcystin LY	0.10	U	ug/L	P431790	
		Microcystin RR	0.10	U	ug/L	P431790	
		Microcystin WR	0.50	U	ug/L	P431790	
		Neosaxitoxin	0.50	U	ug/L	P431791	
		Microcystin YR	0.25	U	ug/L	P431790	
		Saxitoxin	0.50	U	ug/L	P431791	
		Nodularin-R	0.10	U	ug/L	P431790	
2419877	EPA 350.1 Rev. 2.0	Ammonia-N	0.01		mg N/L	P431991	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.19	I	mg N/L	P431866	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.2		mg N/L	P432076	
	EPA 365.1 Rev. 2.0	Total-P	0.069		mg P/L	P431968	
2419878	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.072		mg P/L	P431836	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431991

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431866

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432076

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431968

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431836

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

Reference Method: EPA 8321B
Batch ID: P431790

Component	Result	Code	Units
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

Reference Method: EPA 8321B
Batch ID: P431791

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: P431991

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	94.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431866

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	98.8		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432076

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431968

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431836

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

Reference Method: EPA 8321B
Batch ID: P431790

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	93.3		P	40 - 150
Desmethyl microcystin LR	94.2		P	40 - 150
Microcystin HilR	98.2		P	40 - 150
Microcystin HtyR	95.2		P	40 - 150
Microcystin LA	103		P	40 - 150
Microcystin LF	102		P	40 - 150
Microcystin LR	90.0		P	40 - 150
Microcystin LW	61.0		P	40 - 150
Microcystin LY	102		P	40 - 150
Microcystin RR	91.9		P	40 - 150
Microcystin WR	90.1		P	40 - 150
Microcystin YR	103		P	40 - 150
Nodularin-R	98.4		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P431791

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	90.2		P	40 - 150
Neosaxitoxin	70.6		P	40 - 150
Saxitoxin	73.6		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431991

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419941	Ammonia-N	96.0	97.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431866

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419897	Kjeldahl Nitrogen	105	97.1	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432076

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419839	NO2NO3-N	94.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431968

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419897	Total-P	97.5	99.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431836

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419814	O-Phosphate-P	97.0	99.0	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P431790

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419846	Cylindrospermopsin	91.7	97.2	P/P	40 - 150
2419846	Desmethyl microcystin LR	99.6	103	P/P	40 - 150
2419846	Microcystin HilR	95.6	106	P/P	40 - 150
2419846	Microcystin HtyR	108	117	P/P	40 - 150
2419846	Microcystin LA	126	104	P/P	40 - 150
2419846	Microcystin LF	121	124	P/P	40 - 150
2419846	Microcystin LR	102	108	P/P	40 - 150
2419846	Microcystin LW	73.5	79.5	P/P	40 - 150
2419846	Microcystin LY	109	119	P/P	40 - 150
2419846	Microcystin RR	88.9	96.3	P/P	40 - 150
2419846	Microcystin WR	85.7	84.0	P/P	40 - 150
2419846	Microcystin YR	103	115	P/P	40 - 150
2419846	Nodularin-R	110	117	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P431791

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2419846	Anatoxin-a	84.4	79.6	P/P	40 - 150
2419846	Neosaxitoxin	48.9	46.3	P/P	40 - 150
2419846	Saxitoxin	61.0	57.6	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P431991

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419941	Ammonia-N	1.51	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P431866

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419897	Kjeldahl Nitrogen	5.85	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P432076

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419839	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P431968

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419897	Total-P	2.08	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P431836

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419814	O-Phosphate-P	2.04	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P431790

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419846	Cylindrospermopsin	5.84	Spike	P	0 - 30
2419846	Desmethyl microcystin LR	3.64	Spike	P	0 - 30
2419846	Microcystin HilR	9.90	Spike	P	0 - 30
2419846	Microcystin HtyR	8.60	Spike	P	0 - 30
2419846	Microcystin LA	19.3	Spike	P	0 - 30
2419846	Microcystin LF	2.41	Spike	P	0 - 30
2419846	Microcystin LR	5.77	Spike	P	0 - 30
2419846	Microcystin LW	7.96	Spike	P	0 - 30
2419846	Microcystin LY	8.61	Spike	P	0 - 30
2419846	Microcystin RR	7.99	Spike	P	0 - 30
2419846	Microcystin WR	1.91	Spike	P	0 - 30
2419846	Microcystin YR	11.1	Spike	P	0 - 30
2419846	Nodularin-R	5.45	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P431791

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2419846	Anatoxin-a	5.88	Spike	P	0 - 30
2419846	Neosaxitoxin	5.54	Spike	P	0 - 30
2419846	Saxitoxin	5.72	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2419876
Field Sample ID: SEHAB0094

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	69.8	P	30 - 160
EPA 8321B	Saxitoxin-15N7	54.1	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A120052
Included Lab Sample IDs: 2419878

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.9	100	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A120066
Included Lab Sample IDs: 2419876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	102	100	P/P	50 - 160
Desmethyl microcystin LR	98.3	108	P/P	50 - 160
Microcystin HilR	106	102	P/P	50 - 160
Microcystin HtyR	107	109	P/P	50 - 160
Microcystin LA	110	120	P/P	50 - 160
Microcystin LF	76.9	80.0	P/P	50 - 160
Microcystin LR	104	107	P/P	50 - 160
Microcystin LW	69.9	98.1	P/P	50 - 160
Microcystin LY	128	119	P/P	50 - 160
Microcystin RR	92.2	92.6	P/P	50 - 160
Microcystin WR	99.2	99.3	P/P	50 - 160
Microcystin YR	111	113	P/P	50 - 160
Nodularin-R	108	110	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A120072
Included Lab Sample IDs: 2419876

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	100	95.2	P/P	50 - 160
Neosaxitoxin	82.6	80.3	P/P	50 - 160
Saxitoxin	86.4	86.2	P/P	50 - 160

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A120096
Included Lab Sample IDs: 2419877

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.9	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A120125
Included Lab Sample IDs: 2419877

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.4	98.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A120157
Included Lab Sample IDs: 2419877

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

Quality Assurance Report
Calibration Verification

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A120182
Included Lab Sample IDs: 2419877

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	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	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	94.6	96.0	97.6			1.51
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	98.8	105	97.1			5.85
EPA 353.2 Rev. 2.0	NO2NO3-N	103	94.5				0.0
EPA 365.1 Rev. 2.0	Total-P	97.1	97.5	99.6			2.08
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	97.0	99.0			2.04
EPA 8321B	Anatoxin-a	90.2	84.4	79.6			5.88
	Cylindrospermopsin	93.3	91.7	97.2			5.84
	Desmethyl microcystin LR	94.2	99.6	103			3.64
	Microcystin HilR	98.2	95.6	106			9.90
	Microcystin HtyR	95.2	108	117			8.60
	Microcystin LA	103	126	104			19.3
	Microcystin LF	102	121	124			2.41
	Microcystin LR	90.0	102	108			5.77
	Microcystin LW	61.0	73.5	79.5			7.96
	Microcystin LY	102	109	119			8.61
	Microcystin RR	91.9	88.9	96.3			7.99
	Microcystin WR	90.1	85.7	84.0			1.91
	Microcystin YR	103	103	115			11.1
	Neosaxitoxin	70.6	48.9	46.3			5.54
	Nodularin-R	98.4	110	117			5.45
	Saxitoxin	73.6	61.0	57.6			5.72

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2419877
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2419877
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2419877
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2419877
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2419878
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2419876
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2419876

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	06/27/2023			06/30/2023 11:39	Khloe J Berg	2419877
EPA 351.2 Rev. 2.0	06/27/2023	06/28/2023 11:03	Dana G. Hughes	06/29/2023 12:51	Ping Hua	2419877
EPA 353.2 Rev. 2.0	06/27/2023			07/05/2023 11:40	Beverly Y. Sanders	2419877
EPA 365.1 Rev. 2.0	06/27/2023	06/30/2023 13:12	Adam P Silver	07/05/2023 11:46	Simonne.V. Calhoun	2419877
EPA 365.1 Rev. 2.0 dissolved	06/27/2023			06/27/2023 13:25	Adam P Silver	2419878
EPA 8321B	06/27/2023	06/27/2023 12:00	Hana Lee	06/27/2023 22:38	Tae K Lee	2419876
	06/27/2023	06/27/2023 12:00	Hana Lee	06/28/2023 08:15	Tae K Lee	2419876