

Chemical Analysis Report

WQAP-2020-08-19-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

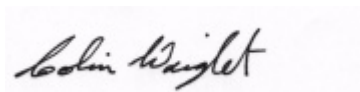
Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2020-08-17-36**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2199 S. Rock Road
Fort Pierce, FL 34945
Attn: Drew Liddick

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Colin Wright, Program Administrator

Date Certified: 09-SEP-2020 09:36

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: Colohatchee Park

Collection Date/Time: 08/18/2020 12:25

Field ID: Colohatchee_Ramp

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2191004	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P386235	
		Cylindrospermopsin**	0.25	U	ug/L	P386235	
		Desmethyl microcystin LR**	0.25	U	ug/L	P386235	
		Microcystin LA**	0.25	U	ug/L	P386235	
		Microcystin LF**	0.25	U	ug/L	P386235	
		Microcystin LR**	0.25	U	ug/L	P386235	
		Microcystin LW**	0.25	U	ug/L	P386235	
		Microcystin LY**	0.25	U	ug/L	P386235	
		Microcystin RR**	0.25	U	ug/L	P386235	
		Microcystin WR**	0.50	U	ug/L	P386235	
		Microcystin YR**	0.25	U	ug/L	P386235	
2191005	EPA 350.1 Rev. 2.0	Ammonia-N	0.055		mg N/L	P386432	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.65		mg N/L	P386512	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.11		mg N/L	P386386	
	EPA 365.1 Rev. 2.0	Total-P	0.049		mg P/L	P386312	
2191006	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.032		mg P/L	P386292	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386432

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386512

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386386

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386312

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386292

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

Reference Method: EPA 8321B
Batch ID: P386235

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 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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P386432

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

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P386512

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	102		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P386386

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

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P386312

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: P386292

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

Reference Method: EPA 8321B
 Batch ID: P386235

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	118		P	40 - 140
Cylindrospermopsin	115		P	40 - 140
Desmethyl microcystin LR	108		P	40 - 140
Microcystin LA	114		P	40 - 140
Microcystin LF	123		P	40 - 140
Microcystin LR	101		P	40 - 140
Microcystin LW	105		P	40 - 140
Microcystin LY	112		P	40 - 140
Microcystin RR	99.8		P	40 - 140
Microcystin WR	96.7		P	40 - 140
Microcystin YR	108		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386432

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191540	Ammonia-N	105	108	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386512

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191098	Kjeldahl Nitrogen	99.4	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386386

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191005	NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191067	Total-P	102	99.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386292

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191006	O-Phosphate-P	99.9	100	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P386235

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2191010	Anatoxin-a	91.4	92.0	P/P	40 - 140
2191010	Cylindrospermopsin	103	106	P/P	40 - 140
2191010	Desmethyl microcystin LR	107	99.0	P/P	40 - 140
2191010	Microcystin LA	101	95.1	P/P	40 - 140
2191010	Microcystin LF	130	127	P/P	40 - 140
2191010	Microcystin LR	101	105	P/P	40 - 140
2191010	Microcystin LW	133	136	P/P	40 - 140
2191010	Microcystin LY	109	105	P/P	40 - 140
2191010	Microcystin RR	135	133	P/P	40 - 140
2191010	Microcystin WR	97.6	92.2	P/P	40 - 140
2191010	Microcystin YR	106	98.4	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P386432

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191540	Ammonia-N	1.91	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P386512

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191098	Kjeldahl Nitrogen	5.12	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P386386

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191005	NO2NO3-N	0.321	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P386312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191067	Total-P	1.72	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P386292

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191006	O-Phosphate-P	0.227	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P386235

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2191010	Anatoxin-a	0.742	Spike	P	0 - 30
2191010	Cylindrospermopsin	2.87	Spike	P	0 - 30
2191010	Desmethyl microcystin LR	8.08	Spike	P	0 - 30
2191010	Microcystin LA	6.19	Spike	P	0 - 30
2191010	Microcystin LF	2.31	Spike	P	0 - 30
2191010	Microcystin LR	3.36	Spike	P	0 - 30
2191010	Microcystin LW	2.30	Spike	P	0 - 30
2191010	Microcystin LY	3.68	Spike	P	0 - 30
2191010	Microcystin RR	1.40	Spike	P	0 - 30
2191010	Microcystin WR	5.70	Spike	P	0 - 30
2191010	Microcystin YR	7.49	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2191004

Field Sample ID: Colohatchee_Ramp

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	107	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	88.1	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A100549

Included Lab Sample IDs: 2191006

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

Reference Method: EPA 8321B

Run ID: A100561

Included Lab Sample IDs: 2191004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	110	107	P/P	50 - 160
Cylindrospermopsin	118	113	P/P	60 - 160
Desmethyl microcystin LR	110	106	P/P	60 - 160
Microcystin LA	120	111	P/P	50 - 160
Microcystin LF	93.2	115	P/P	60 - 160
Microcystin LR	110	106	P/P	60 - 160
Microcystin LW	83.7	106	P/P	60 - 160
Microcystin LY	120	111	P/P	60 - 160
Microcystin RR	104	101	P/P	60 - 160
Microcystin WR	110	101	P/P	60 - 160
Microcystin YR	120	102	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A100580

Included Lab Sample IDs: 2191005

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A100597

Included Lab Sample IDs: 2191005

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A100607

Included Lab Sample IDs: 2191005

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.0	95.2	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A100656

Included Lab Sample IDs: 2191005

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.4	99.4	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	98.2	105	108			1.91
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	99.4	105			5.12
EPA 353.2 Rev. 2.0	NO2NO3-N	100	100	101			0.321
EPA 365.1 Rev. 2.0	Total-P	106	102	99.4			1.72
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	103	99.9	100			0.227
EPA 8321B	Anatoxin-a	118	91.4	92.0			0.742
	Cylindrospermopsin	115	103	106			2.87
	Desmethyl microcystin LR	108	107	99.0			8.08
	Microcystin LA	114	101	95.1			6.19
	Microcystin LF	123	130	127			2.31
	Microcystin LR	101	101	105			3.36
	Microcystin LW	105	133	136			2.30
	Microcystin LY	112	109	105			3.68
	Microcystin RR	99.8	135	133			1.40
	Microcystin WR	96.7	97.6	92.2			5.70
	Microcystin YR	108	106	98.4			7.49

Reference Method Descriptions

Method	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2191005
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2191005
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2191005
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2191005
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2191006
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2191004

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	08/19/2020			08/22/2020 15:04	Ping Hua	2191005
EPA 351.2 Rev. 2.0	08/19/2020	08/25/2020 09:40	Sima Feizi	08/26/2020 10:14	Virginia P. Brown	2191005
EPA 353.2 Rev. 2.0	08/19/2020			08/21/2020 09:13	Beverly Y. Sanders	2191005
EPA 365.1 Rev. 2.0	08/19/2020	08/20/2020 12:33	Yen Ta	08/24/2020 09:14	Lipi Saha	2191005
EPA 365.1 Rev. 2.0 dissolved	08/19/2020			08/19/2020 15:05	Virginia P. Brown	2191006
EPA 8321B	08/19/2020	08/20/2020 08:00	Juyoung Kim	08/20/2020 11:32	Mohammad Ghaffari	2191004