

Chemical Analysis Report

WQAP-2019-10-08-01

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

Event Description: **Algal Bloom Response - As needed**
Request ID: **RQ-2019-09-16-48**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 19-OCT-2019 15:01

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: Holly Bluff Marina Canal

Collection Date/Time: 10/07/2019 12:38

Field ID: Holly Bluff Marina Canal

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2125639	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P372077	
		Cylindrospermopsin**	0.25	U	ug/L	P372077	
		Microcystin LA**	0.25	U	ug/L	P372077	
		Microcystin LF**	0.25	U	ug/L	P372077	
		Microcystin LR**	0.25	U	ug/L	P372077	
		Microcystin LY**	0.25	U	ug/L	P372077	
		Microcystin RR**	0.25	U	ug/L	P372077	
		Microcystin YR**	0.25	U	ug/L	P372077	
2125640	EPA 350.1 Rev. 2.0	Ammonia-N	0.063		mg N/L	P372304	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.4		mg N/L	P372174	MS
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.17		mg N/L	P372434	
	EPA 365.1 Rev. 2.0	Total-P	0.15		mg P/L	P372181	
2125641	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.11		mg P/L	P372119	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372304

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372174

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372434

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372181

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372119

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

Reference Method: EPA 8321B
Batch ID: P372077

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	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 LY	0.25	U	ug/L
Microcystin RR	0.25	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: P372304

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: P372174

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372434

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: P372181

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372119

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.8		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P372077

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	119		P	40 - 140
Cylindrospermopsin	93.4		P	40 - 140
Microcystin LA	98.3		P	40 - 140
Microcystin LF	91.3		P	40 - 140
Microcystin LR	90.4		P	40 - 140
Microcystin LY	93.5		P	40 - 140
Microcystin RR	108		P	40 - 140
Microcystin YR	86.6		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P372304

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2125647	Ammonia-N	103	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P372174

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2125647	Kjeldahl Nitrogen	94.1	89.9	P/F	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P372434

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2123914	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P372181

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2125666	Total-P	98.8	99.9	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P372119

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2125648	O-Phosphate-P	94.2	95.2	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P372077

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2125639	Anatoxin-a	134	131	P/P	40 - 140
2125639	Cylindrospermopsin	89.6	85.2	P/P	40 - 140
2125639	Microcystin LA	100	103	P/P	40 - 140
2125639	Microcystin LF	92.4	103	P/P	40 - 140
2125639	Microcystin LR	98.1	101	P/P	40 - 140
2125639	Microcystin LY	93.0	96.9	P/P	40 - 140
2125639	Microcystin RR	104	116	P/P	40 - 140
2125639	Microcystin YR	89.8	95.6	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P372304

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2125647	Ammonia-N	0.272	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P372174

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2125647	Kjeldahl Nitrogen	3.26	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P372434

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2123914	NO2NO3-N	0.489	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P372181

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2125666	Total-P	1.06	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P372119

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2125648	O-Phosphate-P	0.582	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P372077

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2125639	Anatoxin-a	2.21	Spike	P	0 - 30
2125639	Cylindrospermopsin	4.97	Spike	P	0 - 30
2125639	Microcystin LA	2.54	Spike	P	0 - 30
2125639	Microcystin LF	10.4	Spike	P	0 - 30
2125639	Microcystin LR	3.15	Spike	P	0 - 30
2125639	Microcystin LY	4.09	Spike	P	0 - 30
2125639	Microcystin RR	10.9	Spike	P	0 - 30
2125639	Microcystin YR	6.21	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2125639

Field Sample ID: Holly Bluff Marina Canal

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	92.0	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B
 Run ID: A94794
 Included Lab Sample IDs: 2125639

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	112	110	P/P	50 - 160
Cylindrospermopsin	102	101	P/P	60 - 160
Microcystin LA	104	102	P/P	50 - 160
Microcystin LF	93.1	99.7	P/P	60 - 160
Microcystin LR	87.5	99.5	P/P	60 - 160
Microcystin LY	90.5	98.6	P/P	60 - 160
Microcystin RR	114	109	P/P	60 - 160
Microcystin YR	86.2	90.3	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Run ID: A94801
 Included Lab Sample IDs: 2125641

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	98.5	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Run ID: A94865
 Included Lab Sample IDs: 2125640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.3	98.3	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Run ID: A94868
 Included Lab Sample IDs: 2125640

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

Reference Method: EPA 353.2 Rev. 2.0
 Run ID: A94889
 Included Lab Sample IDs: 2125640

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

Reference Method: EPA 365.1 Rev. 2.0
 Run ID: A94909
 Included Lab Sample IDs: 2125640

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	105	106	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	
EPA 350.1 Rev. 2.0	Ammonia-N	100	103	102			0.272
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	97.4	94.1	89.9			3.26
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	102	102			0.489
EPA 365.1 Rev. 2.0	Total-P	105	98.8	99.9			1.06
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.8	94.2	95.2			0.582
EPA 8321B	Anatoxin-a	119	134	131			2.21
	Cylindrospermopsin	93.4	89.6	85.2			4.97
	Microcystin LA	98.3	103	100			2.54
	Microcystin LF	91.3	103	92.4			10.4
	Microcystin LR	90.4	101	98.1			3.15
	Microcystin LY	93.5	96.9	93.0			4.09
	Microcystin RR	108	104	116			10.9
	Microcystin YR	86.6	95.6	89.8			6.21

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2125640
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2125640
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2125640
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2125640
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2125641
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2125639

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	10/08/2019			10/10/2019 14:03	Ping Hua	2125640
EPA 351.2 Rev. 2.0	10/08/2019	10/09/2019 12:05	Sima Feizi	10/10/2019 14:20	Julia Storbeck	2125640
EPA 353.2 Rev. 2.0	10/08/2019			10/11/2019 09:37	Beverly Y. Sanders	2125640
EPA 365.1 Rev. 2.0	10/08/2019	10/09/2019 14:19	Vijayalakshmi Reddy	10/11/2019 14:24	Lipi Saha	2125640
EPA 365.1 Rev. 2.0 dissolved	10/08/2019			10/08/2019 15:49	Julia Storbeck	2125641
EPA 8321B	10/08/2019	10/08/2019 10:45	Juyoung Kim	10/08/2019 12:25	Juyoung Kim	2125639