Chemical Analysis Report

WQAP-2019-11-13-01

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-2019-07-22-66**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Date Certified: 26-NOV-2019 14:47

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: HAB_111219_Lkldyl **Collection Date/Time: 11/12/2019 10:45**

Field ID: HAB-SW-0001 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2135381	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P374120	
		Cylindrospermopsin**	0.25	U	ug/L	P374120	
		Desmethyl microcystin LR**	0.25	U	ug/L	P374120	
		Microcystin LA**	0.25	U	ug/L	P374120	
		Microcystin LF**	0.25	U	ug/L	P374120	
		Microcystin LR**	0.25	U	ug/L	P374120	
		Microcystin LW**	0.25	U	ug/L	P374120	
		Microcystin LY**	0.25	U	ug/L	P374120	
		Microcystin RR**	0.25	U	ug/L	P374120	
		Microcystin WR**	0.50	U	ug/L	P374120	
		Microcystin YR**	0.25	U	ug/L	P374120	
2135382	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P374262	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P374420	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P374240	
	EPA 365.1 Rev. 2.0	Total-P	0.043		mg P/L	P374426	
2135383	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P374183	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374262

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374420

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374240

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374426

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374183

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

Reference Method: EPA 8321B
Batch ID: P374120

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: P374262

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374420

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374240

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: P374426

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: P374183

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.7		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P374120

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	111		P	40 - 140
Cylindrospermopsin	92.3		P	40 - 140
Desmethyl microcystin LR	98.8		P	40 - 140
Microcystin LA	107		P	40 - 140
Microcystin LF	105		P	40 - 140
Microcystin LR	98.1		P	40 - 140
Microcystin LW	112		P	40 - 140
Microcystin LY	114		P	40 - 140
Microcystin RR	106		P	40 - 140
Microcystin WR	102		P	40 - 140
Microcystin YR	96.1		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374262

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135382	Ammonia-N	93.8	94.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374420

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135389	Kjeldahl Nitrogen	106	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374240

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135087	NO2NO3-N	97.8	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374426

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135289	Total-P	105	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374183

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135293	O-Phosphate-P	100	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P374120

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2135381	Anatoxin-a	98.4	103	P/P	40 - 140
2135381	Cylindrospermopsin	86.7	89.5	P/P	40 - 140
2135381	Desmethyl microcystin LR	91.5	94.3	P/P	40 - 140
2135381	Microcystin LA	93.4	94.1	P/P	40 - 140
2135381	Microcystin LF	89.8	85.0	P/P	40 - 140
2135381	Microcystin LR	91.3	98.1	P/P	40 - 140
2135381	Microcystin LW	89.9	91.9	P/P	40 - 140
2135381	Microcystin LY	107	104	P/P	40 - 140
2135381	Microcystin RR	98.4	109	P/P	40 - 140
2135381	Microcystin WR	86.9	87.1	P/P	40 - 140
2135381	Microcystin YR	95.6	95.1	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P374262

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135382	Ammonia-N	1.13	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P374420

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135389	Kjeldahl Nitrogen	0.957	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P374240

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135087	NO2NO3-N	3.13	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P374426

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135289	Total-P	3.31	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P374183

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135293	O-Phosphate-P	0.535	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P374120

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2135381	Anatoxin-a	4.64	Spike	P	0 - 30
2135381	Cylindrospermopsin	3.19	Spike	P	0 - 30
2135381	Desmethyl microcystin LR	2.91	Spike	P	0 - 30
2135381	Microcystin LA	0.707	Spike	P	0 - 30
2135381	Microcystin LF	5.47	Spike	P	0 - 30
2135381	Microcystin LR	7.18	Spike	P	0 - 30
2135381	Microcystin LW	2.25	Spike	P	0 - 30
2135381	Microcystin LY	2.99	Spike	P	0 - 30
2135381	Microcystin RR	10.1	Spike	P	0 - 30
2135381	Microcystin WR	0.227	Spike	P	0 - 30
2135381	Microcystin YR	0.483	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2135381
Field Sample ID: HAB-SW-0001

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	93.0	P	30 - 165

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A95717
Included Lab Sample IDs: 2135383

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: A95727
Included Lab Sample IDs: 2135381

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	101	105	P/P	50 - 160
Cylindrospermopsin	90.5	94.7	P/P	60 - 160
Desmethyl microcystin LR	91.1	99.8	P/P	60 - 160
Microcystin LA	100	113	P/P	50 - 160
Microcystin LF	93.2	113	P/P	60 - 160
Microcystin LR	96.3	101	P/P	60 - 160
Microcystin LW	98.4	108	P/P	60 - 160
Microcystin LY	106	119	P/P	60 - 160
Microcystin RR	107	92.1	P/P	60 - 160
Microcystin WR	95.8	106	P/P	60 - 160
Microcystin YR	99.1	98.7	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A95734
Included Lab Sample IDs: 2135382

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A95747
Included Lab Sample IDs: 2135382

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	100	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A95879
Included Lab Sample IDs: 2135382

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	97.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A95931
Included Lab Sample IDs: 2135382

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	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	99.0	93.8	94.9			1.13
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	106	105			0.957
EPA 353.2 Rev. 2.0	NO2NO3-N	104	97.8	101			3.13
EPA 365.1 Rev. 2.0	Total-P	106	105	102			3.31
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.7	100	99.5			0.535
EPA 8321B	Anatoxin-a	111	98.4	103			4.64
	Cylindrospermopsin	92.3	86.7	89.5			3.19
	Desmethyl microcystin LR	98.8	91.5	94.3			2.91
	Microcystin LA	107	93.4	94.1			0.707
	Microcystin LF	105	89.8	85.0			5.47
	Microcystin LR	98.1	91.3	98.1			7.18
	Microcystin LW	112	89.9	91.9			2.25
	Microcystin LY	114	107	104			2.99
	Microcystin RR	106	98.4	109			10.1
	Microcystin WR	102	86.9	87.1			0.227
	Microcystin YR	96.1	95.6	95.1			0.483

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2135382
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2135382
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2135382
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2135382
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2135383
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2135381

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	11/13/2019			11/14/2019 13:46	Ping Hua	2135382
EPA 351.2 Rev. 2.0	11/13/2019	11/19/2019 11:25	Sima Feizi	11/20/2019 16:55	Jhamieka S. Greenwood	2135382
EPA 353.2 Rev. 2.0	11/13/2019			11/14/2019 12:37	Beverly Y. Sanders	2135382
EPA 365.1 Rev. 2.0	11/13/2019	11/19/2019 12:09	Yen Ta	11/22/2019 13:54	Benjamin T. Nordmann	2135382
EPA 365.1 Rev. 2.0 dissolved	11/13/2019			11/13/2019 14:13	Virginia P. Brown	2135383
EPA 8321B	11/13/2019	11/14/2019 09:00	Juyoung Kim	11/14/2019 11:04	Juyoung Kim	2135381