Chemical Analysis Report

WQAP-2019-08-20-03

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-2019-07-22-55**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2295 Victoria AVE
Suite 364
Fort Myers, FL 33901
Attn: Kirby Wolfe

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: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 03-SEP-2019 10:51

NON-CONFORMANCE REPORT INCLUDED

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: Bonita Ct. Canal **Collection Date/Time: 08/19/2019 09:50**

Field ID: SD081919-001 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112672	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P369252	
		Cylindrospermopsin**	0.25	U	ug/L	P369252	
		Microcystin LA**	0.25	U	ug/L	P369252	
		Microcystin LF**	0.25	U	ug/L	P369252	
		Microcystin LR**	0.25	U	ug/L	P369252	
		Microcystin LY**	0.25	U	ug/L	P369252	
		Microcystin RR**	0.25	U	ug/L	P369252	
		Microcystin YR**	0.25	U	ug/L	P369252	

Sample Location: Bonita Ct. Canal **Collection Date/Time: 08/19/2019 09:50**

Field ID: SD081919-001 Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2112681	EPA 350.1 Rev. 2.0	Ammonia-N	0.008	Y	mg N/L	P369693	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.59	Y	mg N/L	P369508	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	UY	mg N/L	P369577	
	EPA 365.1 Rev. 2.0	Total-P	0.031	Y	mg P/L	P369510	
2112682	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P369410	

Ref. Method and Comment:
EPA 350.1 Rev. 2.0: The sample was received unpreserved: pH > 2. Sample preserved in laboratory.
EPA 351.2 Rev. 2.0: The sample was received unpreserved: pH > 2. Sample preserved in laboratory.
EPA 353.2 Rev. 2.0: The sample was received unpreserved: pH > 2. Sample preserved in laboratory.
EPA 365.1 Rev. 2.0: Total-P: The sample was received unpreserved: pH > 2. Sample preserved in laboratory.

Non-Conformance Report

NCR ID: 7861

Event(s)	Job(s)	Sample(s)	Test(s)
WQAP-2019-08-20-03	TLH-2019-08-20-16	2112681	

NCR Type: SHIPPING/RECEIVING **NCR Category: Preservation Not Intact**

Observation: Sample not preserved to pH < 2.

Resolution: Sample preserved in the laboratory with sulfuric acid.
H2SO4 Lot# SA8274050 | Expiration Date: 10/01/2019
Data will be qualified as appropriate.

Authorized by/Date: Joshua Ayres 8/27/2019

The Non-Conformance Report details exceptions or problems encountered with the events/jobs/samples/test.
Please address questions to:

Chemistry	Colin Wright	(850) 245-8085
Biology	Cheryl Swanson	(850) 245-8177

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369693

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369508

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369577

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369510

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369410

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

Reference Method: EPA 8321B
Batch ID: P369252

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: P369693

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: P369508

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369577

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369510

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.2		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369410

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

Reference Method: EPA 8321B
Batch ID: P369252

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	125		P	40 - 140
Cylindrospermopsin	102		P	40 - 140
Microcystin LA	111		P	40 - 140
Microcystin LF	138		P	40 - 140
Microcystin LR	113		P	40 - 140
Microcystin LY	83.8		P	40 - 140
Microcystin RR	115		P	40 - 140
Microcystin YR	104		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369693

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112043	Ammonia-N	103	104	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369508

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112967	Kjeldahl Nitrogen	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369577

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112043	NO2NO3-N	99.8	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369510

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112681	Total-P	92.6	93.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369410

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112682	O-Phosphate-P	97.0	97.8	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P369252

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2112286	Anatoxin-a	131	127	P/P	40 - 140
2112286	Cylindrospermopsin	99.5	88.3	P/P	40 - 140
2112286	Microcystin LA	110	95.1	P/P	40 - 140
2112286	Microcystin LF	125	118	P/P	40 - 140
2112286	Microcystin LR	118	111	P/P	40 - 140
2112286	Microcystin LY	99.8	91.9	P/P	40 - 140
2112286	Microcystin RR	106	102	P/P	40 - 140
2112286	Microcystin YR	102	105	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P369693

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112043	Ammonia-N	0.685	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P369508

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112967	Kjeldahl Nitrogen	0.0641	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P369577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112043	NO2NO3-N	1.90	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P369510

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112681	Total-P	1.10	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P369410

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112682	O-Phosphate-P	0.782	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P369252

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2112286	Anatoxin-a	2.91	Spike	P	0 - 30
2112286	Cylindrospermopsin	11.9	Spike	P	0 - 30
2112286	Microcystin LA	14.4	Spike	P	0 - 30
2112286	Microcystin LF	6.42	Spike	P	0 - 30
2112286	Microcystin LR	5.57	Spike	P	0 - 30
2112286	Microcystin LY	8.27	Spike	P	0 - 30
2112286	Microcystin RR	2.67	Spike	P	0 - 30
2112286	Microcystin YR	2.50	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report
Surrogates

Lab Sample ID: 2112672
Field Sample ID: SD081919-001

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	113	P	30 - 165

Quality Assurance Report
Calibration Verification

Reference Method: EPA 8321B
Run ID: A93654
Included Lab Sample IDs: 2112672

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	112	112	P/P	50 - 160
Cylindrospermopsin	98.0	98.5	P/P	60 - 160
Microcystin LA	105	92.9	P/P	50 - 160
Microcystin LF	123	107	P/P	60 - 160
Microcystin LR	110	102	P/P	60 - 160
Microcystin LY	95.8	85.6	P/P	60 - 160
Microcystin RR	98.1	107	P/P	60 - 160
Microcystin YR	95.7	95.6	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A93683
Included Lab Sample IDs: 2112682

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.6	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A93747
Included Lab Sample IDs: 2112681

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A93750
Included Lab Sample IDs: 2112681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	108	107	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A93776
Included Lab Sample IDs: 2112681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.8	99.2	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A93798
Included Lab Sample IDs: 2112681

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	105	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	100	103	104			0.685
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	102	102			0.0641
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.8	102			1.90
EPA 365.1 Rev. 2.0	Total-P	97.2	92.6	93.6			1.10
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	99.5	97.0	97.8			0.782
EPA 8321B	Anatoxin-a	125	131	127			2.91
	Cylindrospermopsin	102	99.5	88.3			11.9
	Microcystin LA	111	110	95.1			14.4
	Microcystin LF	138	125	118			6.42
	Microcystin LR	113	118	111			5.57
	Microcystin LY	83.8	99.8	91.9			8.27
	Microcystin RR	115	106	102			2.67
	Microcystin YR	104	102	105			2.50

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2112681
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2112681
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2112681
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2112681
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2112682
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2112672

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	08/20/2019			08/26/2019 12:21	Ping Hua	2112681
EPA 351.2 Rev. 2.0	08/20/2019	08/22/2019 11:15	Sima Feizi	08/23/2019 10:57	Joseph Suarez	2112681
EPA 353.2 Rev. 2.0	08/20/2019			08/23/2019 10:42	Beverly Y. Sanders	2112681
EPA 365.1 Rev. 2.0	08/20/2019	08/22/2019 12:30	Lipi Saha	08/26/2019 11:29	Lipi Saha	2112681
EPA 365.1 Rev. 2.0 dissolved	08/20/2019			08/20/2019 15:34	Jhamieka S. Greenwood	2112682
EPA 8321B	08/20/2019	08/20/2019 12:15	Juyoung Kim	08/20/2019 13:31	Juyoung Kim	2112672