Chemical Analysis Report

WQAP-2019-10-16-01

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-2019-08-19-58**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2199 South Rock Road
Fort Pierce, FL 34945
Attn: Matthew Sewell

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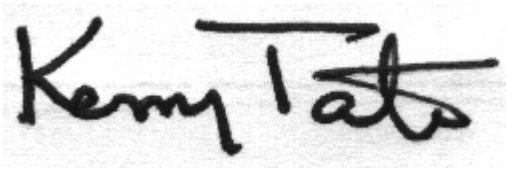
Certified by: Kerry Tate, Ph.D., Environmental Administrator

Date Certified: 30-OCT-2019 12:09



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: Middleton Fish Camp **Collection Date/Time: 10/15/2019 11:10**

Field ID: Fish Camp Cut Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2128474	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P372543	
		Cylindrospermopsin**	0.25	U	ug/L	P372543	
		Microcystin LA**	0.25	U	ug/L	P372543	
		Microcystin LF**	0.25	U	ug/L	P372543	
		Microcystin LR**	0.25	U	ug/L	P372543	
		Microcystin LY**	0.25	U	ug/L	P372543	
		Microcystin RR**	0.25	U	ug/L	P372543	
		Microcystin YR**	0.25	U	ug/L	P372543	
2128475	EPA 350.1 Rev. 2.0	Ammonia-N	0.038		mg N/L	P372885	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P372681	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.062		mg N/L	P372806	
	EPA 365.1 Rev. 2.0	Total-P	0.26		mg P/L	P372743	
2128476	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.22		mg P/L	P372624	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372885

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372681

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372806

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372743

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372624

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

Reference Method: EPA 8321B
Batch ID: P372543

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: P372885

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: P372681

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.9		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372806

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372743

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	95.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372624

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

Reference Method: EPA 8321B
Batch ID: P372543

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	135		P	40 - 140
Cylindrospermopsin	111		P	40 - 140
Microcystin LA	112		P	40 - 140
Microcystin LF	125		P	40 - 140
Microcystin LR	112		P	40 - 140
Microcystin LY	118		P	40 - 140
Microcystin RR	122		P	40 - 140
Microcystin YR	120		P	40 - 140

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372885

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2128475	Ammonia-N	97.7	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372681

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2128305	Kjeldahl Nitrogen	101	98.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372806

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2128483	NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372743

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2128067	Total-P	96.0	98.7	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372624

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2128273	O-Phosphate-P	96.3	95.4	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P372543

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2128459	Anatoxin-a	126	126	P/P	40 - 140
2128459	Cylindrospermopsin	97.7	96.1	P/P	40 - 140
2128459	Microcystin LA	96.3	88.9	P/P	40 - 140
2128459	Microcystin LF	113	130	P/P	40 - 140
2128459	Microcystin LR	113	103	P/P	40 - 140
2128459	Microcystin LY	99.7	108	P/P	40 - 140
2128459	Microcystin RR	110	113	P/P	40 - 140
2128459	Microcystin YR	105	107	P/P	40 - 140

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P372885

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2128475	Ammonia-N	0.664	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P372681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2128305	Kjeldahl Nitrogen	1.80	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P372806

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2128483	NO2NO3-N	0.0	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P372743

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2128067	Total-P	2.64	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P372624

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2128273	O-Phosphate-P	0.633	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P372543

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2128459	Anatoxin-a	0.204	Spike	P	0 - 30
2128459	Cylindrospermopsin	1.68	Spike	P	0 - 30
2128459	Microcystin LA	7.96	Spike	P	0 - 30
2128459	Microcystin LF	13.8	Spike	P	0 - 30
2128459	Microcystin LR	9.81	Spike	P	0 - 30
2128459	Microcystin LY	7.50	Spike	P	0 - 30
2128459	Microcystin RR	2.06	Spike	P	0 - 30
2128459	Microcystin YR	2.24	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2128474
Field Sample ID: Fish Camp Cut

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	112	P	30 - 165

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A95007
Included Lab Sample IDs: 2128476

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A95036
Included Lab Sample IDs: 2128474

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	122	122	P/P	50 - 160
Cylindrospermopsin	96.7	98.3	P/P	60 - 160
Microcystin LA	111	107	P/P	50 - 160
Microcystin LF	121	120	P/P	60 - 160
Microcystin LR	102	98.4	P/P	60 - 160
Microcystin LY	102	105	P/P	60 - 160
Microcystin RR	106	108	P/P	60 - 160
Microcystin YR	104	111	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A95097
Included Lab Sample IDs: 2128475

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A95099
Included Lab Sample IDs: 2128475

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A95132
Included Lab Sample IDs: 2128475

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A95180
Included Lab Sample IDs: 2128475

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	99.0	97.5	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	97.7	98.9			0.664
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.9	101	98.6			1.80
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	99.0	99.0			0.0
EPA 365.1 Rev. 2.0	Total-P	95.1	96.0	98.7			2.64
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	96.3	95.4			0.633
EPA 8321B	Anatoxin-a	135	126	126			0.204
	Cylindrospermopsin	111	97.7	96.1			1.68
	Microcystin LA	112	96.3	88.9			7.96
	Microcystin LF	125	113	130			13.8
	Microcystin LR	112	113	103			9.81
	Microcystin LY	118	99.7	108			7.50
	Microcystin RR	122	110	113			2.06
	Microcystin YR	120	105	107			2.24

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2128475
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2128475
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2128475
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2128475
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2128476
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2128474

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	10/16/2019			10/21/2019 13:12	Ping Hua	2128475
EPA 351.2 Rev. 2.0	10/16/2019	10/17/2019 12:22	Sima Feizi	10/22/2019 21:27	Jhamieka S. Greenwood	2128475
EPA 353.2 Rev. 2.0	10/16/2019			10/21/2019 09:26	Lauren Lees	2128475
EPA 365.1 Rev. 2.0	10/16/2019	10/18/2019 15:10	Lipi Saha	10/21/2019 12:28	Beverly Y. Sanders	2128475
EPA 365.1 Rev. 2.0 dissolved	10/16/2019			10/16/2019 13:07	Virginia P. Brown	2128476
EPA 8321B	10/16/2019	10/17/2019 09:00	Juyoung Kim	10/17/2019 13:30	Juyoung Kim	2128474