

Chemical Analysis Report

WQAP-2019-06-20-03

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-2019-06-03-42**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
2600 Blair Stone Rd
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Tallahassee, FL 32399-2400
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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 09-JUL-2019 11:11



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: Manatee River - Near Ellenton

Collection Date/Time: 06/19/2019 10:45

Field ID: Manatee River - Near Ellenton

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2097023	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P365985	MS
		Cylindrospermopsin**	0.25	U	ug/L	P365985	
		Microcystin LA**	0.25	U	ug/L	P365985	
		Microcystin LF**	0.25	U	ug/L	P365985	
		Microcystin LR**	0.25	U	ug/L	P365985	
		Microcystin LY**	0.25	U	ug/L	P365985	
		Microcystin RR**	0.25	U	ug/L	P365985	
		Microcystin YR**	0.25	U	ug/L	P365985	

Sample Location: Manatee River - Near Ellenton

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Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2097024	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P366280	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.7		mg N/L	P366636	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P366316	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P366253	
2097025	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.096		mg P/L	P366045	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P366280

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P366636

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366316

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P366253

Component	Result	Code	Units
Total-P	0.005	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P366045

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

Reference Method: EPA 8321B
Batch ID: P365985

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: P366280

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P366636

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366316

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: P366253

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P366045

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.9		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P365985

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	136		P	40 - 140
Cylindrospermopsin	104		P	40 - 140
Microcystin LA	101		P	40 - 140
Microcystin LF	88.9		P	40 - 140
Microcystin LR	80.8		P	40 - 140
Microcystin LY	96.9		P	40 - 140
Microcystin RR	105		P	40 - 140
Microcystin YR	95.4		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P366280

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2098072	Ammonia-N	105	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P366636

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2096728	Kjeldahl Nitrogen	98.8	99.7	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P366316

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2096474	NO2NO3-N	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P366253

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2097024	Total-P	103	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P366045

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2097015	O-Phosphate-P	96.0	96.1	P/P	90 - 110

Reference Method: EPA 8321B
 Batch ID: P365985

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2096473	Anatoxin-a	100	112	P/P	40 - 140
2096473	Cylindrospermopsin	31.0	36.7	F/F	40 - 140
2096473	Microcystin LA	86.0	91.4	P/P	40 - 140
2096473	Microcystin LF	73.1	82.4	P/P	40 - 140
2096473	Microcystin LR	81.5	81.8	P/P	40 - 140
2096473	Microcystin LY	93.3	98.8	P/P	40 - 140
2096473	Microcystin RR	97.2	97.9	P/P	40 - 140
2096473	Microcystin YR	90.1	89.0	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P366280

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2098072	Ammonia-N	0.853	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P366636

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2096728	Kjeldahl Nitrogen	0.788	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P366316

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2096474	NO2NO3-N	0.477	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P366253

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097024	Total-P	0.815	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P366045

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2097015	O-Phosphate-P	0.0779	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P365985

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2096473	Anatoxin-a	10.7	Spike	P	0 - 30
2096473	Cylindrospermopsin	16.8	Spike	P	0 - 30
2096473	Microcystin LA	6.13	Spike	P	0 - 30
2096473	Microcystin LF	12.0	Spike	P	0 - 30
2096473	Microcystin LR	0.323	Spike	P	0 - 30
2096473	Microcystin LY	5.71	Spike	P	0 - 30
2096473	Microcystin RR	0.657	Spike	P	0 - 30
2096473	Microcystin YR	1.25	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: 2097023

Field Sample ID: Manatee River - Near Ellenton

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	134	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A92238

Included Lab Sample IDs: 2097023

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	106	97.0	P/P	50 - 160
Cylindrospermopsin	118	110	P/P	60 - 160
Microcystin LA	111	110	P/P	50 - 160
Microcystin LF	130	136	P/P	60 - 160
Microcystin LR	102	95.8	P/P	60 - 160
Microcystin LY	120	125	P/P	60 - 160
Microcystin RR	123	107	P/P	60 - 160
Microcystin YR	99.6	92.6	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A92248

Included Lab Sample IDs: 2097025

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.4	98.0	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A92337

Included Lab Sample IDs: 2097024

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A92358

Included Lab Sample IDs: 2097024

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

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A92359

Included Lab Sample IDs: 2097024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	105	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A92534

Included Lab Sample IDs: 2097024

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.2	96.1	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	103	105	106			0.853
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105	98.8	99.7			0.788
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	105	104			0.477
EPA 365.1 Rev. 2.0	Total-P	98.4	103	104			0.815
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.9	96.0	96.1			0.0779
EPA 8321B	Anatoxin-a	136	100	112			10.7
	Cylindrospermopsin	104	31.0	36.7			16.8
	Microcystin LA	101	86.0	91.4			6.13
	Microcystin LF	88.9	73.1	82.4			12.0
	Microcystin LR	80.8	81.5	81.8			0.323
	Microcystin LY	96.9	93.3	98.8			5.71
	Microcystin RR	105	97.2	97.9			0.657
	Microcystin YR	95.4	90.1	89.0			1.25

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2097024
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2097024
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2097024
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2097024
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2097025
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2097023

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	06/20/2019			06/25/2019 14:08	Ping Hua	2097024
EPA 351.2 Rev. 2.0	06/20/2019	07/02/2019 11:30	Adrian Shelby	07/03/2019 11:05	Joseph Suarez	2097024
EPA 353.2 Rev. 2.0	06/20/2019			06/26/2019 08:43	Beverly Y. Sanders	2097024
EPA 365.1 Rev. 2.0	06/20/2019	06/25/2019 11:00	Lipi Saha	06/26/2019 09:52	Lipi Saha	2097024
EPA 365.1 Rev. 2.0 dissolved	06/20/2019			06/20/2019 17:26	Julia Storbeck	2097025
EPA 8321B	06/20/2019	06/20/2019 14:15	Juyoung Kim	06/20/2019 14:58	Mohammad Ghaffari	2097023