

Chemical Analysis Report

WQAP-2019-04-09-01

Florida Department of Environmental Protection
Central Laboratory
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DOH Accreditation E31780

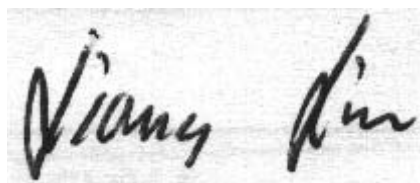
Event Description: **Algal Bloom Response - As needed**
Request ID: **RQ-2019-01-07-19**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Certified by: Liang Lin, Environmental Administrator

Date Certified: 24-APR-2019 15:28

A handwritten signature in black ink, appearing to read "Liang Lin", is shown on a light-colored 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: Lake Pot

Collection Date/Time: 04/08/2019 12:15

Field ID: Lake Pot

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2076412	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P361845	
		Cylindrospermopsin**	0.25	U	ug/L	P361845	
		Microcystin LA**	0.25	U	ug/L	P361845	
		Microcystin LF**	0.25	U	ug/L	P361845	
		Microcystin LR**	0.25	U	ug/L	P361845	
		Microcystin LY**	0.25	U	ug/L	P361845	
		Microcystin RR**	0.25	U	ug/L	P361845	
		Microcystin YR**	0.25	U	ug/L	P361845	

Sample Location: Lake Pot

Collection Date/Time: 04/08/2019 12:15

Field ID: Lake Pot

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2076416	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P361962	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	4.5		mg N/L	P361846	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P362051	
	EPA 365.1 Rev. 2.0	Total-P	0.11		mg P/L	P362145	
2076417	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P361837	

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P361962

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P361846

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362051

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362145

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361837

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

Reference Method: EPA 8321B
Batch ID: P361845

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: P361962

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: P361846

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362051

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362145

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361837

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

Reference Method: EPA 8321B
Batch ID: P361845

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	96.6		P	40 - 140
Cylindrospermopsin	138		P	40 - 140
Microcystin LA	119		P	40 - 140
Microcystin LF	123		P	40 - 140
Microcystin LR	98.5		P	40 - 140
Microcystin LY	120		P	40 - 140
Microcystin RR	114		P	40 - 140
Microcystin YR	121		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P361962

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075617	Ammonia-N	100	103	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P361846

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075136	Kjeldahl Nitrogen	107	97.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P362051

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2075136	NO2NO3-N	98.6	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P362145

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076395	Total-P	98.6	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P361837

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076398	O-Phosphate-P	97.5	98.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P361845

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2076937	Anatoxin-a	95.5	95.4	P/P	40 - 140
2076937	Cylindrospermopsin	126	112	P/P	40 - 140
2076937	Microcystin LA	115	113	P/P	40 - 140
2076937	Microcystin LF	133	118	P/P	40 - 140
2076937	Microcystin LR	101	103	P/P	40 - 140
2076937	Microcystin LY	97.5	118	P/P	40 - 140
2076937	Microcystin RR	113	118	P/P	40 - 140
2076937	Microcystin YR	121	122	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P361962

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075617	Ammonia-N	1.42	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P361846

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075136	Kjeldahl Nitrogen	5.91	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P362051

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2075136	NO2NO3-N	0.401	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P362145

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076395	Total-P	0.764	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P361837

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076398	O-Phosphate-P	0.613	Spike	P	0 - 20

Reference Method: EPA 8321B
 Batch ID: P361845

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2076937	Anatoxin-a	0.104	Spike	P	0 - 30
2076937	Cylindrospermopsin	11.5	Spike	P	0 - 30
2076937	Microcystin LA	2.25	Spike	P	0 - 30
2076937	Microcystin LF	11.5	Spike	P	0 - 30
2076937	Microcystin LR	2.27	Spike	P	0 - 30
2076937	Microcystin LY	19.0	Spike	P	0 - 30
2076937	Microcystin RR	4.57	Spike	P	0 - 30
2076937	Microcystin YR	0.670	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: 2076412
Field Sample ID: Lake Pot

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	86.8	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A90555

Included Lab Sample IDs: 2076417

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.2	98.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A90603

Included Lab Sample IDs: 2076416

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	100	99.3	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A90614

Included Lab Sample IDs: 2076416

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	105	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A90630

Included Lab Sample IDs: 2076412

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	100	94.6	P/P	50 - 160
Cylindrospermopsin	98.2	110	P/P	60 - 160
Microcystin LA	97.9	110	P/P	50 - 160
Microcystin LF	88.0	104	P/P	60 - 160
Microcystin LR	80.4	88.4	P/P	60 - 160
Microcystin LY	94.8	105	P/P	60 - 160
Microcystin RR	87.6	91.9	P/P	60 - 160
Microcystin YR	99.6	99.6	P/P	60 - 160

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A90667

Included Lab Sample IDs: 2076416

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: A90770

Included Lab Sample IDs: 2076416

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	99.5	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		LCS	Precision SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	100	100	103			1.42
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	107	97.0			5.91
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	101	98.6	98.0			0.401
EPA 365.1 Rev. 2.0	Total-P	104	98.6	99.3			0.764
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.5	97.5	98.1			0.613
EPA 8321B	Anatoxin-a	96.6	95.5	95.4			0.104
	Cylindrospermopsin	138	126	112			11.5
	Microcystin LA	119	115	113			2.25
	Microcystin LF	123	118	133			11.5
	Microcystin LR	98.5	101	103			2.27
	Microcystin LY	120	97.5	118			19.0
	Microcystin RR	114	113	118			4.57
	Microcystin YR	121	121	122			0.670

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2076416
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2076416
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2076416
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2076416
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2076417
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2076412

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	04/09/2019			04/10/2019 12:03	Ping Hua	2076416
EPA 351.2 Rev. 2.0	04/09/2019	04/10/2019 13:15	Adrian Shelby	04/11/2019 12:07	Joseph Suarez	2076416
EPA 353.2 Rev. 2.0	04/09/2019			04/12/2019 10:43	Beverly Y. Sanders	2076416
EPA 365.1 Rev. 2.0	04/09/2019	04/15/2019 13:05	Sima Feizi	04/16/2019 13:28	Rosalyn Ballman	2076416
EPA 365.1 Rev. 2.0 dissolved	04/09/2019			04/09/2019 17:08	Julia Storbeck	2076417
EPA 8321B	04/09/2019	04/11/2019 09:00	Juyoung Kim	04/11/2019 11:46	Juyoung Kim	2076412