

Chemical Analysis Report

WQAP-2019-12-11-01

Florida Department of Environmental Protection
Central Laboratory
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Tallahassee, FL 32399-2400
DOH Accreditation E31780

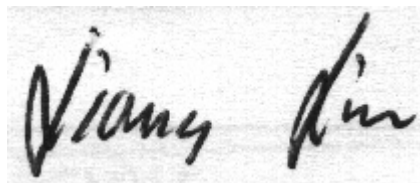
Event Description: **Algal Bloom Response -SOROC**
Request ID: **RQ-2019-11-25-32**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

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

Date Certified: 23-DEC-2019 16:56

A handwritten signature in black ink, appearing to read "Liang Lin", 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: Marina Town Hancock Creek

Collection Date/Time: 12/10/2019 08:30

Field ID: SDHAB-121019-001

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2142206	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P375585	LCS
		Cylindrospermopsin**	0.25	U	ug/L	P375585	
		Desmethyl microcystin LR**	0.25	UJ	ug/L	P375585	
		Microcystin LA**	0.25	U	ug/L	P375585	
		Microcystin LF**	0.25	U	ug/L	P375585	
		Microcystin LR**	0.25	U	ug/L	P375585	
		Microcystin LW**	0.25	U	ug/L	P375585	
		Microcystin LY**	0.25	U	ug/L	P375585	
		Microcystin RR**	0.25	U	ug/L	P375585	
		Microcystin WR**	0.25	U	ug/L	P375585	
		Microcystin YR**	0.25	U	ug/L	P375585	
2142207	EPA 350.1 Rev. 2.0	Ammonia-N	0.012		mg N/L	P375867	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P375949	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P376147	
	EPA 365.1 Rev. 2.0	Total-P	0.13		mg P/L	P375703	
2142208	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.078		mg P/L	P375639	

Ref. Method and Comment:

EPA 8321B: Refer to the Lab Analysis Report for an explanation of QC Codes.

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375867

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375949

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376147

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375703

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375639

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

Reference Method: EPA 8321B
Batch ID: P375585

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	0.25	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: P375867

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375949

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376147

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375703

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: P375639

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

Reference Method: EPA 8321B
Batch ID: P375585

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	112		P	40 - 140
Cylindrospermopsin	106		P	40 - 140
Desmethyl microcystin LR	141		F	40 - 140
Microcystin LA	130		P	40 - 140
Microcystin LF	133		P	40 - 140
Microcystin LR	134		P	40 - 140
Microcystin LW	123		P	40 - 140
Microcystin LY	128		P	40 - 140
Microcystin RR	121		P	40 - 140
Microcystin WR	122		P	40 - 140
Microcystin YR	122		P	40 - 140

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375867

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141725	Ammonia-N	103	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375949

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2143904	Kjeldahl Nitrogen	101	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376147

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2142207	NO2NO3-N	98.1	97.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375703

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2142103	Total-P	103	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375639

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2142109	O-Phosphate-P	96.3	97.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P375585

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2141682	Anatoxin-a	93.1	98.4	P/P	40 - 140
2141682	Cylindrospermopsin	72.2	75.4	P/P	40 - 140
2141682	Desmethyl microcystin LR	138	134	P/P	40 - 140
2141682	Microcystin LA	111	119	P/P	40 - 140
2141682	Microcystin LF	104	118	P/P	40 - 140
2141682	Microcystin LR	131	131	P/P	40 - 140
2141682	Microcystin LW	98.6	102	P/P	40 - 140
2141682	Microcystin LY	107	112	P/P	40 - 140
2141682	Microcystin RR	108	112	P/P	40 - 140
2141682	Microcystin WR	113	115	P/P	40 - 140
2141682	Microcystin YR	109	111	P/P	40 - 140

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P375867

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141725	Ammonia-N	1.42	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P375949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2143904	Kjeldahl Nitrogen	2.28	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P376147

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142207	NO2NO3-N	0.511	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P375703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142103	Total-P	2.29	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P375639

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2142109	O-Phosphate-P	0.650	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P375585

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2141682	Anatoxin-a	5.49	Spike	P	0 - 30
2141682	Cylindrospermopsin	4.30	Spike	P	0 - 30
2141682	Desmethyl microcystin LR	3.39	Spike	P	0 - 30
2141682	Microcystin LA	6.45	Spike	P	0 - 30
2141682	Microcystin LF	12.1	Spike	P	0 - 30
2141682	Microcystin LR	0.445	Spike	P	0 - 30
2141682	Microcystin LW	3.63	Spike	P	0 - 30
2141682	Microcystin LY	4.58	Spike	P	0 - 30
2141682	Microcystin RR	3.50	Spike	P	0 - 30
2141682	Microcystin WR	1.55	Spike	P	0 - 30
2141682	Microcystin YR	1.29	Spike	P	0 - 30

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

Quality Assurance Report Surrogates

Lab Sample ID: 2142206
Field Sample ID: SDHAB-121019-001

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Carbamazepine-d10	127	P	30 - 165

Quality Assurance Report Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A96266

Included Lab Sample IDs: 2142208

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.9	95.9	P/P	90 - 110

Reference Method: EPA 8321B

Run ID: A96289

Included Lab Sample IDs: 2142206

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	87.0	87.7	P/P	50 - 160
Cylindrospermopsin	97.4	94.4	P/P	60 - 160
Desmethyl microcystin LR	129	126	P/P	50 - 160
Microcystin LA	119	118	P/P	50 - 160
Microcystin LF	121	115	P/P	60 - 160
Microcystin LR	123	114	P/P	60 - 160
Microcystin LW	115	103	P/P	50 - 160
Microcystin LY	111	111	P/P	60 - 160
Microcystin RR	112	106	P/P	60 - 160
Microcystin WR	110	117	P/P	60 - 160
Microcystin YR	101	98.2	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A96319

Included Lab Sample IDs: 2142207

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A96351

Included Lab Sample IDs: 2142207

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

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A96455

Included Lab Sample IDs: 2142207

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.8	101	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A96466

Included Lab Sample IDs: 2142207

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	102	101	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	98.7	103	105			1.42
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	104	101	104			2.28
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	100	98.1	97.6			0.511
EPA 365.1 Rev. 2.0	Total-P	106	103	105			2.29
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	96.3	97.1			0.650
EPA 8321B	Anatoxin-a	112	93.1	98.4			5.49
	Cylindrospermopsin	106	72.2	75.4			4.30
	Desmethyl microcystin LR	141	138	134			3.39
	Microcystin LA	130	111	119			6.45
	Microcystin LF	133	104	118			12.1
	Microcystin LR	134	131	131			0.445
	Microcystin LW	123	98.6	102			3.63
	Microcystin LY	128	107	112			4.58
	Microcystin RR	121	108	112			3.50
	Microcystin WR	122	113	115			1.55
	Microcystin YR	122	109	111			1.29

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2142207
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2142207
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2142207
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2142207
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2142208
EPA 8321B / E31780	Microcystins in water matrices by HPLC/MS/MS	2142206

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	12/11/2019			12/13/2019 12:24	Ping Hua	2142207
EPA 351.2 Rev. 2.0	12/11/2019	12/17/2019 12:25	Sima Feizi	12/18/2019 16:16	Jhamieka S. Greenwood	2142207
EPA 353.2 Rev. 2.0	12/11/2019			12/19/2019 09:25	Beverly Y. Sanders	2142207
EPA 365.1 Rev. 2.0	12/11/2019	12/12/2019 10:19	Yen Ta	12/13/2019 13:40	Benjamin T. Nordmann	2142207
EPA 365.1 Rev. 2.0 dissolved	12/11/2019			12/11/2019 13:49	Samantha Davila	2142208
EPA 8321B	12/11/2019	12/12/2019 09:00	Juyoung Kim	12/12/2019 12:44	Juyoung Kim	2142206