Chemical Analysis Report

WQAP-2021-02-03-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - CEROC**
Request ID: **RQ-2021-02-01-68**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
FL Dept. of Environmental Protection
3319 Maguire Blvd Ste 232
Orlando, FL 32803
Attn: Natalie Ayala

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: Colin Wright, Program Administrator

Date Certified: 23-FEB-2021 09:44

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 Highland @ Northern Shore **Collection Date/Time: 02/02/2021 10:19**

Field ID: HABCE0066_LakeHighland1 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2223000	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P393349	
		Cylindrospermopsin	0.25	U	ug/L	P393349	
		Desmethyl microcystin LR	0.25	U	ug/L	P393349	
		Microcystin HilR**	0.25	U	ug/L	P393349	
		Microcystin HtyR**	0.25	U	ug/L	P393349	
		Microcystin LA	0.25	U	ug/L	P393349	
		Microcystin LF	0.25	U	ug/L	P393349	
		Microcystin LR	0.25	U	ug/L	P393349	
		Microcystin LW	0.25	U	ug/L	P393349	
		Microcystin LY	0.25	U	ug/L	P393349	
		Microcystin RR	0.25	U	ug/L	P393349	
		Microcystin WR	0.50	U	ug/L	P393349	
		Microcystin YR	0.25	U	ug/L	P393349	
2223004	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P393517	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.48		mg N/L	P393595	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P393365	
	EPA 365.1 Rev. 2.0	Total-P	0.026		mg P/L	P393399	
2223008	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P393328	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Formosa @ Asher Lane **Collection Date/Time: 02/02/2021 10:40**

Field ID: HABCE0055_LakeFormosa Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2223001	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P393349	
		Cylindrospermopsin	0.25	U	ug/L	P393349	
		Desmethyl microcystin LR	0.25	U	ug/L	P393349	
		Microcystin HilR**	0.25	U	ug/L	P393349	
		Microcystin HtyR**	0.25	U	ug/L	P393349	
		Microcystin LA	0.25	U	ug/L	P393349	
		Microcystin LF	0.25	U	ug/L	P393349	
		Microcystin LR	0.25	U	ug/L	P393349	
		Microcystin LW	0.25	U	ug/L	P393349	
		Microcystin LY	0.25	U	ug/L	P393349	
		Microcystin RR	0.25	U	ug/L	P393349	
		Microcystin WR	0.50	U	ug/L	P393349	
		Microcystin YR	0.25	U	ug/L	P393349	
2223005	EPA 350.1 Rev. 2.0	Ammonia-N	0.12		mg N/L	P393630	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.82		mg N/L	P393595	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.067		mg N/L	P393365	
	EPA 365.1 Rev. 2.0	Total-P	0.052		mg P/L	P393399	
2223009	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P393328	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Estelle near OMA **Collection Date/Time: 02/02/2021 11:06**

Field ID: HABCE0058_LakeEstelle Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2223002	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P393349	
		Cylindrospermopsin	0.25	U	ug/L	P393349	
		Desmethyl microcystin LR	0.25	U	ug/L	P393349	
		Microcystin HilR**	0.25	U	ug/L	P393349	
		Microcystin HtyR**	0.25	U	ug/L	P393349	
		Microcystin LA	0.25	U	ug/L	P393349	
		Microcystin LF	0.25	U	ug/L	P393349	
		Microcystin LR	0.25	U	ug/L	P393349	
		Microcystin LW	0.25	U	ug/L	P393349	
		Microcystin LY	0.25	U	ug/L	P393349	
		Microcystin RR	0.25	U	ug/L	P393349	
		Microcystin WR	0.50	U	ug/L	P393349	
		Microcystin YR	0.25	U	ug/L	P393349	
2223006	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P393630	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.78		mg N/L	P393595	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P393365	
	EPA 365.1 Rev. 2.0	Total-P	0.048		mg P/L	P393399	
2223010	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P393328	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: Lake Rowena near lift station **Collection Date/Time: 02/02/2021 11:33**

Field ID: HABCE0067_LakeRowena1 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2223003	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P393349	
		Cylindrospermopsin	0.25	U	ug/L	P393349	
		Desmethyl microcystin LR	0.25	U	ug/L	P393349	
		Microcystin HilR**	0.25	U	ug/L	P393349	
		Microcystin HtyR**	0.25	U	ug/L	P393349	
		Microcystin LA	0.25	U	ug/L	P393349	
		Microcystin LF	0.25	U	ug/L	P393349	
		Microcystin LR	0.25	U	ug/L	P393349	
		Microcystin LW	0.25	U	ug/L	P393349	
		Microcystin LY	0.25	U	ug/L	P393349	
		Microcystin RR	0.25	U	ug/L	P393349	
		Microcystin WR	0.50	U	ug/L	P393349	
		Microcystin YR	0.25	U	ug/L	P393349	
2223007	EPA 350.1 Rev. 2.0	Ammonia-N	0.021		mg N/L	P393630	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.81		mg N/L	P393595	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P393365	
	EPA 365.1 Rev. 2.0	Total-P	0.044		mg P/L	P393436	
2223011	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P393328	

Ref. Method and Comment:
EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393517

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393630

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393595

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393365

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393399

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393436

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P393328

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

Reference Method: EPA 8321B
Batch ID: P393349

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 HilR	0.25	U	ug/L
Microcystin HtyR	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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P393349

Component	Result	Code	Units
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	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: P393517

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393630

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393595

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: P393365

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393399

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393436

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: P393328

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	98.6		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P393349

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	119		P	40 - 150
Cylindrospermopsin	113		P	40 - 150
Desmethyl microcystin LR	114		P	40 - 150
Microcystin HilR	107		P	40 - 150
Microcystin HtyR	98.7		P	40 - 150
Microcystin LA	126		P	40 - 150
Microcystin LF	115		P	40 - 150
Microcystin LR	120		P	40 - 150
Microcystin LW	108		P	40 - 150
Microcystin LY	122		P	40 - 150

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P393349

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Microcystin RR	120		P	40 - 150
Microcystin WR	120		P	40 - 150
Microcystin YR	117		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393517

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2223004	Ammonia-N	102	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393630

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2223024	Ammonia-N	99.2	100	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393365

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2222911	NO2NO3-N	98.0	98.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393399

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2223004	Total-P	104	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393436

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2223007	Total-P	106	105	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P393328

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2223008	O-Phosphate-P	100	100	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P393349

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2223000	Anatoxin-a	109	116	P/P	40 - 150
2223000	Cylindrospermopsin	109	112	P/P	40 - 150
2223000	Desmethyl microcystin LR	106	112	P/P	40 - 150
2223000	Microcystin HilR	108	111	P/P	40 - 150
2223000	Microcystin HtyR	105	107	P/P	40 - 150
2223000	Microcystin LA	113	111	P/P	40 - 150
2223000	Microcystin LF	108	102	P/P	40 - 150
2223000	Microcystin LR	111	112	P/P	40 - 150
2223000	Microcystin LW	107	114	P/P	40 - 150
2223000	Microcystin LY	103	114	P/P	40 - 150
2223000	Microcystin RR	117	113	P/P	40 - 150
2223000	Microcystin WR	110	103	P/P	40 - 150
2223000	Microcystin YR	112	117	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393517

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2223004	Ammonia-N	0.883	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P393630

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2223024	Ammonia-N	0.782	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P393595

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2222707	Kjeldahl Nitrogen	0.616	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P393365

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2222911	NO2NO3-N	0.509	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393399

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2223004	Total-P	1.28	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P393436

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2223007	Total-P	0.708	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P393328

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2223008	O-Phosphate-P	0.0999	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P393349

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2223000	Anatoxin-a	6.53	Spike	P	0 - 30
2223000	Cylindrospermopsin	3.44	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P393349

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2223000	Desmethyl microcystin LR	5.53	Spike	P	0 - 30
2223000	Microcystin HilR	2.30	Spike	P	0 - 30
2223000	Microcystin HtyR	1.40	Spike	P	0 - 30
2223000	Microcystin LA	1.91	Spike	P	0 - 30
2223000	Microcystin LF	6.26	Spike	P	0 - 30
2223000	Microcystin LR	1.70	Spike	P	0 - 30
2223000	Microcystin LW	6.15	Spike	P	0 - 30
2223000	Microcystin LY	9.88	Spike	P	0 - 30
2223000	Microcystin RR	2.67	Spike	P	0 - 30
2223000	Microcystin WR	6.25	Spike	P	0 - 30
2223000	Microcystin YR	4.53	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2223000
Field Sample ID: HABCE0066_LakeHighland1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	128	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	96.0	P	30 - 160

Lab Sample ID: 2223001
Field Sample ID: HABCE0055_LakeFormosa

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	118	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	93.0	P	30 - 160

Lab Sample ID: 2223002
Field Sample ID: HABCE0058_LakeEstelle

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	118	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	94.6	P	30 - 160

Lab Sample ID: 2223003
Field Sample ID: HABCE0067_LakeRowena1

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	107	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	81.1	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A103394
Included Lab Sample IDs: 2223008, 2223009, 2223010, 2223011

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	99.0	99.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A103410
Included Lab Sample IDs: 2223004, 2223005, 2223006, 2223007

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	99.5	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A103415
Included Lab Sample IDs: 2223000, 2223001, 2223002, 2223003

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	103	103	P/P	50 - 160
Cylindrospermopsin	89.6	95.5	P/P	60 - 160
Desmethyl microcystin LR	103	101	P/P	60 - 160
Microcystin HilR	101	98.8	P/P	60 - 160
Microcystin HtyR	101	92.3	P/P	60 - 160
Microcystin LA	123	87.2	P/P	50 - 160
Microcystin LF	120	90.0	P/P	60 - 160
Microcystin LR	102	104	P/P	60 - 160
Microcystin LW	100	95.8	P/P	60 - 160
Microcystin LY	122	83.2	P/P	60 - 160
Microcystin RR	105	101	P/P	60 - 160
Microcystin WR	92.5	95.3	P/P	60 - 160
Microcystin YR	104	92.3	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A103458
Included Lab Sample IDs: 2223005

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.1	96.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A103475
Included Lab Sample IDs: 2223004, 2223006

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	101	P/P	90 - 110
Total-P	99.2	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A103478
Included Lab Sample IDs: 2223004

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	101	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A103495
Included Lab Sample IDs: 2223007

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.5	97.5	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A103528
Included Lab Sample IDs: 2223005, 2223006, 2223007

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: A103537
Included Lab Sample IDs: 2223004, 2223005, 2223006, 2223007

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	102	103	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	102	102	104			0.883
	Ammonia-N	101	99.2	100			0.782
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103					0.616
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	98.0	98.5			0.509
EPA 365.1 Rev. 2.0	Total-P	104	104	103			1.28
	Total-P	104	106	105			0.708
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	98.6	100	100			0.0999
EPA 8321B	Anatoxin-a	119	109	116			6.53
	Cylindrospermopsin	113	109	112			3.44
	Desmethyl microcystin LR	114	106	112			5.53
	Microcystin HilR	107	108	111			2.30
	Microcystin HtyR	98.7	105	107			1.40
	Microcystin LA	126	113	111			1.91
	Microcystin LF	115	108	102			6.26
	Microcystin LR	120	111	112			1.70
	Microcystin LW	108	107	114			6.15
	Microcystin LY	122	103	114			9.88
	Microcystin RR	120	117	113			2.67
	Microcystin WR	120	110	103			6.25
	Microcystin YR	117	112	117			4.53

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2223004, 2223005, 2223006, 2223007
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2223004, 2223005, 2223006, 2223007
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2223004, 2223005, 2223006, 2223007
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2223004, 2223005, 2223006, 2223007
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2223008, 2223009, 2223010, 2223011
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2223000, 2223001, 2223002, 2223003

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	02/03/2021			02/08/2021 19:05	Ping Hua	2223004
	02/03/2021			02/10/2021 16:55	Ping Hua	2223005
	02/03/2021			02/10/2021 16:57	Ping Hua	2223006
	02/03/2021			02/10/2021 16:58	Ping Hua	2223007
EPA 351.2 Rev. 2.0	02/03/2021	02/10/2021 12:24	Yen Ta	02/11/2021 10:37	Julia Storbeck	2223004
	02/03/2021	02/10/2021 12:24	Yen Ta	02/11/2021 10:38	Julia Storbeck	2223005
	02/03/2021	02/10/2021 12:24	Yen Ta	02/11/2021 10:40	Julia Storbeck	2223006
	02/03/2021	02/10/2021 12:24	Yen Ta	02/11/2021 10:41	Julia Storbeck	2223007
EPA 353.2 Rev. 2.0	02/03/2021			02/04/2021 09:39	Beverly Y. Sanders	2223004
	02/03/2021			02/04/2021 09:41	Beverly Y. Sanders	2223005
	02/03/2021			02/04/2021 09:42	Beverly Y. Sanders	2223006
	02/03/2021			02/04/2021 09:43	Beverly Y. Sanders	2223007
EPA 365.1 Rev. 2.0	02/03/2021	02/04/2021 17:06	Madeline Gruver	02/05/2021 17:01	Shengyu Wang	2223005
	02/03/2021	02/04/2021 17:06	Madeline Gruver	02/08/2021 14:11	Shengyu Wang	2223004
	02/03/2021	02/04/2021 17:06	Madeline Gruver	02/08/2021 14:19	Shengyu Wang	2223006
	02/03/2021	02/05/2021 14:15	Lipi Saha	02/09/2021 15:57	Shengyu Wang	2223007
EPA 365.1 Rev. 2.0 dissolved	02/03/2021			02/03/2021 15:37	Virginia P. Brown	2223008
	02/03/2021			02/03/2021 15:40	Virginia P. Brown	2223009
	02/03/2021			02/03/2021 15:41	Virginia P. Brown	2223010
	02/03/2021			02/03/2021 15:42	Virginia P. Brown	2223011
EPA 8321B	02/03/2021	02/04/2021 08:00	Pramila Ghimire	02/04/2021 10:31	Juyoung Kim	2223000
	02/03/2021	02/04/2021 08:00	Pramila Ghimire	02/04/2021 10:48	Juyoung Kim	2223001
	02/03/2021	02/04/2021 08:00	Pramila Ghimire	02/04/2021 11:04	Juyoung Kim	2223002
	02/03/2021	02/04/2021 08:00	Pramila Ghimire	02/04/2021 11:21	Juyoung Kim	2223003