Chemical Analysis Report

WQAP-2022-07-13-02

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

Event Description: **Algal Bloom Response- NEROC**
Request ID: **RQ-2022-07-18-44**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Jacksonville, FL 32256
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Certified by: Thekkekalathil Chandrasekhar, Environmental Consultant Date Certified: 28-JUL-2022 11:29

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: Violet Lake @ 130 Violet Cir **Collection Date/Time: 07/12/2022 14:25**

Field ID: NEHAB0087 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2341004	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416466	
		Cylindrospermopsin	0.25	I	ug/L	P416465	
		Desmethyl microcystin LR	0.25	U	ug/L	P416465	
		Microcystin HilR	0.25	U	ug/L	P416465	
		Microcystin HtyR	0.25	U	ug/L	P416465	
		Microcystin LA	0.10	U	ug/L	P416465	
		Microcystin LF	0.10	U	ug/L	P416465	
		Microcystin LR	0.25	U	ug/L	P416465	
		Microcystin LW	0.25	U	ug/L	P416465	
		Microcystin LY	0.10	U	ug/L	P416465	
		Microcystin RR	0.10	U	ug/L	P416465	
		Microcystin WR	0.50	U	ug/L	P416465	
		Neosaxitoxin	0.50	U	ug/L	P416466	
		Microcystin YR	0.25	U	ug/L	P416465	
		Saxitoxin	0.50	U	ug/L	P416466	
		Nodularin-R	0.10	U	ug/L	P416465	
2341010	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	I	mg N/L	P416784	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.39		mg N/L	P416987	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P416768	
	EPA 365.1 Rev. 2.0	Total-P	0.009		mg P/L	P416804	
2341015	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P416640	

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: 183rd Ave Canal off Cross Creek **Collection Date/Time: 07/12/2022 11:15**

Field ID: NEHAB0076 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2341005	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416466	
		Cylindrospermopsin	0.10	U	ug/L	P416465	
		Desmethyl microcystin LR	0.25	U	ug/L	P416465	
		Microcystin HilR	0.25	U	ug/L	P416465	
		Microcystin HtyR	0.25	U	ug/L	P416465	
		Microcystin LA	0.10	U	ug/L	P416465	
		Microcystin LF	0.10	U	ug/L	P416465	
		Microcystin LR	0.25	U	ug/L	P416465	
		Microcystin LW	0.25	U	ug/L	P416465	
		Microcystin LY	0.10	U	ug/L	P416465	
		Microcystin RR	0.10	U	ug/L	P416465	
		Microcystin WR	0.50	U	ug/L	P416465	
		Neosaxitoxin	0.50	U	ug/L	P416466	
		Microcystin YR	0.25	U	ug/L	P416465	
		Saxitoxin	0.50	U	ug/L	P416466	
		Nodularin-R	0.10	U	ug/L	P416465	
2341011	EPA 350.1 Rev. 2.0	Ammonia-N	0.13		mg N/L	P416784	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P416776	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.01	I	mg N/L	P416768	
	EPA 365.1 Rev. 2.0	Total-P	0.19		mg P/L	P416804	
2341016	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.10		mg P/L	P416640	

Sample Location: Lochloosa Lake entrance to Cross Creek **Collection Date/Time: 07/12/2022 11:50**

Field ID: NEHAB0079 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2341006	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416466	
		Cylindrospermopsin	0.10	U	ug/L	P416465	
		Desmethyl microcystin LR	0.25	U	ug/L	P416465	
		Microcystin HilR	0.25	U	ug/L	P416465	
		Microcystin HtyR	0.25	U	ug/L	P416465	
		Microcystin LA	0.10	U	ug/L	P416465	
		Microcystin LF	0.10	U	ug/L	P416465	
		Microcystin LR	0.67	I	ug/L	P416465	
		Microcystin LW	0.25	U	ug/L	P416465	
		Microcystin LY	0.10	U	ug/L	P416465	
		Microcystin RR	0.83		ug/L	P416465	
		Microcystin WR	0.50	U	ug/L	P416465	
		Neosaxitoxin	0.50	U	ug/L	P416466	
		Microcystin YR	0.25	U	ug/L	P416465	
		Saxitoxin	0.50	U	ug/L	P416466	
		Nodularin-R	0.10	U	ug/L	P416465	
2341012	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P416784	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P416778	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P416768	
	EPA 365.1 Rev. 2.0	Total-P	0.099		mg P/L	P416597	
2341017	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.010		mg P/L	P416640	

Sample Location: Lochloosa Lake @ park **Collection Date/Time: 07/12/2022 12:30**

Field ID: NEHAB0082 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2341007	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416466	
		Cylindrospermopsin	0.10	U	ug/L	P416465	
		Desmethyl microcystin LR	0.25	U	ug/L	P416465	
		Microcystin HilR	0.25	U	ug/L	P416465	
		Microcystin HtyR	0.25	U	ug/L	P416465	
		Microcystin LA	0.10	U	ug/L	P416465	
		Microcystin LF	0.10	U	ug/L	P416465	
		Microcystin LR	0.56	I	ug/L	P416465	
		Microcystin LW	0.25	U	ug/L	P416465	
		Microcystin LY	0.10	U	ug/L	P416465	
		Microcystin RR	0.53		ug/L	P416465	
		Microcystin WR	0.50	U	ug/L	P416465	
		Neosaxitoxin	0.50	U	ug/L	P416466	
		Microcystin YR	0.25	U	ug/L	P416465	
		Saxitoxin	0.50	U	ug/L	P416466	
		Nodularin-R	0.10	U	ug/L	P416465	
2341013	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P416784	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.9		mg N/L	P416823	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P416768	
	EPA 365.1 Rev. 2.0	Total-P	0.059		mg P/L	P416804	
2341018	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P416640	

Sample Location: Lochloosa Lake NE in Veg **Collection Date/Time: 07/12/2022 12:15**

Field ID: NEHAB0083 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2341008	EPA 8321B	Anatoxin-a	0.25	U	ug/L	P416580	
		Cylindrospermopsin	0.10	U	ug/L	P416579	
		Desmethyl microcystin LR	0.25	U	ug/L	P416579	
		Microcystin HilR	0.25	U	ug/L	P416579	
		Microcystin HtyR	0.25	U	ug/L	P416579	
		Microcystin LA	0.10	U	ug/L	P416579	
		Microcystin LF	0.10	U	ug/L	P416579	
		Microcystin LR	0.56	I	ug/L	P416579	
		Microcystin LW	0.25	U	ug/L	P416579	
		Microcystin LY	0.10	U	ug/L	P416579	
		Microcystin RR	0.61		ug/L	P416579	
		Microcystin WR	0.50	U	ug/L	P416579	
		Neosaxitoxin	0.50	U	ug/L	P416580	
		Microcystin YR	0.25	U	ug/L	P416579	
		Saxitoxin	0.50	U	ug/L	P416580	
		Nodularin-R	0.10	U	ug/L	P416579	
2341014	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P416784	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.8		mg N/L	P416778	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P416768	
	EPA 365.1 Rev. 2.0	Total-P	0.082		mg P/L	P416804	
2341019	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P416640	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416784

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416776

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416778

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416823

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416987

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416768

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416597

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416804

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416640

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

Quality Assurance Report
Method Blank Results

Reference Method: EPA 8321B
Batch ID: P416465

Component	Result	Code	Units
Cylindrospermopsin	0.10	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	0.10	U	ug/L
Microcystin LF	0.10	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.10	U	ug/L
Microcystin RR	0.10	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.10	U	ug/L

Reference Method: EPA 8321B
Batch ID: P416466

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Reference Method: EPA 8321B
Batch ID: P416579

Component	Result	Code	Units
Cylindrospermopsin	0.10	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	0.10	U	ug/L
Microcystin LF	0.10	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.10	U	ug/L
Microcystin RR	0.10	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L
Nodularin-R	0.10	U	ug/L

Reference Method: EPA 8321B
Batch ID: P416580

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Neosaxitoxin	0.50	U	ug/L
Saxitoxin	0.50	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416784

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.6		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416776

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416778

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416823

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416987

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416768

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416597

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416804

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416640

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

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 8321B
Batch ID: P416465

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	98.6		P	40 - 150
Desmethyl microcystin LR	88.9		P	40 - 150
Microcystin HilR	87.6		P	40 - 150
Microcystin HtyR	99.0		P	40 - 150
Microcystin LA	105		P	40 - 150
Microcystin LF	101		P	40 - 150
Microcystin LR	82.6		P	40 - 150
Microcystin LW	107		P	40 - 150
Microcystin LY	94.2		P	40 - 150
Microcystin RR	87.1		P	40 - 150
Microcystin WR	93.4		P	40 - 150
Microcystin YR	103		P	40 - 150
Nodularin-R	86.4		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P416466

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	98.2		P	40 - 150
Neosaxitoxin	107		P	40 - 150
Saxitoxin	102		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P416579

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cylindrospermopsin	98.5		P	40 - 150
Desmethyl microcystin LR	86.9		P	40 - 150
Microcystin HilR	88.4		P	40 - 150
Microcystin HtyR	97.4		P	40 - 150
Microcystin LA	104		P	40 - 150
Microcystin LF	90.8		P	40 - 150
Microcystin LR	76.6		P	40 - 150
Microcystin LW	88.4		P	40 - 150
Microcystin LY	91.3		P	40 - 150
Microcystin RR	84.0		P	40 - 150
Microcystin WR	89.7		P	40 - 150
Microcystin YR	92.9		P	40 - 150
Nodularin-R	83.1		P	40 - 150

Reference Method: EPA 8321B
Batch ID: P416580

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	93.8		P	40 - 150
Neosaxitoxin	107		P	40 - 150
Saxitoxin	101		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416784

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2341010	Ammonia-N	95.2	95.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416776

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2341072	Kjeldahl Nitrogen	93.3	95.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416778

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2340690	Kjeldahl Nitrogen	99.2	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416823

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2341276	Kjeldahl Nitrogen	103	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416768

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2340896	NO2NO3-N	99.5	99.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416597

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2341012	Total-P	107	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416804

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2341013	Total-P	105	106	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416640

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2341015	O-Phosphate-P	96.0	100	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P416465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2340301	Cylindrospermopsin	91.7	95.0	P/P	40 - 150
2340301	Desmethyl microcystin LR	88.5	88.1	P/P	40 - 150
2340301	Microcystin HilR	88.2	89.3	P/P	40 - 150
2340301	Microcystin HtyR	94.5	94.8	P/P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 8321B
Batch ID: P416465

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2340301	Microcystin LA	99.8	104	P/P	40 - 150
2340301	Microcystin LF	96.8	90.2	P/P	40 - 150
2340301	Microcystin LR	78.7	81.5	P/P	40 - 150
2340301	Microcystin LW	90.6	89.9	P/P	40 - 150
2340301	Microcystin LY	92.1	90.1	P/P	40 - 150
2340301	Microcystin RR	86.8	84.7	P/P	40 - 150
2340301	Microcystin WR	86.5	84.7	P/P	40 - 150
2340301	Microcystin YR	97.6	101	P/P	40 - 150
2340301	Nodularin-R	87.7	86.0	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P416466

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2340301	Anatoxin-a	101	101	P/P	40 - 150
2340301	Neosaxitoxin	72.1	68.9	P/P	40 - 150
2340301	Saxitoxin	57.7	58.5	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P416579

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2341008	Cylindrospermopsin	103	102	P/P	40 - 150
2341008	Desmethyl microcystin LR	91.8	89.7	P/P	40 - 150
2341008	Microcystin HilR	90.0	88.7	P/P	40 - 150
2341008	Microcystin HtyR	93.8	91.5	P/P	40 - 150
2341008	Microcystin LA	98.5	97.6	P/P	40 - 150
2341008	Microcystin LF	87.3	92.8	P/P	40 - 150
2341008	Microcystin LR	81.8	80.8	P/P	40 - 150
2341008	Microcystin LW	85.1	90.5	P/P	40 - 150
2341008	Microcystin LY	92.6	91.0	P/P	40 - 150
2341008	Microcystin RR	83.8	81.4	P/P	40 - 150
2341008	Microcystin WR	87.6	88.7	P/P	40 - 150
2341008	Microcystin YR	95.6	94.9	P/P	40 - 150
2341008	Nodularin-R	84.9	82.9	P/P	40 - 150

Reference Method: EPA 8321B
Batch ID: P416580

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2341008	Anatoxin-a	106	108	P/P	40 - 150
2341008	Neosaxitoxin	74.8	76.5	P/P	40 - 150
2341008	Saxitoxin	71.7	71.6	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P416784

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2341010	Ammonia-N	0.399	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2341072	Kjeldahl Nitrogen	1.66	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416778

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2340690	Kjeldahl Nitrogen	1.47	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2341276	Kjeldahl Nitrogen	1.81	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P416987

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2341918	Kjeldahl Nitrogen	4.90	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P416768

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2340896	NO2NO3-N	0.504	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416597

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2341012	Total-P	0.954	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P416804

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2341013	Total-P	0.375	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P416640

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2341015	O-Phosphate-P	4.27	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P416465

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2340301	Cylindrospermopsin	3.63	Spike	P	0 - 30
2340301	Desmethyl microcystin LR	0.458	Spike	P	0 - 30
2340301	Microcystin HilR	1.26	Spike	P	0 - 30
2340301	Microcystin HtyR	0.232	Spike	P	0 - 30
2340301	Microcystin LA	4.27	Spike	P	0 - 30
2340301	Microcystin LF	7.11	Spike	P	0 - 30
2340301	Microcystin LR	3.51	Spike	P	0 - 30
2340301	Microcystin LW	0.768	Spike	P	0 - 30
2340301	Microcystin LY	2.22	Spike	P	0 - 30
2340301	Microcystin RR	2.43	Spike	P	0 - 30
2340301	Microcystin WR	2.03	Spike	P	0 - 30
2340301	Microcystin YR	3.49	Spike	P	0 - 30
2340301	Nodularin-R	1.99	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P416466

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2340301	Anatoxin-a	0.245	Spike	P	0 - 30
2340301	Neosaxitoxin	4.50	Spike	P	0 - 30
2340301	Saxitoxin	1.44	Spike	P	0 - 30

Reference Method: EPA 8321B
Batch ID: P416579

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2341008	Cylindrospermopsin	0.988	Spike	P	0 - 30
2341008	Desmethyl microcystin LR	2.38	Spike	P	0 - 30
2341008	Microcystin HilR	1.44	Spike	P	0 - 30
2341008	Microcystin HtyR	2.53	Spike	P	0 - 30
2341008	Microcystin LA	0.929	Spike	P	0 - 30
2341008	Microcystin LF	6.06	Spike	P	0 - 30
2341008	Microcystin LR	1.21	Spike	P	0 - 30
2341008	Microcystin LW	6.08	Spike	P	0 - 30
2341008	Microcystin LY	1.72	Spike	P	0 - 30
2341008	Microcystin RR	2.69	Spike	P	0 - 30
2341008	Microcystin WR	1.31	Spike	P	0 - 30
2341008	Microcystin YR	0.697	Spike	P	0 - 30
2341008	Nodularin-R	2.31	Spike	P	0 - 30

Quality Assurance Report
Precision

Reference Method: EPA 8321B
Batch ID: P416580

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2341008	Anatoxin-a	1.42	Spike	P	0 - 30
2341008	Neosaxitoxin	2.22	Spike	P	0 - 30
2341008	Saxitoxin	0.153	Spike	P	0 - 30

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

Quality Assurance Report
Surrogates

Lab Sample ID: 2341004
Field Sample ID: NEHAB0087

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	71.3	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	100	P	30 - 160

Lab Sample ID: 2341005
Field Sample ID: NEHAB0076

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	72.7	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	89.0	P	30 - 160

Lab Sample ID: 2341006
Field Sample ID: NEHAB0079

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	83.2	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	87.2	P	30 - 160

Lab Sample ID: 2341007
Field Sample ID: NEHAB0082

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	82.3	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	81.6	P	30 - 160

Lab Sample ID: 2341008
Field Sample ID: NEHAB0083

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR ethyl-d5	99.8	P	30 - 160
EPA 8321B	Neosaxitoxin-15N7	91.3	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A113495
Included Lab Sample IDs: 2341015, 2341016, 2341017, 2341018, 2341019

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	96.6	93.0	P/P	90 - 110
O-Phosphate-P	98.8	96.6	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A113512
Included Lab Sample IDs: 2341004, 2341005, 2341006, 2341007, 2341008

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	90.4	90.9	P/P	50 - 160
Neosaxitoxin	101	104	P/P	50 - 160
Saxitoxin	97.9	97.2	P/P	50 - 160

Reference Method: EPA 8321B
Run ID: A113513
Included Lab Sample IDs: 2341004, 2341005, 2341006, 2341007, 2341008

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Cylindrospermopsin	97.8	96.8	P/P	60 - 160
Desmethyl microcystin LR	68.8	79.4	P/P	60 - 160
Microcystin HilR	72.7	82.5	P/P	60 - 160
Microcystin HtyR	80.8	88.9	P/P	60 - 160
Microcystin LA	89.6	97.3	P/P	50 - 160
Microcystin LF	62.1	66.4	P/P	60 - 160
Microcystin LR	63.2	71.1	P/P	60 - 160
Microcystin LW	75.3	79.3	P/P	60 - 160
Microcystin LY	76.7	87.8	P/P	60 - 160
Microcystin RR	75.1	76.1	P/P	60 - 160
Microcystin WR	81.2	86.3	P/P	60 - 160
Microcystin YR	80.7	91.6	P/P	60 - 160
Nodularin-R	72.7	74.6	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A113529
Included Lab Sample IDs: 2341012

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

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A113558
Included Lab Sample IDs: 2341010, 2341011, 2341012, 2341013, 2341014

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

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A113563
Included Lab Sample IDs: 2341010, 2341011, 2341012, 2341013, 2341014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.2	99.8	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A113606
Included Lab Sample IDs: 2341011, 2341013, 2341014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	97.2	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113613
Included Lab Sample IDs: 2341011

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.4	92.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A113617
Included Lab Sample IDs: 2341010

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113630
Included Lab Sample IDs: 2341012, 2341014

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	95.0	97.7	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113648
Included Lab Sample IDs: 2341013

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A113704
Included Lab Sample IDs: 2341010

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	96.6	96.9	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	96.6	95.2	95.6			0.399
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	100	93.3	95.9			1.66
	Kjeldahl Nitrogen	103	99.2	101			1.47
	Kjeldahl Nitrogen	99.7	103	105			1.81
	Kjeldahl Nitrogen	102					4.90
EPA 353.2 Rev. 2.0	NO2NO3-N	98.5	99.5	99.0			0.504
EPA 365.1 Rev. 2.0	Total-P	100	107	106			0.954
	Total-P	101	105	106			0.375
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	96.0	100			4.27
EPA 8321B	Anatoxin-a	98.2	101	101			0.245
	Anatoxin-a	93.8	106	108			1.42
	Cylindrospermopsin	98.6	91.7	95.0			3.63
	Cylindrospermopsin	98.5	103	102			0.988
	Desmethyl microcystin LR	88.9	88.5	88.1			0.458
	Desmethyl microcystin LR	86.9	91.8	89.7			2.38
	Microcystin HilR	87.6	88.2	89.3			1.26
	Microcystin HilR	88.4	90.0	88.7			1.44
	Microcystin HtyR	99.0	94.5	94.8			0.232
	Microcystin HtyR	97.4	93.8	91.5			2.53
	Microcystin LA	105	99.8	104			4.27
	Microcystin LA	104	98.5	97.6			0.929
	Microcystin LF	101	96.8	90.2			7.11
	Microcystin LF	90.8	87.3	92.8			6.06
	Microcystin LR	82.6	78.7	81.5			3.51
	Microcystin LR	76.6	81.8	80.8			1.21
	Microcystin LW	107	90.6	89.9			0.768
	Microcystin LW	88.4	85.1	90.5			6.08
	Microcystin LY	94.2	92.1	90.1			2.22
	Microcystin LY	91.3	92.6	91.0			1.72
	Microcystin RR	87.1	86.8	84.7			2.43
	Microcystin RR	84.0	83.8	81.4			2.69
	Microcystin WR	93.4	86.5	84.7			2.03
	Microcystin WR	89.7	87.6	88.7			1.31
	Microcystin YR	103	97.6	101			3.49
	Microcystin YR	92.9	95.6	94.9			0.697
	Neosaxitoxin	107	72.1	68.9			4.50
	Neosaxitoxin	107	74.8	76.5			2.22
	Nodularin-R	86.4	87.7	86.0			1.99
	Nodularin-R	83.1	84.9	82.9			2.31
	Saxitoxin	102	57.7	58.5			1.44
	Saxitoxin	101	71.7	71.6			0.153

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2341010, 2341011, 2341012, 2341013, 2341014
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2341010, 2341011, 2341012, 2341013, 2341014
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2341010, 2341011, 2341012, 2341013, 2341014
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2341010, 2341011, 2341012, 2341013, 2341014

Reference Method Descriptions

Method	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2341015, 2341016, 2341017, 2341018, 2341019
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2341004, 2341005, 2341006, 2341007, 2341008
EPA 8321B	Saxitoxin in water matrices by HPLC/MS/MS	2341004, 2341005, 2341006, 2341007, 2341008

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	07/13/2022			07/18/2022 11:27	Ping Hua	2341010
	07/13/2022			07/18/2022 11:31	Ping Hua	2341011
	07/13/2022			07/18/2022 11:33	Ping Hua	2341012
	07/13/2022			07/18/2022 11:34	Ping Hua	2341013
	07/13/2022			07/18/2022 11:35	Ping Hua	2341014
EPA 351.2 Rev. 2.0	07/13/2022	07/19/2022 11:11	Samantha L Bates	07/20/2022 12:46	Alexandra J Mattheus	2341011
	07/13/2022	07/19/2022 11:11	Samantha L Bates	07/20/2022 16:42	Alexandra J Mattheus	2341012
	07/13/2022	07/19/2022 11:11	Samantha L Bates	07/20/2022 16:44	Alexandra J Mattheus	2341014
	07/13/2022	07/20/2022 11:06	Samantha L Bates	07/21/2022 11:53	Alexandra J Mattheus	2341013
	07/13/2022	07/25/2022 12:53	Simonne.V. Calhoun	07/26/2022 11:03	Samantha L Bates	2341010
EPA 353.2 Rev. 2.0	07/13/2022			07/18/2022 09:47	Beverly Y. Sanders	2341010
	07/13/2022			07/18/2022 09:48	Beverly Y. Sanders	2341011
	07/13/2022			07/18/2022 09:49	Beverly Y. Sanders	2341012
	07/13/2022			07/18/2022 09:50	Beverly Y. Sanders	2341013
	07/13/2022			07/18/2022 09:51	Beverly Y. Sanders	2341014
EPA 365.1 Rev. 2.0	07/13/2022	07/14/2022 13:10	Simonne.V. Calhoun	07/15/2022 10:32	James L Waggerby	2341012
	07/13/2022	07/19/2022 16:00	Adam P Silver	07/20/2022 09:57	James L Waggerby	2341013
	07/13/2022	07/19/2022 16:00	Adam P Silver	07/20/2022 10:03	James L Waggerby	2341011
	07/13/2022	07/19/2022 16:00	Adam P Silver	07/20/2022 10:04	James L Waggerby	2341014
	07/13/2022	07/19/2022 16:00	Adam P Silver	07/20/2022 14:28	James L Waggerby	2341010
EPA 365.1 Rev. 2.0 dissolved	07/13/2022			07/14/2022 08:41	Chandler E Cox	2341015
	07/13/2022			07/14/2022 08:46	Chandler E Cox	2341016
	07/13/2022			07/14/2022 08:47	Chandler E Cox	2341017
	07/13/2022			07/14/2022 08:52	Chandler E Cox	2341018
	07/13/2022			07/14/2022 08:53	Chandler E Cox	2341019
EPA 8321B	07/13/2022	07/14/2022 09:00	Manjita Shrestha	07/14/2022 15:42	Manjita Shrestha	2341004
	07/13/2022	07/14/2022 09:00	Manjita Shrestha	07/14/2022 15:56	Manjita Shrestha	2341005
	07/13/2022	07/14/2022 09:00	Manjita Shrestha	07/14/2022 16:10	Manjita Shrestha	2341006
	07/13/2022	07/14/2022 09:00	Manjita Shrestha	07/14/2022 16:24	Manjita Shrestha	2341007
	07/13/2022	07/14/2022 09:00	Umesh Chiluwal	07/14/2022 17:04	Umesh Chiluwal	2341004
	07/13/2022	07/14/2022 09:00	Umesh Chiluwal	07/14/2022 17:21	Umesh Chiluwal	2341005
	07/13/2022	07/14/2022 09:00	Umesh Chiluwal	07/14/2022 17:38	Umesh Chiluwal	2341006
	07/13/2022	07/14/2022 09:00	Umesh Chiluwal	07/14/2022 17:55	Umesh Chiluwal	2341007
	07/13/2022	07/14/2022 12:00	Manjita Shrestha	07/14/2022 17:33	Manjita Shrestha	2341008
	07/13/2022	07/14/2022 12:00	Umesh Chiluwal	07/14/2022 19:20	Umesh Chiluwal	2341008