

**Memorandum**

**To:** Ms. Colleen Conover, Lake Hopatcong Commission  
**From:** Michael Hartshorne, Princeton Hydro  
**CC:** Fred Lubnow, Ph.D., Princeton Hydro  
**RE:** 14 August 2018 – Cyanotoxin Testing – Lake Hopatcong  
**Date:** 28 August 2018  
**Pages:** 6

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Princeton Hydro conducted the final cyanobacteria / cyanotoxin testing events at Lake Hopatcong on 14 August 2018. The data collected as part of this effort are provided below.

*Methodology*

Princeton Hydro sampled at ten stations on 14 August 2018. At each station, plankton grab samples were collected, preserved with Lugol's and the plankton community identified to genus by Princeton Hydro. In addition, at each site, samples were collected in glass vials and analyzed the same day for the cyanotoxins Microcystin and Cylindrospermopsin utilizing ELISA based test kits from Abraxis. In addition, *in-situ* monitoring at each station was conducted utilizing a Hach MS5 water quality meter which was calibrated prior to use. The locations of the sampling stations are depicted in Figure 1.

## Results

The results of the sampling effort are listed in the following tables (Tables 2 through 5).

**Table 2: Cyanotoxin Data**

Cyanotoxin Results - 14 August 2018		
Station	Microcystin	Cylindrospermopsin
B1	Negative	Negative
B2	Negative	< 0.5 ppb
B3	Negative	< 0.5 ppb
B4	Negative	Negative
B5	Negative	Negative
B6	Negative	Negative
B7	< 1 ppb	Negative
B8	Negative	Negative
B9	Negative	Negative
B10	Negative	Negative
Draft EPA Criteria for Recreation	4 ppb	8 ppb

**Table 3: *In-situ* Data**

Lake Hopatcong - 14 August 2018 - Cyanotoxin Monitoring - <i>In-situ</i> Data							
Station	Secchi (m)	Temp (°C)	SpC (mS/cm)	DO (mg/L)	DO% (%)	pH (units)	Notes
B1	1.0	25.72	0.431	6.77	83.1	8.07	light brown tint, SAV: vallisneria, coontail, slender naiad, robbins' pondweed
B2	1.2	25.87	0.409	7.57	93.1	7.48	Clear water, SAV: slender naiad, coontail, elodea, vallisneria, nitella, Eurasian watermilfoil
B3	1.2	24.97	0.844	8.93	108.2	7.58	Dense mat algae, some benthic algae and Eurasian watermilfoil
B4	1.1	24.60	0.872	10.30	124.0	7.80	Scattered mat algae
B5	1.3	26.62	0.518	9.28	115.8	8.17	Clear, SAV: slender naiad, vallisneria, Eurasian watermilfoil, coontail
B6	N/A	26.22	0.526	7.51	93.0	8.04	Clear
B7	N/A	26.27	0.526	7.44	92.2	7.92	Clear
B8	2.0	26.33	0.516	9.12	113.2	8.06	Clear
B9	0.8	23.59	0.215	5.36	63.2	7.68	Brown tint, Benthic algae
B10	1.3	25.09	0.389	7.74	93.9	7.85	Brown tint, SAV: slender naiad, Eurasian watermilfoil, elodea, coontail, vallisneria



**Table 5: Plankton Data (2 of 2)**

<b>Phytoplankton and Zooplankton Community Composition Analysis (2 of 2)</b>																	
<b>Sampling Location: Lake Hopatcong</b>						<b>Sampling Date: 8/14/18</b>						<b>Examination Date: 8/23/18</b>					
<b>Phytoplankton (cells/mL)</b>																	
<b>Bacillariophyta</b>	<b>B6</b>	<b>B7</b>	<b>B8</b>	<b>B9</b>	<b>B10</b>	<b>Chlorophyta</b>	<b>B6</b>	<b>B7</b>	<b>B8</b>	<b>B9</b>	<b>B10</b>	<b>Cyanobacteria</b>	<b>B6</b>	<b>B7</b>	<b>B8</b>	<b>B9</b>	<b>B10</b>
<i>Melosira</i>	3,560	3,162			7,388	<i>Golenkinia</i>	170				381	<i>Anabaena</i>	4,916	8,936	23,760	548	8,531
<i>Synedra</i>	212	34		30	190	<i>Scenedesmus</i>	297	137		122	381	<i>Aphanacapsa</i>	381	584	7,425		
<i>Fragilaria</i>	636	241				<i>Chlorella</i>	297	309		30	190	<i>Oscillatoria</i>	3,814	1,100			
<i>Tabellaria</i>	593	825			3,351	<i>Pediastrum</i>	3,051	584			267	<i>Aphanizomenon</i>	2,628	2,990	81,971		2,475
<i>Navicula</i>	85	103		91	38	<i>Ankistrodesmus</i>	170				114	<i>Microcystis</i>	2,585	2,234		213	13,672
<i>Cymbella</i>	42					<i>Crucigenia</i>	720	550			1,942	<i>Lyngbya</i>		1,375	2,970		
<i>Stephanodiscus</i>		34		30	38	<i>Staurastrum</i>	127				114	<i>Gloeocapsa</i>		172			457
<i>Centronella</i>					114	<i>Chlamydomonas</i>	85					<i>Cylindrospermopsis</i>			10,692		
						<i>Sphaerocystis</i>	381					<i>Raphidiopsis</i>					190
						<i>Oocystis</i>	339					<i>Chroococcus</i>					229
						<i>Spondylosium</i>		137									
						<i>Haematococcus</i>				30							
						<i>Ankistrodesmus</i>				61							
						<b>Eustigmatophyceans</b>						<b>Euglenoids</b>					
												<i>Euglena</i>					38
												<i>Phacus</i>					38
<b>Chrysophyta</b>						<b>Cryptomonads</b>						<b>Pyrrophyta</b>					
<i>Mallomonas</i>	85	241		91	190	<i>Cryptomonas</i>	720	962	297	396	152	<i>Peridinium</i>	42		297		
<b>Sites:</b>	<b>B6</b>	<b>B7</b>	<b>B8</b>	<b>B9</b>	<b>B10</b>	<b>Comments:</b>											
<b>Total Phytoplankton (cells/mL)</b>	25,936	24,710	127,412	1,642	40,480												

Overall, the plankton communities were generally diverse with a mixture of diatoms, cryptomonads, greens and blue-greens. Total cell counts ranged from a minimum of 1,642 cells/mL at B9 to a maximum of 134,735 cells/mL at B5 which was dominated primarily by *Aphanizomenon* and secondarily by *Anabaena*. The cyanobacteria were prevalent at all stations but were most prevalent at B5 and B8 with measures of 128,658 cells/mL and 126,818 cells/mL, respectively.

Microcystins were negative at all stations with the exception of B7 which showed a concentration of  $< 1 \mu\text{g/L}$ . This value is well below the draft recreational threshold of  $4 \mu\text{g/L}$  set by the US EPA. Cylindrospermopsin was negative at all stations with the exception of a value of  $< 0.5 \mu\text{g/L}$  at B2 and B3 which is well below the draft criteria of  $8 \mu\text{g/L}$ .

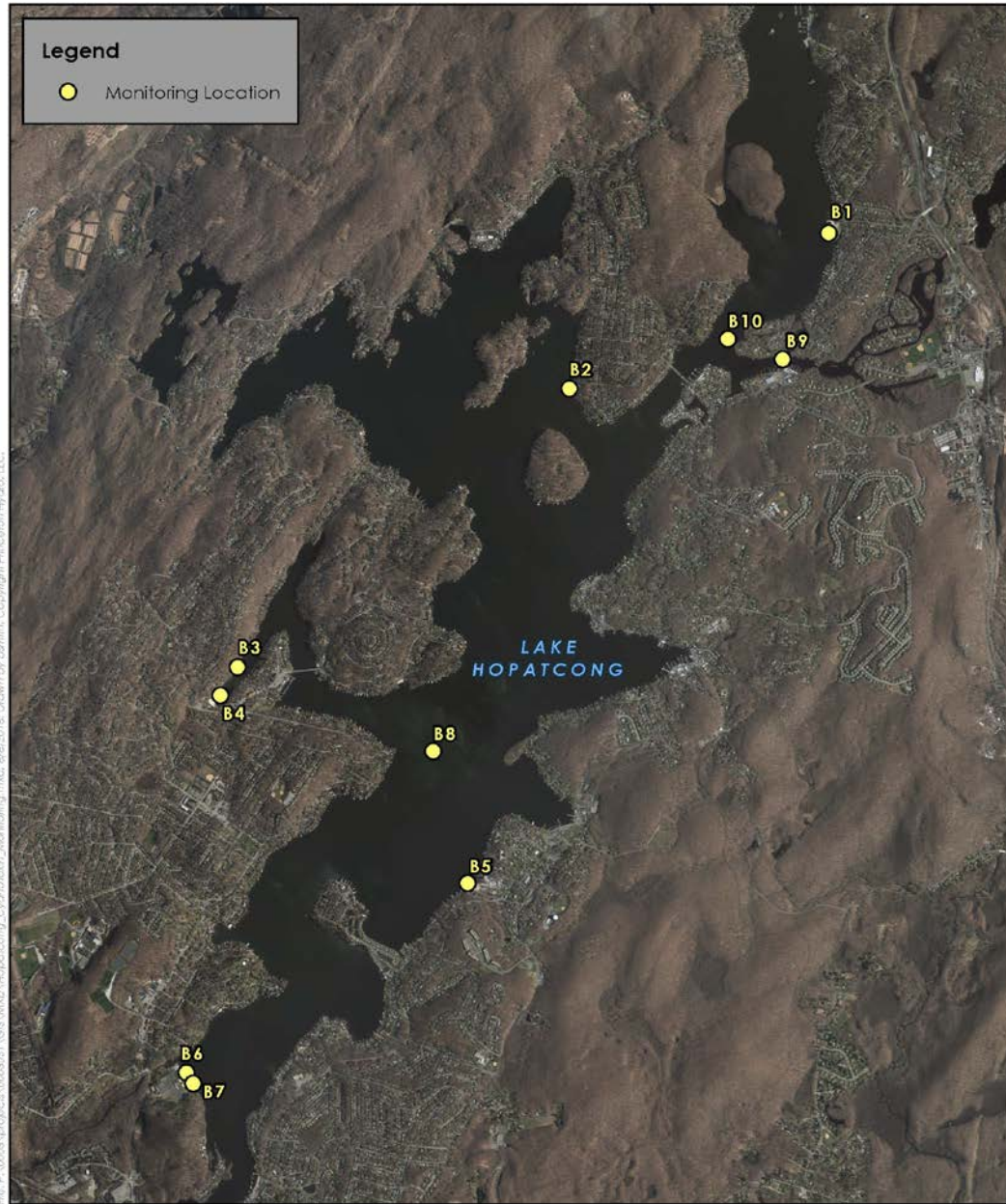
Thank you for your review of this brief summary. Please feel free to contact me or Dr. Fred Lubnow with any questions or concerns.

Sincerely,

A handwritten signature in black ink that reads "Michael Hartshorne". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Michael Hartshorne  
Senior Limnologist  
Princeton Hydro, LLC

Figure 1: Sampling Stations



NOTES:  
1. Monitoring locations are approximate.  
2. 2010 orthorectified imagery obtained from NJ Office of Information Technology by (NUCIS), Office of Geographic Information Systems (OGIS).  
Map Projection: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

### CYANOTOXIN MONITORING LOCATION MAP

LAKE HOPATCONG  
MORRIS AND SUSSEX COUNTIES  
NEW JERSEY

