



# Lake and Pond Solutions Co.

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Camp and Center Lake Rehabilitation District  
Attn: Tom Strachan  
9508 271<sup>st</sup> Ave.  
Trevor, WI 53179

June 5<sup>th</sup>, 2020

Dear Mr. Strachan,

Thank you for your continued interest in Lake and Pond Solutions Co. The following report is a summary of results from our cyanobacteria (blue-green algae) sampling on Center Lake on May 27<sup>th</sup>, 2020.

## Background

During our EWM survey on May 6<sup>th</sup>, 2020, we observed multiple locations on Center Lake with potential cyanobacteria growth. CCLR D approved sampling and analysis for cyanobacteria on May 14<sup>th</sup>, 2020, but due to extensive rain and flooding, samples were not taken until water level returned to normal. A 250mL algae/water sample was taken from the surface of Center Lake near the boat launch at 8am on 5-27-2020. It was shipped on ice overnight to GreenWater Laboratories (GWL) in Florida which is the only private full-service laboratory of its kind with a strict focus on cyanobacteria and toxins.

## Potentially Toxicogenic (PTOX) Cyanobacteria Screen

On May 29<sup>th</sup>, 2020, GWL took a one mL sample to prepare and scan at 100x for the presence of potentially toxicogenic (PTOX) cyanobacteria using a Nikon TE200 Inverted Microscope. Higher magnification was used as necessary for identification and micrographs.

The sample was dominated by loose cells and filaments of the PTOX cyanobacterium *Aphanizomenon flos-aqua/lebahnii*. Other PTOX cyanobacteria observed included *Microcystis* spp. (> 50 colonies per mL), *Anagnostidinema* sp. (> 40 filaments per mL), and *Phormidium/Microcoleus* sp. (> 20 filaments per mL). These four cyanobacteria species have the potential to produce toxins including microcystin, saxitoxin, anatoxin-a / homoanatoxin-a, and cylindrospermopsin. GWL recommended analysis for all four toxins based on the PTOX Screen.

## Toxin Analysis

On June 2<sup>nd</sup>, 2020, GWL took a 50 mL sample to prepare for cell lysis to release potential toxins. An enzyme-linked immunosorbent assay (ELISA) was used to determine microcystin and saxitoxin levels while liquid chromatography mass spectrometry was used for anatoxin and cylindrospermopsin. Results of the testing showed NO DETECT for saxitoxin, anatoxin-a, and cylindrospermopsin. The microcystin test revealed a concentration of 0.85 ng/mL. Although this toxin is present, it does not exceed the current "EPA Recommended Value for Recreational Criteria and Swimming Advisory" (8.0 ng/mL).



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## Summary

Although three of the toxins were not detected and one (microcystin) was well below EPA health limits, it is important to note that this was a single sample at one point in the lake. Microcystin is primarily a liver toxin, although it is also a skin, eye, and throat irritant. When released, toxins may persist for weeks to months. Toxin production can be affected by light and temperature. But just because a species can produce a toxin, it doesn't mean it always will.

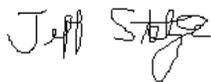
There are four potentially toxigenic cyanobacteria species in Center Lake which are producing low levels of microcystin. Cyanobacteria (blue-green algae) are most often blue-green in color but can also be blue, green, silver, white, reddish-purple, or brown. These species are different than beneficial green algae in that they typically look suspect and often have a strong odor. At any point, algal densities and/or toxin levels could increase so care should be taken by residents using the lake.

According to the WDNR, **if you think you are experiencing symptoms** related to exposure of cyanobacteria (e.g., stomach cramps, diarrhea, vomiting, headache, fever, muscle weakness, difficulty breathing), contact your doctor or the Wisconsin Poison Center (800-222-1222). **If your pet displays symptoms** such as seizures, vomiting, or diarrhea after contact with surface water, contact your veterinarian right away.

Currently the WDNR does not recommend treating blue-green algae blooms with algaecide because they state that toxins are released resulting in a slug of toxin in the water. Instead they insist on waiting for the bloom to dissipate on its own. This "Leaky Cell Hypothesis" has been researched by Dr. John Rodgers from Clemson University who demonstrated that total microcystin decreased following treatment while untreated areas showed a steady increase in both cell density and total microcystin. They determined that risks are not avoided by taking "no action" but noted that algaecide should be applied before algal densities and microcystin production poses risks. The study ultimately concluded that the Leaky Cell Hypothesis is based on unrealistic treatments, flawed consideration of risks, and not supported by results from typical, surface water treatments. Despite this data, the WDNR has not altered their thought process so unfortunately treatment is not an option.

Since cyanobacteria is usually related to nutrient pollution, landowners and citizens can help minimize the problems associated with blooms by: using lawn fertilizers only where truly needed, preventing yard debris from entering surface water, minimizing erosion, and maintaining vegetative buffer strips along the lake shoreline.

Sincerely,



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