Toxic Cyanobacteria

Continued from front cover

cy and intensity may be reduced. However, it may take a long time to effectively change the nutrient concentrations in a waterbody. Inputs from the watershed that enter a lake or pond every year will lead to large amounts of phosphorous in the sediment. The nutrients will continue to serve as a source of food for the blue-green algae and lead to future, potentially larger, blooms. There are phosphorous binding compounds that can be applied to your waterbody to help reduce the available "food source" for algae.

Another approach to prevent the nutrients from becoming available to the blue-green algae is the installation of submersed aeration. Adding oxygen at the bottom of a lake or pond will act as the glue that will help bind the nutrients (phosphorous) to the iron in the sediment and keep it inaccessible to the blue-green algae.

SonicSolutions technology, which uses sound waves at a specific vibration frequency to disrupt the cell walls of the algae (similar to how an opera singer can shatter a glass by using their voice), can also be used. In essence, the sound waves will cause the algal cells to shrivel up without breaking apart and releasing the potentially dangerous toxins. This may be a safe alternative in certain situations where a large die off of blue-green algae would be dangerous due to the simultaneous toxic release.

SOLitude Lake Management has the tools, experience, and expertise to help prevent and control a potentially dangerous blue-green algae bloom. Educating residents and managers to use best management practices can also promote awareness and minimize a bloom: using lawn fertilizers only where truly needed, preventing yard debris (e.g., leaves, grass clippings, etc.) from washing into storm drains and waterbodies, and planting native vegetation along shorelines of lakes, ponds and streams are just a few examples. Precautions should always be taken when there are blue-green algae present in a waterbody and residents should wait for a bloom to dissipate before going in or near the water. ■

Phosphorus Management Techniques

By **Dominic Meringolo, Senior Environmental Engineer**

We all get old... and so does your waterbody. In addition to sediment, lakes and ponds can build up a stock of nutrients, particularly phosphorus. Higher levels of phosphorus will generally increase the severity and frequency of algal blooms and also favor growth of potentially toxic cyanobacteria (blue-green algae) species. Ideally, you would dredge the waterbody to remove the collected nutrients and sediment, but what if that is not a feasible option? Built-up or "legacy" phosphorus can release back into the water (referred to as "internal recycling") and, along with new phosphorus from inflowing water, both can contribute to chronic algae blooms.

For most lakes and ponds, it is not feasible to reduce phosphorus levels sufficiently through surrounding watershed management alone. The contribution from internal recycling of phosphorus often makes it impossible to reach water quality management goals. A well designed water quality restoration program will address both watershed and internal sources of phosphorus.

Phosphorus is most often the limiting nutrient for algae growth, or in other words, is in the shortest supply as compared to other growth regulating factors. While treatment with algaecides will help in the short term, there are also options available to proactively manage blooms by reducing the amount of phosphorus available for algae growth. Treatment with Phoslock or aluminum sulfate (alum) will bind with phosphorus in the water, and at higher application rates, will also bind the potentially available phosphorus in the sediment. How long the benefit will last depends on how much new phosphorus enters the pond, and whether a high enough rate was applied to handle the relative contribution of internal recycling.

Phoslock is a technology that uses modified bentonite clay infused with lanthanum (natural element). Upon application to the water, the lanthanum is released from the clay matrix and quickly binds with phosphorus which then settles to the bottom. Unused lanthanum which settles to the bottom is then available to bind with any phosphorus being released from the sediment. If incoming phosphorus is high, periodic or higher dose treatments may be required.

Alum is a similar technology that is used to bind phosphorus in the water and sediments of lakes and ponds. Instead of lanthanum, the application of alum releases aluminum which then forms a polymer ("floc") that binds with phosphorus and also captures solids and organic material suspended in the water. Alum is commonly used in drinking water treatment plants to settle out suspended materials before distribution to homes and businesses. Like lanthanum, unused floc settles to the bottom where it's available to capture phosphorus being released from the sediment.

It is important to have some information about the water and sediment quality in your lake and pond prior to implementing a phosphorus management strategy. It's also good to know a little about the volume and the quality of the incoming water. This data will help to determine the dose and frequency of treatment best suited for the conditions. For smaller ponds with high flows, it's likely that more frequent, low dose applications will be best. For larger ponds with slowly flushing water, a single treatment may last for the season or even multiple seasons. In large lakes, where the incoming water quality is good and most of the phosphorus loading is due to internal recycling, a properly planned treatment can have the potential of improving water quality and reducing nuisance algae growth for 20 years or more!

In addition to Phoslock and alum, there are several other products that may be utilized to provide water quality enhancement and control of nuisance algae, such as SeClear and bacterial/enzyme additives. We are always considering all such options for our clients, but if you have questions or are interested in a water quality assessment and phosphorus management services for your lake or pond, please contact our professionals at solitudelakemanagement.com/contact or call 888.480.LAKE. ■