

Blue-green algae:

Information for drinking water system owners and operators.

What are blue-green algae?

Blue-green algae are primitive microscopic plants that live in fresh water. Their scientific name is **cyanobacteria** but they are more commonly known as pond scum. Normally blue-green algae are barely visible, but, during warm weather, populations can rapidly increase to form a large mass called a bloom. Blooms most commonly occur during the late summer and early fall.

What conditions favour algae growth?

Blue-green algae thrive in areas where the water is shallow, slow moving, and warm, but they may also be present below the surface in deeper, cooler water. One key factor affecting growth rates is the level of available nutrients such as phosphorus and nitrogen.

How can I recognize a blue-green algae bloom?

Dense blue-green algae blooms may make the water look like bluish-green pea soup. When the bloom is very large, algae may form solid-looking clumps. Fresh blooms often smell like newly mown grass; older blooms smell like rotting garbage.

Is this a new problem?

Blue-green algae blooms are natural phenomena that occur in fresh water lakes, bays and inlets in countries around the world. The first report of harm to animals from blue-green algae came from South Australia in 1878.

Should I be concerned about blue-green algae?

Yes, you should be cautious, particularly in the event of an algae bloom. Although many forms of blue-green algae are relatively harmless, some forms produce toxins which can be harmful to human health and the health of animals.

The most common toxins are called **microcystins** and are released into the water when the algae cell wall is broken either due to natural death and decay of the cell, by exposure to corrosive chemicals such as chlorine, or by abrasion.

Symptoms of human health effects from ingested algae toxins are headaches, fever, diarrhea, abdominal pain, nausea and vomiting. However, if swallowed in large quantities, more serious health effects may occur.

Can drinking water be contaminated by toxins from blue-green algae?

If water is obtained from a surface water source during a blue-green algae bloom, then it is possible that the water may be contaminated with toxins. Usually people won't drink water contaminated with blue-green algae blooms because of its unsightly pea soup appearance and foul smell. However, sometimes it is hard to tell if the drinking

water has been contaminated unless confirmed by laboratory tests specifically for measuring microcystin levels.

How much microcystin is allowable in drinking water under the Ontario Drinking Water Quality Standards?

The current Ontario Drinking Water Quality Standard for the blue-green algae toxin microcystin-LR is a concentration of 0.0015 mg/L (which is the same as 1.5 µg/L or 1.5 parts per billion).

Can water containing cyanobacteria be treated to make it safe to drink?

Treatment of drinking water containing algae can be effective when the cyanobacteria have been removed early in the treatment process through specialized filtration systems. Some follow-up treatment processes have been found to be effective in removal of microcystin; particularly oxidation processes, activated carbon, and membrane filtration. These systems are more commonly used by large treatment facilities.

What about smaller treatment systems and private supplies?

Small drinking water systems with modest treatment facilities (such as used by resorts) and private supplies with either no treatment or minimal water treatment systems are less likely to have the specialized equipment to effectively filter and treat water during algae blooms. The treatment methods most commonly used by this sector are for the most part, ineffective against cyanobacterial contamination.

If I see a bloom and suspect it is blue-green algae, what immediate actions should I take?

It is best to be cautious. If you suspect a blue-green algae bloom, assume toxins are present, avoid using the water and call the Ministry of the Environment Spills Action Centre at 1-800-268-6060.

Important Information for Owners/Operators of Drinking Water Systems

As a provider of drinking water, you have an obligation to provide water that is safe to drink.

You must be aware of the health threats posed by blue-green algae blooms and you must take actions to mitigate these threats. At-risk systems are responsible for identifying their risk exposure level and taking appropriate actions.

Although you may currently have no direct requirement to sample for microcystin, there may be circumstances when it may be appropriate to obtain samples for analysis on a case-by-case basis. At that point, it is most likely you will be working with the local Health Unit, and the MOE District Office and Drinking Water Supervisor in response to a reported bloom. Very specific laboratory tests for microcystin are currently only available at the Ministry's laboratory and must be prearranged through the District.

For more information on blue-green algae contact the Ministry of the Environment's Public Information Centre at: 1-800-565-4923 and see Health Canada's fact sheet at:

www.hc-sc.gc.ca/hecs-sesc/water/factsheets/blue_green_algae.htm