Lake Hamilton
Blue Green Algae Fact Sheet/ FAQ

What is Blue Green Algae?

Blue Green Algae (BGA) are a very small organism, also known as Cyanobacteria, that is a simple aquatic plant. The Blue Green Algae bacteria rely on sunlight (along with a number of other energy sources) for survival and are therefore considered photosynthetic bacteria.

Blue Green Algae naturally occur in rivers, lakes and oceans and when in isolation cannot be seen by the human eye. However when they 'bloom' the Blue Green Algae may sometimes become visible as either a scum or a blue/green coloration of the water body, hence the name.

Blue Green Algae are vital to the aquatic ecosystem in which they are present. The Blue Green Algae organism is both a food source for fish and other aquatic life and a consumer of nitrogen and phosphorus in the water ways.

Figure 1: Blue Green Algae in Lake Hamilton

What is a Blue Green Algae 'bloom'?

Blue Green Algae relies on both a food source and ideal conditions to grow. When conditions are idealistic and food sources are available the algae are able to multiply to a point where they are considered to be "blooming".

Contrary to popular belief, not all algal blooms are determined by visible factors such as the stereotypical 'scum' on top of the water. Some of the species of Blue Green Algae responsible for the release of harmful toxins are simply not visible to the human eye. For this reason there are a number of triggers that Councils, health authorities and water authorities use to determine if a Blue Green Algae bloom is present.

What factors are considered when determining a Blue Green Algae Bloom?

The factors used to determine a Blue Green Algae bloom in recreational water bodies are;

- Greater than or equal to 50,000 cells/mL of *Microcystis aeruginosa*
- Total combined biovolume of *known toxic species* greater than or equal to 4mm^3/L
- Total combined biovolume of all Cyanobacteria species greater than or equal to 10mm^3/L
- Cyanobacterial scum present
- Advice from the water testing laboratory

Often an odour will be present during an algal bloom and can provide a simple yet effective way to determine if an algal bloom may in fact be present.

How long do blooms generally last?

Algae, just like humans, rely on food sources for survival. Blue Green Algae is generally reliant on phosphorus, nitrogen and sunlight to enable growth and survival, provided that both of these two food sources are available, Blue Green Algae can survive and bloom for an infinite amount of time.

For this reason there are a number of preventative measures implemented by water quality and monitoring professionals to remove, or prevent entry of, Nitrogen and Phosphorus from or into recreational water bodies such as Lake Hamilton. By removing the food source of algae we can reduce the number of blooms occurring and also the length of time the blooms are likely to last.

Are all Blue Green Algae toxic and what are the Health effects?

No, not all species of Blue Green Algae are toxic. Of the 1500 known species of Blue Green Algae there is only approximately 50 species that produce toxins. The most common toxic species of algae that is found in Lake Hamilton is *Anabaena.*

The Anabaena species produces a neurotoxin that can damage nerves and cause muscle spasms, particularly in the specific muscles that assist humans and animals to breathe (The Cooperative Research Centre fo Water Quality and Treatment, 2008).

Whilst illness from contact with blue green algae is rare there are three specific toxins that an algal species may produce. Depending upon the species that you have come into contact with, symptoms may vary.

The three main types of toxin produced by algae are;

- **Allergens** – may produce a wide variety of reactions, some of which include irritation of the eyes, skin rashes, diarrhoea and possibly gastroenteritis.
- **Heptatoxins** – cause damage to the liver and may be involved in an increased chance of some cancers.
- **Neurotoxins** – as discussed above, may damage nerves, cause muscle weakness, muscle spasms and in severe cases, paralysis.

How often is Lake Hamilton tested for Blue Green Algae?

Southern Grampians Shire Council operate a regular and stringent monitoring regime of Lake Hamilton. SGSC monitors Lake Hamilton 12 months of the year.

At what time of the year is Blue Green Algae blooms most common?

The survival and growth of Blue Green Algae is highly dependent upon a number of factors. Most importantly Blue Green Algae relies on sunlight, warm water temperature and nutrients such as Phosphorus and Nitrogen which infers that algal blooms are most likely to occur during the warmer months.

The monitoring program undertaken by Southern Grampians Shire Council has shown over the past 6 years that most commonly Lake Hamilton experiences blooms between October and April, however various species of BGA are more susceptible to the environmental conditions than others. For this reason it is possible for algal blooms to occur at any time throughout the year.

When can I not use Lake Hamilton?

To protect you and your animals from harm, it is highly recommended that Lake Hamilton waterbody is not used for any recreational or commercial purposes whilst the algae warning signage is erected by Council. Recreational use includes, rowing, waterskiing, sailing, motor boats, fishing , swimming and animal drinking water . Commercial use includes, testing of motors, watercraft and animal drinking water.

What Lake Hamilton facilities can I use when blue green algae signage is erected?

You can use Lake Hamilton walking track, picnic areas, playgrounds and skatepark whilst algae warning signage erected. To protect you and your animals from harm, do not enter, touch or drink Lake Hamilton water whilst the blue green algae signage erected

When are the Algae warning signage erected and what does it look like?

The algae warning signage is erected at waterbody foreshore by Council immediately preceding one or more of the following of trigger points are confirmed:

- Greater than or equal to 50,000 cells/mL of *Microcystis aeruginosa*
- Total combined biovolume of *known toxic species* greater than or equal to 4mm^3/L
- Total combined biovolume of all Cyanobacteria species greater than or equal to 10mm^3/L
- Cyanobacteria scum present.
- Advice from the water testing laboratory.

The algae signage erected by Southern Grampians Shire Council is a generic Algae Warning Sign that is used by Water Authorities and Councils across Victoria and New South Wales and is a highly distinguishing sign that is easily noticed when erected.

Figure 2: Blue Green Algae Warning Signage

Where are the Algae warning signs posted at Lake Hamilton?

There are a number of prominent sites at which the Blue Green Algae Signage is erected by Council during times of a BGA bloom. The sites are designated as such to include all of the public access points to the lake and include;

- At the Boat Ramp
- At the Spillway
- At the Beach BBQ area
- At the Southern car park of Lake Hamilton (adjacent to the Skate Park)
- At the Pedestrian Bridge
- On all Lake Hamilton Maps located around the Lake

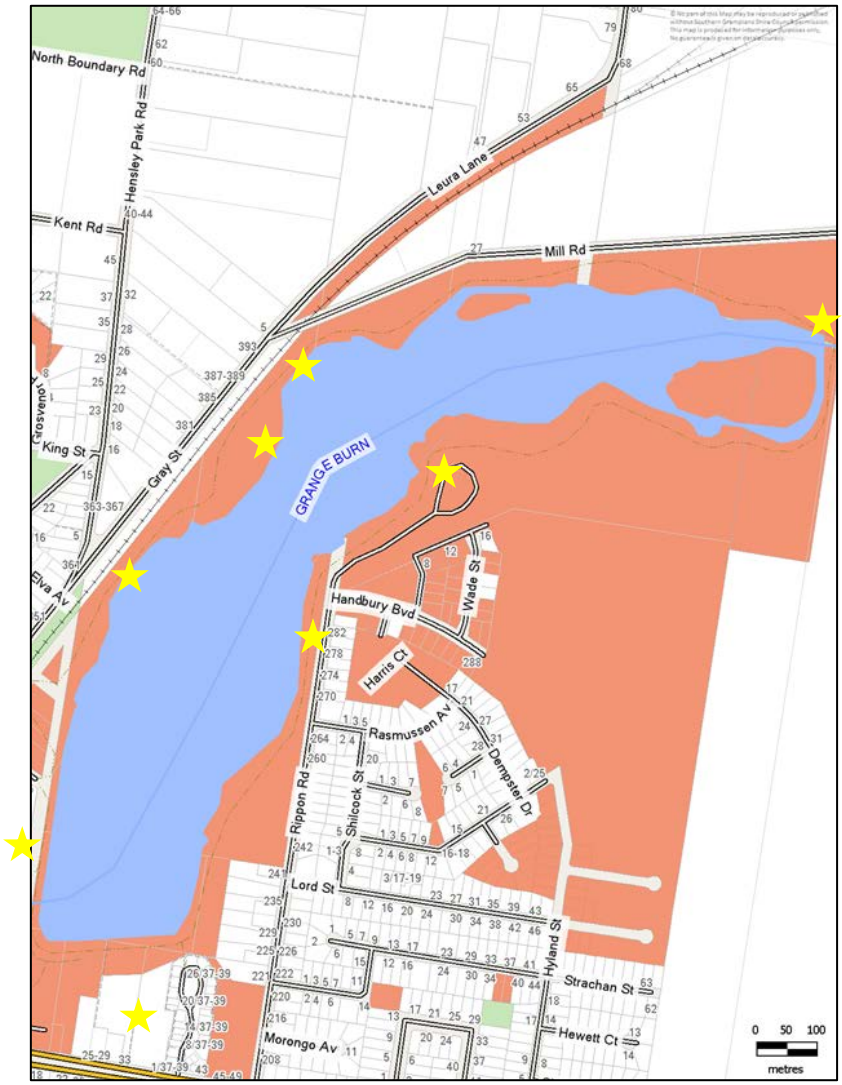

Figure 3: Location of Blue Green Algae Warning Signage at Lake Hamilton

How will I know when Lake Hamilton is not fit for use?

The first point of reference to determine if the Lake is suitable for use is to look for the algae warning signage at Lake Hamilton. There will be signage erected if the Lake has been deemed unsuitable for use however if you are unsure as to whether the Lake is suitable for recreational activities there are also a number of other public notification stages to look out for.

When Lake Hamilton is tested and considered unsafe according to the guidelines previously mentioned Council immediately distributes a media release to advise the public of a BGA bloom. This media release can be found in the Hamilton Spectator and on Councils website www.sthgrampians.vic.gov.au . Notification of a bloom can also be sought by contacting Southern Grampians Shire Council on www.sthgrampians.vic.gov.au, 5573 0444 or Hamilton Visitor Information Centre on 1800 807 056.

For more immediate notification of an Algae bloom in Lake Hamilton there is a contact list developed by Councils Environmental Health Unit that notifies contacts by email of any identified issues with Lake Hamilton water quality issues. If you wish to be added to this contact list please contact Council's Environmental Health Unit on 03 5573 0244 and provide your details.

Contact Us

Southern Grampians Shire Council

Web: www.sthgrampians.vic.gov.au

In Person: 1 Market Place or 111 Brown St, Hamilton, Victoria

Email: council@sthgrampians.vic.gov.au

Mail: Locked Bag 685 Hamilton VIC 3300

Fax: 03 5571 1068

References

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Image Credits

Figure 1 – Southern Grampians Shire Council, Environmental Health Unit 2011

Figure 2 - Department of Sustainability and Department of Sustainability and Environment, 2012.

Figure 3 – Southern Grampians Shire Council, 2012