

Lake Hood Q&A – February 2024

What has the Water Quality Taskforce done?

The following is a summary of the key actions undertaken by the taskforce since its formation:

- June 2023 review of historical lake water quality – following the first bloom in May 2023
- June/July 2023 research into options for managing cyanobacteria risk
- August 2023 completed briefing paper for Lake Hood stakeholders identifying options for managing cyanobacteria risk
- August 2023 completed business case to purchase weed harvester
- Sept 2023 discussions with various companies on aeration options
- Oct 2023 commenced aeration trial in western canal
- Oct 2023 commenced weekly monitoring of aeration trial water temperature and dissolved oxygen
- Nov 2023 weed harvester ordered by ACL from Canada
- Dec 2023 discussions with Australian and American companies on options for phosphorus removal from water
- Jan 2024 discussions with NZ companies on bacterial control of cyanobacteria
- Jan 2024 released brief to NIWA for proposal to offer scientific advice to inform a management plan and mitigation options

What solutions is the taskforce considering?

- Investigating options to get more water into the lake. This includes potentially resubmitting the non-consumptive take application to enable more water to be diverted from the river into the lake and then discharging this water back into the river 2.8km downstream from the intake.
- Options to improve water circulation around the lake, including propulsion within the canals and constructing a second lake outlet, then pumping from canals down to this second outlet.
- Phosphorus reduction in the water by investigating products that absorb or lock up phosphorus.
- Upstream wetlands to treat ground water prior to it entering the lake.
- Aerators to oxygenate the water to reduce the availability of phosphorus.

What leads to cyanobacteria blooms?

Blooms form when environmental conditions allow for rapid growth of new cells: sunlight, nutrients, temperature and pH. Therefore to reduce blooms, we need to reduce the causes of the blooms. The contributing factor that we are prioritising is controlling nutrients.

What is Environment Canterbury's responsibility?

Environment Canterbury (ECan) determines how much water can be taken from the Ashburton Hakatere River through the regional plan and resource consent process.

The taskforce is currently communicating with ECan to investigate potential options, including whether it is possible to get more water into the lake.

What is happening with the aeration trial? There seems to be more weed in the trial area.

The aerators were not brought in to address weed, but to test how they affect temperature and dissolved oxygen within the water column. The trial is ongoing until we can see trends change over time.

What about drilling bores to take and discharge groundwater into the lake?

This option has not been progressed due to the unlikely ability to obtain resource consent, and generally because groundwater has higher nutrient levels than river water.

Has the taskforce got a management plan?

The taskforce is commissioning NIWA to research Lake Hood to help inform the drafting of a management plan. The taskforce is also talking to consultants and advisors around the world to gather up options for consideration. The reason for the research is that we need scientific confirmation that phosphorous is the critical cause, in order to identify the right solutions.

Is funding holding up the process?

The priority issue at hand is determining what solutions are most likely to work for our lake, then it will be balancing those options against the time and financial cost to implement the solutions. Some options can't only be trialled at the lake but will also require laboratory testing first and clear understanding if the option is safe to apply to NZ conditions. Some options will also require external approvals, such as resource consents.

We've heard other countries are using sonar to control algae, is that true?

Sonar is being used at overseas drinking water treatment plants. This option has been looked at, but there are potentially multiple challenges with this technology and it is still without guaranteed success.

What is causing the smell at the lake?

Some bacteria release an earthy smell, like when it's recently rained. If it's a rotting-type smell, it's more likely to be biomass breaking down.

Is weed slowing down water circulation causing potential problems?

Having weed in the lake is good up until a point. Weed locks up some of the nutrients but we don't want too much as it does reduce water movement through the lake. The purchase of a weed harvester will help keep weed under control.

What about the Grass Carp?

Over the last 20 years over 3000 Grass Carp have been put into the lake to eat the weed to keep levels down. But since investigating algal bloom solutions, we've learnt that the waste they leave behind adds to the total nutrient loading in the lake. So, it has been decided to not add more Grass Carp to Lake Hood.

Would diverting Carters Creek back into the river mean we can take more from the river?

The current consenting framework doesn't allow this. However, Carters Creek does play a part in the water quality issues. A Carters Creek catchment group has been created to investigate the water quality and drainage issues in that catchment. People are welcome to join the group, whose activities include doing practical things to help themselves where they can.

Could we utilise water from another source, such as the Rangitata Diversion Race (RDR) scheme?

This wouldn't be allowed under current consents and would have to be agreed upon by RDR and its stakeholders. This has more barriers to implement than other options.

Is there any point in draining the lake, dredging it and starting from scratch?

This is unlikely to be a practical option for many reasons. Disposal of vast amounts of sediment will be difficult. Draining the lake could affect the structural integrity of the lake walls and dam. It would take a long time to refill the lake and this would likely be untenable for residents and users, particularly if the lake was drained in a dry year and unable to be refilled by river water.

Cyanobacteria are also still present in the river so without a management solution at the lake itself the bloom is likely to return.

Since more water is being discharged out of the lake (due to the inflow of groundwater) compared to what we're bringing in through the river intake, could we recirculate the water from the outlet back into the lake?

With a big enough pump this is technically possible, but could be quite expensive compared with other options.

What if residents were placed on a roster to drive their watercraft around canals – would that assist the water circulation around the lake?

It could help improve water flow through the canals possibly if it was done multiple times a day, but this option hasn't been explored as a priority, as it may be expensive and time costly for the individual watercraft owner compared with other options. This option would only be of benefit to the lake before a bloom starts.

Will the lake experience another algal bloom next summer?

The taskforce cannot guarantee that the lake will not experience an algal bloom next summer. It is likely that the lake will experience future algal blooms but the taskforce is working hard to minimise and reduce the number of algal blooms.