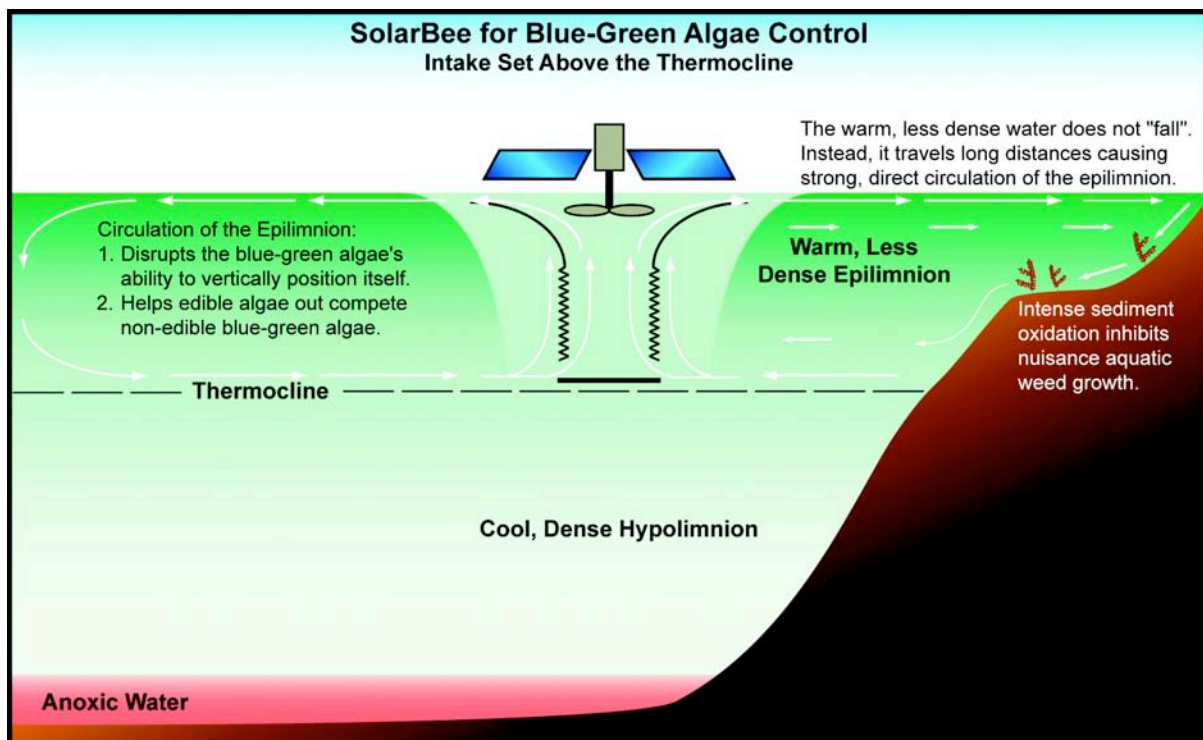


Press Release

Harmful algal blooms (HABs) dominated by cyanobacteria (blue-green algae) are perhaps the greatest lake management issue for water treatment operations. In addition to being unsightly and causing eye-watering odours, they release geosmin and 2-methylisoborneol (2-MIB) into the water that cause taste and odour complaints, as well as cyanotoxins that can create serious public health concerns (Ref Fig 1). Reservoir management approaches have typically relied on toxic chemicals or energy-intensive de-stratification systems, until the SolarBee™.



The SolarBee is a solar-powered, long-distance floating water circulator developed about 10 years ago, and is now the leading non-chemical solution for lake and reservoir restoration in North America. SolarBee-induced long-distance circulation (LDC) has proven effective for preventing HABs in over 300 lakes, reservoirs and ponds since 2000. Significant economic savings on energy and chemical use are typical among the over 100 municipalities currently using SolarBees in their raw water storage reservoirs, with one US city saving as much as £250,000 per year just from activated carbon reductions alone.

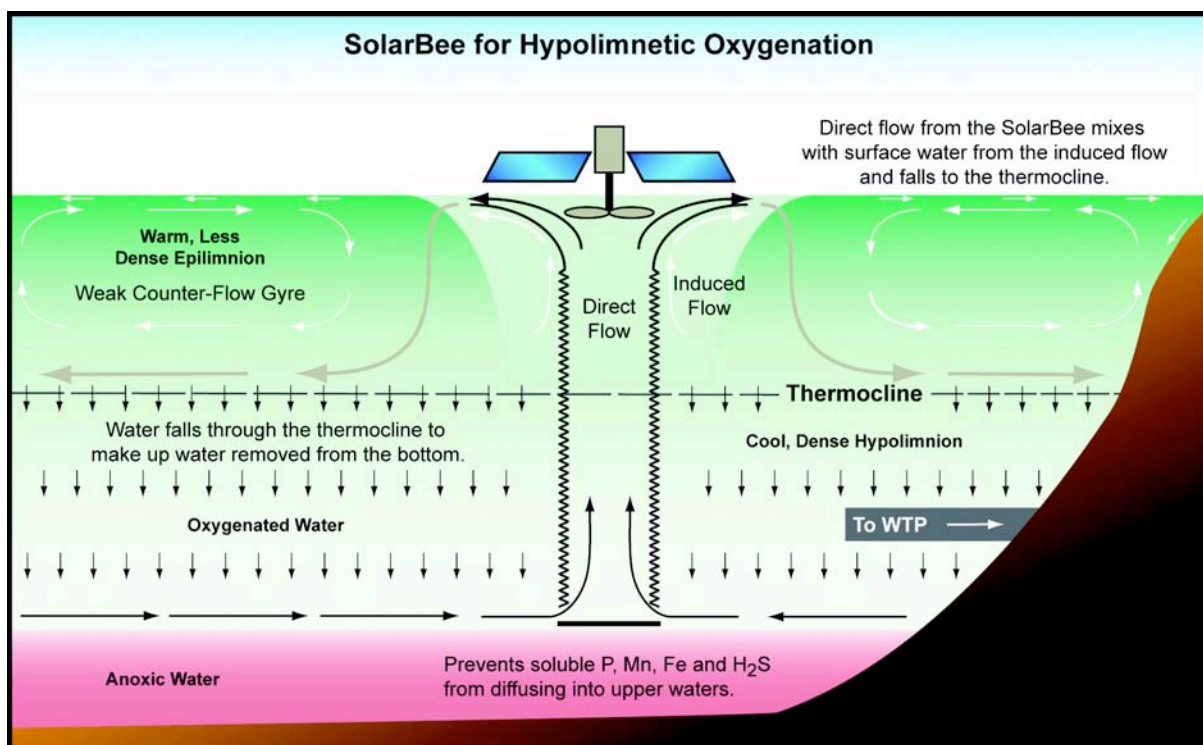
But not only is this innovative product more cost effective, it is also "greener" than conventional technologies, particularly whole-lake de-stratification. De-stratification achieved through bottom aeration, a common lake management approach, is energy intensive, and has a potential to bring up poor-quality bottom water rich in algal nutrients, hydrogen sulphide, soluble iron and manganese, and possibly heavy metals. If not sized properly, lake water quality and HABs can actually become worse when bottom water is brought to the lake surface.

In contrast, the SolarBee is a floating up-flow pump where water comes into the intake hose horizontally from all directions, moves up the intake hose, and leaves the machine at the

water surface again horizontally and radially. The adjustable intake hose can be set at any depth from 1 m to greater than 30 m. SolarBee™ circulators come in various sizes. Each machine runs both day and night (thanks to an onboard battery charged by the solar panels), with an extremely efficient, brushless, low-voltage motor that is entirely solar powered. The circulators are made of 316-stainless steel, HDPE, and have a life expectancy of 25+ years.

With the intake positioned above the thermocline in the warmer surface waters (epilimnion) where algae grow, the SolarBee provides maximum LDC for preventing HABs by disrupting their preferred stagnant habitat without disturbing anoxic bottom waters. The largest unit can effectively treat up to 14 ha with ecological benefits being additive for multiple units in larger water bodies.

For water treatment plants that get lake water in deeper waters below the thermocline (hypolimnion), the SolarBee intake hose can be set below the reservoir outlet for hypolimnetic oxygenation. The SolarBee raises anoxic bottom water to the surface, and circulates oxygen-rich water back down to the hypolimnion. Increasing dissolved oxygen concentrations in this way prevents dissolved manganese and iron, as well as hydrogen sulphide, from passing into the water treatment plant. (Ref Fig 2).



Recent Project Summary:

In a recent project, South West Water saved £500,000 in capital cost and over £400,000 projected savings in electricity costs over the 25-year project life when compared with the conventional de-stratification approach. By utilizing solar technology for lake management they will also mitigate 1,950 tonnes of CO₂ emissions. This is equivalent to planting 2,670 trees or offsetting emissions from 22 cars travelling 10,000 miles p.a. for the next 25 years.



The table below summarizes this project:

Location	College Reservoir No. 4, Penryn, Cornwall
Customer	South West Water Ltd
Consultant	Black & Veatch Ltd
Reservoir Background	College Reservoir 4 is an 18 ha reservoir with a small island. It has an average depth of 1.5 m and is just over 5 m deep near the draw-off to the treatment works. The reservoir supplies raw water to College WTW, which treats a maximum of 9.5 ML/day.
Machines Installed	Five (5) SB10000v12 machines; four (4) deployed for maximum algae and macrophyte control; one (1) with the intake deep for increasing oxygen in the deeper waters near the take off.
Deployment Time	2 days
CAPEX Savings	More than £500,000 saving compared with conventional de-stratification solution over 25-year project life.
OPEX Saving	More than £400k saving in electricity costs over 25-year project life compared with conventional de-stratification solution.
Carbon Saving	Over the 25-year life of the project, SW Water will mitigate 1,950 tonnes of CO ₂ emissions. This is equivalent to planting 2,670 trees or offsetting emissions from 22 cars travelling 10,000 miles p.a. for the next 25 years.

Preventing taste and odour complaints by restoring the reservoir with SolarBee™ circulators is much more cost effective than treatment at the works, with estimated payback of around 2 years due to less frequent regeneration of activated carbon filters. In addition to preventing water stagnation and controlling HABs, LDC also improves the entire lake ecosystem by providing a healthier environment for fish and other aquatic organisms.

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