Abstract

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Title

Biological activated carbon for management of biogenic taste and odour

Description

An increase in frequency and intensity of algal and cyanobacterial blooms in freshwater reservoirs has been observed, resulting from human activity and climate change. These events pose a series of challenges for water utilities, including formation of disinfection by-products and production of toxins. Additionally, multiple algae and cyanobacteria species can produce a multitude of compounds associated with unpleasant taste and odour (T&O), which reduce aesthetic value in areas used for recreation, influence consumer perception of water quality and increase treatment costs of potable water. Conventional drinking water treatment strategies are generally unable to remove these T&O compounds to levels below their human odour threshold.

Biological activated carbon (BAC) is an effective and resilient technology that can be used for the removal of biogenic T&O compounds. This NHASP research project, in partnership with Melbourne Water, uses extensive characterisation and a long-term bench-scale experimental set-up with multiple commercial activated carbons, to assess which BAC properties have the most influence on the removal of T&O compounds. The evaluation includes all phases of the activated carbon filter lifespan, including the fresh (adsorption only) phase, biofilm formation, steady-state BAC and modelling of remaining removal capacity. Aspects such as seasonality of T&O and its effect on biofilm activity and treatability are also assessed.