

Virtual Curtain technology - from wastewater to rainwater

As at August 2014

To help mining companies manage their environmental footprint, CSIRO has developed a wastewater treatment process using hydrotalcites, to purify wastewater from mines in a faster, more efficient way than current processes.

The Challenge

Around the world the minerals industry is keen to find more efficient ways to treat their wastewater and reduce their environmental footprint.

Mine sites require water for metal recovery, mineral processing and to control dust. After use, the wastewater is stored in ponds before being treated and released into the environment.

Effective removal of a range of different contaminants in the wastewater can be a challenge due to the number of complex steps required to ensure the water, once treated, is suitable for reuse or safe discharge.

Lime-based methods can be effective but may create large volumes of sludge requiring the water to go through additional treatments prior to discharge.

The Solution

CSIRO has developed Virtual Curtain technology, a treatment process that overcomes many of the difficulties of lime-based methods and offers a simpler and smarter process.

The process utilises hydrotalcites which are layered minerals consisting of aluminium and magnesium rich layers. Hydrotalcites begin to form when aluminium and magnesium are present at an ideal ratio and under certain conditions.

As mining wastewater often contains substantial magnesium and aluminium concentrations, the hydrotalcites can be created utilising a combination of these elements and a range of contaminants that are already present in the wastewater.



> Hydrotalcite treatment in progress - subsurface spraying

As hydrotalcites form, the contaminants become trapped and can then be easily removed, leaving behind a higher quality water and up to 80 per cent less sludge.

Benefits for the Mining Industry

In November 2013, the first commercial application of the Virtual Curtain technology was completed in a mine pit pond in Queensland. This application treated over 50 million litres of contaminated water that was eventually released back into the environment.

Hydrotalcite-treated water can be recycled back into the plant to lower the total cost of water used in the mining operations, ultimately helping to reduce water consumption with less water being drawn from the environment. Importantly the process doesn't require large amounts of infrastructure or difficult chemistry so can quickly and easily be implemented to treat a range of mining and other wastewaters.

The technology has been commercialised to Australian company, Virtual Curtain Limited, who have an exclusive worldwide license.

FURTHER INFORMATION

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