

RESEARCH INITIATIVES

New technology for red mud rehabilitation –
University of Queensland, Rio Tinto and Queensland Alumina Limited



Researchers from the University of Queensland's Sustainable Minerals Institute (SMI) have been working with Rio Tinto Aluminum's Yarwun Refinery and Queensland Alumina Limited (QAL) since 2018 on developing the technology for rehabilitating the waste also known as red mud.

Currently, Alumina refineries in Australia and overseas are facing enormous environmental and economic challenges in rehabilitating red mud as conventional methods to develop sustainable ecosystems are very expensive. Significant volumes of bauxite residues or 'red mud' are being stored in dams at alumina refineries worldwide. Caustic soda and alkaline minerals that remain in the red mud make it difficult to overcome the extremely alkaline and salty conditions in the short-term.

The research aims to understand the fundamental processes to break barriers of persistent and reversible alkalinity and salinity in red mud within a short time frame, and improve the reliability and operability of the new technology. This has been the biggest obstacle to many decades of efforts to rehabilitate the vast areas of red mud landscapes worldwide. If successful the research would significantly impact the economic and ecological sustainability of the alumina industry in Australia.

As at September 2021, bio-engineering technology transforming the mining industry's red mud into a soil-like material capable of hosting plant life entered into its final stage of testing. With further funding from Rio Tinto and QAL, SMI will soon trial the technology at an operational scale at two red mud sites.

