



Alfa Laval decanters revolutionize coal mine tailings management strategy

Rix's Creek Coal Preparation Plant, Australia

Case story



An Alfa Laval decanter centrifuge dewateres Rix's Creek coal mine tailings, reducing the need for tailings dams while reducing capital investment and water and energy consumption.

The Rix's Creek coal mining operation, part of the Bloomfield Group, set out to improve its onsite coal tailings management as part of its sustainability strategy to reduce water and energy consumption and minimize the surface footprint of waste handling processes. After evaluating various technologies, Rix's Creek engineers installed an Alfa Laval decanter centrifuge to dry coal tailings.

The result? Savings in capital expenditures as well as, about 90% recovery and re-use of the process water.

Located in New South Wales, Rix's Creek is an open cut coal mining operation that produces an estimated 2.58 M tonnes of raw coal and 1.49 M tonnes of saleable thermal and semi-soft coking coal each year for use in the steel and power industries. With the existing tailings dam nearing capacity, Rix's Creek decided to pursue a dry tailings management alternative.

Proven technology dewateres coal tailings

Rix's Creek had these key evaluation criteria: spadeable cake with approximately 60% dry solids to be co-disposed with coarse reject material into the pit to assist with mine rehabilitation; clean centrate for re-use in the coal washing process; and, sound operating economy.

Key benefits

- Reduction in tailings dam capacity requirement
- Reduced capital investment compared to alternatives
- Dry solids in excess of 60% (by mass) contribute to open cut rehabilitation
- Water savings and water re-use in the plant
- Continuous, enclosed and clean operation
- Minimal operator monitoring required
- Smaller footprint compared to other technologies

After two years of evaluation and extensive testing of several technologies, Rix's Creek project manager Robert Booth and CHPP manager Greg Bain recommended the installation of an Alfa Laval decanter centrifuge to dewater mine tailings into dry cake.

"Initially we used a pilot scale decanter to thicken the thickener underflow prior to treatment in another drying process we were trialling," says Booth. "But the decanter produced an acceptable spadeable product. So we decided to pursue this option."

Because Rix's Creek extracts coal from 20+ coal seams containing hard-to-dewater fines, such as bentonite clay and volcanic sediments, Booth and Bain wanted proof that the Alfa Laval decanter was up to the task. Alfa Laval conducted extensive spin tests, which produced excellent cake with high dry solids concentration and clear centrate using chemical additives.

What's more, the Alfa Laval decanter with its patented 2Touch control system has proven effective for over a decade in Australia's demanding wastewater treatment and drilling fluids dewatering environments.

"Based on the test results and a tour of the Alfa Laval service centre in Sydney, we decided to let Alfa Laval recommend a course of action to meet our operating parameters," says Booth.

Huge savings in water, energy and capital investment

After installation, the Alfa Laval decanter centrifuge has provided an alternate method of coal tailings management



The Alfa Laval decanter produces spadeable cake with 67% dry solids by mass, which is put back into the open cut for mine rehabilitation.



The Alfa Laval decanter centrifuge effectively dewateres hard-to-handle coal tailings.

at Rix's Creek and delivered significant savings in capital expenditures, water consumption and energy usage.

"Using the decanter centrifuge enables us to retain and re-use 80–90% of the process water. Given the water shortage here, these are significant savings," says Booth. "Plus we no longer have to pump the water three kilometers away for processing, so the energy savings add up, too."

Moreover, cake quality and handleability has exceeded expectations, with cake concentration between 62 and 67 percent dry solids by mass. No free water can be squeezed from the cake.

With these benefits, the Alfa Laval decanter may also influence how other Australian mining companies handle tailings wastewater in the future.

Glocal service and support

Alfa Laval offers global decanter centrifuge expertise, local process know-how and a strong reputation. This convinced Booth and Bain that Alfa Laval could handle design, installation, commissioning, service and support.

"Parts and service are readily available through the Alfa Laval service centre just two hours away," says Bain. "Support is always close by."

Future of tailings management

Based on the past performance of the Alfa Laval decanter, the Bloomfield Group ordered two additional decanter centrifuges.

"The success of the Rix's Creek project has enormous ramifications for our company and the industry at large," Bain concludes.

How to contact Alfa Laval

Contact details for all countries are continually updated on our web site. Please visit www.alfalaval.com to access the information direct.