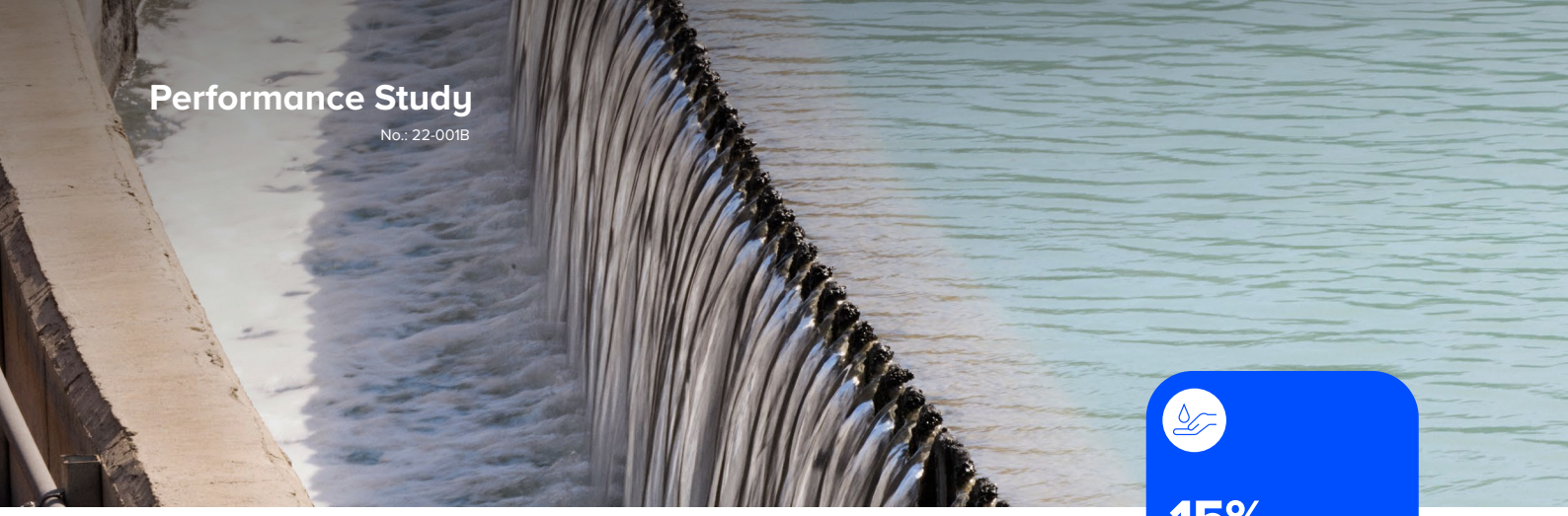

Performance Study

No.: 22-001B

Commodity
Copper

Technology
Spiral Rake Blade System

Application
Paste Thickener

Study type
Customer Story

Country
Kazakhstan

15%
Increase in water recovery at the plant

15%
Reduction in tailings volume

11%
Increase in underflow density

How we increased tailings dam stability and water recovery at a large copper mine in Kazakhstan

A large copper mine in Kazakhstan, operating two plants, increased their tailings thickener underflow densities by 11% following installation of our deep cone thickeners with patented spiral rake blade systems. The new thickeners, installed at their second plant, increase water recovery at the plant by 15% and reduce the flowrate to the tailings facility by 15%.

At the mine's first concentrator, the existing thickeners were not able to achieve the target underflow density of 65% solids (w/w). At the central thickened discharge (CTD) style tailings storage facility (TSF), the low underflow density tailings mostly channelled and flowed into the dam rather than building up the desired beach slope. The result was a tailings pond that was not in the original design and that required additional pumping to recycle the water back to the plant. It also led to an earlier-than-planned expansion of the TSF.

With their existing thickeners averaging only about 61% solids (w/w), the copper miner approached us to supply paste thickeners that would deliver underflow densities in excess of 68% solids (w/w).

Based on existing R&D work that was looking at ways to improve underflow density, we were able to incorporate a new inner spiral rake blade designed for high tonnage applications to enable consistent high underflow densities from the three 45m deep cone thickeners.

Since start-up of the paste thickeners, underflow densities of between 66% and 70% solids (w/w) are consistently achieved, the first time a plant of this scale has achieved this level of dewatering. This recovers more water and reduces the volume of the tailings by 15%, helping maximise deposited density and best utilise available TSF space.

The spiral rake design helps eliminate short-circuiting in the thickener mud bed, providing a more consistent mud bed residence time and higher underflow density. The overall result is a tailings facility that is safer, easier, and more economical to operate and control, while also consuming less energy.

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