



CASE: GOLD MINE, WESTERN AUSTRALIA

## Thickener upgrade worth its weight in gold

With productivity and performance hampered by their leach feed thickener, one of Australia's largest open-pit gold mines asked FLSmidth to investigate. The solution FLSmidth delivered continues to pay dividends.

### Background and objective

One of Australia's largest open-pit gold mines was dealing with a productivity and performance issue. Their leach feed thickener was creating a bottleneck in their processing plant. The thickener – which was neither supplied nor installed by FLSmidth – was an off-the-shelf design. It was not optimised for the plant or the processing requirements, and was hindering the gold mine's success.

As the on-site maintenance contractor, FLSmidth was asked to assess the problem and offer a solution.

The objective: to improve overall plant performance.

“Having control of the project meant we could keep to the required tight delivery schedule, while remaining on top of quality and planning on site”

Dane Smith  
Product Manager, Dewatering

# Our process knowledge and full-service offering delivered significant productivity improvements

## Defining the project

FLSmidth's team of specialists initiated a range of test work, a process review and structural analysis of the bridge and thickener tank. It was established that the existing feed system was undersized and hampered by air entrainment. The density-reliant dilution system meant that the feed stream was not being diluted, resulting in high flocculant consumption, poor overflow quality and lower than desired underflow density.

FLSmidth engineers recommended the mine install a proven combination of FLSmidth's E-DUC® dilution technology and E-Volute™ feedwell.

## The solution

FLSmidth's combined E-DUC and E-Volute solution directly targeted the thickener's underperformance characteristics of low flocculant efficiency and feed distribution.

The E-DUC system uses feed stream momentum to dilute incoming feed prior to the feedwell, optimising flocculant consumption through improved mixing profiles and residence time.

The E-Volute feedwell provides excellent feed stream energy dissipation, optimal mixing energy and shear profiles, resulting in maximum floccule growth and even feed distribution into the thickener tank.

## The results

Initial analysis revealed the installation of FLSmidth's E-DUC system and E-Volute feedwell reduced flocculant consumption by 34%. It improved overall performance of the thickener, which now achieves consistent production of up to 1000 tph (original nameplate design of 700 tph). The production bottleneck at the thickener has also been eliminated.

Average thickener underflows have been increased by 4–6% (w/w) – a level that has been set to limit increases in viscosity in the carbon-in-leach (CIL). The 34 m opposition thickener is now delivering a higher average underflow density of 52–54% (often reaching up to 56%) than the 44 m tailings thickener. This increase is giving an additional 11–16% residence time in the leach circuit, which helps to maximise recoveries.



In a package that is unique to FLSmidth, the complete service on this project included design, engineering, fabrication (including the new feed system), planning, scheduling, project management, installation and commissioning. FLSmidth was able to complete the project ahead of schedule. In fact, the planned shutdown period for installation was reduced by three shifts.

The mine has achieved return on investment on the new system in less than six months.

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