

Mining goes mobile

A privately owned manufacturer is developing technology that could make below-surface processing feasible, resulting in big savings. By Luke Forrestal

EVER SINCE large-scale underground mining began, haulage has been one of the biggest cost concerns. Often, much of an underground mine owner's time is occupied with finding a more efficient way of transporting ore to the surface for processing.

If, however, some of that processing could be done underground and only a small, high-value portion of the ore sent to the surface for further treatment, it would change the game dramatically. The reduction in haulage requirements would bring huge savings in mine operating costs.

The feasibility of this idea has been tested by the mining industry before, but never as promisingly as in the Ballarat, Victoria, laboratories of Gekko Systems, a privately owned manufacturer of mineral-processing equipment with an outstanding record of innovation.

Husband-and-wife team Sandy Gray and Elizabeth Lewis-Gray began the Gekko business in 1996, having secured a federal grant to develop the InLine Pressure Jig, a unique device for gravity separation of minerals. The company has since expanded its product line, focusing on alternative processes, and established itself in important mining markets around the world.

Gekko has maintained a robust research and development program and is two-and-a-half years into its most ambitious project. Trials will soon begin of a prototype processing plant that incorporates the company's gravity floatation and intensive leach mineral separation technologies and can be assembled and moved around in confined spaces underground.

If the project is successful, certain mines will for the first time have the option of pre-concentrating ore into a form of slurry before either pumping it through a pipeline or using truck or shaft haulage to bring it to the surface. Gekko forecasts that haulage costs could come down by more than 50 per cent.

According to Lewis-Gray, the company's chief executive, the genesis of the project was natural. Two concepts that Gekko has had a hand in either pioneering or reintroducing in the mining industry – ore pre-concentration and the modularisation of processing plants – seemed to lend themselves perfectly to processing in an underground environment when combined.

At this stage, the company has not gone to great lengths to publicise what it is doing for fear of generating too much hype and not being able to deliver on expectations. But Lewis-Gray says everyone she has spoken

to has been extremely supportive.

"Where people have a particular application [for the underground processing plant], they're very excited," she says. "Then there are the companies that think it's a great idea, but don't have a particular application for it right now.

"It will probably take some time to iron out some of the operational bugs. But the economics of it are so appealing that I think we will very quickly sign up a number of customers who are looking to invest in the equipment and take it underground or who are looking to do more test work with it."

One company that has expressed an interest and is keeping a close eye on Gekko's progress is Bendigo Mining. Bendigo owns above-ground processing facilities that feature Gekko equipment, but could be a candidate to use the underground plant in the future.

"It all makes good sense," Bendigo

managing director Rod Hanson says. "It's one of those things that has the potential to make a real difference; it's not tinkering around the edges.

"Gold mines like we have in Victoria appear to be a good opportunity. The potential is certainly there in deeper mines where trucking is a significant cost or hoisting is a significant cost; and in mines where it's possible to use the gravity process to upgrade ore."

Hanson appreciates that the underground processing plant uses proven technologies, a move that has reduced some of the technical risk. He also likes that the plant is mobile and able to be moved easily in mine tunnels, which typically measure five metres high by five metres wide.

"One of the problems in the past when people have looked at underground processing is they required fairly big openings because they tended to use larger-scale gear," he says. "But Gekko has modularised everything. You can put it in openings that don't need a vast amount of additional engineering."

Hanson's only reservation is on the issue of tailings disposal. The plan is to dispose of tailings in mined-out voids underground, but in the early stages of mining these are unlikely to be available. He does not, however, expect the problem to be insurmountable.

Dale Elphinstone, the man behind the Elphinstone underground mining equipment business – now owned by global mining equipment giant Caterpillar – is another one taking a keen interest in the Gekko project – and not merely because he is a member of the company's board.

Elphinstone believes the

underground processing plant could signal a paradigm shift in the economics of underground mining. "It's got the potential to reduce the haulage costs of underground mines to as low as 10 per cent of what they are today," he says. "It's potentially industry-changing.

"[Gekko has] done a great job of reducing the size of the components and reorganising the way they are laid out so we can sit them in a five [metre] by five [metre] tunnel. It's just another step in improving the economic capabilities of the underground mining industry."

Elphinstone is not worried by the prospect that the underground processing plant could diminish the market for his equipment. Rather, he envisages more sales opportunities.

"How many trucks and loaders can you sell to a mine that doesn't operate because it's not economic? You don't sell any. At least this way, with the underground processing plant in place, you still sell drills and loaders and some trucks because the material still needs to be hauled to a central location."

As the largest R&D undertaking in Gekko's history, the underground processing plant project is expected to cost more than \$4 million by the time it is finished. Of that, the federal government will have provided about \$1.5 million; the rest will have come out of company coffers.

In terms of what it might mean for Gekko in the future, Lewis-Gray hopes it will confirm the company's reputation as a forward thinker and garner it more attention from the big names of global mining. "We've mainly worked with SMEs so far, but I think this will improve our presence in the eyes of the larger mining companies," she says.

Although other mining technology and services groups are listing on the Australian Securities Exchange at a regular rate, Gekko has no plans to follow suit. Conditions in the market may be strong, but Lewis-Gray says a listing could pose problems in the long term.

"If it was ever going to happen, it would be as part of a larger conglomerate of mining services groups," she says. "You're just too exposed to the ups and downs of the mining cycle if you're a fairly focused, smaller business like ours." ●

UNDERGROUND PROCESSING: HOW IT WORKS

