

# Innovation to the fore

Austpac Resources is seeking funds to develop a large pilot plant to demonstrate the power of the company's revolutionary ilmenite process technology. **By Paul Garvey**

**A**ustpac Resources managing director Mike Turbott describes it as "being bitten by the ERMS bug". For the past 15 years, Turbott, a geologist with a decorated career in resources exploration, has dedicated his professional life to the advancement of his company's Enhanced Roasting and Magnetic Separation (ERMS) processing technology.

The resources industry can be a frustrating game requiring patience. As Turbott can attest, this is particularly true when it comes to establishing new processing technologies.

Turbott points out that Austpac would not have dedicated so many years, resources and efforts to the technology if he and his colleagues did not firmly believe in the process and its near-term potential for commercial application.

The technology at the heart of Austpac is the ERMS SR process, an Austpac-developed ilmenite processing technique which produces super-high grade synthetic rutile.



Installation of the oxidation fluid bed roaster.

The process combines Austpac's ERMS and Enhanced Acid Regeneration System (EARS) technologies.

ERMS is a roasting process which magnetises ilmenite, making it amenable to leaching in hydrochloric acid, while EARS regenerates hydrochloric acid from the waste iron chloride liquors produced by leaching ilmenite.

The engineering complexities are difficult for a humble journalist to describe, but those hungry for more technical insight should visit Austpac's comprehensive website (see at a glance box).

In simple terms, the ERMS SR technology works by using roasting and acid leaching to process ilmenite — a common mineral made up of iron and titanium and often associated with mineral sands deposits — into super-high grade synthetic rutile, which is used as a feedstock for the production of titanium dioxide. Titanium dioxide is used predominantly as pigment in paint, and also in the manufacture of products as diverse as glossy magazine paper and plastics. High-grade feedstock is also required for titanium metal for applications such as golf clubs and artificial joints.

Austpac's process differs from the existing ilmenite processing options in a number of key ways.

Firstly, the grade of the synthetic rutile product (as great as 97% titanium dioxide) is higher than other rival processes.

Secondly, the ERMS SR system is the only processing option that can successfully treat ilmenite from any deposit in the world, regardless of weathering or impurities.

"The advantage of our technology is that it can handle any ilmenite; we're not restricted by the quality of feed like the other available processing options," Turbott says.

To date, more than 80 ilmenites from around the world have been successfully processed through the system.



Austpac Resources managing director Mike Turbott ...  
"It's taken persistence but we believe in the technology and its applications, and we're all very excited about the stage we're at."

This could have lucrative ramifications in the Murray Basin of Victoria and New South Wales. The high impurity content of the ilmenite set to come out of the region's mineral sands' mines means owners like BeMaX and Iluka are considering stockpiling the ilmenite or returning it to the ground. Austpac's ERMS SR could represent a far more economic means of disposal. Austpac already has a healthy relationship with BeMaX, with Austpac set to provide the Murray Basin miner with a Low Temperature Roasting (LTR) facility.

Thirdly, ERMS SR not only produces a potentially valuable by-product of iron pellets, it is also capable of regenerating the hydrochloric acid needed in the process. The environmental and economic benefits are obvious.

As with all new processing technologies, however, Austpac is hostage to an impasse on a par with anything in Joseph Heller's *Catch 22*.

Would-be customers are unwilling to commit to using an innovative new process until they can witness the technology being successfully demonstrated at a commercial level. Austpac can't demonstrate the technology at a commercial level until it finds a customer willing to commit.

Austpac's recent agreements with mineral sands producers BeMaX Resources, Iluka and Iluka's 50%-owned subsidiary Consolidated Rutile are encouraging signs. In addition, Austpac's successful commissioning of a 2.5 tonnes per hour LTR plant at New Zealand Steel's Glenbrook site proves that at least one of the company's technologies can be commercially applied.

However the onus is still on Austpac to secure the funds and get the ball rolling on the construction of a plant to demonstrate the technology on a commercial scale.

With Austpac set to embark on a final feasibility study into the construction of a 30,000 tonnes per annum ERMS SR plant



Current upgrades to Austpac's pilot ERMS SR plant in New South Wales will lift production capacity to 1500 tonnes per annum of synthetic rutile.

later this year, Turbott says his company is on the verge of demonstrating that commerciality.

For the past eight years, Austpac has been operating a pilot ERMS SR plant at Kooragang Island in NSW. The proceeds from a recently completed \$1.23 million share placement are being used to upgrade and expand the pilot plant into a unit capable of producing 1500tpa of synthetic rutile.

This upgrade is the first step in the 30,000tpa plant feasibility study, with the major benefit of the pilot plant expansion being the reduction of the scale-up risk associated with the proposed plant. The scale-up from the pilot plant will come in at a manageable rate of 20:1. In comparison, some elements of the ill-fated Stawell plant of Australian Magnesium Corporation involved scale-ups in the vicinity of 1000:1, while upgrading LionOre Mining International's Activox base metal treatment plant, currently operating successfully as a demonstration plant in Botswana, requires a scale-up ratio of just under 200:1.

Meanwhile, Austpac faces the challenge of sourcing the capital to fund the feasibility study.

With the funds from the shareholder placement committed to the pilot plant upgrade, (to be finished by mid-2005), Austpac is still chasing \$4-6 million to fund the remainder of the study.

Turbott says he is in the process of sourcing the funds for the feasibility

study, adding he is confident the necessary resources would be secured "in the near future".

At press time Austpac had yet to select a specific site for the 30,000tpa plant. It will be built somewhere on Australia's eastern seaboard and will likely cost around \$50 million.

The location of the plant will be determined by the source of the ilmenite. While ilmenite is abundant, the bulk of Australia's current production is tied up in long-term supply contracts. Austpac will most likely source its feed for the plant from Consolidated Rutile's North Stradbroke Island operations. A memorandum of understanding to take 70,000tpa of ilmenite feed has been signed between Consolidated Rutile and Austpac, while Austpac also has an agreement with Iluka for the marketing of super high-grade synthetic rutile.

Should the larger plant get the go-ahead, the new facility could be in production by mid-2007 — a time, says Turbott, when a substantial window in the world market for titanium dioxide feedstock is set to open.

Given the scars Australia's investment community is carrying in the wake of the high-profile and expensive failures of new processing technologies — the high-pressure acid leaching facilities at Anaconda Nickel's laterite operation and the fatal cost blow-outs at Australian Magnesium Corp's billion-dollar Stawell

project — it is easy to see why would-be investors might clutch their purse strings tighter at the thought of investing.

Turbott, however, urges the doubters to look closer at the technology behind ERMS SR — in particular, the simplicity of it.

"It's not rocket science," Turbott says. "There's nothing unusual about roasting ilmenite. It happens all the time. We just roast it a little differently."

The bulk of the technology is a clever modification of existing processes. While the acid regeneration is innovative, indications are that the process works.

Should the scale-up go ahead, the opportunities for Austpac should be substantial. While the titanium dioxide business comprises a small number of players, Turbott points out that it is as big as the nickel industry in dollar terms.

Then there are the opportunities that would be liberated by ERMS SR, such as the massive lower-grade titanium ilmenite resources of India, hitherto restrained by a lack of suitable processing technologies.

"It's taken persistence but we believe in the technology and its applications, and we're all very excited about the stage we're at," Turbott says.

"We could, ostensibly, become the leading synthetic rutile producer in the world. The ERMS SR process has the potential to unlock resources like those in India.

"Once we've got our first full-scale plant working, the world is our oyster."

**austpac resources  
... at a glance**

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**MARKET CAPITALISATION**  
\$21.24 million (at press time)

**MAJOR SHAREHOLDERS**  
Christopher Leech (3.04%)  
JP Morgan (2.82%)  
Richard Delaney (2.68%)