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Exploring in 3D

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THE mining industry is often a place of bizarre paradoxes. While the Australian mining sector is frequently seen as a risk-taker's paradise, it's not always easy for new technologies to gain acceptance in the marketplace.

Peter Williams is the managing director of HiSeis, a Curtin University spin-out commercialising an innovative three-dimensional seismic imaging technology.

The company says its imaging systems can give a clear picture of hard rock geology up to 1.5 kilometres deep, and map major shears and faults, as well as intrusive rocks.



A HiSeis team at work in Finland

HiSeis said its seismic technology works by sending acoustic waves into the ground from weight drop, vibratory or explosive sources placed at the surface, and measures the acoustic energy returning to the surface using geophones, laid out in either a line or grid fashion.

The technique has been well developed and implemented in the oil and gas industry, and is one of their primary tools for technical risk assessment in exploration and for petroleum engineering/reservoir calculation. A similar technique has also been used in the medical industry to build up images of the human body.

Launched 12 months ago, HiSeis has rapidly built up a profitable business – in a far better timeframe than most technology start-ups, to be fair – with turnover of several million dollars a year, according to Williams.

Around 70% of that money has come from overseas contracts, however; despite the fact the technology was developed here, local companies have been slower to adopt the technology.

However, HiSeis is active in the Australian market and has won contracts in Western Australia, South Australia, Finland and the US – for a range of commodities, including gold, nickel, copper, uranium, as well as water.

In the next 12 months, the company plans to be working in Queensland, Spain, Ireland and possibly west Africa, depending how contracts pan out.

But uptake in Australia has been relatively slow, according to Williams.

"Australia's the place we have the poorest traction right now, which is interesting. The large jobs are more likely to be overseas right now – why that is I'm not quite sure," he said.

HiSeis lists a number of significant majors on its client list already – companies such as Barrick, First Quantum Minerals, Rio Tinto Exploration and others. However, Williams said the willingness of local executives to take a punt on emerging technology was very variable.

"It really depends on the company and the people inside the company. Executive management really have to be prepared to take on the so-called 'technical risk' because they can see a value proposition – and I guess we've been able to paint the value proposition more convincingly overseas," he said.

Williams said the uptake of his company's technology in Australia has been better among companies looking to solve a particular problem.

The company has just completed a survey for Tasman Resources, which is seeking to better define the targets for diamond drilling at its Vulcan iron oxide copper-gold uranium project.

"They have tenements that are just due north of Olympic Dam, so they're looking for bloody big targets, but they're down at about 900 metres. They've gone through the traditional geophysics, and got an answer and then drilled a couple of holes based on those answers," he said.

Williams said the feedback from Tasman was that the company had spent reasonable amounts of

exploration money on traditional methods for relatively ambivalent results – best results from the first drilling program included 53m at 0.10% copper, 0.04 grams per tonne gold and 0.02 kilograms per tonne uranium oxide from 907m.

Tasman turned to HiSeis to help deliver a clearer picture of the deep geology of the region so it could better target future rounds of drilling.

“They asked us to do a couple of rounds of seismic [surveying] to try to image the geology down at 900 metres. And we could do the a seismic survey, imaging down at 14 kilometres of line length and down to about 1.5-2.0 kilometres, for less than the cost of one drillhole,” he said.

HiSeis began that work for Tasman at the end of August, and results are due to be announced to the market within the next few weeks.

Williams said the HiSeis technology offered some significant advantages over traditional techniques.

“The proposition for these guys is fantastic – now they can say ‘we can see the geology, we know where we went wrong – we didn’t have the resolution in the traditional geophysics techniques to see what we wanted to see and to therefore plan the hole,” he said.

The need for commercial confidentiality also makes it difficult to win new business. Most companies considering using new technology want to see successful results before taking a chance on it – justifiably so, when you may be talking about several hundred thousand dollars worth of shareholders’ money.

But demonstrating that is difficult when you need to preserve the confidentiality of the previous clients, who are often reluctant to allow HiSeis to use images generated at their projects in HiSeis’s pitches to new clients.

“Education is an issue. It’s fine to have come out of a university and have done all of your academic research and have been published in a couple of journals, but to actually convince someone who hasn’t maybe come across seismic on the ground before – it takes time to do that,” Williams said.

“And they want to see successful case studies in their own geological terrain. You have to go to someone who has the successful case study in a particular terrain and ask them if you can show it to the next guy to convince them – and that isn’t trivial.”

While the relatively slow local uptake of the technology is frustrating for Williams, he also accepts the company is relatively successful compared to most other technology start-ups.

It’s a rare tech start-up that’s profitable and growing within two years of its founding, according to Curtin University director of intellectual property commercialisation Rohan McDougall.

McDougall told *MNN* the mining sector in Australia, while occasionally conservative in its approach to new technologies, is large enough that new ideas can carve out a profitable niche business from which to expand.

“The mining sector is one of the few, if not the only industry where Australia has the critical mass required to invest in and bring new technologies to market. There is also access to experienced executives in this space,” he said.

“It is true that the big companies and projects are risk-averse but people are always looking for a competitive edge. If you can develop a product or process that adds value then there is a significant market right on your doorstep.”

Williams said HiSeis was concentrating on expanding its business through word of mouth.

“Bear in mind we’ve only been going for twelve months or so, so we’re still gathering traction,” he said.

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