



Playing a Key Role in Tackling the Looming Crisis in Mineral Exploration

The mineral discovery rate is declining precipitously worldwide. Especially in Australia, new mineral deposits are getting harder to unearth. Until a decade ago, around 70 to 80 moderately sized discoveries were made every year in Australia. Now, the industry struggles to find a few deposits annually as the search moves under cover of barren rock or sediments which make it technically very difficult and expensive to explore. This decline is considered a major threat to the financial system as the mining industry holds the largest slice of the Australian economy. According to The Australian Bureau of Statistics, Australia's mining industry has delivered a 10.4 percent share of the Australian economy in 2019-2020, making it the largest economic contributor with a \$202 billion GDP. Today, the future of this contribution is at risk due to the trend of declining discovery of major, new mineral deposits.

Thus, to reverse this trend and address the threat of declining mineral inventory by increasing the probability of discovery and reducing the time from discovery to production, The Mineral Exploration Cooperative Research Centre (MinEx CRC) was established in 2018 under the Australian Government's CRC Programme. MinEx CRC is focused on developing a novel set of drilling and sensing tools to measure the subsurface, exploring new ways to deploy those tools, and finding new methods to assess the resultant data and inform mineral exploration decisions to kick off a



Andrew Bailey, CEO



“

We will develop new exploration tools and new ways to deploy them that will recognise the fundamental importance of collecting data from the subsurface.

”

virtuous cycle of exploration activity leading to discovery. “We will develop new exploration tools and new ways to deploy them that will recognise the fundamental importance of collecting data from the subsurface,” asserts Andrew Bailey, the CEO of MinEx CRC.

Addressing Declining Exploration in Three Research Programmes

To create new opportunities for mineral discovery, MinEx CRC focuses on three key areas: (1) developing more productive, safer, and environmentally friendly drilling methods; (2) coming up with new technologies for collecting data while drilling; and; (3) delivering a National Drilling Initiative (NDI) – a world-first collaboration of Geological Surveys, researchers and industry that will undertake drilling and collecting vital data on never before sampled rocks that are hidden but prospective for minerals. MinEx CRC’s strategic research plan is defined by three key programme streams. Its first major programme is to further develop coiled tube drilling technology. This efficient technology makes it easier to drill out the sample beneath the rock cover to find new mineral deposits at depth. Unlike conventional drilling where the drill string

consists of individual steel rods that must be connected and disconnected, the drill string incoiled tube drilling has a continuous, malleable steel coil which makes the process quite easier. Overall, it improves productivity and safety while reducing the cost and environmental impact of drilling.

The second flagship programme of MinEx CRC is to improve and speed up data retrieval and analytics by using sensors attached to the drill rig. The conventional exploration method involves drilling a hole with a diamond drill rig and then pulling up the core, logging and sectioning it, and then putting it in bags to send it to a lab for testing. After receiving the result, a geologist then decides the next phase of drilling. MinEx aims to shorten the time involved in this process by delivering data about the mineral, chemistry, and physical properties of the rocks while drilling or immediately after. To achieve this, it has several ongoing projects cumulating around geochemical data, petrophysical properties of rocks, and seismic properties and data from the hole. “The vision is that decisions that would normally take weeks or months will happen the same day and you can use the steering capability of the rig to steer it towards a target or a



“

MinEx CRC's culture is driven by ethical behaviour, diversity, inclusion, and integrity.

”

different part of the geology right away,” explains Andrew Bailey, the Chief Executive Officer of MinEx.

Finally, its third key programme focuses on collaborating drilling to explore untapped areas of potential mineral wealth in Australia. Through NDI, it manages and delivers drilling programs in multiple case study areas proposed by MinEx CRC's partner geological survey organisations. “The NDI is a world-first collaboration of Geological Surveys, researchers and industry, to undertake drilling in under-explored areas of potential mineral wealth and provide a test-bed for new mineral exploration technologies,” adds Bailey.

Weaving a Value-Driven Culture

MinEx CRC's culture is driven by ethical behaviour, diversity, inclusion, and integrity. Keeping all these core values as the cornerstone, the organisation shapes its decisions and aligns its activities to consistently deliver against its purpose and promise. MinEx CRC is committed to an ethos of equal opportunity and fair

treatment of all those associated with MinEx CRC-related activities, regardless of diversity. “To meet its vision, it is a requirement for MinEx CRC to exchange research and development ideas across broad disciplines with a range of people of diverse views through open and respectful dialogue at face-to-face and online meetings, conferences, and field and drilling activities,” opines Bailey.

Blazing the Path Forward

When it comes to the future, Bailey believes that mining, especially in Australia, will be dependent on new fit-for-purpose technologies and tools, designed based on knowledge of the deep exploration search space, and focused on exploration ‘productivity’. And, it needs to be rapid, economical, safe, and environmentally friendly and combined with real-time data. According to Bailey, this is just the beginning of the new era of technology and there's much more ahead in the future. “These technologies are advancing rapidly; their impact will be evident in two to five years and further on the horizon,” concludes Bailey.