CRCLEME Cooperative Research Centre for Landscape Environments and Mineral Exploration	CRC Association Media Release 05/19 May 2005

GUMTREES AND MULGA: SIGNPOSTS TO MINERALS

Gum trees and mulga may point the way to Australia's next mineral strikes, in a scientific breakthrough with promising implications for the nation's $12 billion gold and base metals industries.

Scientists in the CRC for Landscape Evolution and Mineral Exploration (LEME) have shown that certain native Australian trees provide giveaway clues to mineral deposits hidden beneath the mantle of transported sediment (called regolith) that carpets two thirds of the continent.

Details of the new technology will be presented at an exploration industry seminar on Wednesday, May 25, 2005 at the Australian Resources Research Centre, in Perth.

For nearly a century of modern exploration the chief challenge has been the difficulty of finding surface traces of buried deposits, says CRC LEME CEO Dr Dennis Gee.

Chemical analysis of soil and water combined with other techniques have helped unearth $3 billion in new gold finds over the past decade – but these geochemical methods only work reliably where the weathered rock is not obscured by transported regolith.

In some areas in inland Australia there is up to 20 metres of "hardpan" – a dry, concrete-like layer close to the surface. In these areas explorers have very little to go on, to help them pinpoint possible new deposits.

This dry layer forms a physical barrier which prevents metal traces from buried mineral deposits being brought close to the surface as dissolved ions in groundwater.

Now CRC LEME teams led by Dr Ravi Anand of CSIRO and Dr Steve Hill of Adelaide University have found that native vegetation, which has very deep tap roots designed to reach water far underground, can do some of the prospecting for us.

“Certain plants, notably the thirsty mulga, act as hydraulic pumps, bringing up the metal-rich water from deep down to nourish their leaves and branches,” Dr Anand explains.

“Dissolved metals enter the roots, rise through the vascular tissues, enter the fruits, twigs, bark and leaves, and then build up in specific products in the tree. ” In several areas north of Kalgoorlie, Dr Anand has detected very high levels of zinc in products of the mulga tree.

In a related study, a LEME doctoral researcher, Karen Hulme at Adelaide University, has confirmed surprisingly high levels of , lead and zinc in certain parts of river red gums, in central outback Australia. In one case this had led to the extension of a mineralized lode in an area covered by transported regolith.

While the research is still in its early stages, the LEME team is confident that, with the help of the trees, they will soon have a practical new way for penetrating the inscrutable regolith and picking up the telltale signatures of hidden metal ore deposits.

In the process they are adding a new word to the Australian dictionary – biominex, or biological mineral exploration.

“For the first time we have hope of a technique that reads surface geochemical signatures of mineralisation concealed under 20 metres of transported regolith (eg hardpan), where no other technique works,” Dr Anand says.

Dr Gee emphasized that although these are very promising developments, further work need to be done on scaling the “footprints”, and defining the “background” in order to define the optimal sampling strategies.

The research addresses National Research Priority Three – frontier technologies for transforming Australian industry.

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