

## Open Letter from Mr George Savell, Chair CRC LEME Board

### FUTURE OF REGOLITH GEOSCIENCE R&D AND INNOVATION IN AUSTRALIA – END USER PRIORITIES

I am writing to you as Chairman of the Cooperative Research Centre for Landscape Environments and Mineral Exploration (CRC LEME) an unincorporated joint venture established and funded under the Australian Government's Cooperative Research Centres Program. Full details of the CRC, its research programs and outputs can be found on our Web Site at: <http://crcleme.org.au>.

Regolith science is a relatively emerging science which CRC LEME 1 and 2 have pursued in a coordinated way for some ten years. Only now are solutions becoming available which can be applied to both mineral search and natural resource management.

The CRC will cease to exist on 30 June 2008. In the opinion of many, regolith science is not yet embedded to a point where it can be left to develop of its own volition.

During 2006 two events focused attention on the need to review what is required for the continuation of regolith research beyond CRC LEME.

■ In July 2006 the independent Fifth Year Review Panel noted that the Minerals Advisory Council which advises the Board was concerned at diminishing numbers of CRCs serving the Minerals industry and strongly recommended the Board evaluate all means of redressing this problem.

■ The Independent Review then drew attention to the fact that we are nowhere near reaching definitive answers to improved exploration through cover. Nor indeed are we close to finding final solutions to salinity management.

Both of these issues are heavily dependent on continuing focused regolith research.

As a result the Governing Board of the CRC has appointed a Special Task Force chaired by our CEO, Dr Steve Rogers, to critically examine the end-user requirements for future regolith geoscience research, post LEME 2.

This will also determine if and what sort of future organisation may be needed to pursue regolith science.

We are seeking input from existing and potential end-users of regolith research to determine the level of demand, future strategies and focus for regolith work. We would very much welcome your input to this exercise. Please feel free to contact Dr Steve Rogers by phone, fax or email as your input is vital in determining this matter.

Thank you for your consideration. We look forward to your response and input which would be appreciated by the end of January 2007.

GEORGE SAVELL  
Chair CRC LEME Board

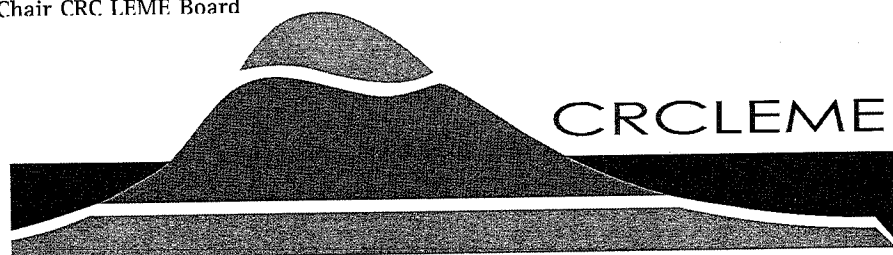
## CRC LEME: Digging up the dirt on Australian regolith science

The Cooperative Research Centre for Landscape Environments and Mineral Exploration (CRC LEME) was established in 2001 under the Australian Government Cooperative Research Centre Program to apply regolith science to the environmental and mineral exploration challenges facing Australia. The Centre grew upon the strong foundations of regolith science left by its highly acclaimed predecessor, the CRC for Landscape Evolution and Mineral Exploration, which formally concluded operations in June 2001.

As an organisation, CRC LEME exists as an unincorporated joint venture between Geoscience Australia, CSIRO (represented by the Divisions of Exploration & Mining, and Land & Water), Australian National University, Curtin University of Technology, the University of Adelaide, NSW Department of Primary Industries, Primary Industries and Resources of South Australia, and the Minerals Council of Australia.

The Centre was specifically created to develop and deliver scientifically robust, innovative, multi-disciplinary research partnerships to assist Australia's minerals exploration and Natural Resource Management (NRM) sectors. This research, which has been delivered and designed with the end user in mind, was developed through the innovative integration of unrelated disciplines such as geology, geophysics, geochemistry, soil science, microbiology/molecular biology, hydrogeochemistry, hydrology, plant biology and ecology. CRC LEME also places a strong emphasis on providing high-quality geoscience-based education to those entering the minerals or environmental management industries, and has one of the highest graduate industry employment uptakes of any CRC.

For more that five years CRC LEME, through its publications such as Open



Cooperative Research Centre for  
Landscape Environments

File Reports, case studies, thematic volumes, datasets and regolith-landform maps, has made an active and valuable contribution to the Australia's geoscientific community.

The Centre's research has helped mineral explorers better understand the processes at work within the regolith environment and assisted in the development of effective exploration programs in highly-weathered terrains or landscapes featuring significant transported cover. In December 2005, the Allen Consulting Group in a report entitled, *The Economic Impact of Cooperative Research Centres In Australia* stated: 'Since the mid-1990s, technology developed by CRC LEME has contributed to the discovery of gold deposits with an inground value of more than \$3 billion.'

Through the application and interpretation of various geophysical techniques applied to the regolith environment, CRC LEME has improved the understanding of near-surface hydrology. In particular, the Centre's research has been able to define and map areas at risk from salinity. The Centre has also made significant progress in understanding the chemical, physical and biological processes that form inland Acid Sulfate Soils (ASS), a significant environmental hazard common to many ephemeral water bodies in Australia.

Since its inception, the major achievements of CRC LEME have been:

- Development of a technique known as phyto-exploration that has allowed the minerals exploration industry to successfully use Australian biota geochemistry to locate mineralisation below transported cover.
- Creation of an *Atlas of Regolith Materials of the Northern Territory* with the Northern Territory Geological Survey – a regional regolith guide designed for mineral explorers and NRM managers.
- Improving the understanding of how groundwater geochemistry can be used to find new mineral deposits.
- Creation of 'low density' geochemical surveys based on stream sediment sam-

pling for use by the minerals exploration industry.

- Identification of bacteria responsible for the geochemical cycling of gold.
- Improved the application and interpretation of airborne and land-based geophysics techniques to identify salt stores and palaeo-drainage systems.
- The development of new geoscientific methods to characterise and map various sulfidic and saline environments in Australia.
- The development of a guide to manage the formation of sulfidic materials in wetlands.

While CRC LEME will cease operations on 30 June 2008, the Centre's research outputs such as its Open File Reports releases, thematic volumes, a digital compendium of regolith maps and geochemical databases, will be available on-line well beyond this date. CRC LEME will also produce a regolith geoscience textbook that will be released by CSIRO Publishing in 2008. This definitive regolith science text book will summarise the advances made in regolith science over the last seven years.

## Heritage Honour for Ancient Fossil Sites

Two ancient fossil sites in South Australia and Victoria have been added to the National Heritage List for their part in changing scientific understanding of the evolution of life on Earth.

Announcing the listings 11 January, the Minister for the Environment and Heritage, Senator Ian Campbell, said South Australia's Ediacara Fossil Site in Nilpena and the Yea Flora Fossil site in Victoria, showcased an important window in the Earth's history.

"Australian fossil sites contain examples of some of the oldest geology in the world and the Australian Government is proud to ensure their protection and conservation," Senator Campbell said.

"Ediacara fossils dated back to around 570 to 540 million years ago, when soft bodied organisms, similar to jellyfish,

swam in the warm tropical seas that covered most of the continent. Geologist Reginald Sprigg discovered the fossils in 1946 and forever changed science's understanding of the fossil record.

"Just thirty Ediacara sites are known to exist anywhere else in the world, with some of the most varied specimens found in Australia. The Ediacaran period is the first geological period to be declared in 120 years and the first to be named after a location in the Southern Hemisphere."

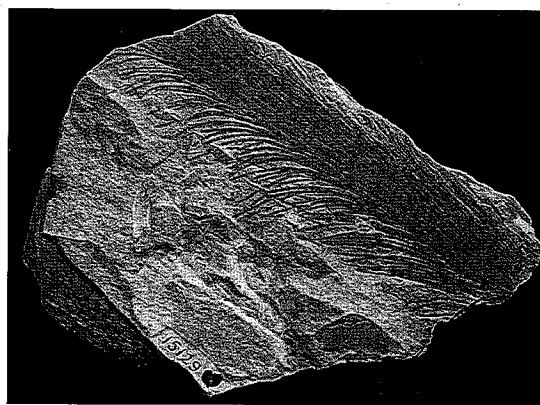
Senator Campbell said the Flora Fossil site at Yea in Victoria was the world's oldest record of how plants from the sea adapted to become land plants around 415 million years ago.

The discovery of these fossils led scientists to reconsider how and where complex land plants evolved.

"The fossils show a primitive type of club moss, called *Baragwanathia longifolia*, with thick, sap carrying stems that grew up to a metre in length and were more densely covered with slender leaves that could be up to four centimetres long," Senator Campbell said.

"I'm extremely pleased to add these important sites to the National Heritage List. Both sites provide a fascinating insight into the earth's evolution."

Source: Australian Heritage Directory ([www.heritage.gov.au](http://www.heritage.gov.au)) press release, 11 January 2007.



*Baragwanathia*, photo by Rodney Start at Museum Victoria. This specimen is in the Museum Victoria collection.