

Sustaining metal supplies – the immediate problem is a failure of exploration

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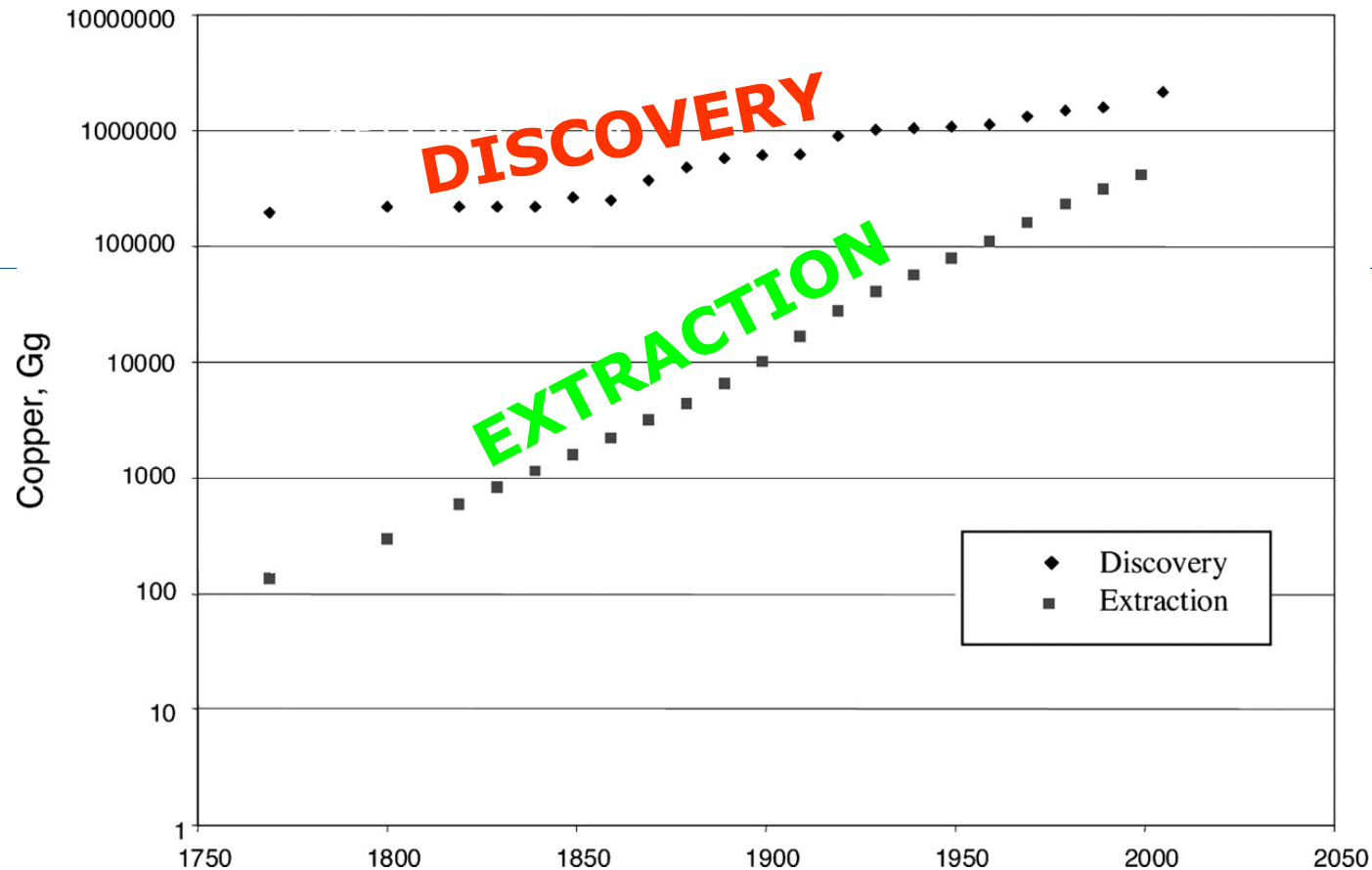
The shocking state of the Earth's mineral resources

“Even reserves of such commonplace elements as zinc, copper, nickel and the phosphorus used in fertiliser will run out in the not-too-distant future...”



New Scientist 26 May 2007 – with permission

Cumulative discovery of copper in ore and the cumulative extraction of copper worldwide in the 18th-20th centuries



Gordon, R. B. et al. (2006) Proc. Natl. Acad. Sci. USA 103, 1209-1214 (Fig.4)

The McKelvey Box –

Expanding reserves by improving geological certainty

RESERVES

- Increasing the density of drill testing of a known deposit

- Drilling extensions to known reserves
- Making discoveries near to known deposits by way of brown-field exploration
- Making discoveries remote from known deposits by way of green-field exploration
 - New geological concepts
 - New exploration technologies

RESOURCE
BASE

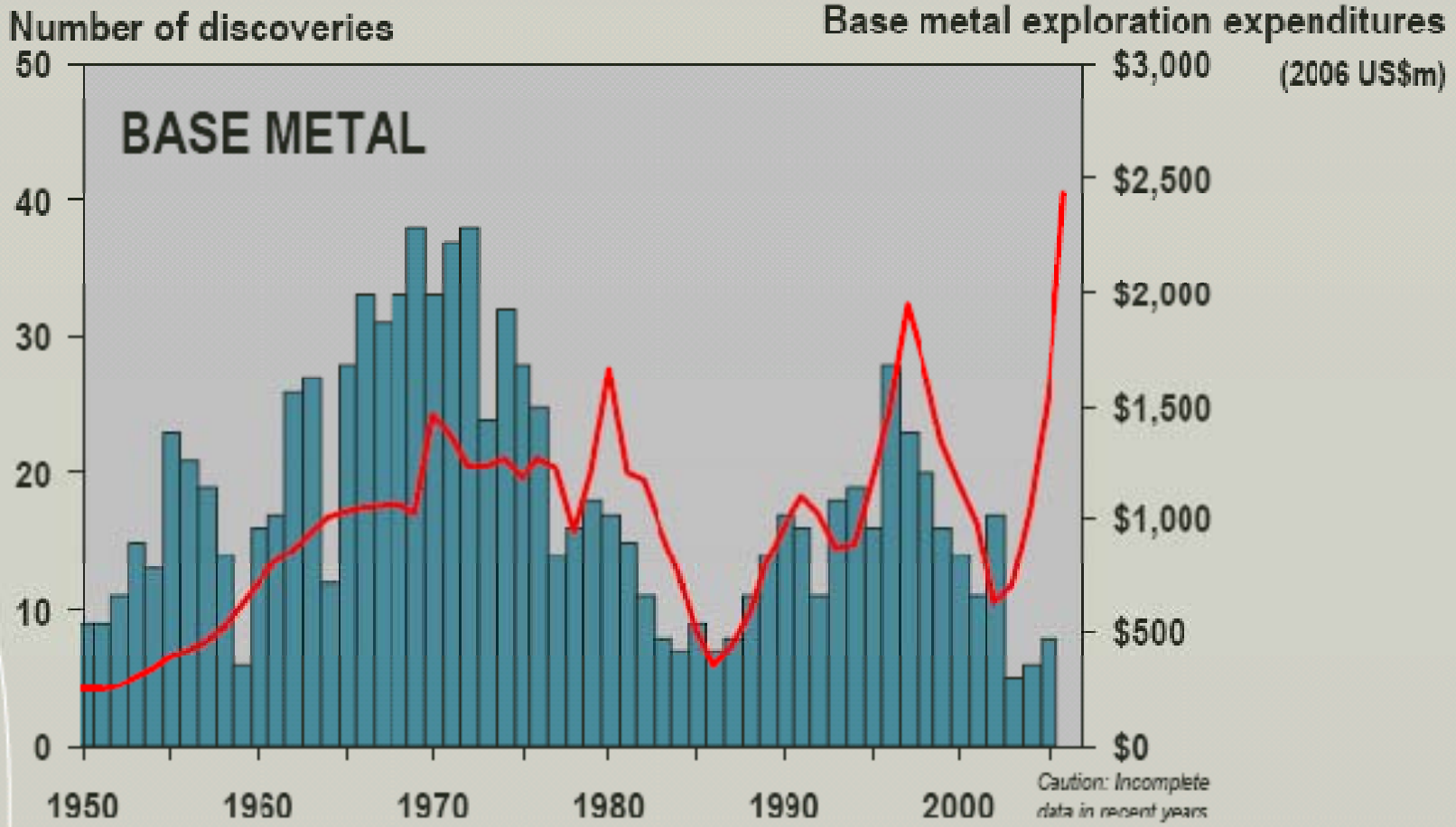


Increasing geological certainty

Increasing feasibility of economic recovery

Industry performance - how many deposits were found ?

Base metal (Cu, Ni, Zn, Pb) discoveries > 0.1mt Cu-equiv: western world: 1950-2005



WHY THERE IS A PROBLEM

The declining discovery rate for world-class base-metal deposits is attributed to the diminishing number of deposits around the world that are amenable to discovery by relatively easy prospecting from the surface. Most important discoveries in the future will come at depth....

*Chip Goodyear, SEG Conference,
Keystone, 2006*

THE OLYMPIC DAM MINE COMPLEX

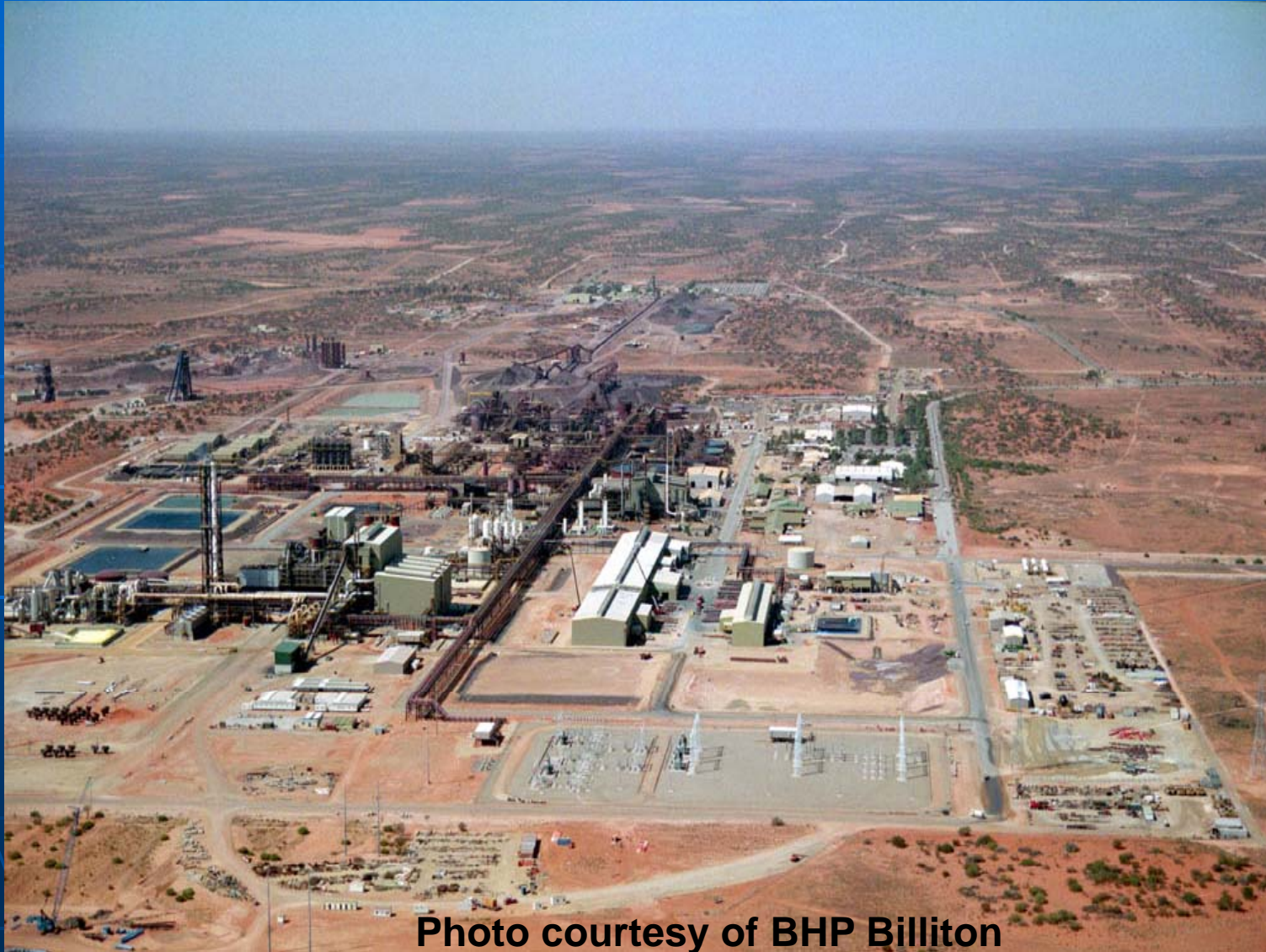
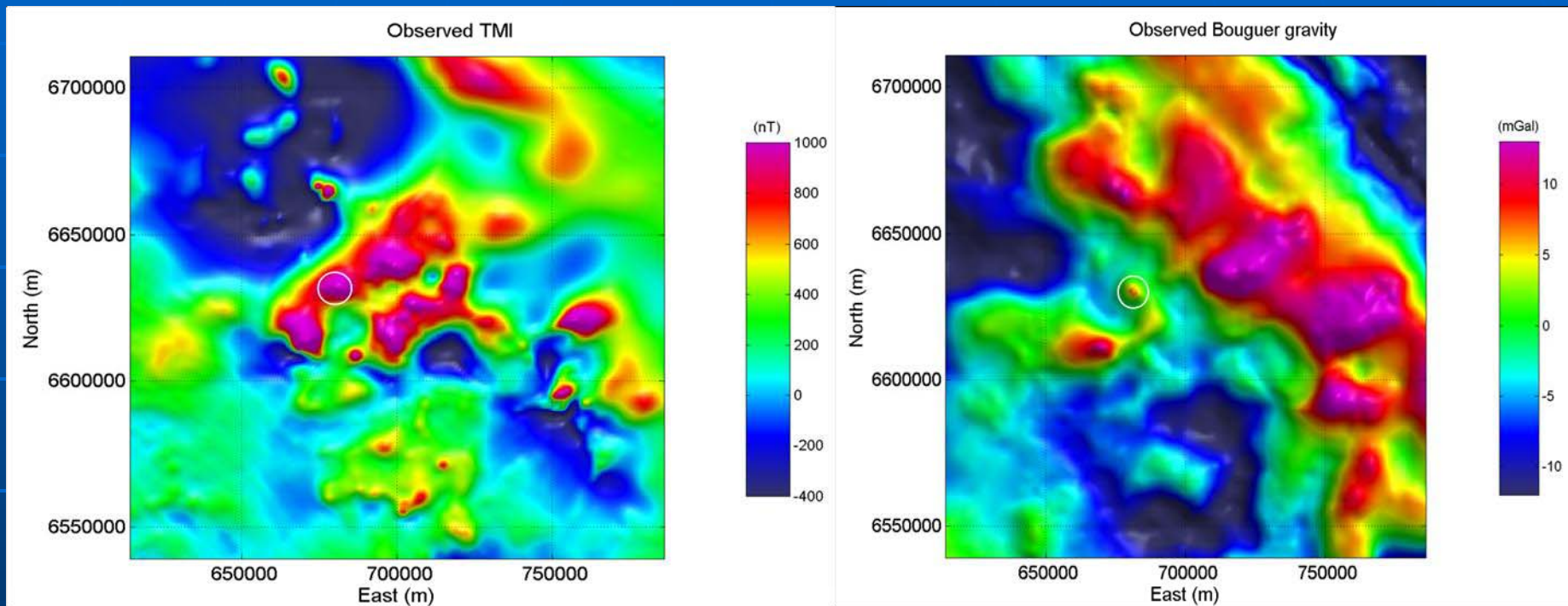


Photo courtesy of BHP Billiton

Olympic Dam – Total contained Cu – all JORC resource classes



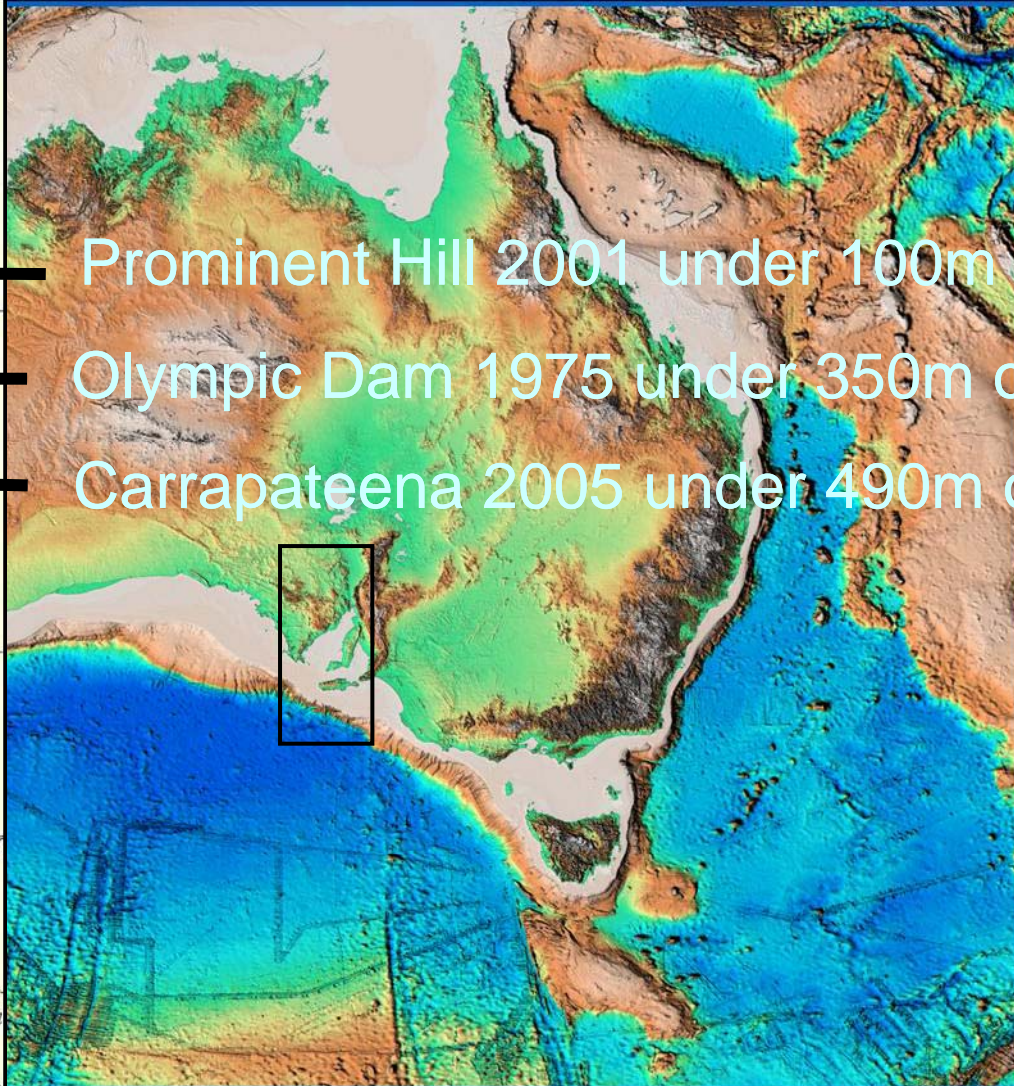
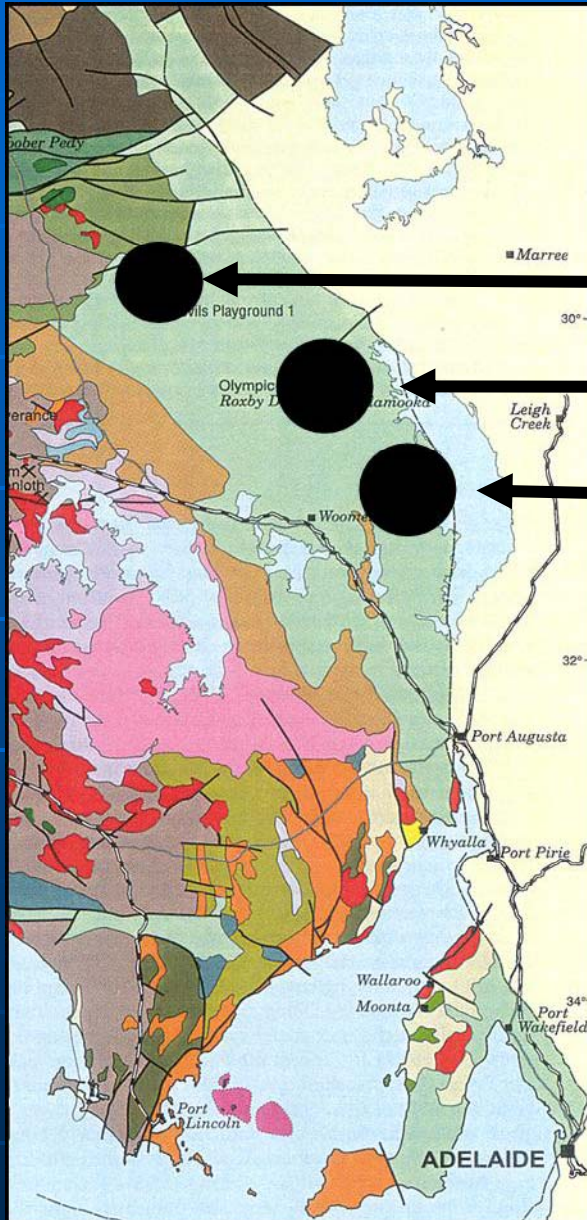
Regional Geophysics in the Olympic Dam Region, SA



Airborne magnetics

Gravity

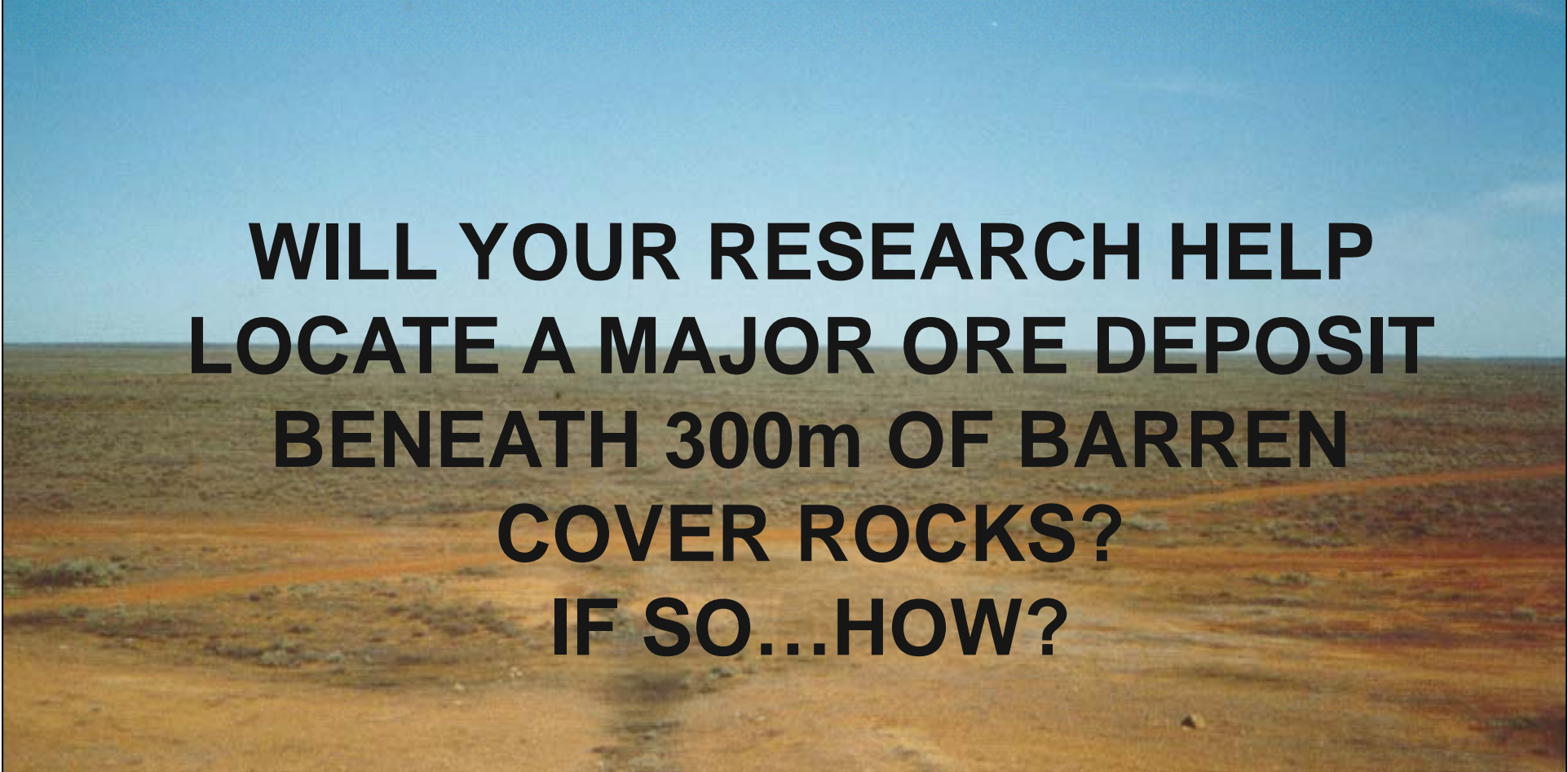
New concepts – new discoveries



Prominent Hill 2001 under 100m of cover
Olympic Dam 1975 under 350m of cover
Carrapateena 2005 under 490m of cover

Deep green-field exploration - geoscience changes required

- A growing focus on 3D geological mapping making extensive use of geophysical data and methods to constrain the subsurface geology
 - a move from rock types to rock properties
- A move from descriptive ore deposit models in exploration to predictive search hypothesizes
- A growing focus on mineral systems, rather than on individual ore deposits



**WILL YOUR RESEARCH HELP
LOCATE A MAJOR ORE DEPOSIT
BENEATH 300m OF BARREN
COVER ROCKS?
IF SO...HOW?**

View from Woomera in South Australia looking
north towards Olympic Dam

THANK YOU