Exploring for the Future: a new initiative to unlock Northern Australia’s minerals, energy & groundwater resources

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Exploring for the Future:

A new initiative to unlock Northern Australia’s minerals, energy & groundwater resources
How do you double your company’s value?

John Vann (Anglo American)

Knowledge frontier

Geographical frontier

- Do NEW things in same space
- Do same things in same space
- Do NEW things in NEW space
- Do same things in NEW space
Minerals: Value Proposition

Long-term divergence

Sources: MinEx Consulting & ABS
Exploring for the Future

- A major new investment in **pre-competitive** geoscience from the Minister for Resources and Northern Australia
- Federal Budget measure **$100.5 million over 4 years** (2016/17 to 2020/21 FY)
- Comprises three integrated elements:
  - Minerals
  - Energy
  - Groundwater
Aim and approach

- Aim is to **increase the attractiveness for exploration investment** by technically de-risking key underexplored **greenfield** regions in northern Australia.

- A prospectus to inform the integrated assessment of mineral, energy and groundwater resource potential based on:
  - New pre-competitive data acquisition, analysis and interpretation;
  - Novel regional studies addressing specific prospectivity questions.

- Undertaken by Geoscience Australia in collaboration with State/Northern Territory government agencies.

- Land access approvals will be obtained before any boots on the ground.
Background to the Minerals Exploring for the Future program


Further information:
- www.uncoverminerals.org.au
- www.coagenergycouncil.gov.au
Northern Australia: Where is it?

Approximately 40% of Australia's land area. Plus parts of South Australia.
Northern Australia-wide activities

New 3D geological maps

Airborne electromagnetics
20 km spacing, 175,000 line km (AusAEM)

Magnetotelluric sites every ~55 km (AusLAMP)

New & better isotopic maps
Why the TISA focus in this area?

- Generally poor geological understanding, especially undercover
- Between two great mineral provinces (TC and Isa)
- High potential for minerals (esp. Cu, Pb, Zn, U, Au)
- Unexplored energy potential
- Agricultural and remote area groundwater demands
Soil geochemistry for baseline and distal footprints

- >700 samples spaced ~20 km
- Sample prep contract with Centre for Appropriate Technologies in Alice Springs
- Start May
Hydro-geochemistry for baseline and distal footprints

- Sampling water bores for hydro-geochemistry
  - Distal footprints mineral exploration
  - Baseline enviro data
  - Start May
AusARRAY passive seismic for cover thickness and deep structure

• Moving array of ~120 seismometers for 12 months at each site
• Complementary to AusLAMP MT
• ~$2.5M of capital equipment ordered
• Start deployment in June
Why AusLAMP and AusARRAY?

Exploring for the Future Programme – AGES 2017

Olympic Dam

Isosurface of seismic velocity (Vsv)

Magneto-telluric data:
cross section of 3D model

Conductive

620 km

Isosurface of seismic velocity (Vsv) derived from the AusREM model (mantle component) of Kennett et al. (2013)

From Skirrow 2016 (IGC, Aug 2016);
3D model by Simon van der Wielen, GSSA
Magneto-telluric data from Thiel & Heinson (2013)
AusGrav: Gravity infill

- Start in April/May
- Better constraints on basin shapes in area of low density gravity

Black areas > 4 km spaced data
Towards 3D: Solid Geology by time – cover thickness
Towards 3D: Solid Geology by time – Pre-Cenozoic
Towards 3D: Solid Geology by time – Pre-Mesozoic
Towards 3D: Solid Geology by time – Pre-Palaeozoic
Towards 3D: integration with regional models
Deep seismic in South Nicolson

- Funded by Energy theme with NTGS, GSQ, and AuScope co-investment
- >1000 km-long deep seismic reflection profiles (start this FY)
- To be followed up by regional field work and stratigraphic drilling (18-19)
Future Activities – Drilling the ultimate test

Mineral Potential

Geology

Passive Seismic
Exploration decision-support and analytical system: MinEx Virtual Laboratory

Imagine an easy to use and inexpensive system with access:

- to all **geoscience** data through web services
- choice of codes
- workflow libraries
- cloud supercompute
- MinEx ecosystem for innovation and METS businesses
In summary:

• Exciting programme of unprecedented scale, scope and skills

• These new data will revolutionise our understanding of northern Australia’s geology.

• Short-term success – deliver the programme (new insights and new jobs)

• Medium-term success – change industry behaviour and attract significant new exploration investment

• Long-term success – *new-ways-in-new-places* exploration leads to new Tier 1 discovery that creates inter-generational wealth for all Australians
For more information
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