AN OVERVIEW OF THE CURNAMONA: A South Australian Perspective

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This presentation

1. The challenge
2. What are we doing?
3. Into the Future…
1. The Challenge

Changing Exploration into Discovery…

- What do we need for new discoveries in the Curnamona?
- More of what we have done or something new?
- What’s the cost and timeframe for this?
- How much of that needs to come from Government, Industry, Researchers …?
- Who are the right people to do it?
Geoscience initiatives / strategies in support of future mineral discoveries in Australia

1. The DISCOVERY challenge...

The covered minerals search space across 80% of Curnamona and margins

Need to UNCOVER Curnamona!
2. What are we doing?...
2. What are we doing?

Geological Survey of South Australia

- Major restructure completed in 2017
- Attract and deliver a geoscience framework to assist mineral explorers to make **mineral discoveries in South Australia**
- World-class geoscience towards a better understanding of South Australia’s **geological framework** and prospectivity
- Delivering **geoscience information and advice** to Minister, government, mineral explorers and community
2. What are we doing?

3 Examples…

1. Better information access and delivery
2. New Geoscience Data Acquisition
3. Drilling into and through the cover

and consider the impact of these for the Curnamona…
South Australian Drill Core Reference Library

minerals.statedevelopment.sa.gov.au/geoscience/drill_core_reference_library
New: South Australian Resources Information Gateway

https://map.sarig.sa.gov.au
2. What are we doing?
Magnetotellurics (AusLAMP)

See further in presentations by Stephan Thiel and Kate Robertson

How do we now build on this?
2. What are we doing?

Gawler Craton
• IOCG Hyper-spectral mineral system mapping

Emmie Bluff 3D Model
Copper Shell (0.8%)

Key
- Red: Hematite
- Gray: Magnetite
- Brown: Hematite – Magnetite
- Blue: Albite
- Purple: K-Feldspar
- Green: Sericite
- Yellow: Sericite – Chlorite
- Blue-Green: Chlorite
- Orange: Copper Shell

Emmie Bluff 3D Model
Alteration Voxel

• Increase the size of the target
• Predict where you are within the mineral system
• IOCG deposits - large alteration systems

Adrian Fabris et al, DET CRC
2. What are we doing?

Gawler Craton

- IOCG geochemical mineral system mapping

Adrian Fabris et al, DET CRC

• IOCG index (commercialisation with Reflex for ioGAS 5.2 release)
DET CRC – cheaper, faster drilling, rapid data collection

Challenge - collecting sufficient data in covered terranes

MSDP – support the pull through of new technology

Lab-at-Rig

Wireless Sub

AutoSonde
DET CRC – Coiled tubing drill rig

• Cheaper and faster drilling!
• 1st comprehensive field trial of RoXplorer®
• Initial trials at Brukunga
• Field test utilised drill pad of cored hole MSDP02

(Photos: Courtesy of Deep Exploration Technologies Cooperative Research Centre)
SA Mineral Systems Drilling Program

Want to know more?

• MSDP webpage – 10 part video series
• Core now available for inspection!
• DET CRC Website

minerals.statedevelopment.sa.gov.au/msdp
2. What are we doing?
PACE Copper Western Gawler Craton / Coompana targeted geoscience program

Coompana Drilling

CDP001

- First core sample from the SA Coompana Province in 30 years
- Basement at 346m
- Currently 164m HQ3 core
- Mixture of foliated dioritic gneiss and undeformed granites
3. Where to from here?...
Where to from here?
National Drilling Initiative (NDI)

MSDP set the scene with concept and CT Drilling Rig trials

The next major step change for Australian pre-competitive geoscience?
MinEx CRC: Research Activities

**Australian National Drilling Initiative (NDI)**
- Data compilation for the NDI
- Depth of cover and interfaces
- Basement mapping with drill rig
- Geochemical background
- Corridor 3D seismic surveys
- Petrophysical vectoring
- Auto 3D geology modelling
- Turbocoring

**Drilling for Definition of Mineral Deposits**
- Coiled tubing drilling (CTD) for definition of mineral deposits
- Trialling CTD in Chile
- Composites for CTD
- Petrophysical logging for CTD
- Real-time downhole assay
- Borehole seismic inversion

**Optimising Conventional Drilling**
- Drilling automation
- Rock properties from drilling data
- Reverse circulation (RC) drilling

**Industry Partners Research Organisations**

**Geoscience Australia State Surveys**

**Research Organisations**

**Industry Partners Research Organisations**

**Significant greenfields CT drilling in NDI pulls through existing technology and provides ideal platform for development of CT for brownfield and drill-out operations**
3. Where to from here?
National Drilling Initiative (NDI)

**Task 1:** Drilling and resampling program to identify and map key aspects of the mineral systems under cover

10 x 10 km pattern with depth to basement 1000 m

- 416 holes
- 203,200 m
- $10.2M @ $50/m
- 41,600 km²
3. Where to from here?

e.g. Eastern Gawler (Olympic Domain)

National Drilling Initiative (NDI)

- Geological surveys access ‘new hammer’ for mapping under cover
- Step-change in geological survey work required to write the prospectus for exploration under cover
- Leveraged cash from CRC Program to support analysis of NDI and related data
- Experience gained by, and success of, previous collaborative drilling programmes such as SA MSDP
GEOLOGICAL SURVEY OF South Australia

DISCOVERY DAY

7th December 2017
National Exploration Undercover School (NExUS)

- Over 30 registrants from industry, government and academia around Australia
- Presenters from industry, government and academia (>10 GSSA presenters and Week 1 lectures at Tonsley)
- 3 week emphasis on engaging “next generation” on UNCOVER challenges

nexus.org.au
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