URANIUM IN SOUTH AUSTRALIA: EXPLORATION FOR EXPANSION

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URANIUM IN SOUTH AUSTRALIA

OLYMPIC DAM is the SINGLE LARGEST uranium deposit in the world.

South Australia hosts \(25\%\) of the world’s uranium resources and \(80\%\) of Australia’s uranium resources.

$499 million

Was the value of uranium oxide produced and exported from South Australia in 2016.

75% of total Australian uranium oxide production in 2016.

5 APPROVED URANIUM MINES

Australia has seven approved uranium mines with five in South Australia.

Olympic Dam, Beverley, Beverley North, Four Mile, Honeymoon

Government of South Australia
Department of the Premier and Cabinet
URANIUM IN SOUTH AUSTRALIA

South Australia hosts significant national and global uranium resources

South Australia produces around 8% of the world's uranium.

South Australia has been a major producer for more than 30 years, operating under a regulatory framework widely recognised as one of the best in the world.
URANIUM IN SOUTH AUSTRALIA

Mines
• BHP: Olympic Dam copper-gold-uranium mine
• Heathgate Resources: Beverley uranium mine
• Quasar Resources: Four Mile uranium mine

Developing Projects
• Boss Resources: Honeymoon uranium project
• Marmota: Junction Dam
• Sinosteel Uranium: Crocker Well
• Samphire Uranium: Samphire
Nuclear Fuel Cycle Royal Commission
Delivering the Recommendations

Resources and Energy Group, DPC is committed to delivering on Recommendations 1 – 5

- Mining Approvals
- Pre-competitive Geoscientific Information
- Geophysics
- **PACE – Plan for Accelerating Exploration**
- Decommissioning and Remediation costs
Delivering the Recommendations
Plans underway for

• “…next-generation SARIG” with modelling capabilities from targeted drilling
• New Drilling initiative … eastern Gawler Craton and Curnamona Province…”
• “South Australia Drill Core Reference Library … new Drilling Initiative, research and innovation institutional partners…”
• “Discovery Drilling” focused on priority uranium targets…
• “establish a Drilling Service, Technology and Training Development Centre”
• Start-up Aboriginal companies with a focus on drilling, sampling and Aboriginal cultural heritage service opportunities”

• Response document at: nuclear.sa.gov.au
Government Initiatives

- PACE Copper and the Copper Strategy
- PACE Gas
- Magnetite Strategy & Steel Taskforce
- Investment Attraction
- Strategic global and local agreements with governments, companies and R&D partners
- Mining Act Review and consistent Regulatory Framework – certainty for long term future
- South Australia Drill Core Reference Library – facilitating exploration
- PACE Supply Chain Development Program
- Mining Services Centre of Excellence / Advanced Modular Solutions
- Business environment – tax reforms
- Energy Plan
PACE Copper
Geophysical Surveys
Gawler Craton Geophysical Survey

As at 5/5/17
Region 2A 80% complete
Region 2B 68% complete
Region 3A 53% complete
Region 3B 54% complete
Region 4A 87% complete
Region 4B 75% complete

For further updates:
Gawler Craton
Geophysical Survey
Coompana Province workflow

- Previously not under tenement
- Covered Proterozoic basement
- Precompetitive data initiative to support discovery, geoscience
Coompana Province: Lithosphere

- Deep crustal seismic and MT
- Reveal lithospheric architecture

Report Book 2015/00029
Mineral System Drilling program / Gawler Ranges Targeted Geoscience
DET CRC – Coiled tubing drill rig

- 1st comprehensive field trial of RoXplorer®
- Utilised drill pad of cored hole MSDP02
MINALYZE – DOWNHOLE XRF

Technology incubation at SA Drill Core Reference Library

- XRF Geochemistry, 1 cm resolution
- MSDP holes scanned – data evaluation phase
AusLAMP Magnetotelluric (MT) Project – mapping ancient fluid pathways

Motivation:

• Mineral occurrences are often associated with ancient magmatic and fluid flux in the crust governed by the lithospheric architecture

• AusLAMP MT can map those fertile areas using electromagnetic signals

• Early results indicate link between deep crustal boundaries and mineral occurrences across the Eastern Gawler
AusLAMP Magnetotelluric (MT) project

- $1.3M *PACE* funding since 2014 to acquire next-generation geophysics AusLAMP grid across SA
- Attraction of ~$0.8M external funding from University of Adelaide, Geoscience Australia and NCRIS to complete SA AusLAMP coverage by Q1 2018
- 317 long-period MT sites acquired to date (~80% of SA)
- 3D resistivity models of the crust and mantle for Gawler, Flinders, Curnamona and Western margins
- Currently acquisition in NE SA funded by $520k *PACE* Copper

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**SA AusLAMP – (NW) Musgraves/APY & NE SA**

*Status as at 26 April 2017*

Legend
- **Yellow** - sites planned
- **Lime Green** - sites currently deployed.
- **Dark Green** - sites currently re-deployed.
- **Aqua** - sites picked up but pending info on data quality.
- **Orange** - sites that have usable data but would benefit from redeploying
- **White** - sites currently deferred indefinitely
- **Red** - sites that need redeploying
- **Blue** - sites completed
Olympic Domain in-fill MT scale reduction for geoscience discovery

- “Zooming in” on fluid and magmatic pathways into the upper crust informed by AusLAMP
- PACE Copper Olympic Domain in-fill MT survey in planning to scale up into the upper crust
- Mapping mineral systems footprint for fluid pathways in 3D
- ~320 Broadband MT sites with site spacing between 1.5 km to 10 km across ~ 100 km x 100 km
- Data collection Q3 2017
Geological Mapping
Geological Mapping

The new ALCURRA 100k surface geology map

994 field observation

54 full suite geochemical analyses

30 regolith material and landform units

57 rock samples

2 new type localities

175 full suite biogeochemical analyses

7 whole rock Sm-Nd & Hf in Zircon data

2 new strat units

11 SHRIMP geochronology dates

26 thin section petrology
Collaborations and Partnerships

Sernageomin, Chile

China National Nuclear Corporation

China Geological Survey

Saskatchewan Geological Survey
National Drilling Initiative (NDI)

Regional mapping (undercover) using a drill rig instead of a geological hammer

The next major step change for Australian pre-competitive geoscience?