Overview of minerals and petroleum exploration in 2015

Ian Scrimgeour
A mixed 2015 for exploration

- Challenging year for bulk commodities and junior explorers
- Strong recovery for gold exploration
- Promising exploration results for base metals and polymetallic deposits
- Continuing strong oil and gas exploration in Beetaloo Sub-basin
- NT mineral exploration remained steady ($105M cf $108M in 2014)
- Increase in greenfields and non-ferrous metals exploration expenditure
- NT’s share of Australian exploration steadily increasing
Fraser Institute Survey 2015

Survey of Mining Companies 2015

NT’s global ranking

Geological Database
- 4th

Investment Attractiveness
- 7th

Best practice mineral potential
- 6th

Current mineral potential
- 10th

2nd in Australia to WA
Non-ferrous metal exploration expenditure 2000-2015

*excludes iron ore and coal
Non-ferrous metal exploration expenditure 2000-2015

- *excludes iron ore and coal*
- *WA figures divided by 3*
NT expenditure by commodity 2000-2015
Commodities as a proportion of total expenditure 2000-2015
Where is exploration occurring?

Expenditure reported to DME in 2015* by geological province

- McArthur Basin 35%
- Arunta 21%
- Pine Creek 10%
- Georgina 6%
- Warramunga 6%
- Tanami 5%
- Pedirka 3%
- Amadeus 3%
- Other 11%

* Reflects expenditure reported in 2015 calendar year for the previous 12 months, so includes substantial component of 2014 exploration

Legend:
- Red: Titles relinquished in 2015
- Green: Granted tenements at end of 2015
Gold

- 50% of expenditure in NT in 2015
- 425,000oz Au produced
- Mid-tier producers investing in gold JVs – Evolution Mining, Independence Group, Northern Star
- Resource growth and expansion at Dead Bullock Soak
- Brownfields exploration in Pine Creek Orogen
- Aggressive and innovative exploration at Tennant Creek
Central Tanami project  
*(Tanami Gold-Northern Star)*
- 25.5 Mt @ 3.2 g/t Au
- Includes **Groundrush** deposit (6.72 Mt @ 4.8 g/t Au)
- Northern Star Resources - JV with plan to bring Central Tanami back to production by 2017

Dead Bullock Soak *(Newmont Australia)*
- $120M expansion approved

Old Pirate *(ABM Resources)*
Commenced production in 2015

**ABM Resources:**
- **Buccaneer** – 19m @ 5.82 g/t Au
- **Hyperion** – 21m @ 4.42 g/t Au
Bluebird (Blaze)
20m @ 8.17 g/t Au, 0.61% Cu

Gecko (Emmerson)
7m @ 5.98% Cu

Mauretania (Emmerson)
30 m at 3.22 g/t Au, 13.1 g/t Ag, 0.33% Cu

Rover 1 (Metals X)
6.28 m @ 19.83 g/t Au, 7.15% Cu
McArthur Basin: world class zinc province

**Teena zinc discovery**

**Teck Australia-Rox Resources**

- One of Australia’s largest recent discoveries
- 10 km west of McArthur River

**2015 drilling:**

- 38.8m @ 16.9% Zn+Pb from 1069m including 20.0m @ 22.43% Zn+Pb

Mineralisation extends over 1.9km x 0.8km
McArthur Basin – regional exploration

- **GPM Metals** – Walker Gossan
  Airborne magnetics, soil sampling, IP

- **MMG Ltd** – North Batten JV

- **Pacifico Minerals** – Coppermine Creek
  10m @1.3% Cu

- **Teck Australia** – Yalco
  Co-funded seismic with NTGS

- **TNG Ltd** – McArthur River project
  High-grade Cu and Ag rock chips in Wollogorang Fm

- **Teck Australia** – Carrara Range
  Exploring in Lawn Hill Platform
Pine Creek’s polymetallic potential

**PNX Metals**

High grade gold-silver-zinc deposits adjacent to railway

**Iron Blow**

2.6 Mt @ 2.4 g/t Au, 130 g/t Ag, 4.8% Zn, 0.9% Pb, 0.3% Cu

**Mount Bonnie**

2015 drilling:

- 8m @ 12.3% Zn, 2.41g/t Au, 321g/t Ag, 0.5% Cu, 2.5% Pb

**Maiden Resource (2016)**

1.3 Mt @ 1.3 g/t Au, 133 g/t Ag, 4.2% Zn, 1.3% Pb, 0.3% Cu
KGL Resources Ltd – Jervois Cu-Ag-Pb-Zn-Au

- **30.5 Mt @ 1.07% Cu, 23.0 g/t Ag**
- 327,000t contained Cu, 22.6 Moz Ag, 190,000t contained Pb-Zn
- 12 km long mineralised zone
- Notice of Intent submitted, PFS released
- Mineralisation drilled to >800m from surface

Resource includes:

- Bellbird – **5.4 Mt @ 1.62% Cu**
- Marshall-Reward **10.6 Mt @ 1.37% Cu**
Copper-gold-silver – central Australia

Independence Group – ABM Resources: Bumblebee discovery

- New greenfields discovery in unexplored region of southwestern Arunta, 400 km west of Alice Springs
- 7m @ 3.3g/t Au, 37.7g/t Ag, 3.2% Cu, 0.9% Pb, 1.3% Zn and 0.08% Co
- Exploration JV now focused on gravity ridge
- New nickel prospects in the same area
Uranium

- $10M of exploration expenditure in NT in 2015
- 2000t $U_3O_8$ produced
- Cameco and Alligator Energy remain active in western Arnhem Land
- New resources defined from historical drilling at Walbiri and Karins (Ngalia Basin; Energy Metals Ltd)
Other commodities

- **TNG Ltd**: Mount Peake V-Ti-Fe project DFS released
- **Arafura Resources**: Nolans REE resource increase
- **Thessally Resources**: Pre-feasibility on magnesia project at Huandot
- **Tellus Holdings**: Progressing Chandler salt project
- **AAM**: Spinifex Bore garnet sand mine planned for 2016
Lithium boom underway

ASX ANNOUNCEMENT
4 February 2016

Liontown expands lithium portfolio with acquisition of Bynoe lithium-tantalum project in the Northern Territory

Second lithium-prospective project acquired with extensive pegmatite field, potential for spodumene mineralisation and tantalum resource.

ASX ANNOUNCEMENT
3rd February 2016

Review of Core tenure identifies lithium potential of NT pegmatites

ASX ANNOUNCEMENT
10 February 2016

Lithium potential at Mithril’s Leaky Bore Project, NT

ASX ANNOUNCEMENT
8th February 2016

New Lithium Project includes largest tin tantalum mine in NT
Onshore oil and gas

- Expenditure reported to DME in 2015 was $121 million
- Most exploration activity focused on Beetaloo Sub-basin
- Six new wells drilled in 2015 for 12,250m
- Significant US investments announced in greater McArthur Basin
- Jemena selected to build and operate Northern Gas Pipeline to link NT gas network to eastern states
- Dingo field commenced production
Tanumbirini-1 (Santos)

OT Downs Sub-basin

Drilled: 2014
Depth: 3945m

Multiple thick intervals of organic-rich rocks accompanied by significant mud gas shows within the Middle Velkerri.

Elevated gas readings were encountered over a total gross interval in excess of 500 m.
Kalala S-1
Amungee NW-1

Beetaloo Sub-basin

Depth: 2619m & 2611m

Both wells intersected a gross interval of over 500 m shale gas in the Middle Velkerri with net pay exceeding 150 m and the presence of moveable hydrocarbons in the form of elevated gas shows.
Amungee NW-H1

Beetaloo Sub-basin

Depth: 3808m

First horizontal appraisal well in Beetaloo Sub-basin

Discovered a prospective and laterally extensive sweet spot with excellent gas shows that indicate the likelihood of high levels of gas saturation across the entire horizontal section of “B Shale” interval of the Middle Velkerri
Wyworrie-1 and Birdum Creek-1 were hydraulically fracture stimulated, tested and then suspended, Tarlee 2 was drilled and then decommissioned and Tarlee-1 was drilled, a DFIT was conducted and then suspended.
Amadeus Basin – Central Petroleum/Santos

2015 Production
Mereenie: 2.395 Bscf gas
0.278 mmbbl oil
Palm Valley: 1.282 Bscf gas
Dingo: 0.026 Bscf gas

Surprise: Central Petroleum
• Oil discovery in western Amadeus Basin
• Produced 80,000 bbl oil before being shut in in August 2015

Dingo: Central Petroleum
• Commenced production Dec 2015
Summary

• The downturn in the resources sector continues to impact on exploration, but the Territory is performing better than most jurisdictions
• A resurgent gold sector is offsetting falls in exploration in other commodities
• Significant activity and promising results for base metals and shale gas
• The Territory’s pipeline of developing projects remains strong
• Through the CORE initiative, NTGS will continue to provide the best possible geological framework and information services to attract and support exploration