

Highlights and outlook for regional resources exploration

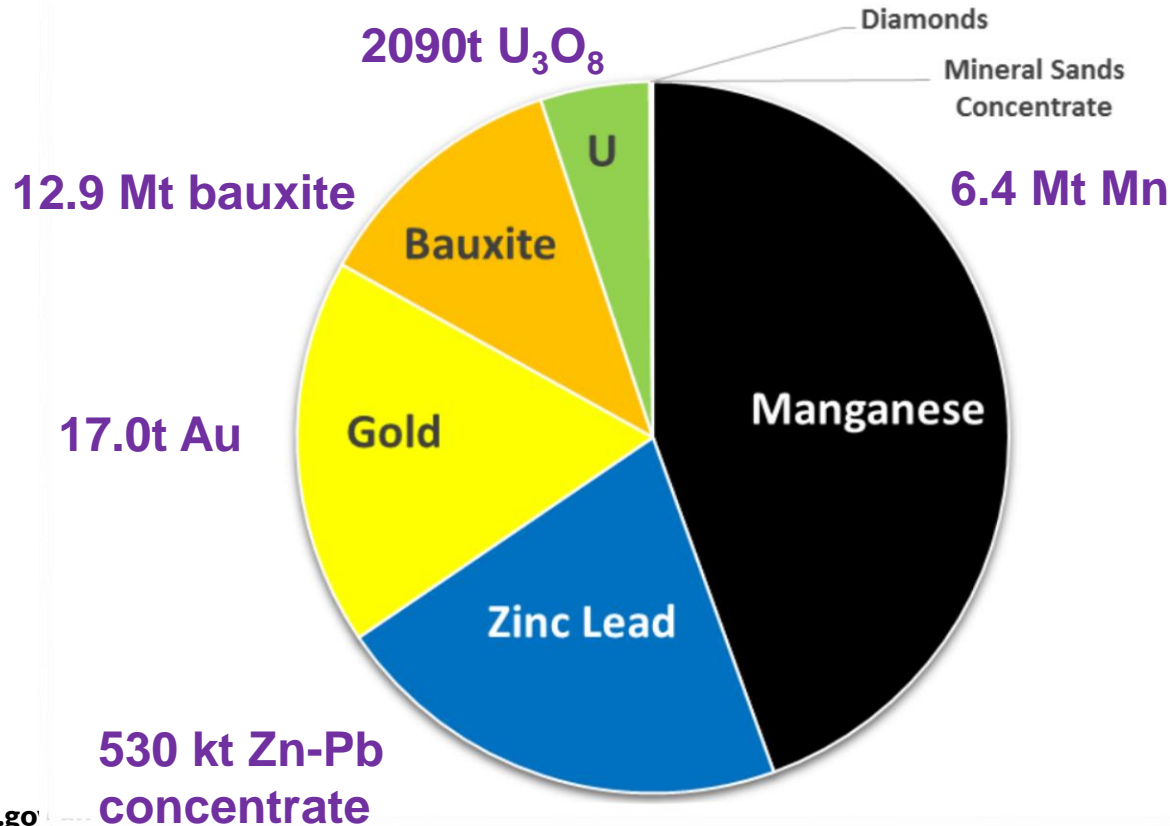
Ian Scrimgeour
Executive Director, NT Geological Survey

16 May 2019

DEPARTMENT OF PRIMARY INDUSTRY AND RESOURCES

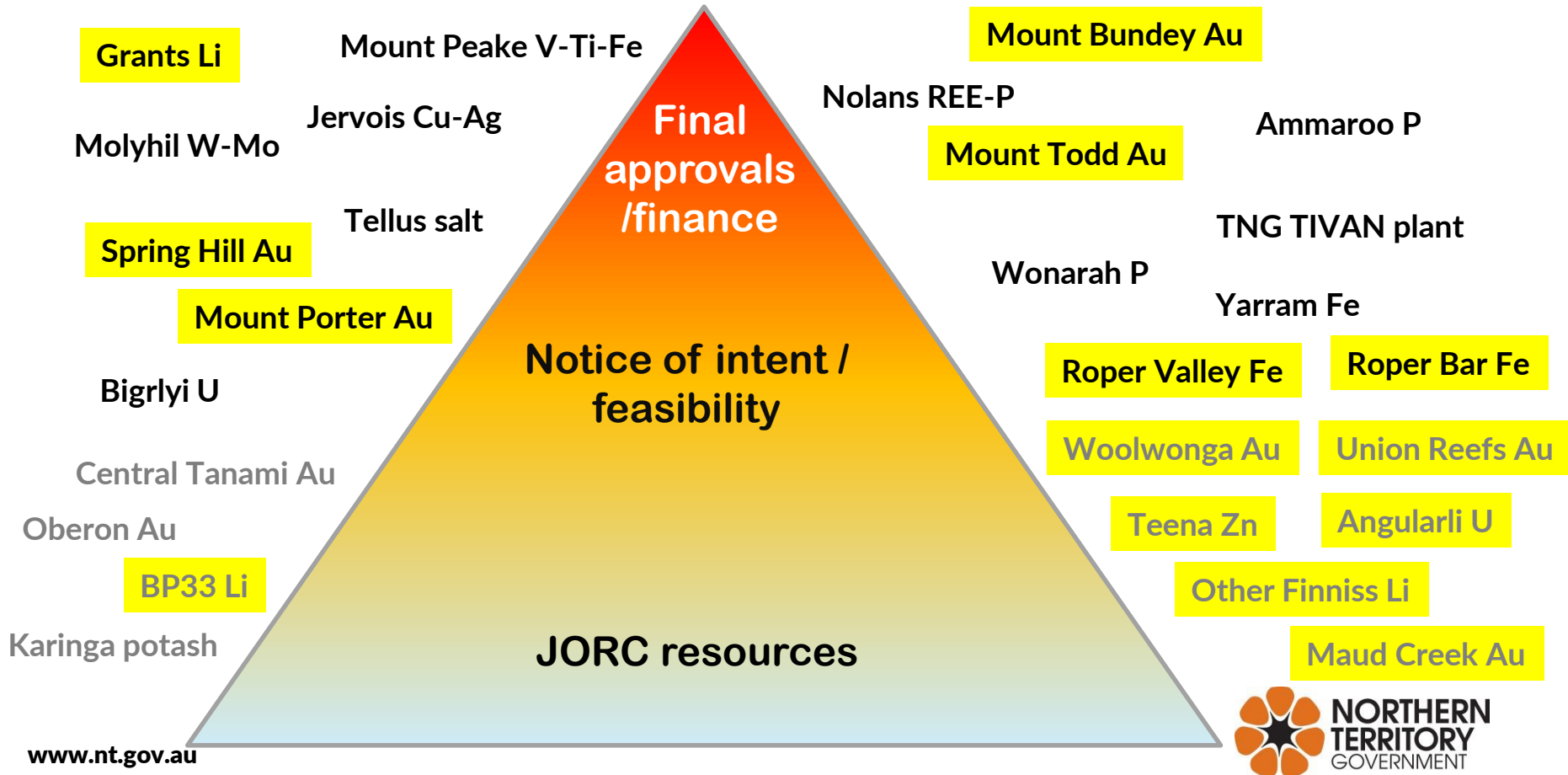
NT mineral production value 2017/18

Area reflects value of production



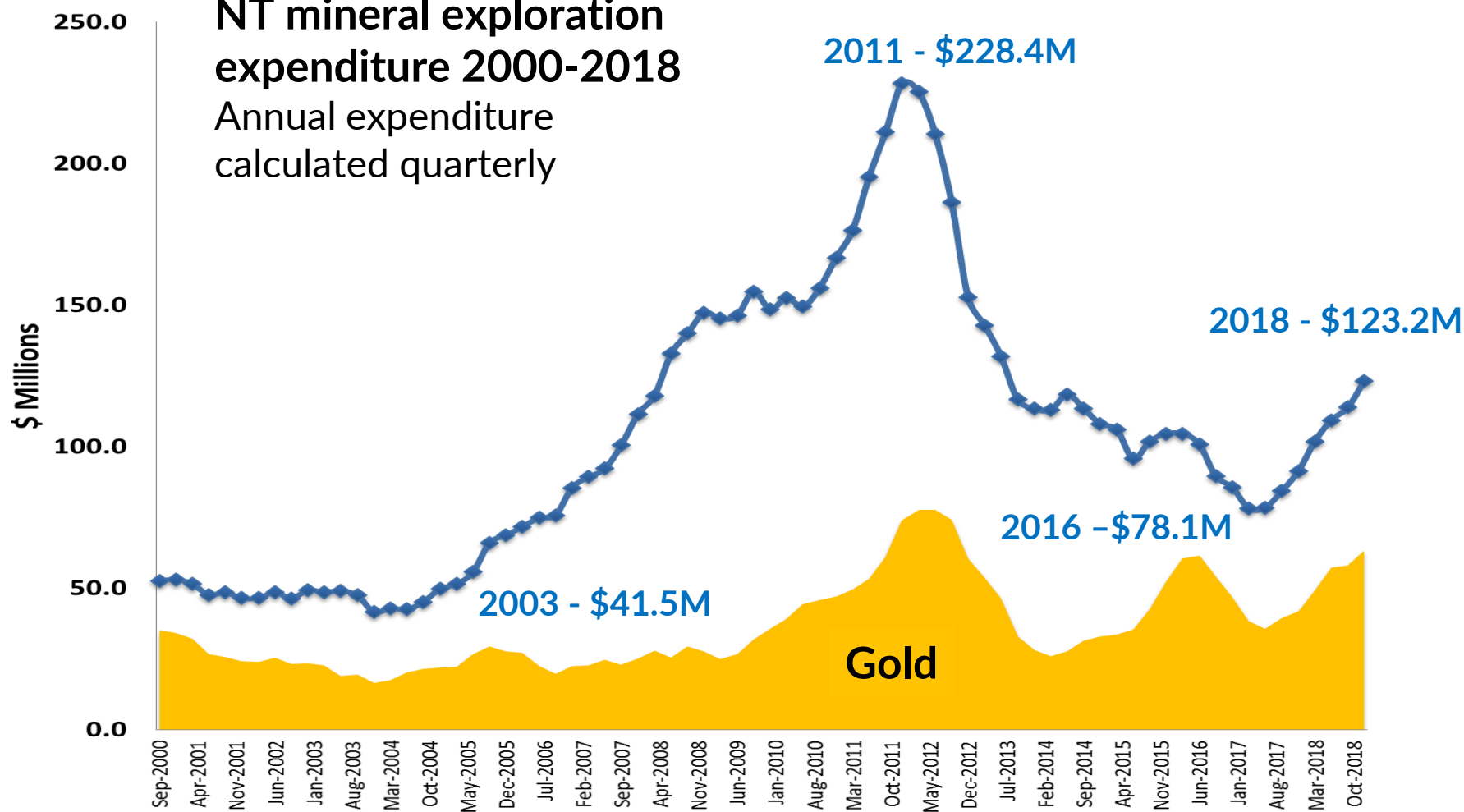
Record mineral
production of
\$4.49B

The Territory's pipeline of mining projects

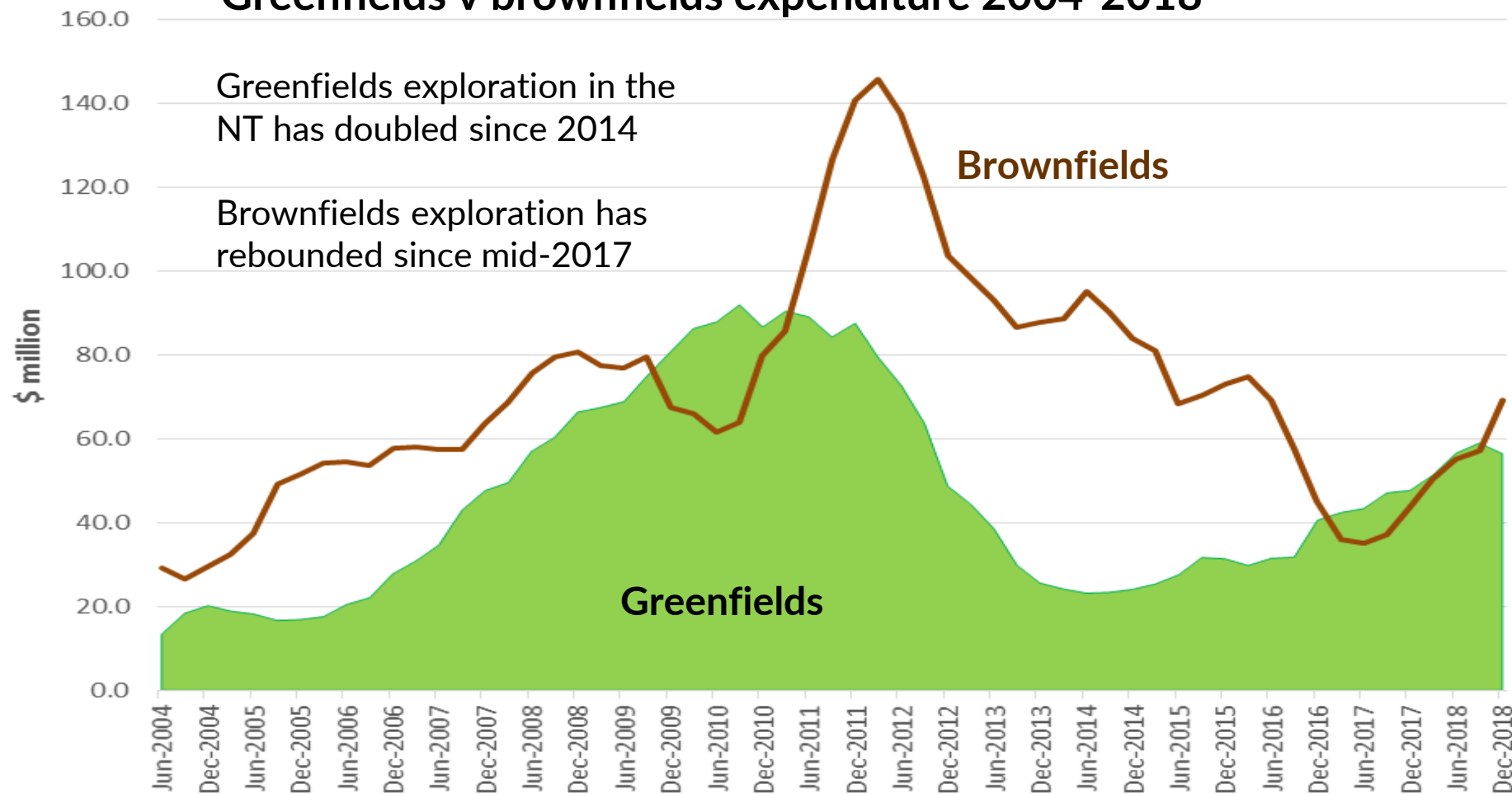


NT mineral exploration expenditure 2000-2018

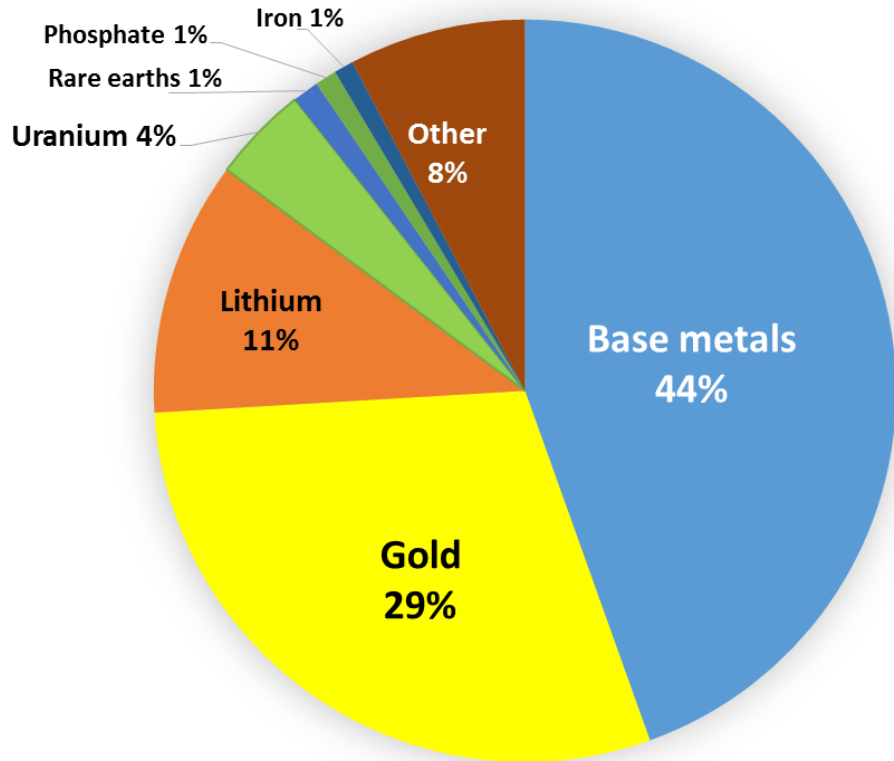
Annual expenditure
calculated quarterly



Greenfields v brownfields expenditure 2004-2018



Mineral exploration expenditure by commodity reported to DPIR in 2018

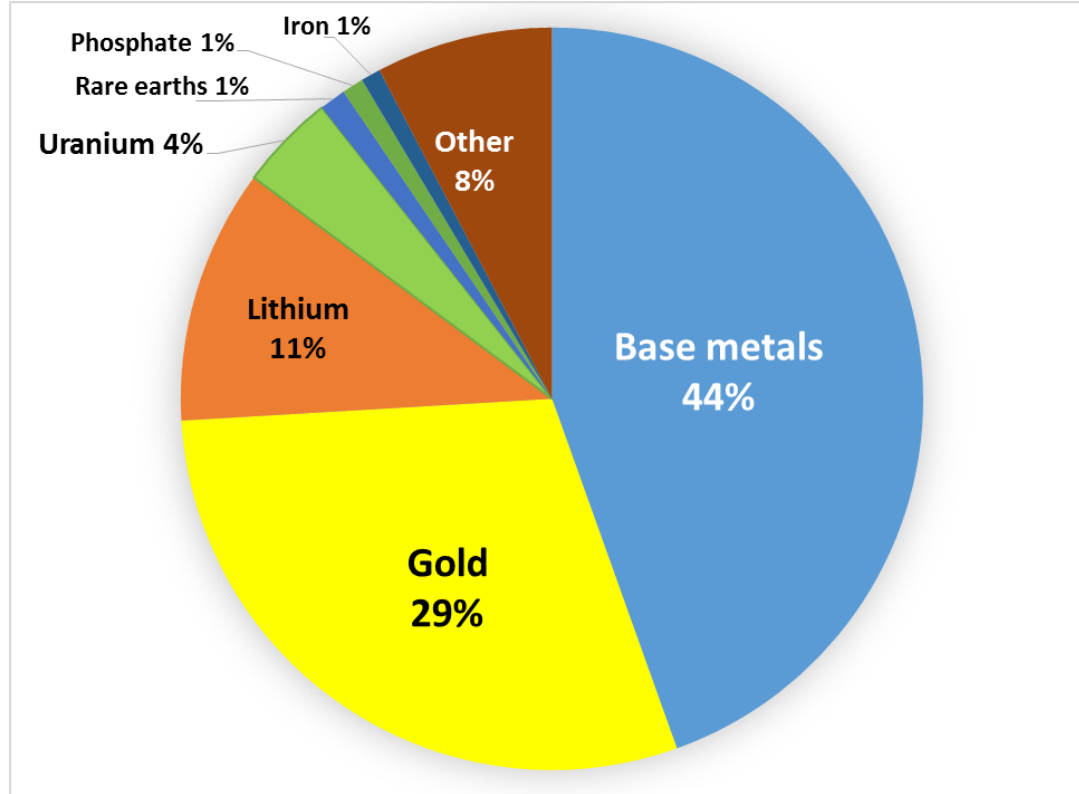


Tangible on-ground expenditure only (excludes overheads, desktop and feasibility studies)

Mineral exploration

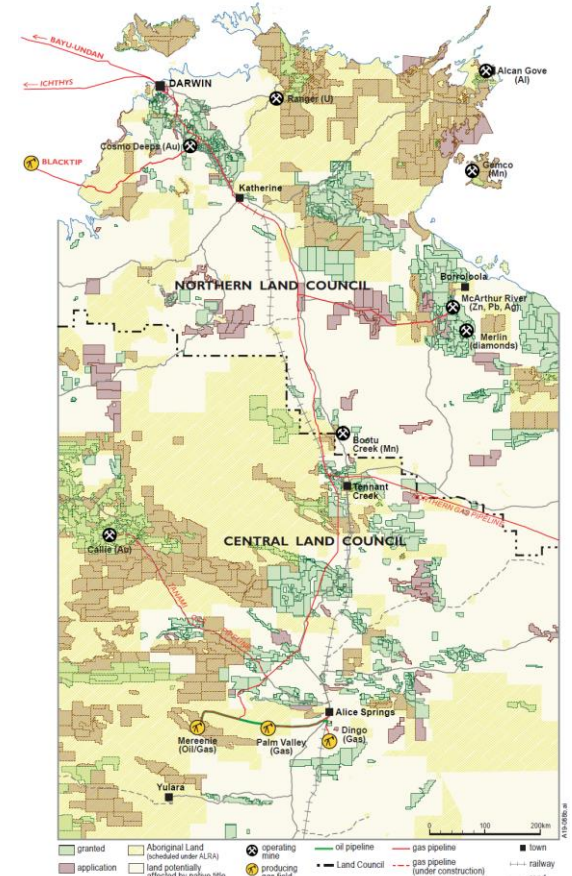
- Key commodities are **copper, zinc, gold, uranium** and **lithium**
- Large areas very underexplored
- Other main commodities for exploration and developing projects: **cobalt, potash, phosphate, vanadium, rare earths, salt, tungsten, magnesium**
- Many projects seeking partners for joint ventures, equity investment, project finance, construction and/or offtake

Mineral exploration expenditure by commodity reported to DPIR in 2018



Tangible on-ground expenditure only (excludes overheads, desktop and feasibility studies)

Mineral exploration expenditure by region reported to DPIR in 2018



Producers with strong cash flow investing in the NT as a growth area



KIRKLAND LAKE GOLD

Pine Creek - Gold

Au

Primary Gold - Toms Gully

Acquisition by Hanking Australia Pty Ltd,
planning redevelopment of Toms Gully
underground mine

Bacchus Resources - Woolwonga

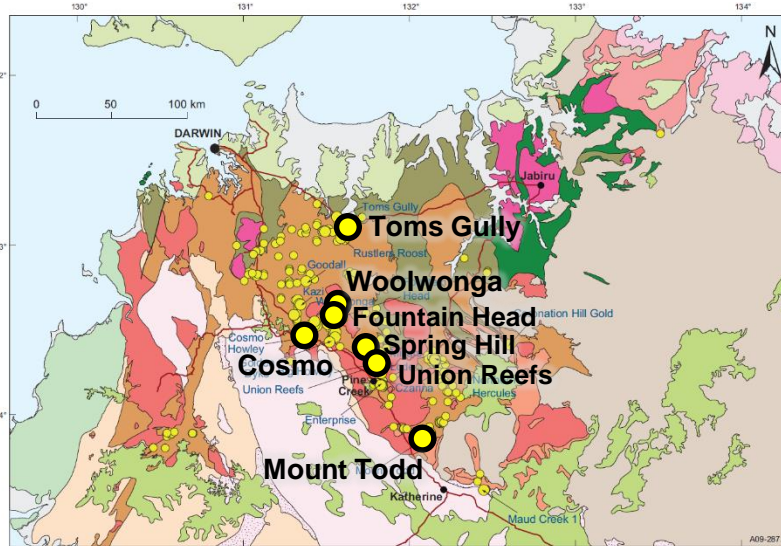
Substantial drilling during
2018

PNX Metals - Fountain Head

High grade gold discovered
at Banner prospect

PC Gold - Spring Hill

Planning commencement of
mining



Kirkland Lake Gold - Cosmo

- Underground development and exploration at *Lantern*
- High grade gold intersected at depth at *Union Reefs*



Drillcore from Lantern

Vista Gold - Mount Todd

DFS well advanced, NT EPA
environmental assessment
process complete

Pine Creek – multiple commodities

Northern Territories Resources – *Browns Pb-Cu-Ni-Co*

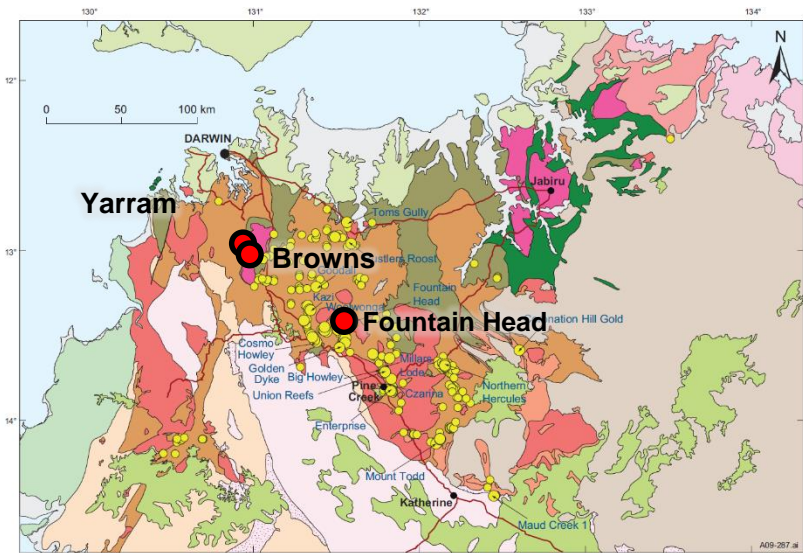
Doe Run Mining terminated option agreement, project sale process underway

PNX Metals – *Hayes Creek Zn-Ag-Au*

EIS and Feasibility Study underway

Territory Resources– *Yarram Fe*

Notice of Intent submitted for 0.5-1.2 Mtpa iron ore mining operation



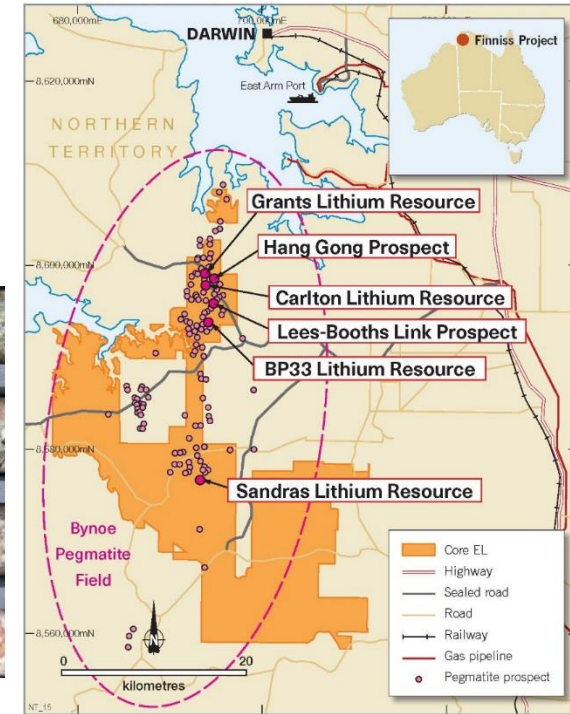
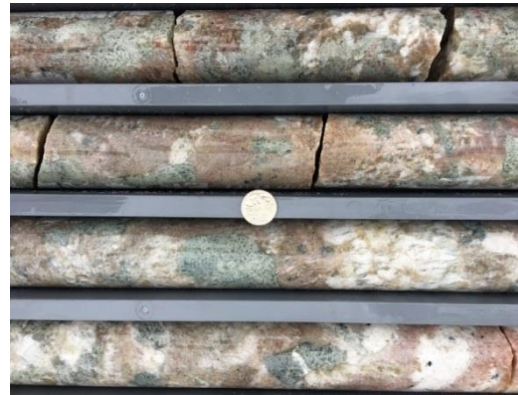
Lithium



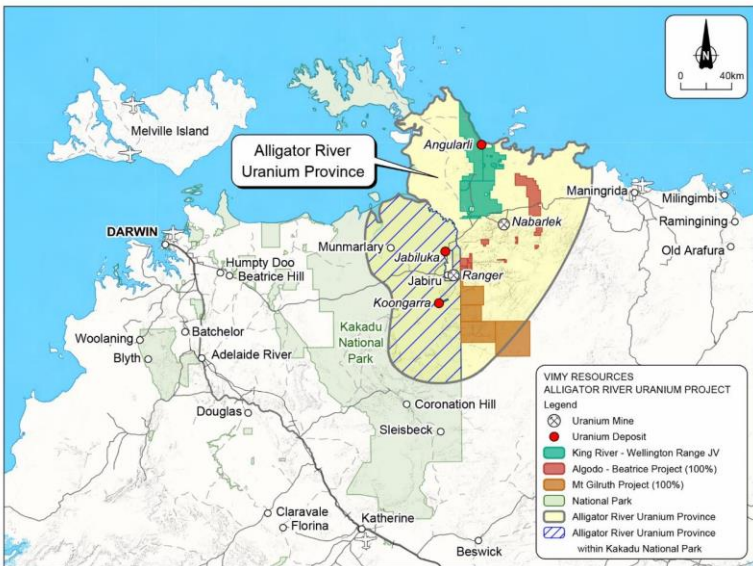
Core Exploration – Finniss project

Combined resource: 9.63 Mt @ 1.3% Li₂O

- Six resources now defined (Grants, BP33, Carlton, Sandras, Hang Gong, Lees)
- Discovery and resource growth continuing at multiple prospects
- DFS released April 2019
- Grants resource passing through development approvals – investment decision planned for 2019

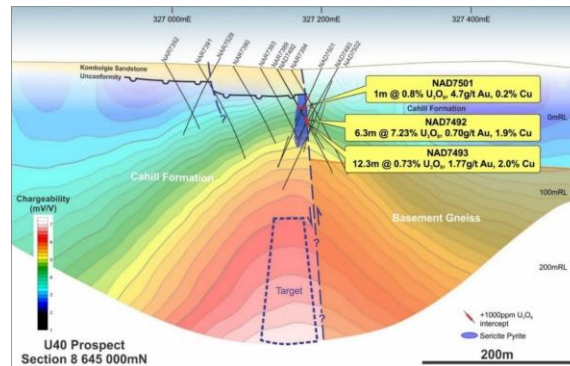


West Arnhem Land – uranium (+ copper, gold, platinum?)



Vimy Resources Ltd

- **King River and Wellington Range** projects acquired from Cameco in March 2018 (JV - Rio Tinto 25%)
- **Angularli** maiden resource: **0.91Mt @ 1.3% U_3O_8** for 26Mlbs U_3O_8 ; best drill intercept of 22.9m @ 4.63% U_3O_8 from 244.6m
- Scoping study released on Angularli development
- RC drill program in 2018 at Angularli and Such Wow

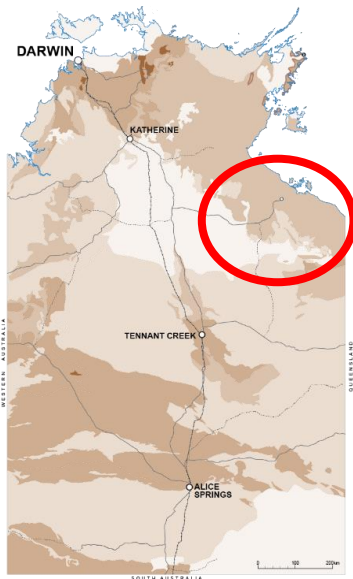


DevEx Resources Ltd

- Targeting multiple commodities at U40 near Nabarlek



McArthur Basin base metals and cobalt



McArthur River Mine overburden management project – Environmental Assessment report received July 2018

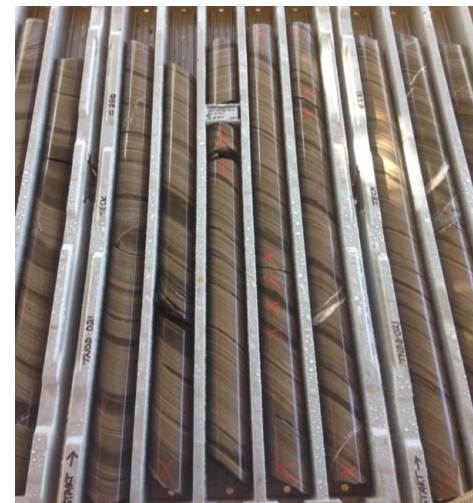
Northern Cobalt – Wollgorang project

- **Running Creek:** 55m @ 0.78% Cu incl. 13m @ 2.01% Cu
- Newly identified copper mineralisation at **GregJo**

Drilling programs in 2018 by **Pacifico Minerals** (Lorella), **Todd River Resources** (McArthur), **Marindi Metals/JOGMEC** (Carinbirini), **MMG** (incl. Cow Lagoon)



Teck Resources: Teena
58 Mt at 11.1% Zn, 1.6% Pb



Roper region: iron ore and ilmenite sand

Roper Valley iron ore

Northern Territory Iron Ore Pty Ltd

Total resource: 488 Mt @ 41.7% Fe

Includes 41.1Mt @ 57.8% Fe

Nol in place

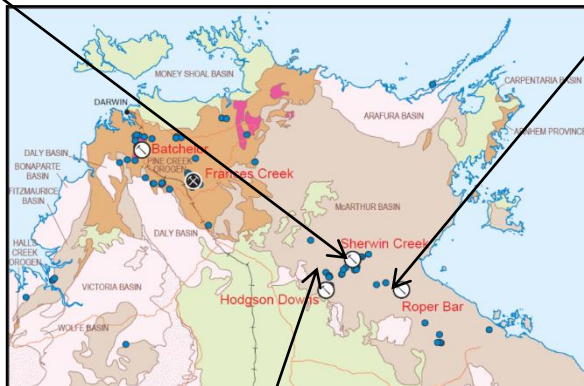
Roper Bar iron ore

(Britmar)

Total resource: 611 Mt @ 40.3% Fe

Includes: 47.4 Mt @ 57.3% Fe

MMP approved for restart of operation



Australian Ilmenite Resources: Sill80

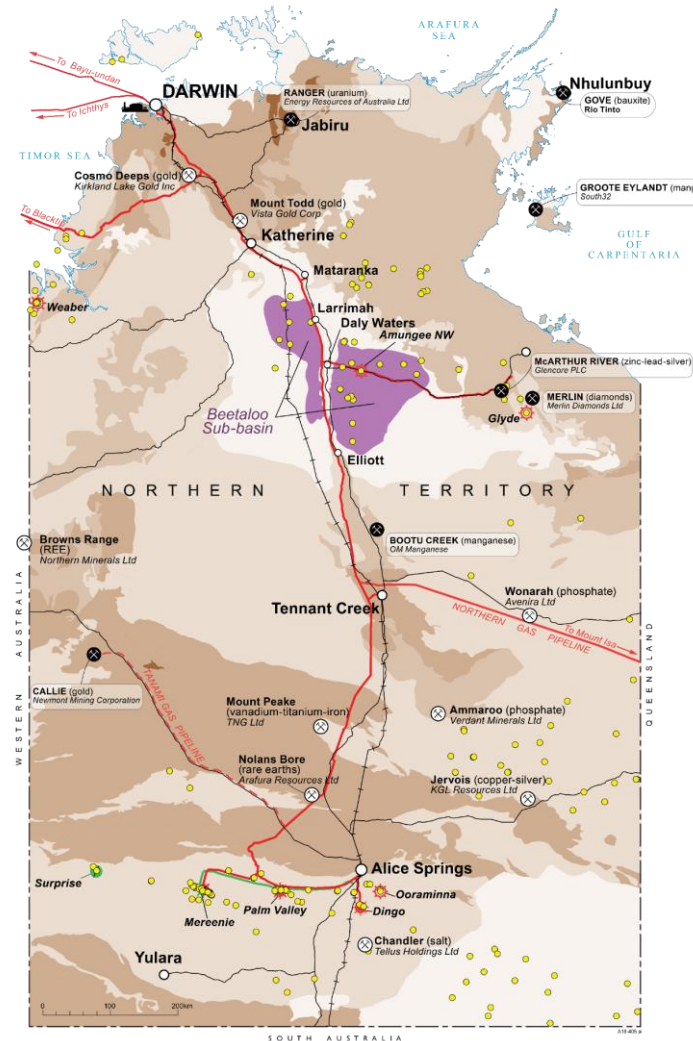
Ilmenite sand

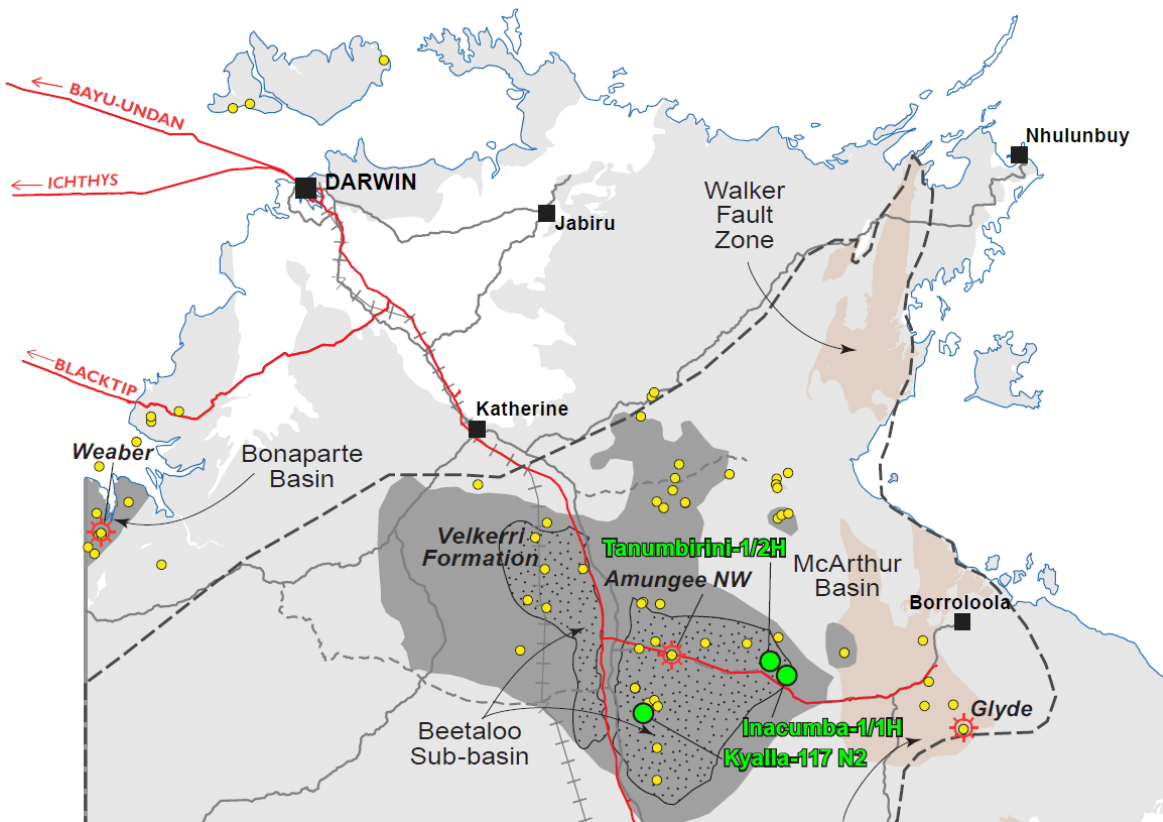
Drilling, ramping up production



Onshore oil and gas: Beetaloo Sub-basin

- Vast, geologically continuous shale gas basin
- Similar in scale and geology to US shale plays
- >500 Tcf of gas in place within B-shale of Velkerri Formation
- First horizontal hydraulically fractured well in 2016 successfully flowed gas
- Multiple dry gas and liquids-rich plays
- Drilling to restart this dry season





EMPs submitted in 2019

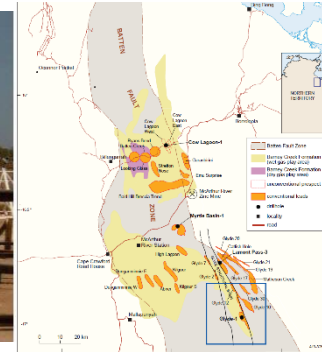
Origin Energy: Kyalla-117 N2

**Santos: Tanumbirini-1/2H
Inacumba-1/1H**

Other basins

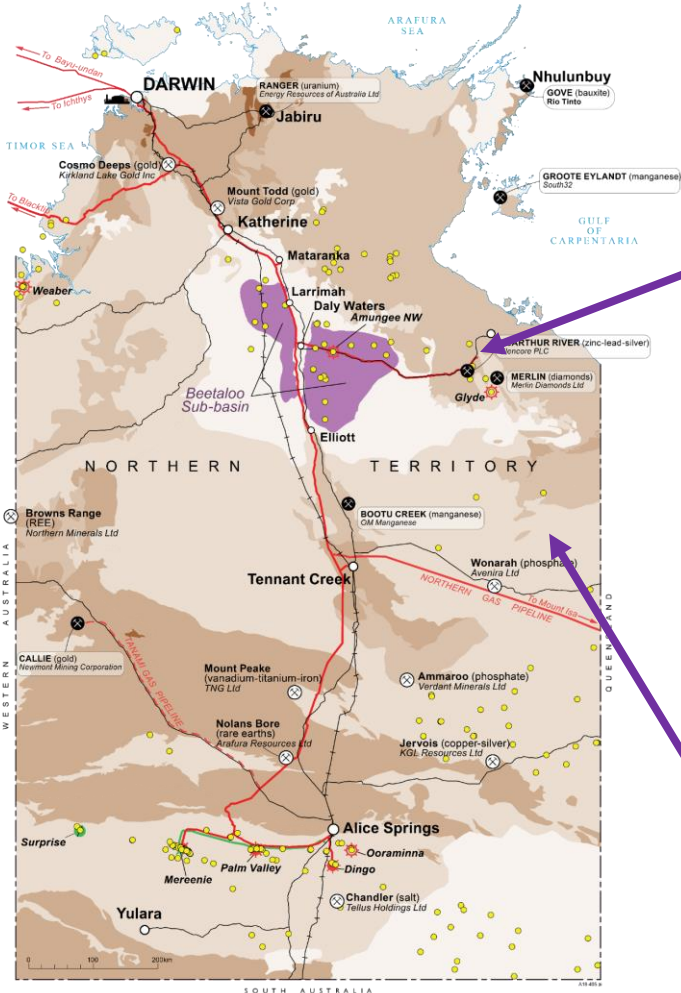
McArthur Basin

- Known conventional gas reservoirs
- Substantial shale gas potential
- **Armour Energy and Imperial Oil and Gas** have extensive exploration tenure



South Nicholson Basin

- Largely untested basin with similarities to Beetaloo Sub-basin



Resourcing the Territory initiative

4 year (2018-2022), \$26 million NT Government initiative to grow the exploration sector

Tanami airborne survey: Photo courtesy of Prodigy Gold



Supporting industry innovation through grants for greenfields exploration

Upgrading the Territory's coverage of geophysical data

Unlocking the resource potential of the Barkly and Gulf regions

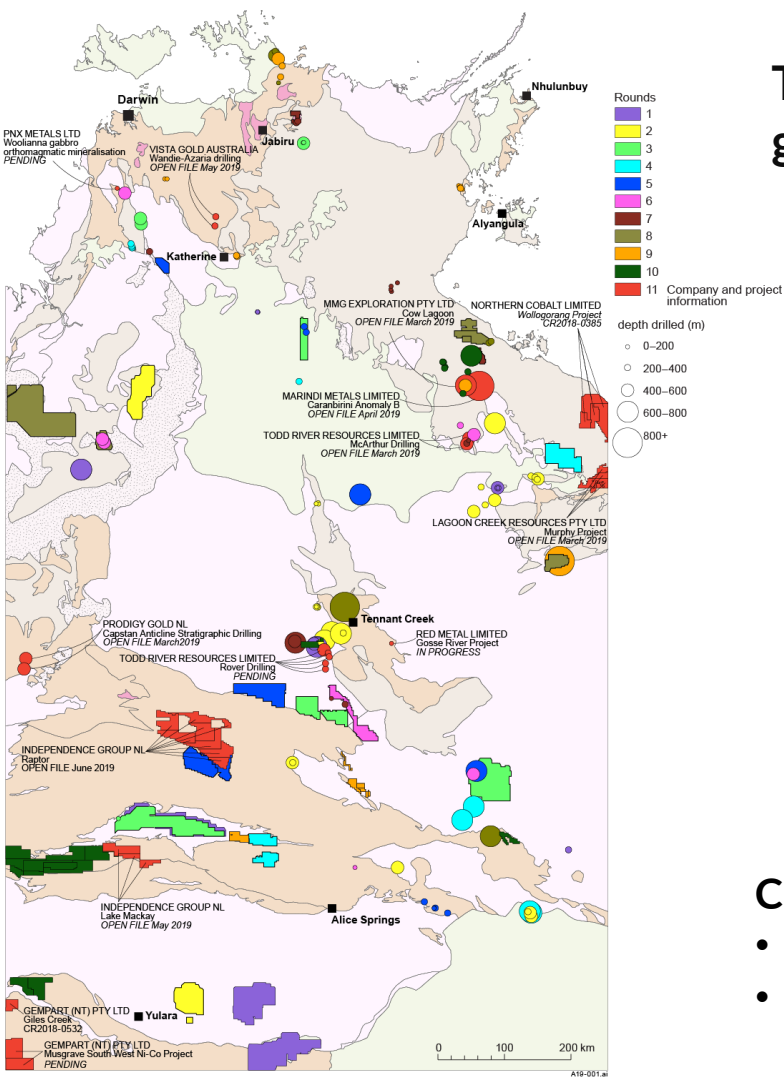
Stimulating greenfields exploration in central Australia

Promoting the Territory's resource potential and investment opportunities; and

Making exploration and geoscience data more accessible

Theme 1: Supporting industry innovation through grants for greenfields exploration

NT Government co-funding of greenfields exploration since 2008



48 Drilling projects completed

130 holes: >47,000 m drilled

37 Geophysics projects completed

~55,000 ground gravity stations

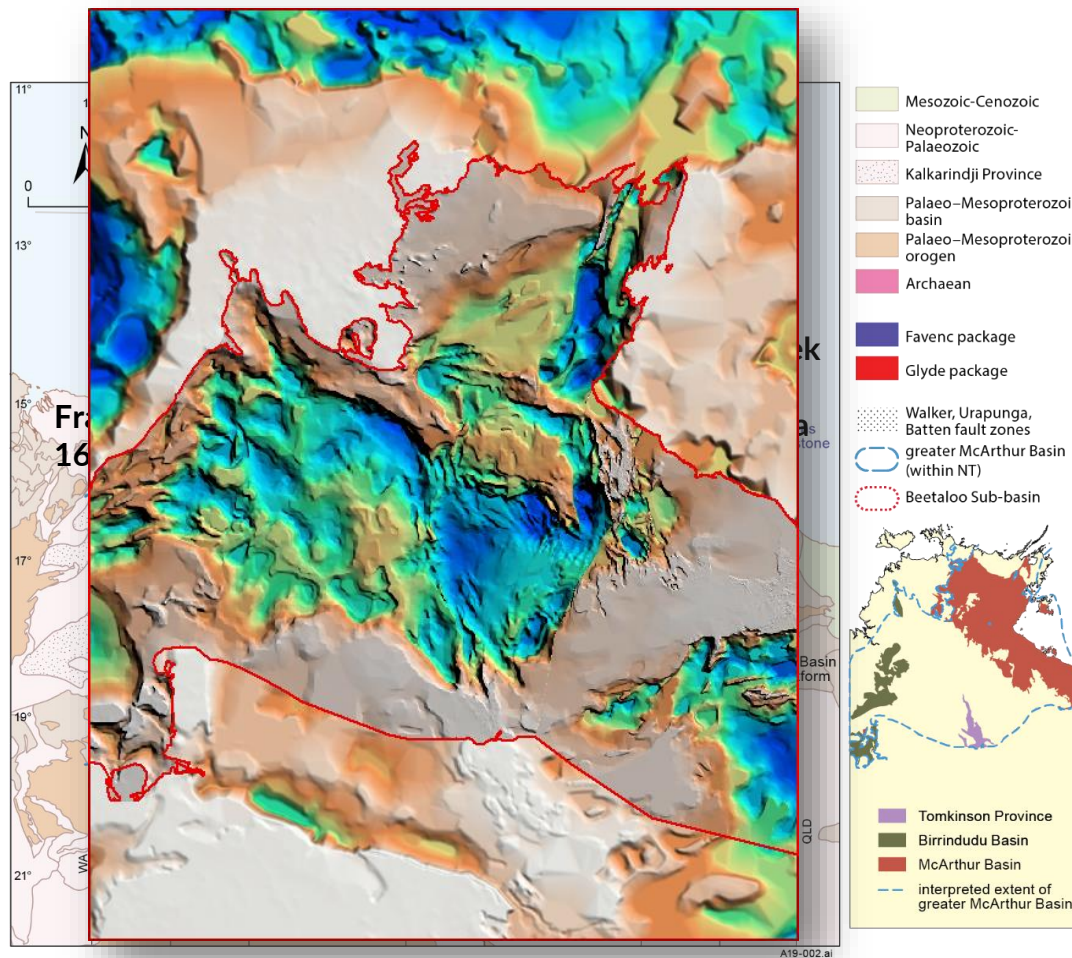
~122,000 line km of airborne magnetic
and radiometric surveys

~30,000 line km of airborne EM surveys

plus MT, seismic, SAM, 3D IP and passive seismic surveys

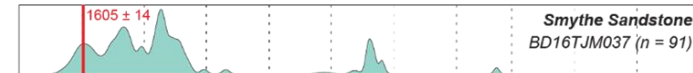
Changes to program under *Resourcing the Territory*

- More funding available, expanded eligibility
- Additional funding for utilising local service and supply

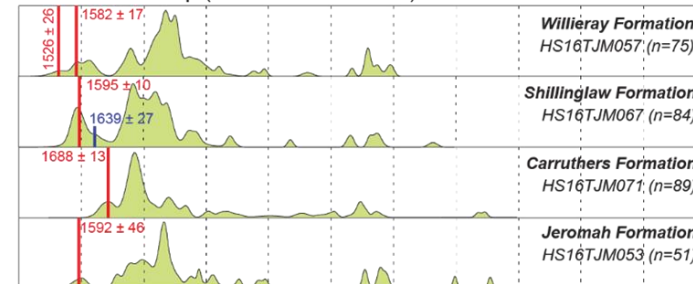


‘greater McArthur Basin’ Continuous distribution of prospective stratigraphy established over vast area of northern Australia

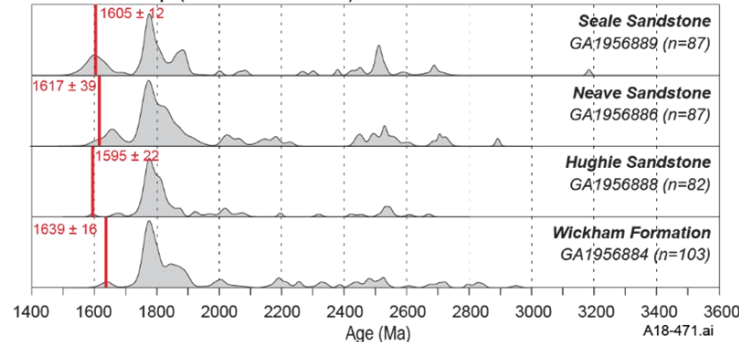
Nathan Group (McArthur Basin)



Namerinni Group (Tomkinson Province)

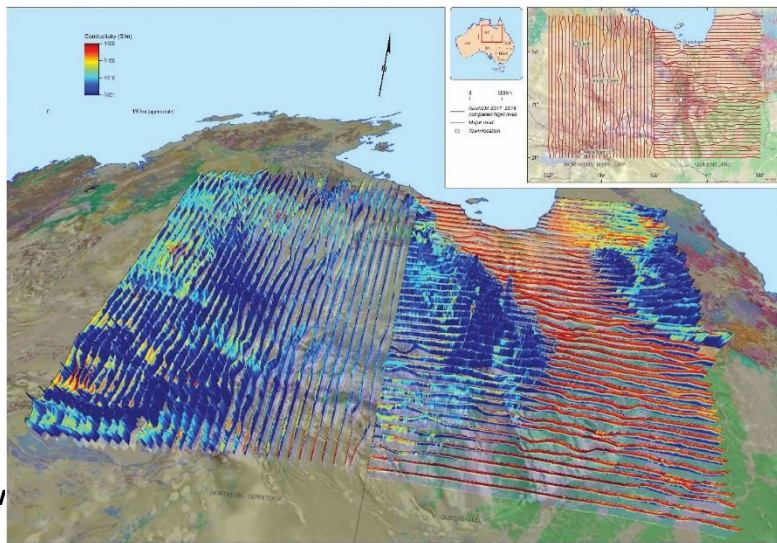


Wattie Group (Birrindudu Basin)

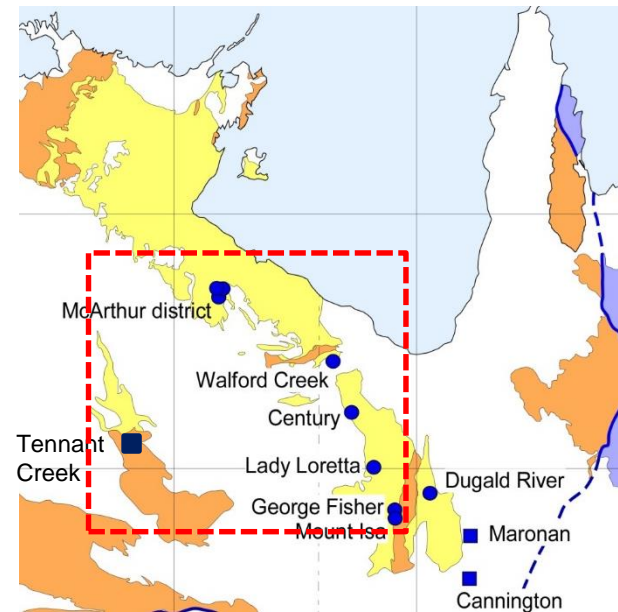


GA Exploring for the Future in TISA area (NTGS co-investing and collaborating)

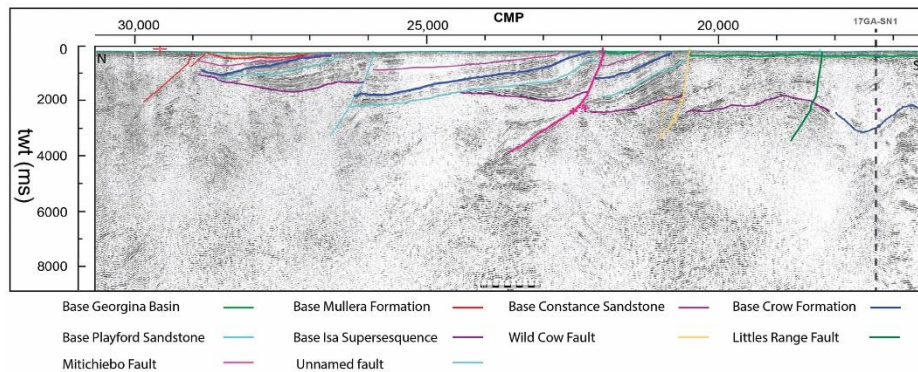
- Unprecedented level of new geoscience data at outcrop to crustal scale
- NTGS mapping South Nicholson and Lawn Hill basins in NT
- Potential for new undercover mineral province east of Tennant Creek



Ley Cooper et al
AGES 2019

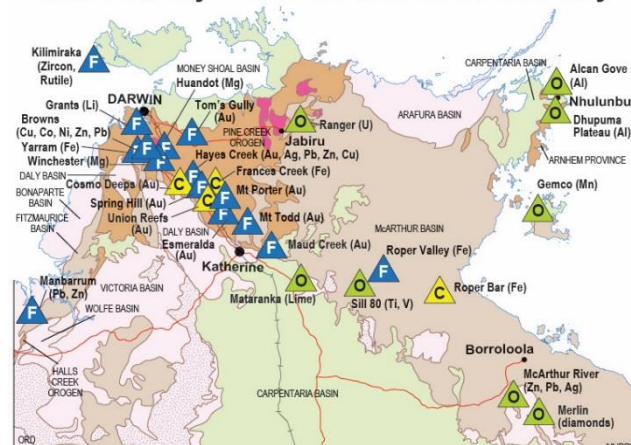


South Nicholson seismic *Carr et al AGES 2019*



More information:
resourcingtheterritory.nt.gov.au

Mineral Projects of the Northern Territory



Annual Geoscience Exploration Seminar (AGES)

AGES 2020
Alice Springs
March 24-25, 2020

www.ages.nt.gov.au



Thank you