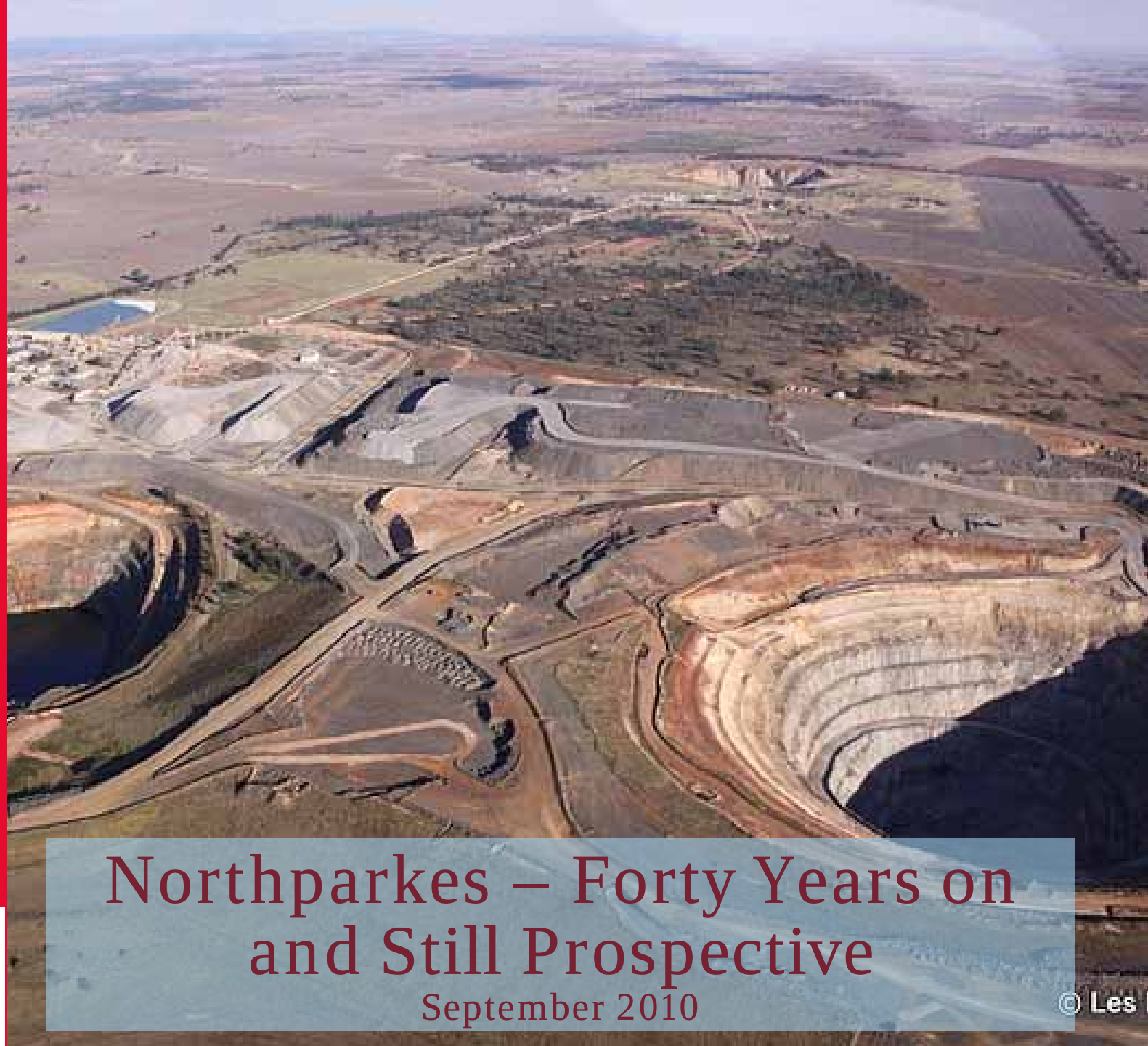
Rio Tinto

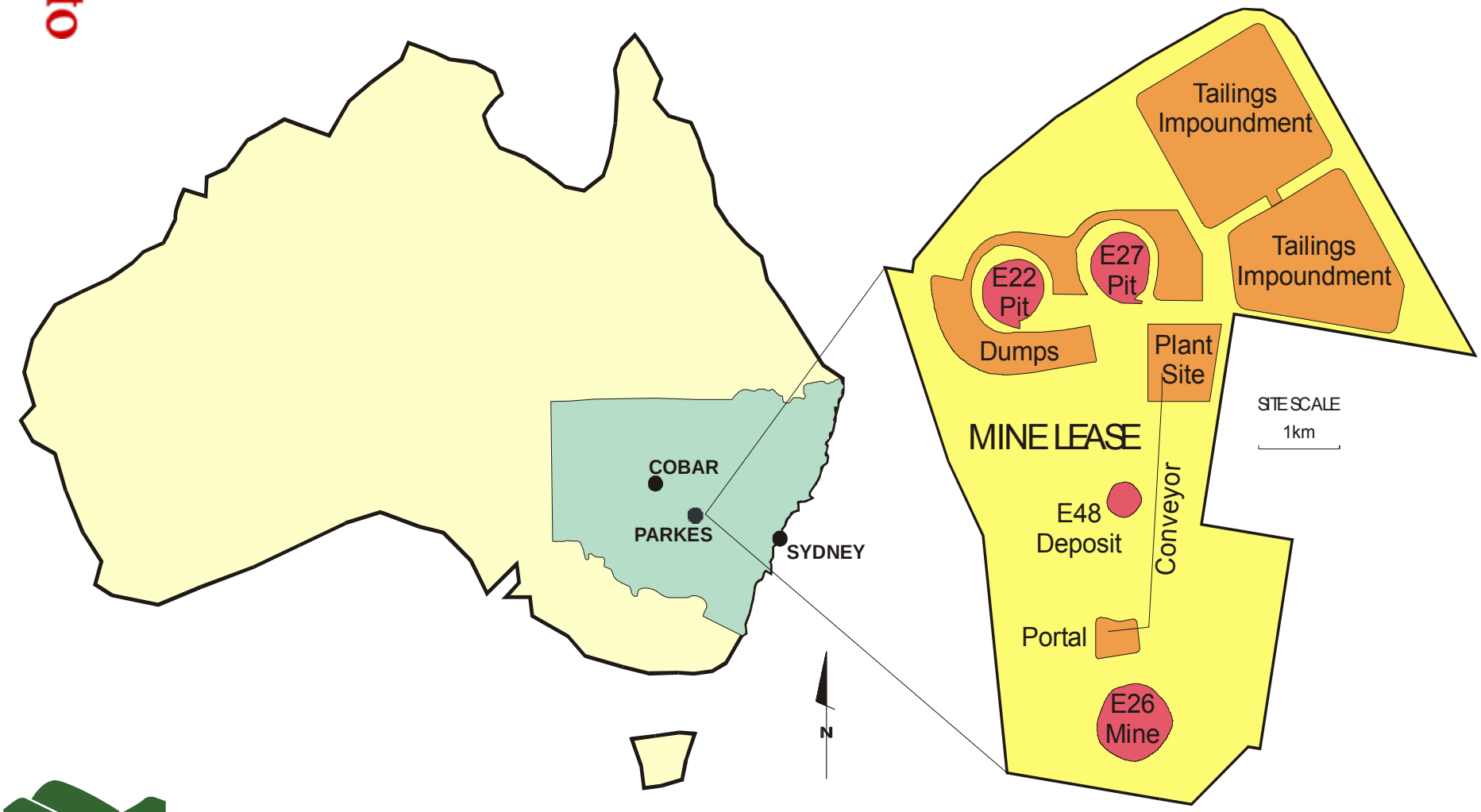


Northparkes – Forty Years on and Still Prospective

September 2010

NORTHPARKES

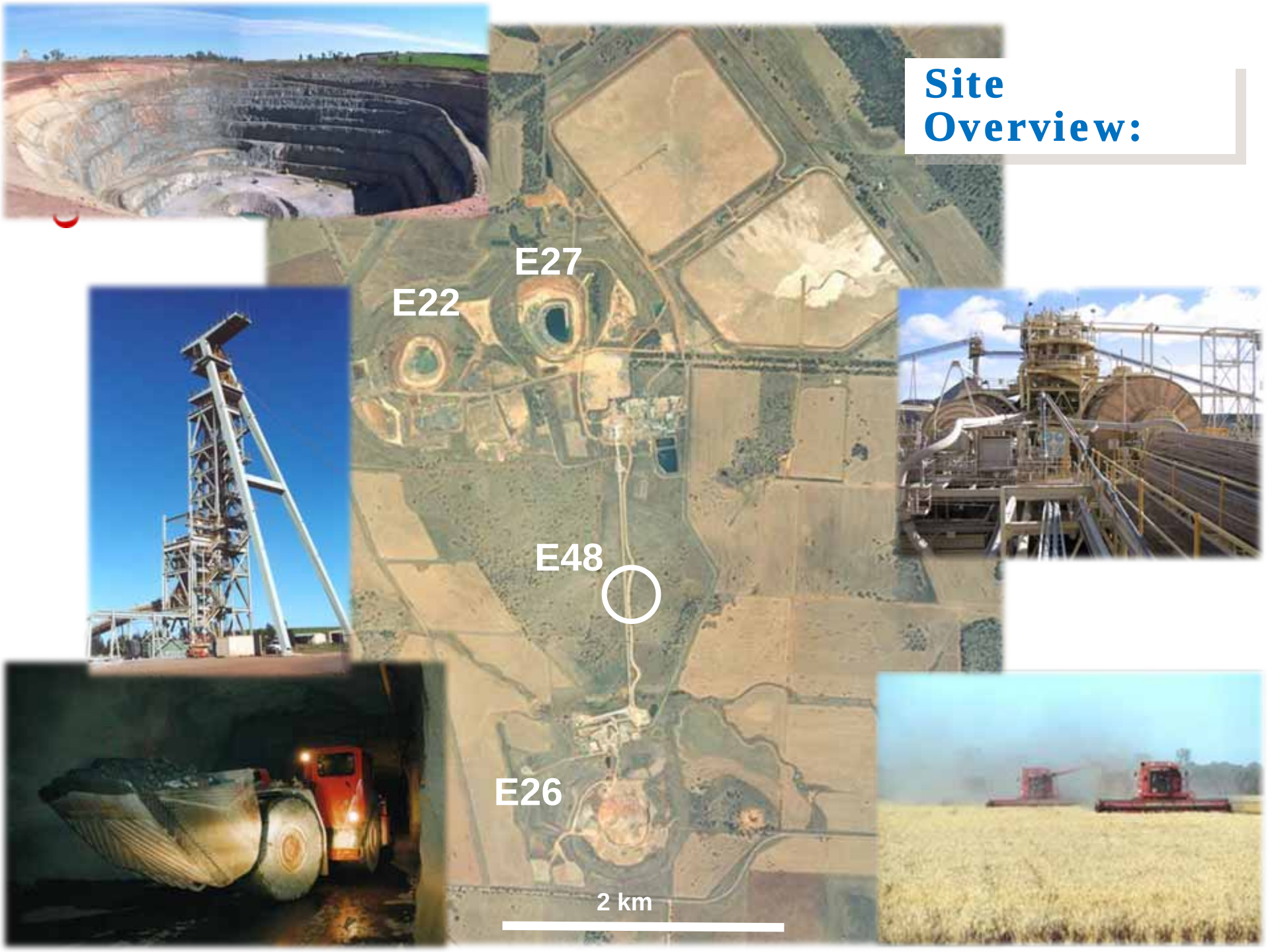
Location


COBAR
PARKES
SYDNEY
N
Tailings Impoundment
Tailings Impoundment
E22 Pit
E27 Pit
Dumps
Plant Site
MINE LEASE
SITE SCALE
1km
E48 Deposit
Conveyor
Portal
E26 Mine

Overview of Northparkes Mines - Who we are!

- Unincorporated joint venture – Rio Tinto (80%) and Sumitomo Group (20%)
- 700 employees (250 staff)
- Copper and gold producer
- Commenced mining in 1994
- First underground block cave mine in Australia
- 1,630 ha of mine lease within 5,670 ha of agricultural land (+ 2,102 ha nearby)
- **Current Life of Mine is 2024**

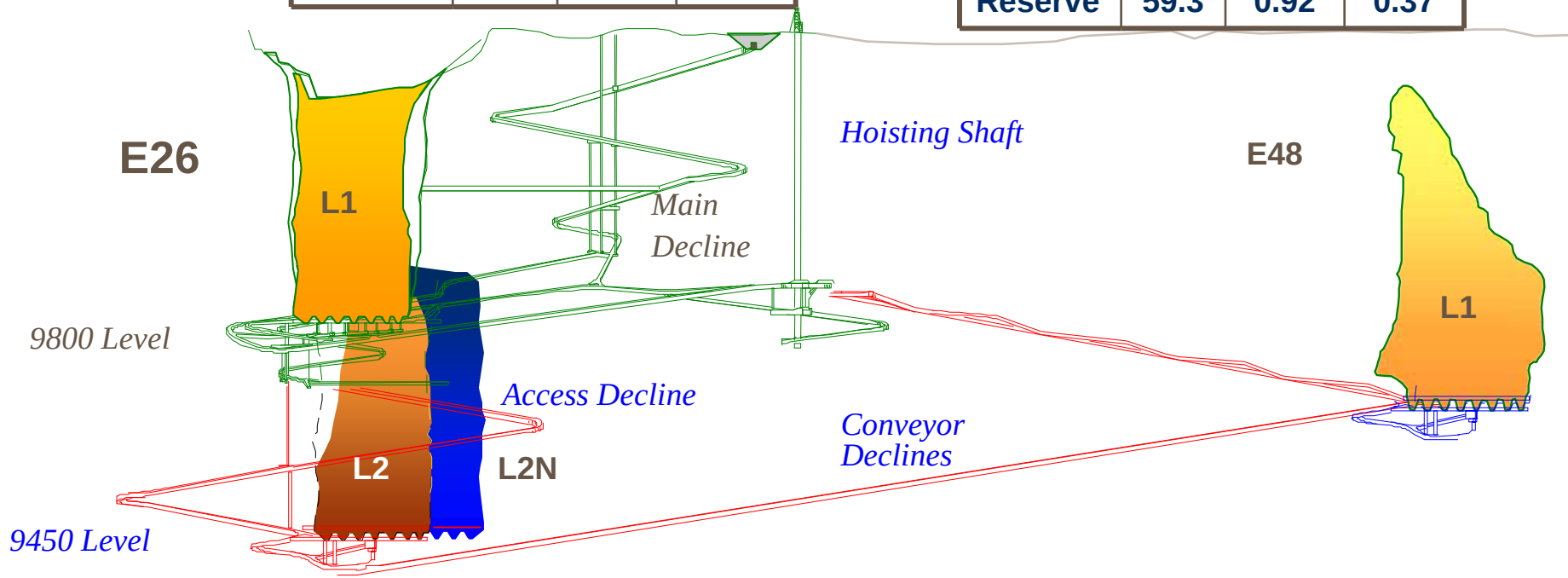
Site Overview:



Underground operations with 14+ year minelife …

E26 L1	Mt	Cu %	Au g/t
Actual	25.5	1.40	0.43

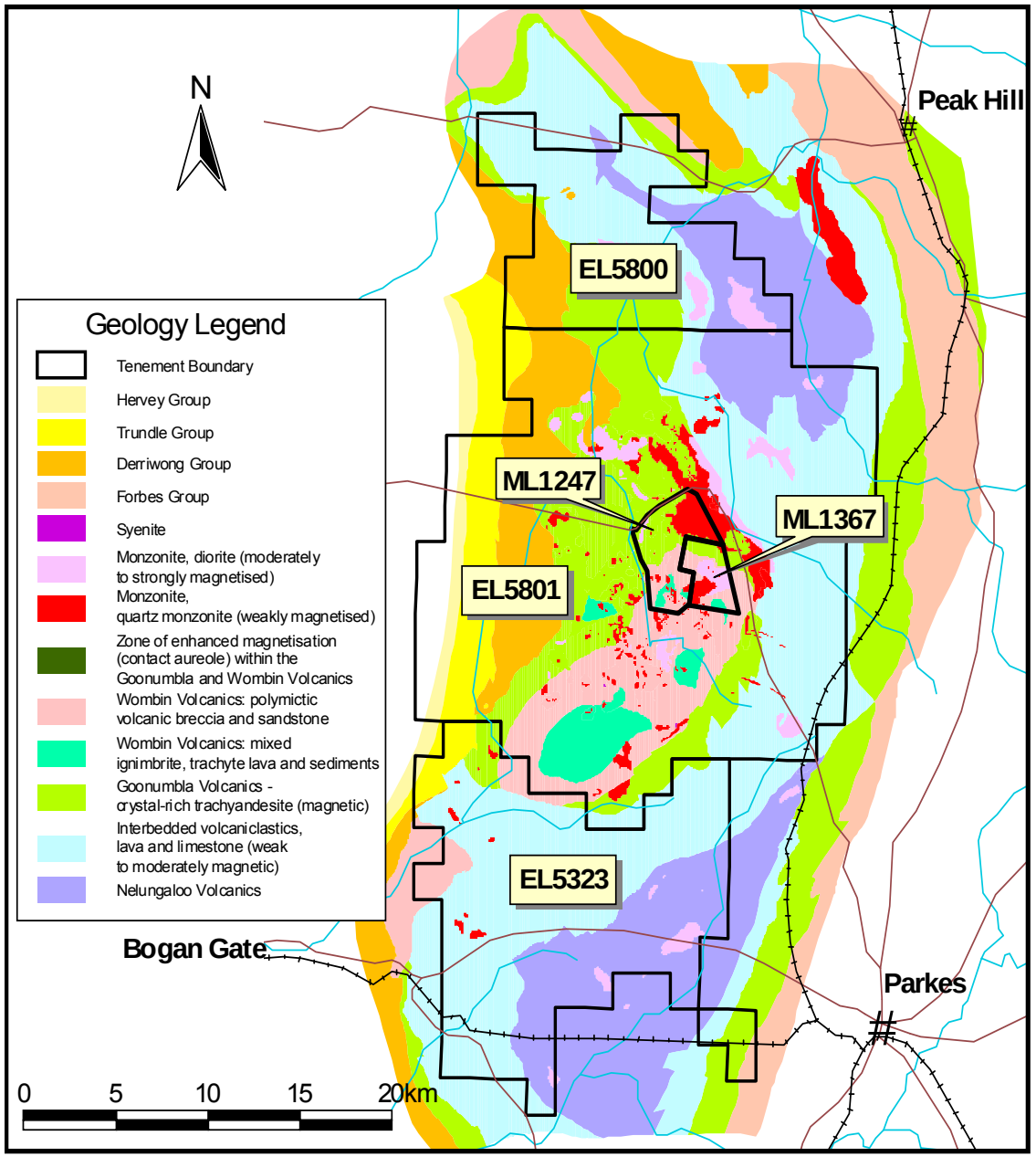
E48 L1	Mt	Cu %	Au g/t
Actual	1.3	0.62	0.30
Reserve	**59.3**	**0.92**	**0.37**



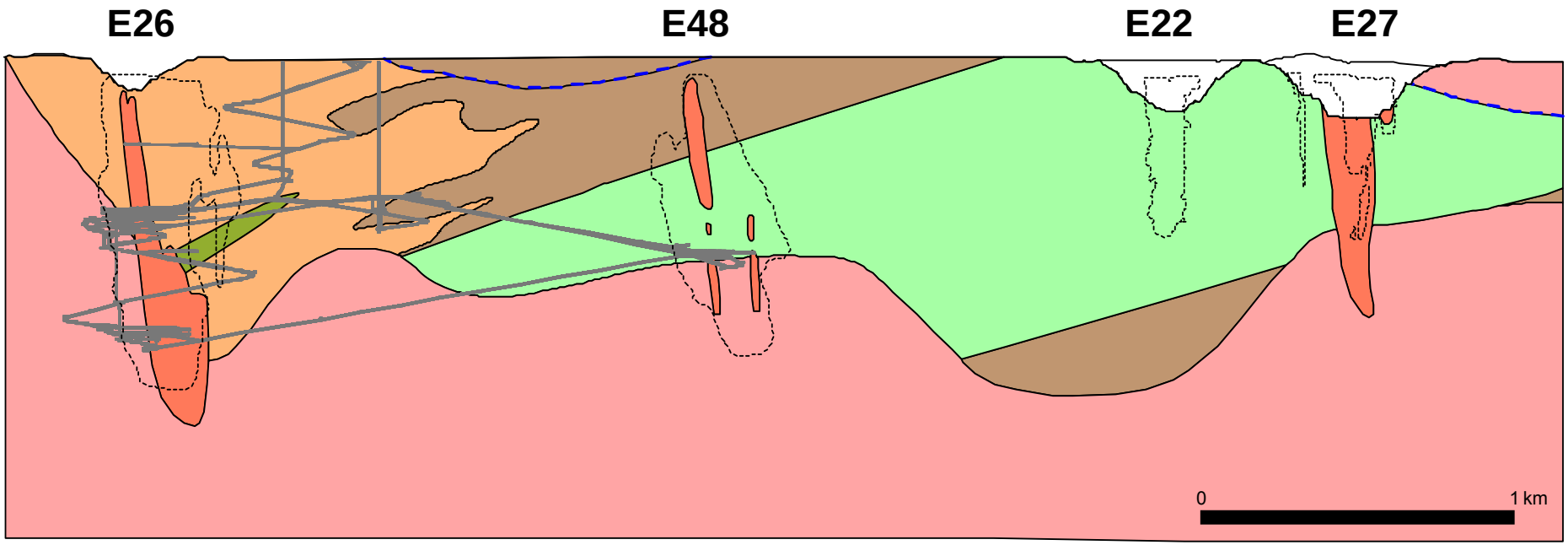
E26 L2	Mt	Cu %	Au g/t
Actual	13.3	1.36	0.58
Resource	**6.4**	**0.91**	**0.28**

E26 L2N	Mt	Cu %	Au g/t
Actual	6.9	0.71	0.21
Reserve	**10.2**	**0.69**	**0.19**

Regional Geology and Tenements



Simplified Geological Long Section

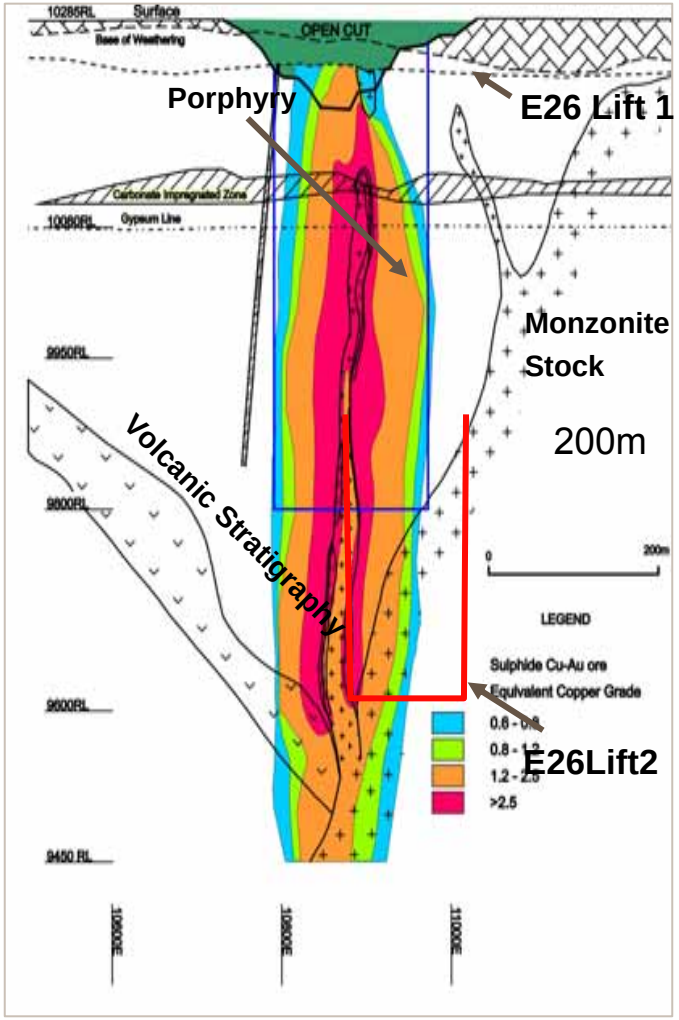


Quartz Monzonite Porphyry
Monzonite Stocks
Altona Fault
Monzodiorite
Latite dominant volcanics
0.5% Cu
Latitic Sediments
Trachytic Sediments
U/G Drives

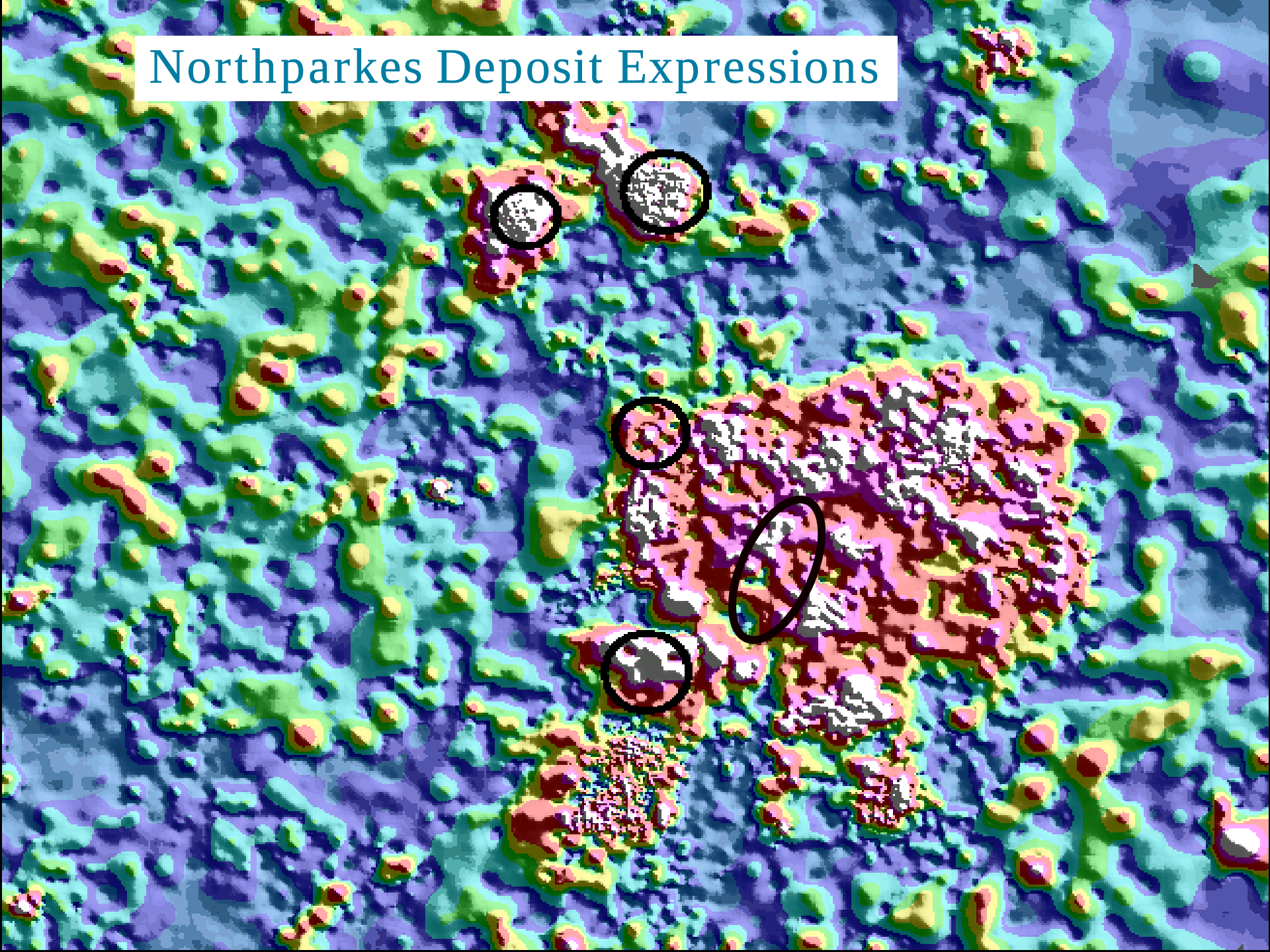
NORTHPARKES

Deposit Characteristics

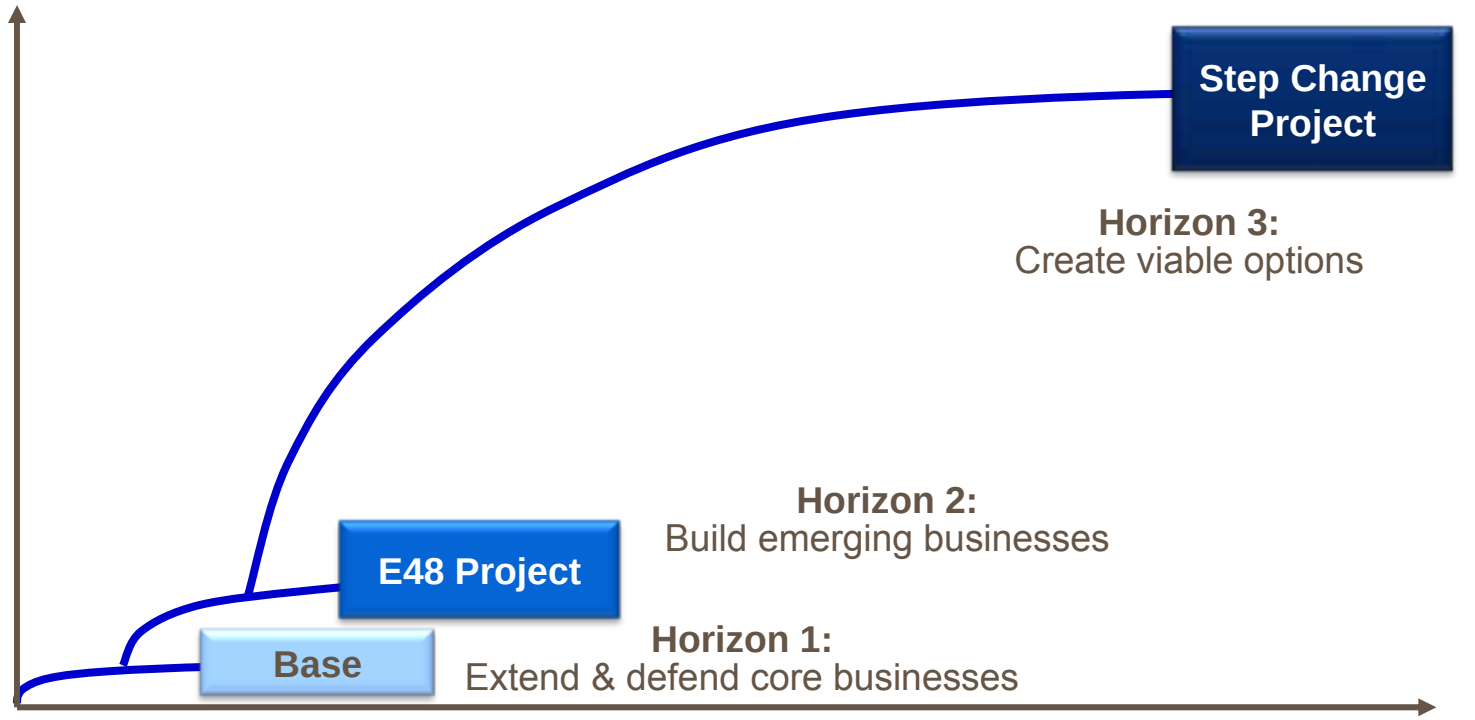
- Pipe-shaped porphyry systems
- Vertically extensive : E26 > 1200m deep
- Mineralisation concentrically zoned around the porphyry
  - Higher grades in or around the porphyry, declining outwards
  - Bornite cores → chalcopyrite → distal pyrite
- Similarly zoned alteration
  - K feldspar → Biotite magnetite → distal sericite chlorite
  - Late phyllic overprint – thermal collapse
- Drilling beneath porphyries and at GRP314 has identified mineralisation in the underlying stock



Northparkes Deposit Expressions



Northparkes' 3 Horizons – creating a viable future



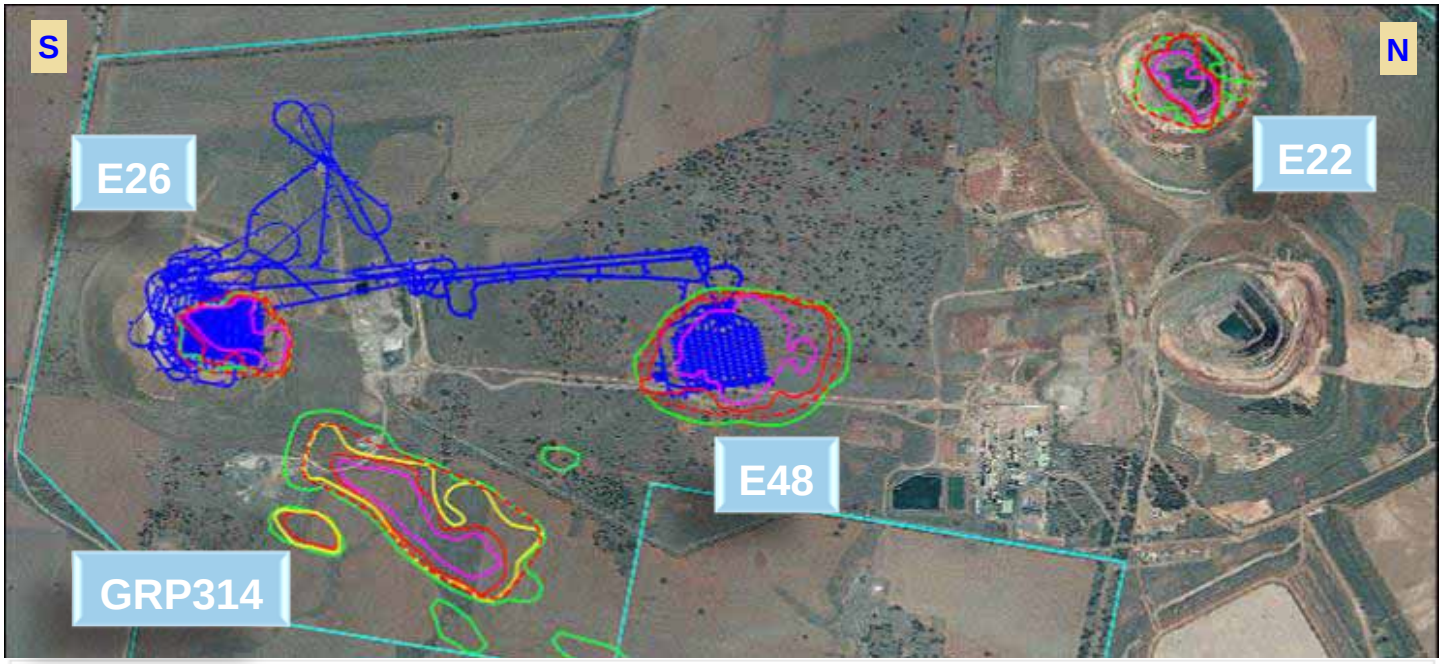
PEOPLE:
- Local sourcing
- Skills + training systems
- Intellectual Property
- Continuous improvement

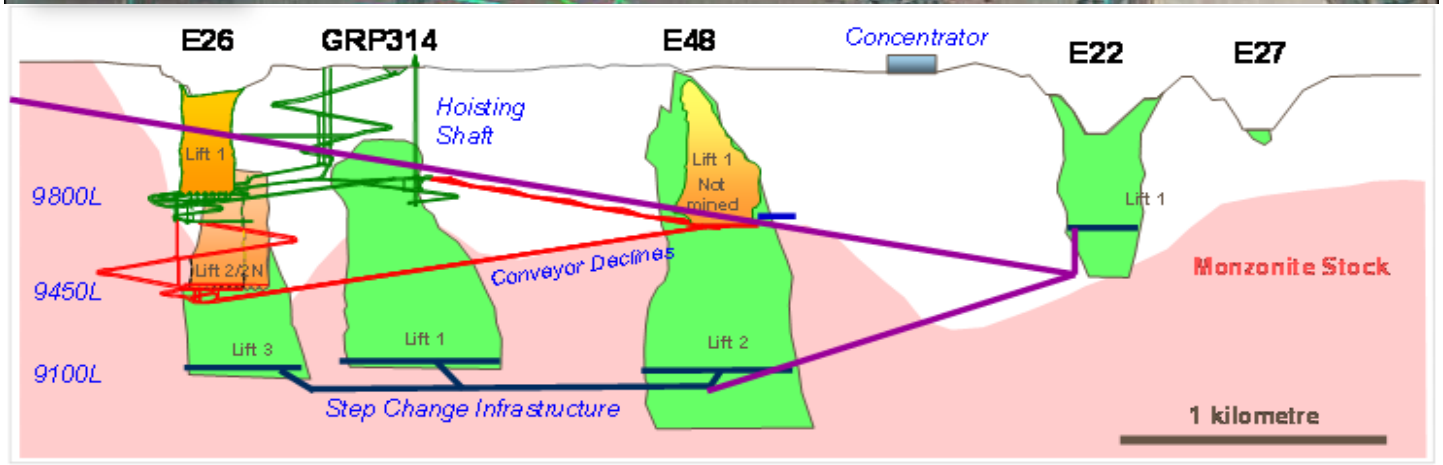
OPERATIONAL BASE:
- Freehold + mining title
- Community/Govt. relationships
- Water/energy access

TECHNOLOGY:
- Block caving
- Mass material handling
- Energy efficiency
- Automation

EXPLORATION

Step Change Project

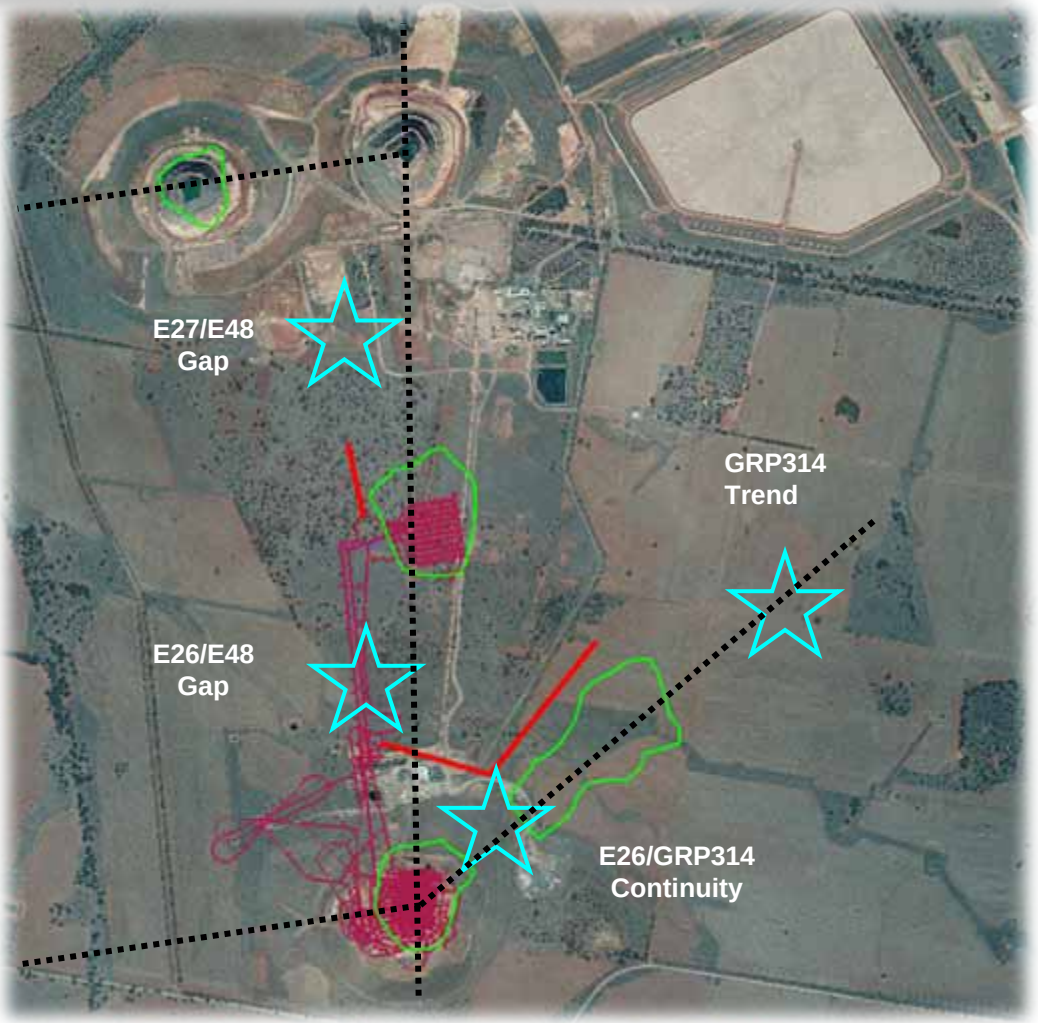




Upside Potential For Additional Resources

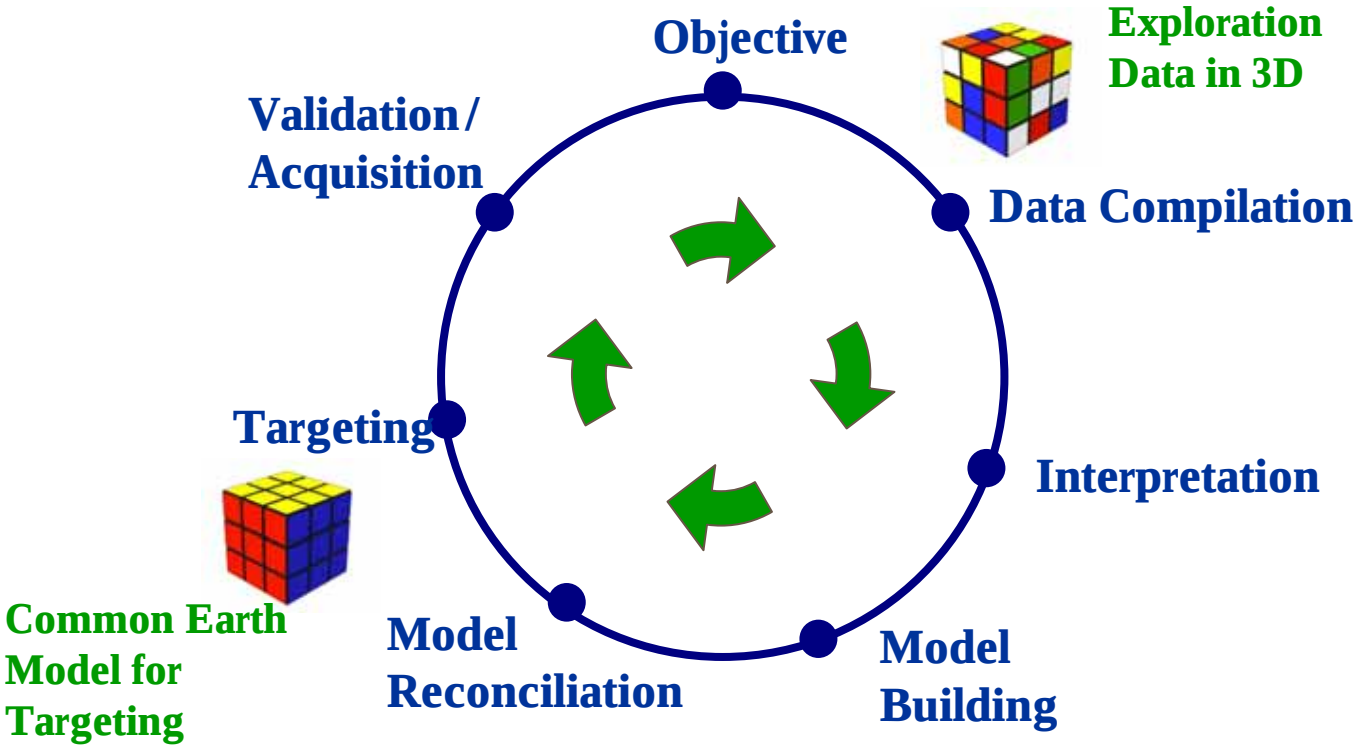
Exploration testing a range of high priority targets within the Mine Corridor and immediate mine environs, complimented by systematic exploration of Northparkes' exploration tenements.

- Mine corridor poorly tested at depth
- Mineralised trends identified and provide high priority targets
- Well resourced exploration team on site to advance targets in parallel with PFS



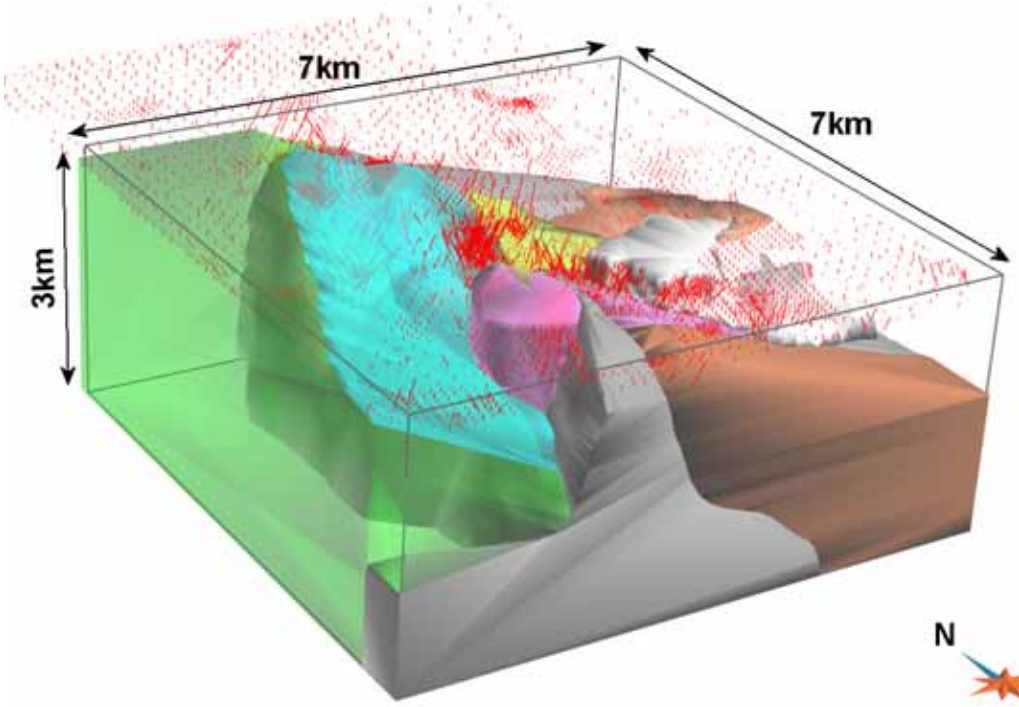
Transition into a full 3D environment for exploration

- Build Common Earth Model which contains available geological and geophysical datasets
- Examine potential field data and how best to use this for target generation.
  - Look at quantitative (inversion) methods for using potential field data for informing the shallow and deep geological model



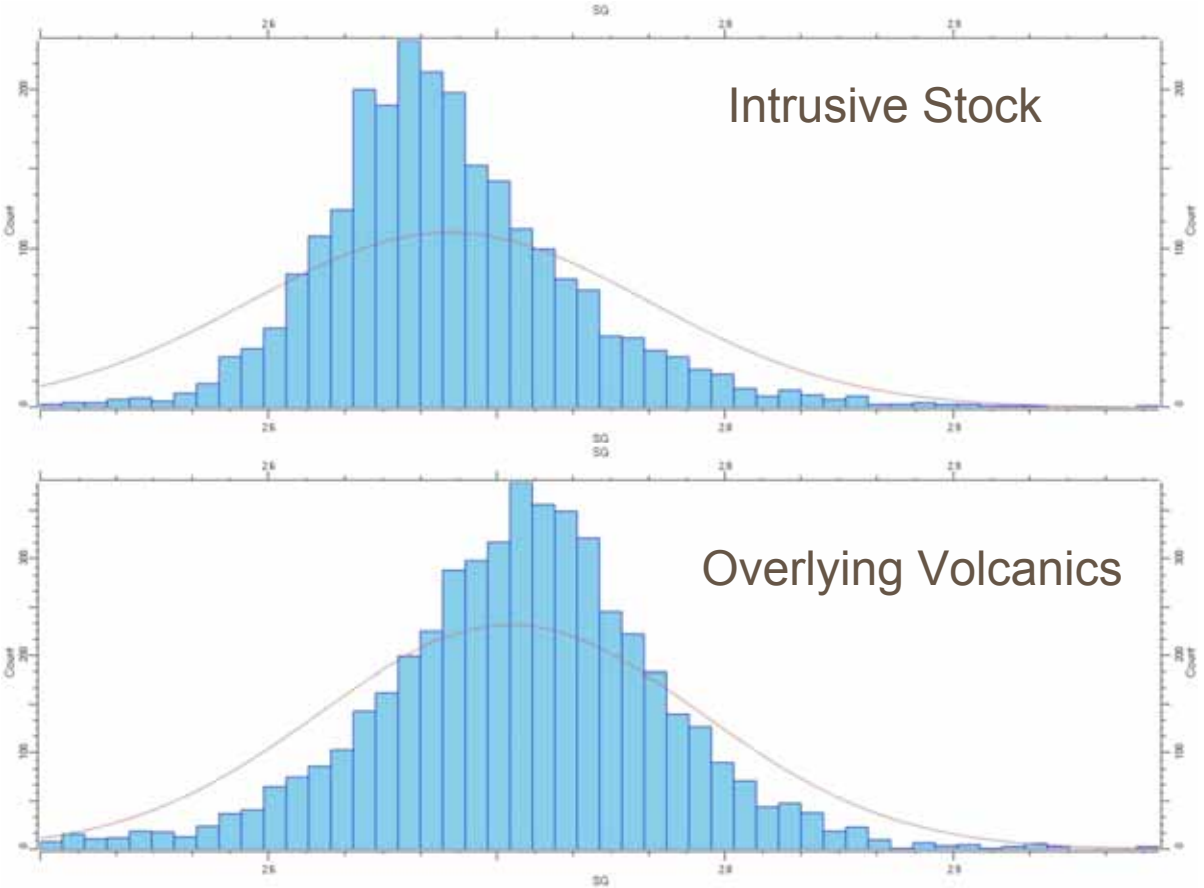
Compilation and Interpretation

- Data was imported into GoCad, based upon project objectives:
  - Topography and 2D compilation
  - Drilling information (18,154 holes – 395,000 assays)
  - Potential Field Geophysical surveys (10,000 gravity stations, >35,000 line km magnetics)
  - Electrical Geophysical surveys (>600 line km IP)
  - Geological Models
- Checked for consistency in data locations, geology codes, normalisation and scaling of property units.



Reconciliation of rock property data in GoCad

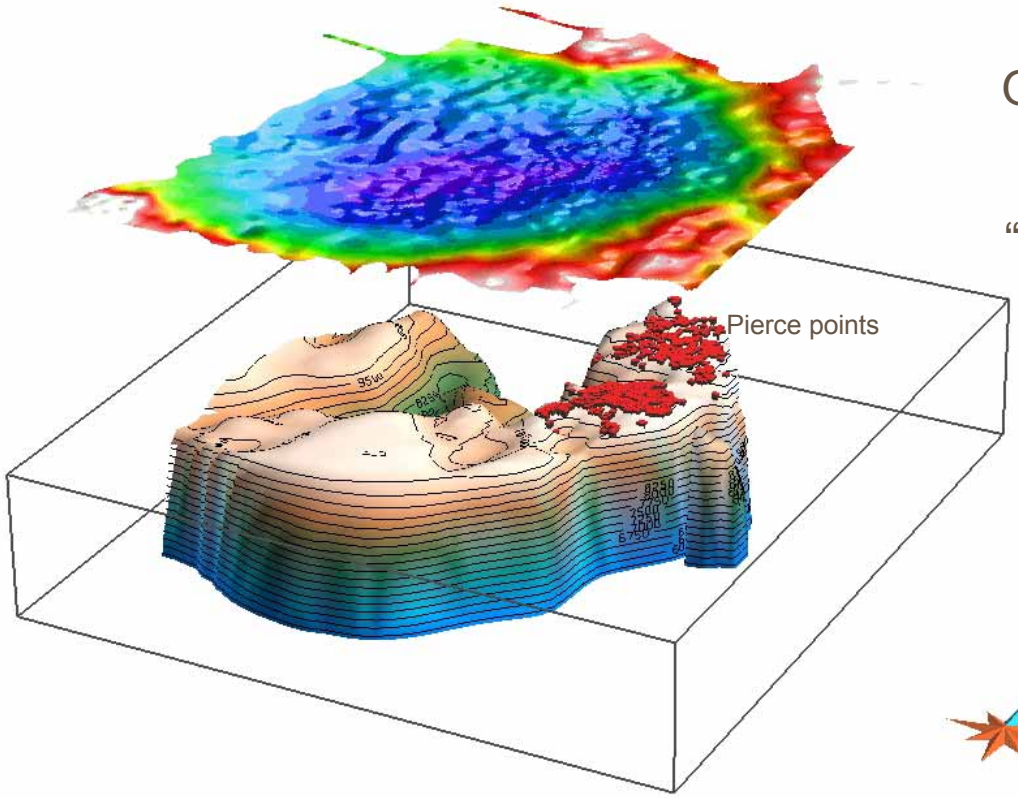
- Analysis of separate volcanic units indicated that the initial 3D model built from sections was not adequately modelling the volcanic pile.
- Density analysis shows that Monzonite stock generally has a lower density than overlying volcanics.



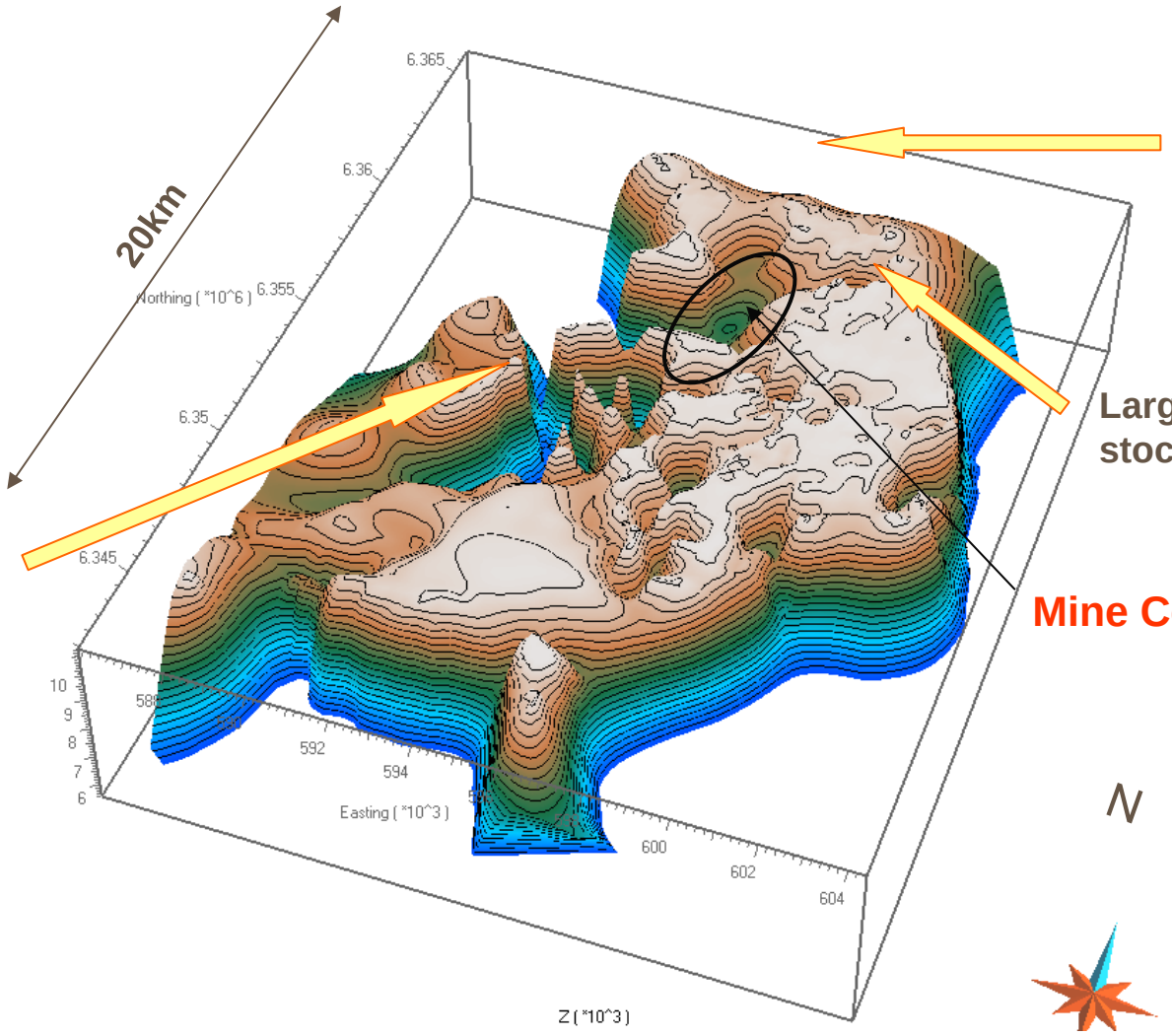
Density histograms of combined stock units and combined overlying volcanics units
(each shown on 2.5g/cc to 3.0g/cc range)

Geologically constrained inversion

- Implement gravity inversion to derive a regional scale geological model for the top of monzonite stock consistent with drill hole pierce points.



And provides model for targeting....



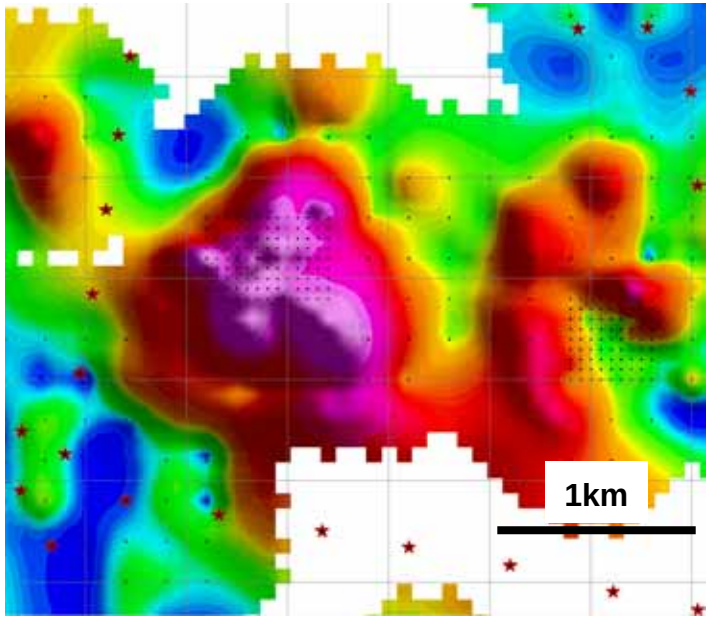
New detail/ridges in stock model

Stock extension to north

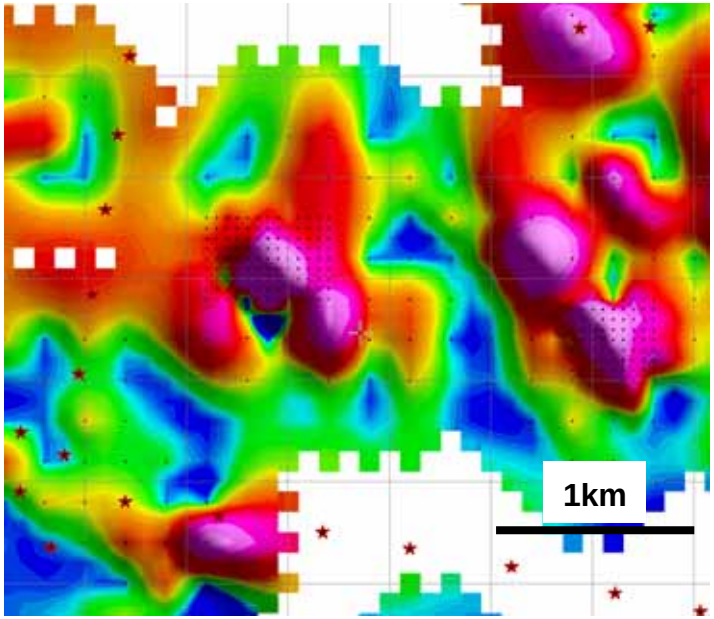
Large parts of stock untested

Mine Corridor

But conventional review still reveals targets...



Cu Soil Samples



Au Soil Samples

N

- Review of datasets completed over tenement package
- After almost 40 years some (obvious) targets remain untested
- Highlights the need to be consistent in collection of fundamental data and the requirement to integrate all available data

Summary

- Continued exploration has revealed potential for larger systems at Northparkes
- Spatial relationship of the mineralised systems and the stock
- Maximising the value of all data through the creation of 3D model where all data is integrated and available for targeting – though thorough "conventional" review can still generate exciting prospects
- Strong management support from all levels with the organisation for ongoing exploration with a focus on targets to leverage into the Step Change Project whilst also advancing regional targets
- After forty years of exploration NPM still has huge exploration potential