NEXUS MINERALS

# CRITICAL METALS EXPLORATION IN NORTHEAST VICTORIA AND SOUTHERN NEW SOUTH WALES

## PRESENTATION

22-23 JUNE 2023

nexus-minerals.com

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- The information in this report that relates to Exploration Results, Mineral Resources or Ore Reserves is based on, and fairly represents, information and supporting documentation, prepared, compiled or reviewed by Mr Andy Tudor, who is a Member of the Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. Mr Tudor is the Managing Director and full-time employee of Nexus Minerals Limited. Mr Tudor has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity for which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Tudor consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.
- The results are available to be viewed on the Company website www.nexus-minerals.com. The Company confirms that the form and context in which the Competent Persons' findings are presented have not been materially modified from the original announcements.
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# COMPANY PROJECTS

## TARGETING:

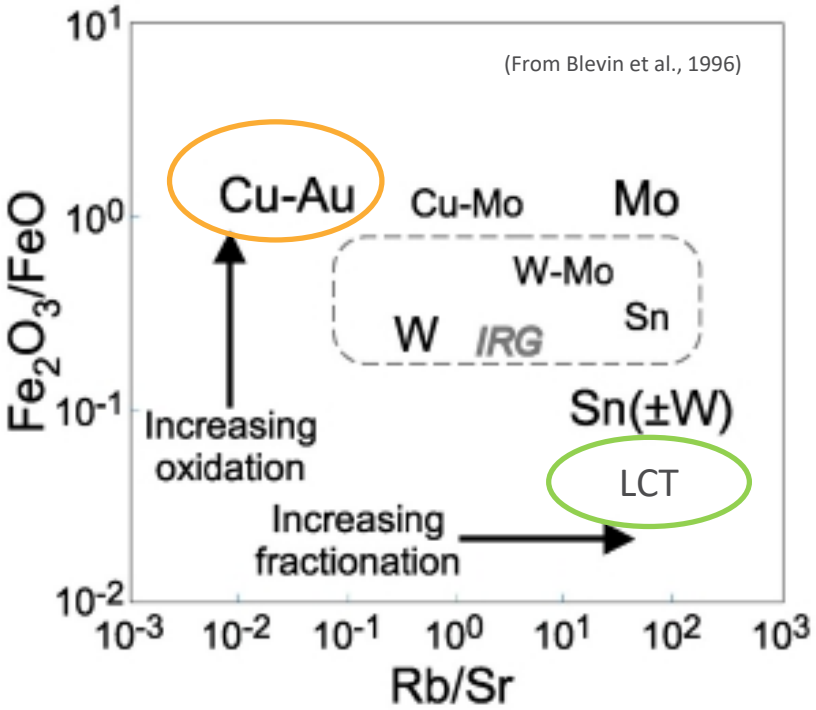
### WESTERN AUSTRALIA

Large scale gold deposits in WA's Eastern Goldfields

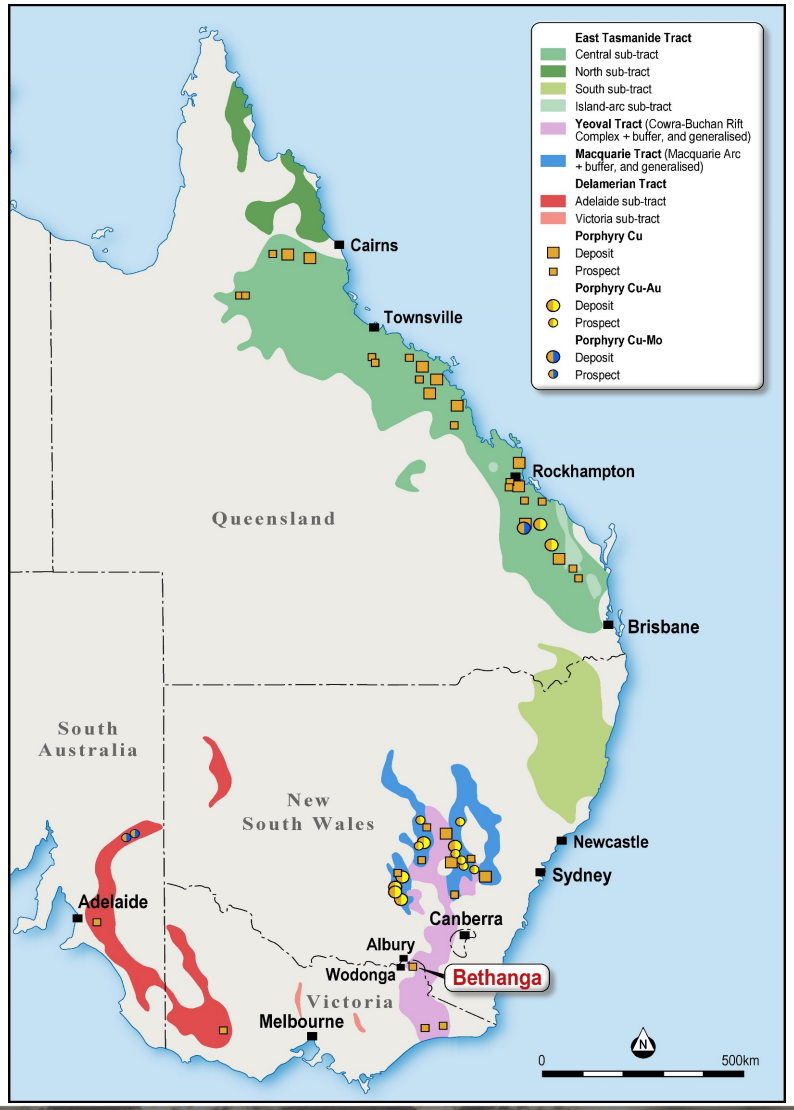
### VICTORIA & NEW SOUTH WALES

Large Porphyry Copper-Gold and Critical Minerals - Lithium, Caesium, Tantalum & Tin

# MAGMATIC HYDROTHERMAL SYSTEMS




- **Magmas associated with porphyry Cu-Au systems are typically:**
  - Oxidised to strongly oxidised (magnetite series)
  - Poorly evolved, primitive melts (K/Rb ratio >250)
  - Poorly fractionated (Rb/Sr ratio <1)
  - Typically hydrous with Sr/Y ratios >40 (hornblende-bearing)
  - I-type metaluminous (Al<(Ca+Na+K))
- **Magmas associated with Sn +/- W and LCT pegmatites are typically:**
  - Strongly reduced
  - Highly fractionated (Rb/Sr >10)
  - Strongly evolved (K/Rb ratio <100)
  - Peraluminous, generally S-type (Al>(Ca+Na+K))




# COMPANY PROJECTS

## BETHANGA PORPHYRY Cu-Au PROJECT

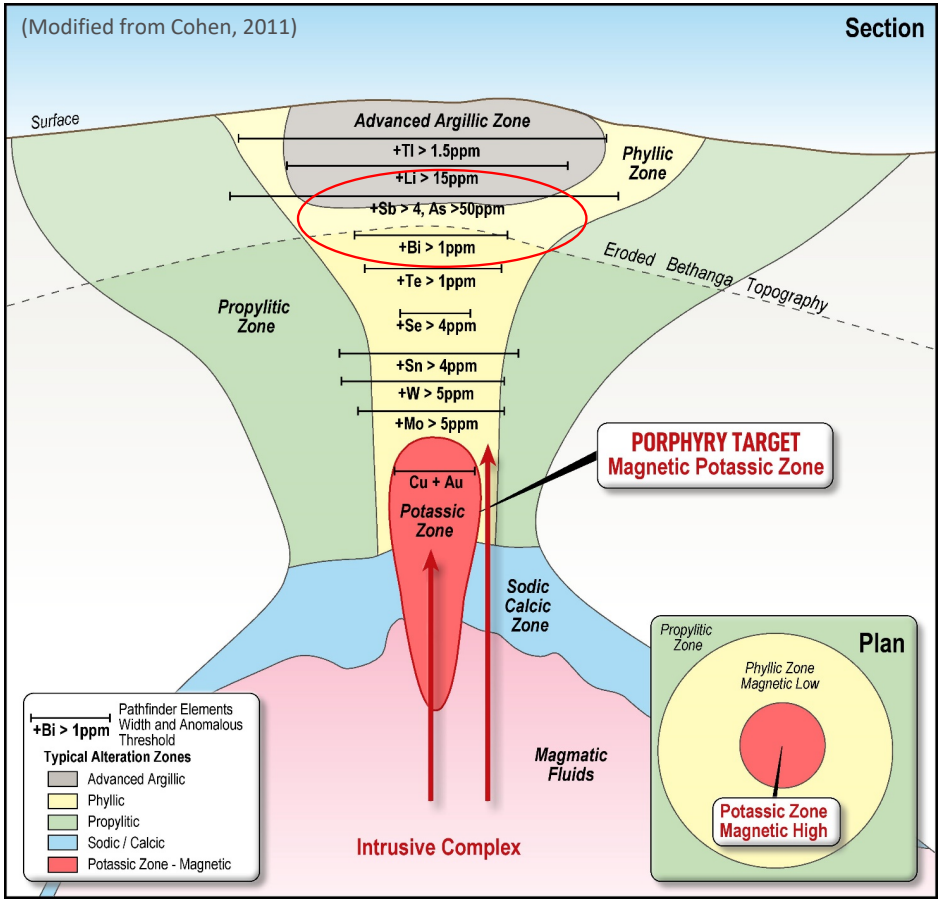
### TARGETING = LARGE SCALE PORPHYRY Cu-Au SYSTEM

- Exploration Tenements cover 130km²
- Located in Australia's premier Porphyry Copper-Gold geological terrain
- Same Paleozoic rock package as the world class Cadia-Ridgeway and Northparkes Porphyry Copper-Gold projects further north in NSW
- The project area is recognised by Geological Survey of Victoria as a region prospective for Porphyry Copper-Gold and VHMS mineralisation

### 'THE RIGHT ROCKS'

- Historically mined for copper and gold at turn of the century (618t Cu and 94kOz Au at 39g/t )
- No exploration activity since 1987

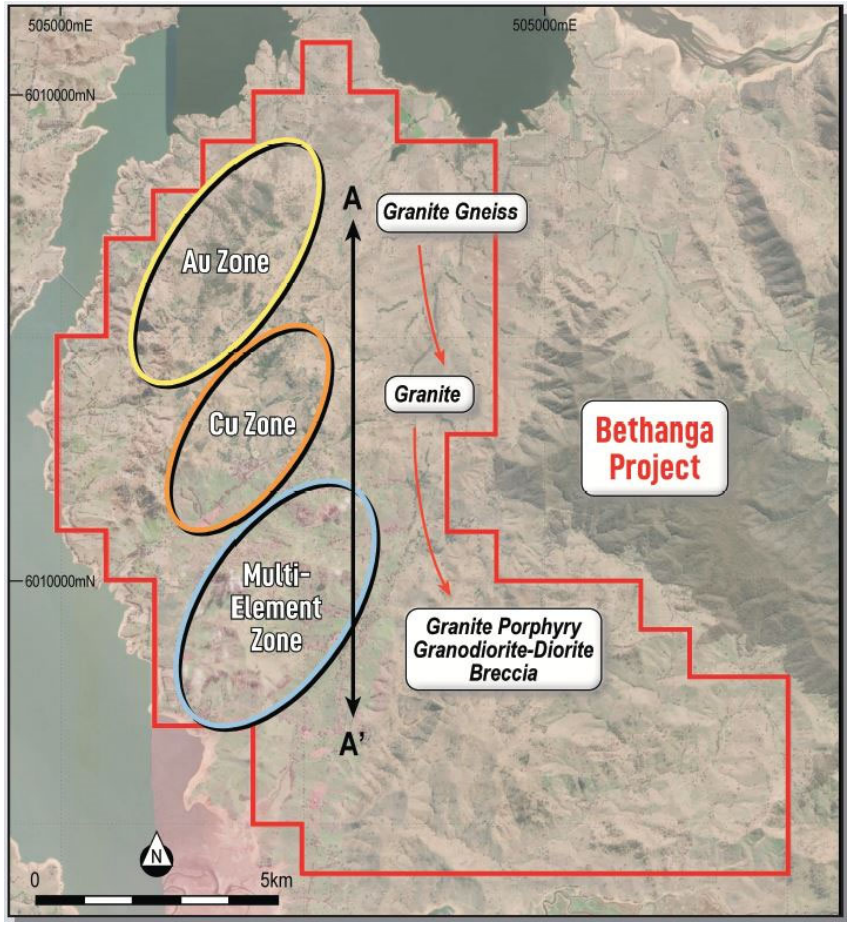
# PORPHYRY Cu-Au




# EXPLORATION MODEL

- Typical Cu-Au porphyries display a magnetic “potassic zone” at the core of the system containing alteration minerals magnetite, biotite and K-feldspar.
- This potassic zone is surrounded by the non-magnetic “phyllic zone” containing quartz, sericite/white mica (illite/muscovite) and pyrite.
- This zone extends outwards to the “propylitic zone” containing chlorite, epidote and carbonate (the “green” rocks).
- This zonation can result in a magnetic response comprising a magnetic high (potassic zone) surrounded by a magnetic low (phyllic zone).
- Surface rock chip data from Bethanga show localised highly anomalous Sb & As and weakly anomalous Bi to define an approximate vertical position

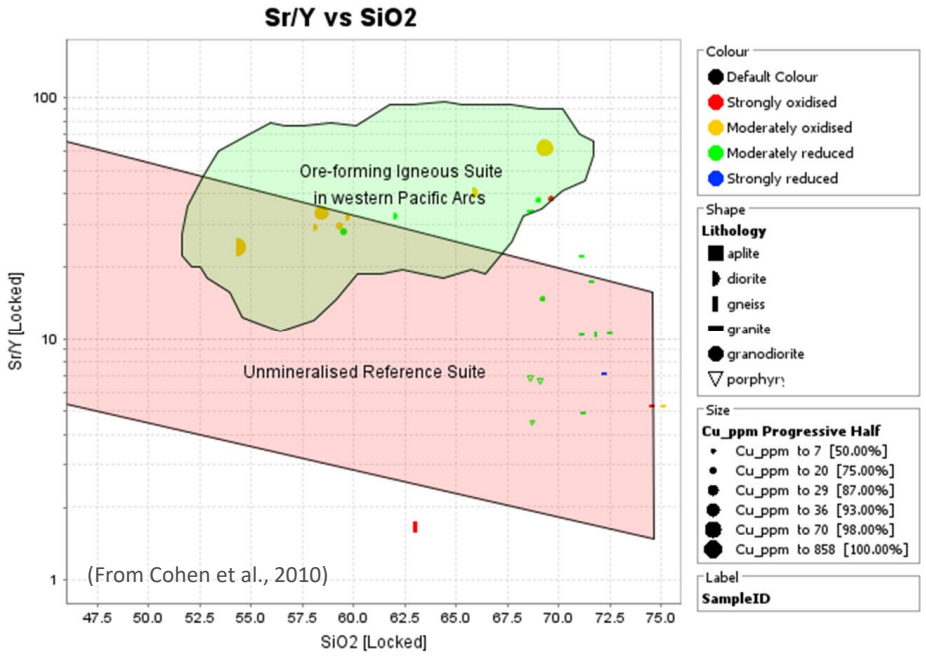
# PORPHYRY Cu-Au




# WORK COMPLETED TO DATE

- 430 rock chip samples (307 by 4-acid digestion & 123 by whole-rock analyses) and 841 regional soil samples (aqua regia digestion with an ICP-OES/MS instrumental finish) over the western portion of the tenement
- 151 rock chip samples (118 by 4-acid digestion & 33 whole-rock analyses) and 1711 soil samples (aqua regia digestion with an ICP-OES/MS instrumental finish) in the southern multi-element in-fill grid area coincident with a subtle magnetic high
- Petrographic examination of 41 samples
- Detailed walking magnetic grid completed over the multi-element zone accompanied by mapping

# PORPHYRY Cu-Au

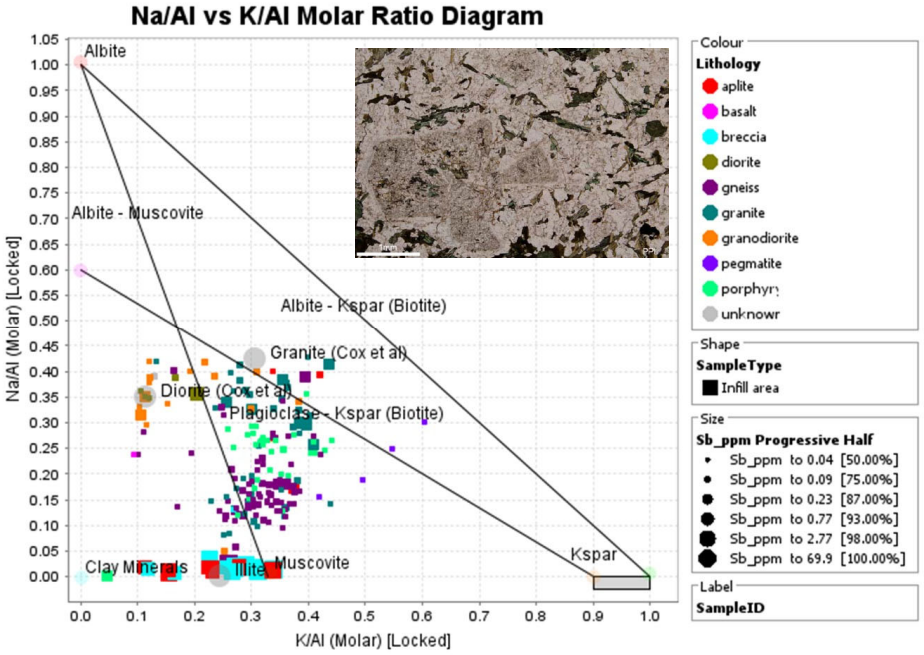



# FERTILITY STUDY POSITIVE RESULTS

## Geochemistry

- Porphyry Cu-Au fertility study returns positive outcomes with Bethanga prospective for hosting a porphyry Cu-Au system
- Drill targets identified – diamond drill hole planning underway
- Rock samples of hornblende-bearing granodiorite to diorite compositions plot in the prospective field for western Pacific porphyry Cu systems and are moderately oxidised
- Rock lithogeochemistry indicates the intrusive rocks are consistent with emplacement into a porphyry tectonic environment (i.e. volcanic arc)
- Soil and rock chip geochemistry returns commodity and trace element enrichments expected in the upper levels of a porphyry Cu system
- Elemental association is consistent with magmatic–hydrothermal fluids originating from a fertile porphyry Cu system

# PORPHYRY Cu-Au

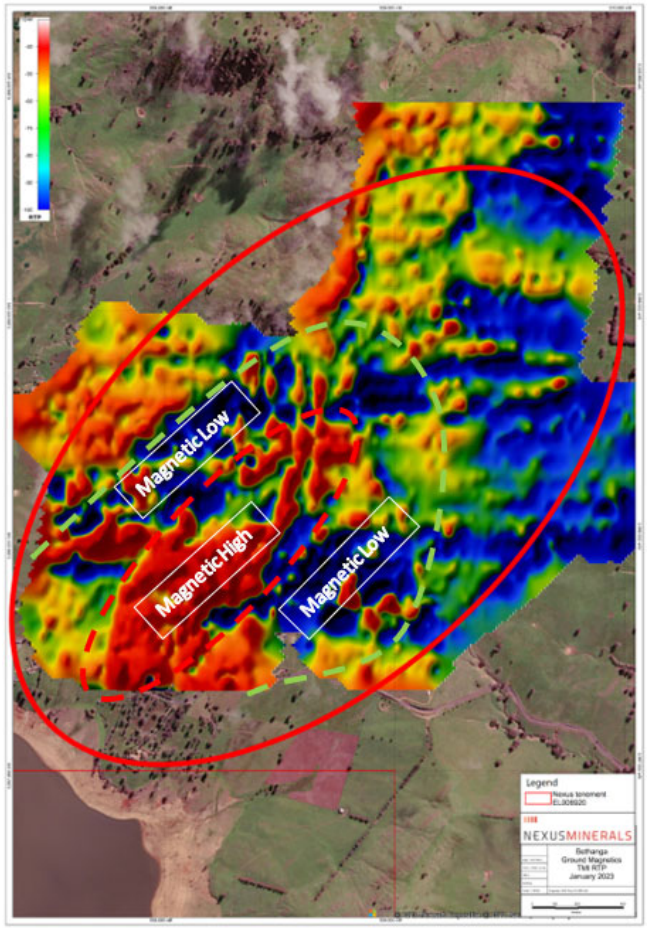



# FERTILITY STUDY POSITIVE RESULTS

## Alteration

- 4-acid digest and whole-rock geochemical data indicate the presence of strong phyllic alteration (Na loss) associated with breccias and aplite dykes
- Short-wave infrared data (TerraSpec analyses of rock chip rejects done at ALS with aiSIRIS interpretations) indicates well crystallised white mica (muscovitic composition) is the dominant spectrally-active mineral present in the multi-element zone
- White mica is associated with partially chloritized hornblende and biotite in diorites (confirmed petrographically)
- Inset shows a white mica-altered plagioclase phenocryst in a groundmass of altered plagioclase and chlorite-altered biotite and hornblende from a sample of diorite (Verbeeten, 2022)

# PORPHYRY Cu-Au

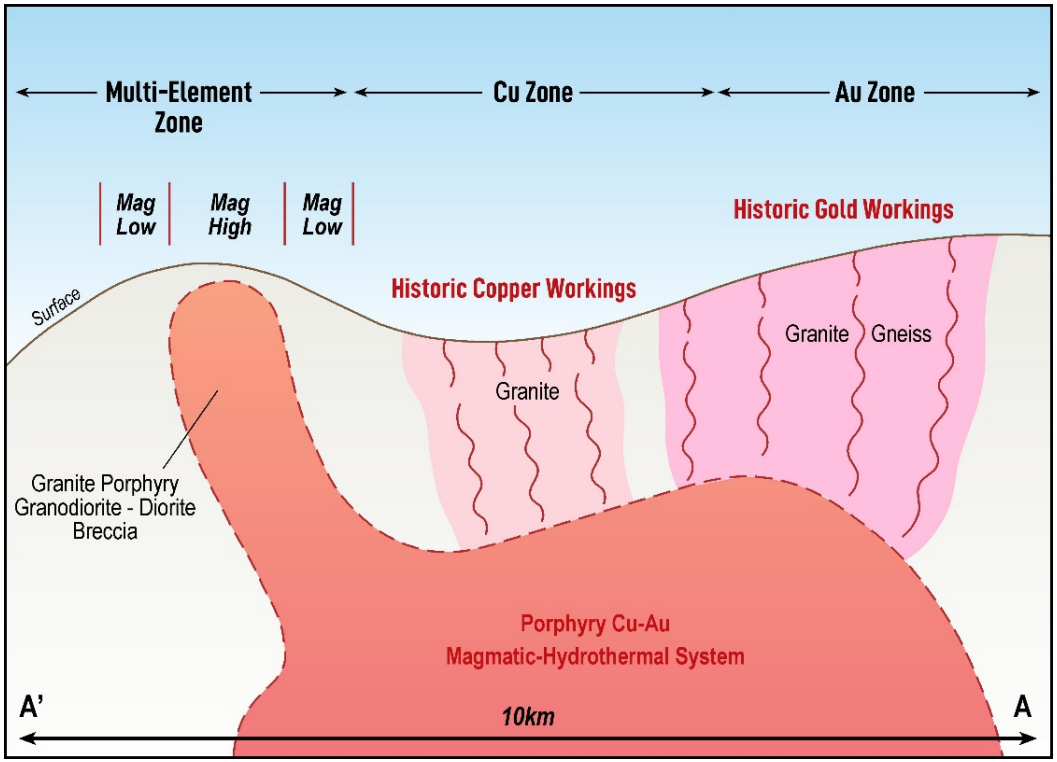



# FERTILITY STUDY POSITIVE RESULTS

## Geophysics

- The porphyry target zone covers ~8km x 3km, with a high priority target zone of ~3km x 1.5km in multi-element zone
- Aeromagnetic and ground magnetic surveys confirm existence of multi-phase magnetic intrusive complex – consistent with the core of a porphyry Cu-Au system
- The magnetic high may represent the magnetic “potassic zone” at the core of the system and correlates with dioritic rocks having higher magnetic susceptibilities compared to enclosing host rocks
- The magnetic lows within and surrounding the magnetic high may represent the non-magnetic phyllic zone and/or magnetite-destructive alteration, consistent with observed lithogeochemical and hyperspectral data

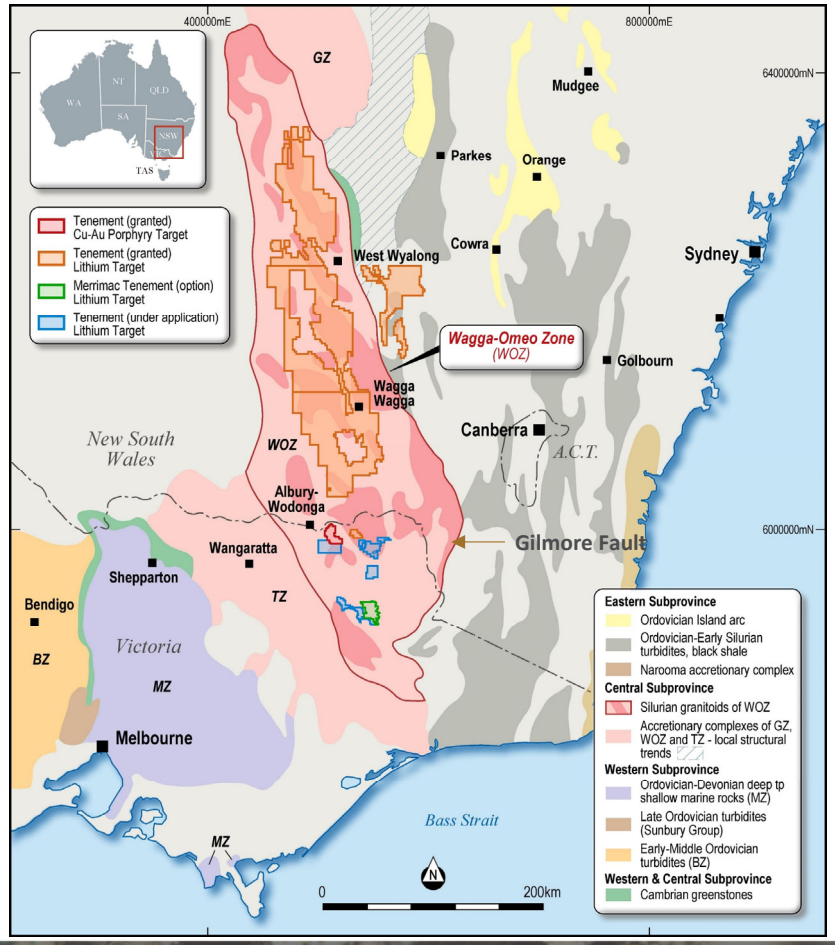
# PORPHYRY Cu-Au – Bethanga Exploration Model – The Science*




- Bethanga Gneiss considered to be pre-Ordovician (older than 480Ma)
- The Bethanga Gneiss may belong to a distinct metamorphic series - not the regional Omeo Metamorphic Complex (OMC)
- The Bethanga Gneiss has distinct mineral assemblage of cordierite-garnet to sillimanite-K-feldspar grade more typical of metamorphic assemblages found in contact aureoles elsewhere in the OMC
- To have such high temperature minerals at such shallow crustal levels and to achieve the high geothermal gradient required, large amounts of mantle-derived magmas would have to have been intruded from the mantle to shallow levels of the crust
- Therefore, were such I-type plutons (and associated Cu-Au mineralisation) emplaced during the Silurian period (~420Ma) potentially located below the presently exposed rocks?

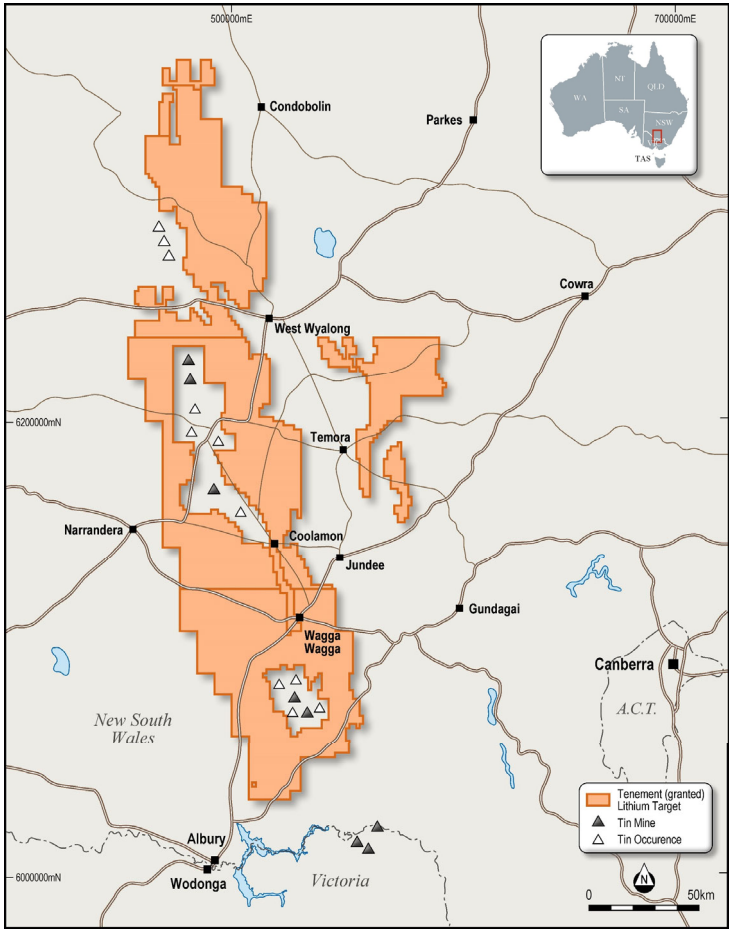
(*From V J Morand 1990)

# CRITICAL MINERAL SEARCH – First Mover Advantage – "Mega Peg"




- Nexus Minerals has been granted over 15,000km$^2$ of prospective tenure in north-east Victoria and NSW
- First mover advantage allows for regional scale exploration targeting with one of the largest pegging exercises in NSW history
- Nexus will be exploring for the following critical minerals:
  - **Lithium**
  - **Caesium**
  - **Tantalum**
  - **Tin**
  - **Copper**
- Lithium-Caesium-Tantalum (LCT) pegmatites are associated with highly fractionated, reduced S-type Silurian granites that often also host tin mineralisation
- The Wagga-Omeo Zone (WOZ) – host to extensive emplacement of Silurian granites and historical tin mining operations and occurrences
- Hence WOZ is determined to be highly prospective for LCT pegmatites and associated tin mineralisation
- The WOZ extends ~700km in a north-south direction and averages ~80km east-west

# CRITICAL MINERAL SEARCH - NSW



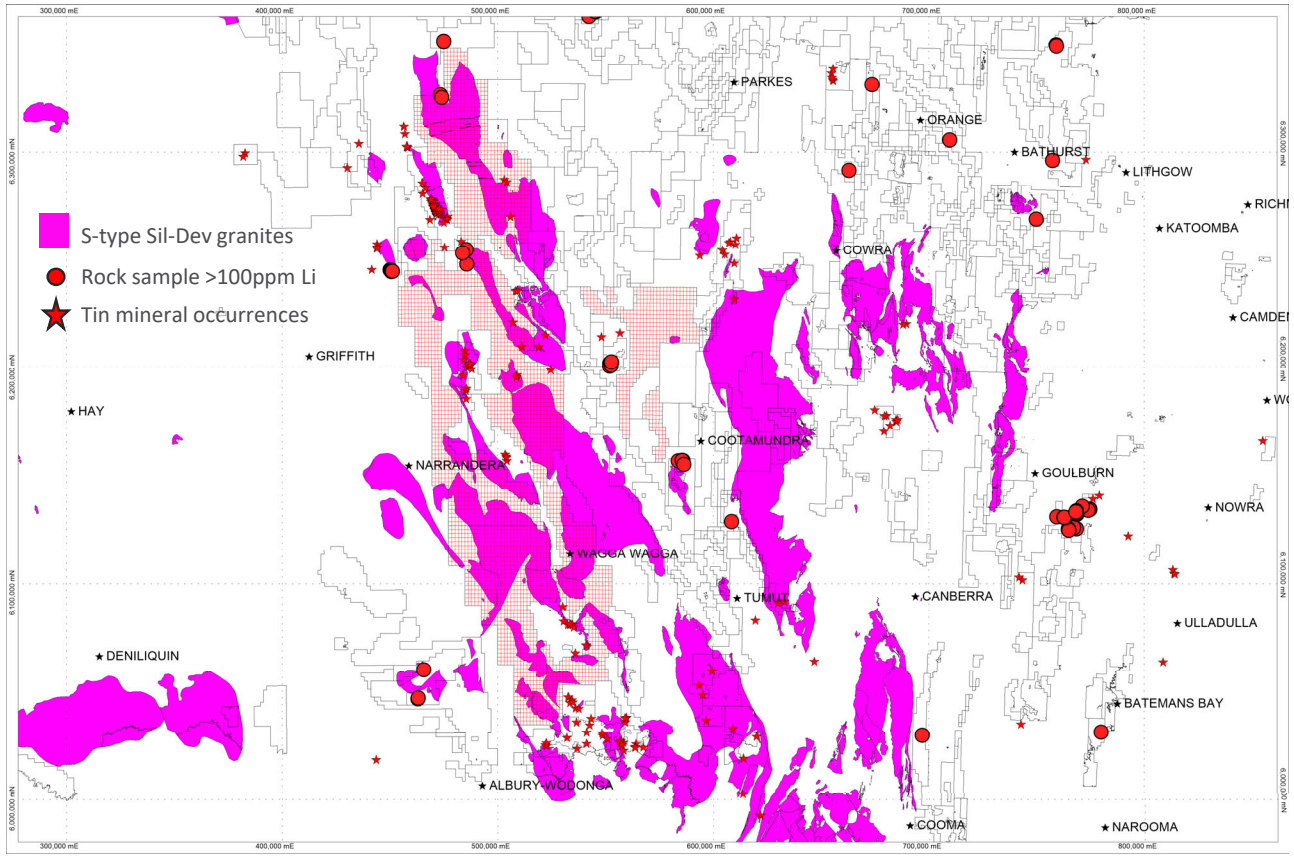

**Over 15,000km$^2$ of prospective WOZ ground tenements granted**

**First mover advantage allows for regional scale exploration targeting with one of the largest pegging exercises in NSW history**

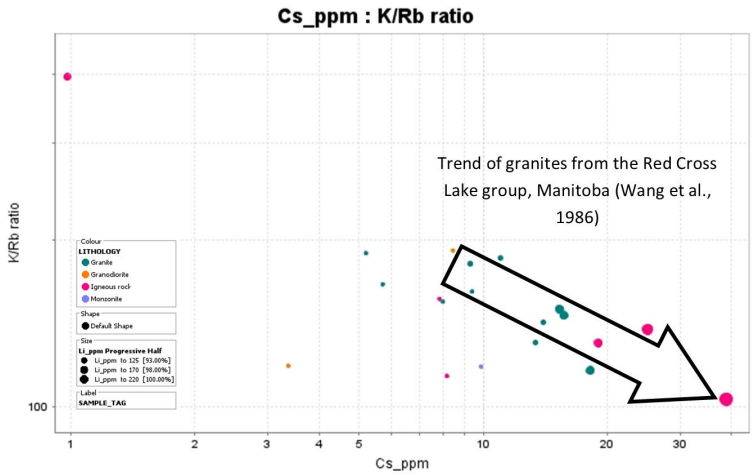
**Tenure considered prospective for: Lithium, Caesium, Tantalum and Tin**

- A review of open file geology and whole-rock geochemistry confirmed that much of the exploration ground applied for in southern NSW is underlain by or adjacent to reduced, fractionated, peraluminous S-type granites
- These same granites are related to spodumene-bearing pegmatites in Victoria
- The re-processing of open file geophysical datasets is the first step to distinguishing the different intrusive phases and the contact zones
- Typically, LCT pegmatites are found approximately 3 to 6 km from the contact of a fertile granite intrusion - so ground truthing will concentrate on this zone
- Field investigations using portable x-ray fluorescence (pXRF) technology and collection of representative samples from intrusive rocks will be used to confirm permissiveness for LCT pegmatite generation

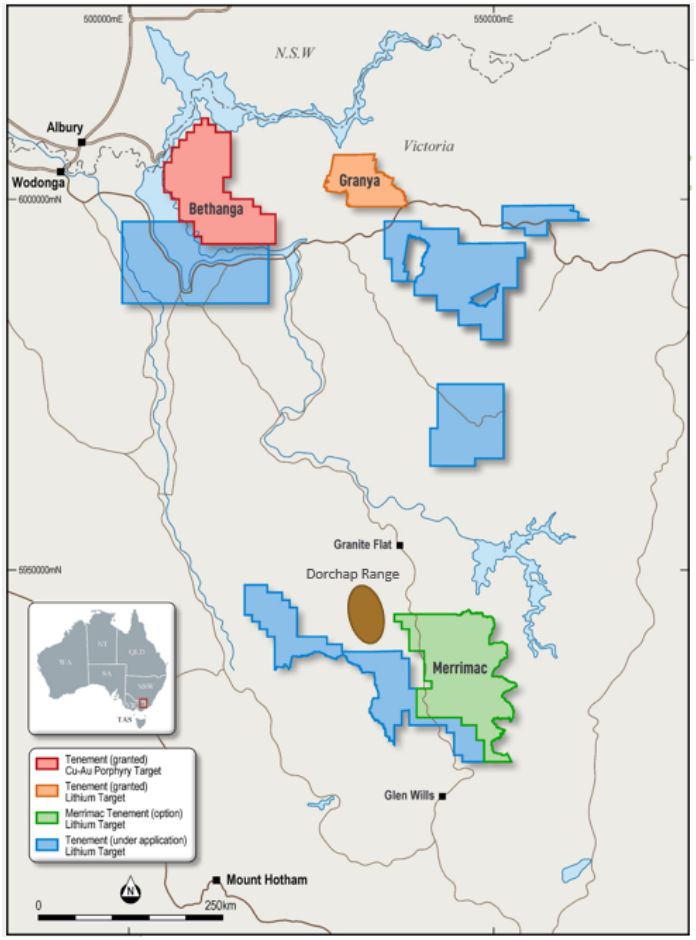
# PRELIMINARY FERTILITY ASSESSMENT - NSW




- Insufficient data are readily available in the GSNSW lithogeochemistry and geology datasets to determine degree of oxidation and fractionation
- What data are available indicate that some of the granites are permissive for LCT pegmatites with comparison to other terranes



# CRITICAL MINERAL SEARCH - Victoria



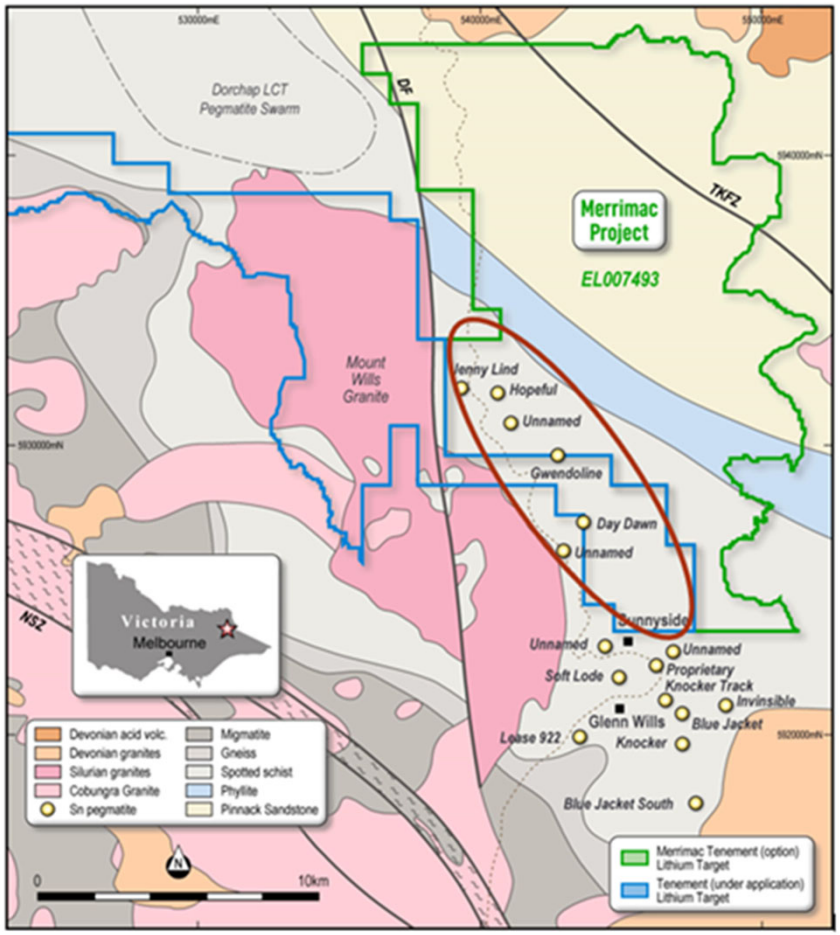

## LCT Pegmatite Exploration

- The discovery of spodumene-bearing LCT pegmatite dykes in the Dorchap Range of north-eastern Victoria has spurred exploration interest for critical minerals in this region and further north into NSW
- The LCT pegmatites of the Dorchap Range are associated with the historical primary tin fields at Mitta Mitta and Mount Wills
- The Mount Wills granite, dated at 420+/-4 Ma (Silurian) may also be genetically related to the LCT pegmatites of the Dorchap Range
- The Mount Wills Granite also partially hosts intrusion-related (?) Ag-Au-Sb mineralization at Glen Wills and Sunnyside

## Granya LCT Project

- Hosts the Thologolong Silurian granite intrusion
- Initial ground truthing has identified extensive pegmatite swarms 3 to 6km from contact
- Mapping and sampling program completed
- pXRF orientation survey currently underway commenced for Li using a basket of proxy analyses (Cs, Ga, Nb, Rb, Sn, Ta and Tl)

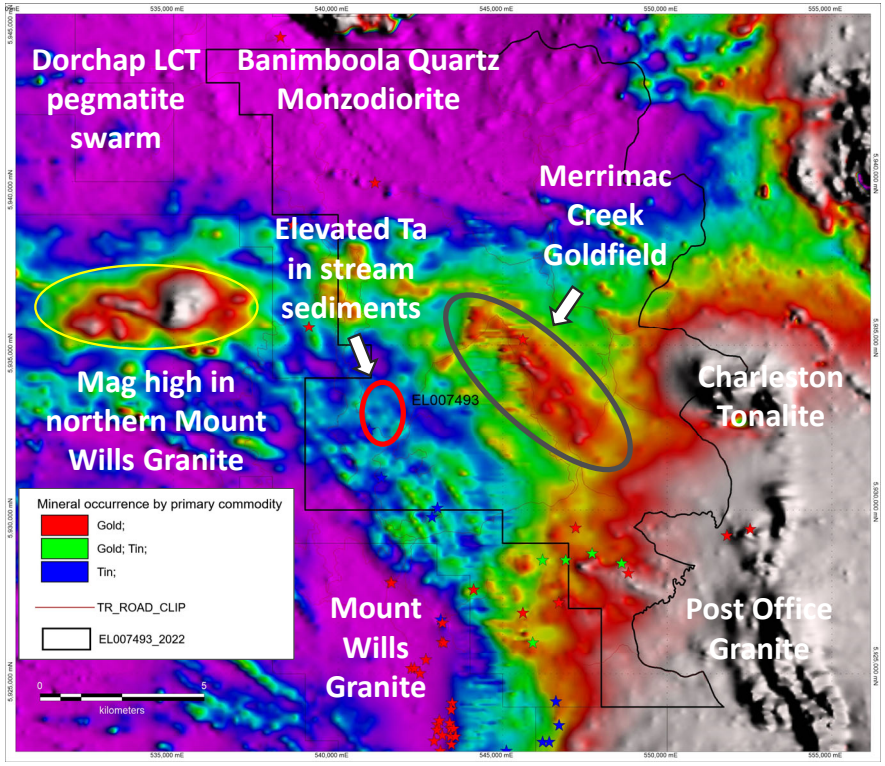
# CRITICAL MINERAL SEARCH - Victoria




## Merrimac LCT Project

- The Merrimac tenement, in addition to the Nexus under application tenement abutting to the south, provides over 10km strike of prospective LCT pegmatite ground
- The Mount Wills granite provides the fertile granitic intrusion
- Exploration target area situated 3-6km zone from the fertile Mount Wills Granite margin, along a line of historical tin pegmatite occurrences.
- The Dorchap LCT pegmatite swarm (Dart Mining/SQM) occurs directly north of the Glen Wills Granite
- Elevated Ta occurs in stream sediments downstream of the Hopeful Sn mine
- Preliminary mapping and sampling program with pXRF analyses completed

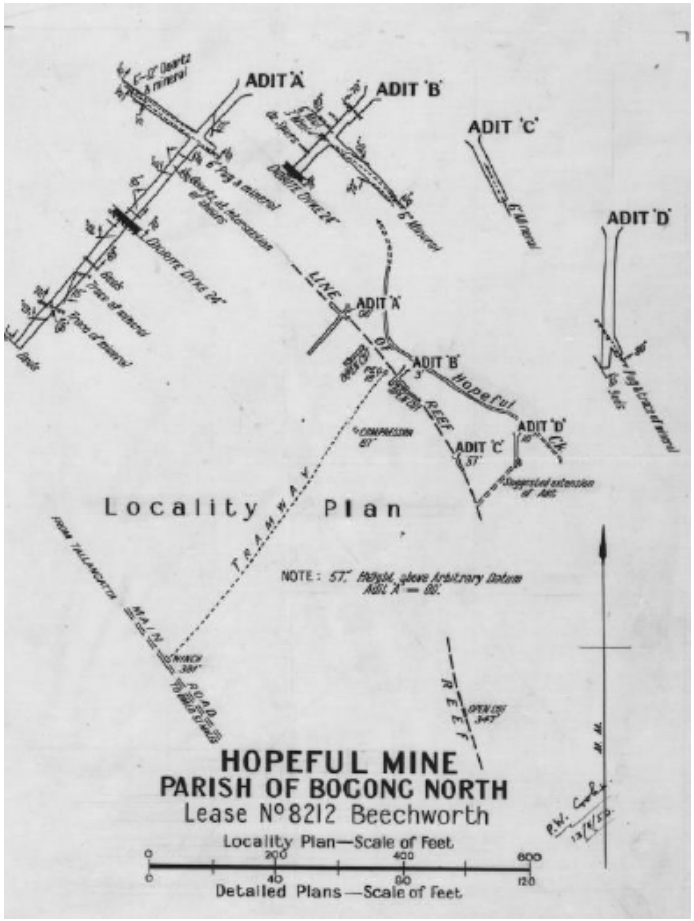
# CRITICAL MINERAL SEARCH - Victoria




## Merrimac Cu-Au Potential

- Contains the historical Merrimac Creek alluvial goldfield with associated strongly Au-mineralized float on nearby ridges
- TMI image suggests the presence of a magnetic body at depth intruding Ordovician metasedimentary rocks (Pinnack Sandstone) that may be connected to the highly magnetic hornblende-biotite bearing Charlestown Tonalite, an early Devonian I-type intrusion directly to the east
- Exploration work has confirmed anomalous Au and Cu in stream sediment BLEG and soil analyses coincident with this subtle magnetic feature
- The highly magnetic Banimboola Quartz Monzodiorite (BQM) occurs directly north and host Cu-Au mineralization at Granite Flat; the BQM is fertile for porphyry Cu-Au

# CRITICAL MINERAL SEARCH - Victoria




## Hopeful Cu-Au Mine

- Historical sample high of 141.52 g/t Au & 8.5% Cu (346/47)
- Mineralized lode material – 87.48 g/t & 3.5% Cu (755/47)
- Northwest-trending lines of reef accessed by a series of adits driven in from Hopeful Creek (Snowy Creek East Branch) level
- Associated with at least two northwest-trending diorite dykes
- Located just west of Merrimac EL boundary.

# PLANNED EXPLORATION ACTIVITIES 2023

| | Apr-23 | May-23 | Jun-23 | Jul-23 | Aug-23 | Sept-23 |
|---|---|---|---|---|---|---|
| **Bethanga Porphyry Cu-Au** | Porphyry fertility assessment results positive | Diamond Drill targets identified and drill program planning | | | | Diamond Drill program |
| **NSW LCT Pegmatites** | NSW tenure processing of regional geochemistry and geophysical datasets | | | Ground truthing of prospective areas | | |
| **Granya LCT Pegmatites** | Ground truthing of granted tenements | | | Review of preliminary data | | |
| **Merrimac LCT Pegmatites/ Porphyry Cu-Au** | Ground truthing of granted tenements | | | Review of preliminary data | | |
| **VIC LCT Pegmatites** | Waiting for granting of tenure | | | Waiting for granting of tenure | | |

# SUMMARY

## VICTORIA AND NSW CRITICAL MINERALS

- Bethanga Porphyry Cu-Au project - positive fertility assessment – drill ready
- NSW LCT Pegmatite project – ~15,000km$^2$ recently granted / regional processing of geochemistry and geophysical datasets underway
- Granya LCT Pegmatite project – preliminary ground exploration completed
- Merrimac LCT Pegmatite/porphyry Cu-Au project – preliminary ground exploration completed
- Victoria LCT Pegmatite projects – 5 prospective areas under application

- *Quality Projects*
- *'The Right Rocks'*
- *Professional and Experienced Management Team*
- *Well Funded $4.87 Million Cash on Hand as at 31/5*

## THANK YOU

**For further information please contact:**

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