

September 2024

Mt Chalmers VHMS – New life for a forgotten gem

Discoveries in the Tasmanides 2024
Glenn Whalan & Peter Caristo



ASX:QML

Important Information

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COMPETENT PERSON (EXPLORATION)

The information in this document that relates to mineral exploration and exploration targets at the Mt Chalmers project is based on work compiled under the supervision of Mr Glenn Whalan, a member of the Australian Institute of Geoscientists (AIG). Mr Whalan is QMines' principal geologist and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity that he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC 2012 Mineral Code). Mr Whalan consents to the inclusion in this document of the exploration information in the form and context in which it appears.

COMPETENT PERSON (MT CHALMERS & DEVELIN CREEK RESOURCES)

The information in this report that relates to mineral resource estimation is based on work completed by Mr. Stephen Hyland, a Competent Person and Fellow of the AusIMM. Mr. Hyland is Principal Consultant Geologist with Hyland Geological and Mining Consultants (HGMC), who is a Fellow of the Australian Institute of Mining and Metallurgy and holds relevant qualifications and experience as a qualified person for public reporting according to the JORC Code in Australia. Mr Hyland is also a Qualified Person under the rules and requirements of the Canadian Reporting Instrument NI 43-101. Mr Hyland consents to the inclusion in this report of the information in the form and context in which it appears.

COMPLIANCE STATEMENT

QMines confirms that it is not aware of any new information or data that materially affects the information included in the "Resource Increases by 104% at Mt Chalmers Project" ASX announcement lodged on 22 November 2022 or the "QMines Delivers Fifth Resource at Develin Creek" ASX announcement lodged on 18 September 2023 (Announcements) and that all material assumptions and technical parameters underpinning the estimates in the Announcement continue to apply and have not materially changed.

MT CHALMERS PROJECT

The historical exploration results in relation to the Mt Chalmers project contained in this document have been reported in accordance with the JORC 2012 Mineral Code and the Competent Person has undertaken sufficient work to disclose the historical exploration results in accordance with the JORC 2012 Mineral Code.

DEVELIN CREEK PROJECT

The historical exploration results in relation to the Develin Creek project contained in this document have been reported in accordance with the JORC 2012 Mineral Code and the Competent Person has undertaken sufficient work to disclose the historical exploration results in accordance with the JORC 2012 Mineral Code.

FUTURE PERFORMANCE

This document contains references to certain targets and plans of QMines which may or may not be achieved. Any forward-looking statements are necessarily based upon a number of estimates and assumptions that, whilst considered reasonable by QMines and the Competent Person, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies, involve known and unknown risks and uncertainties that could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forward-looking statements.

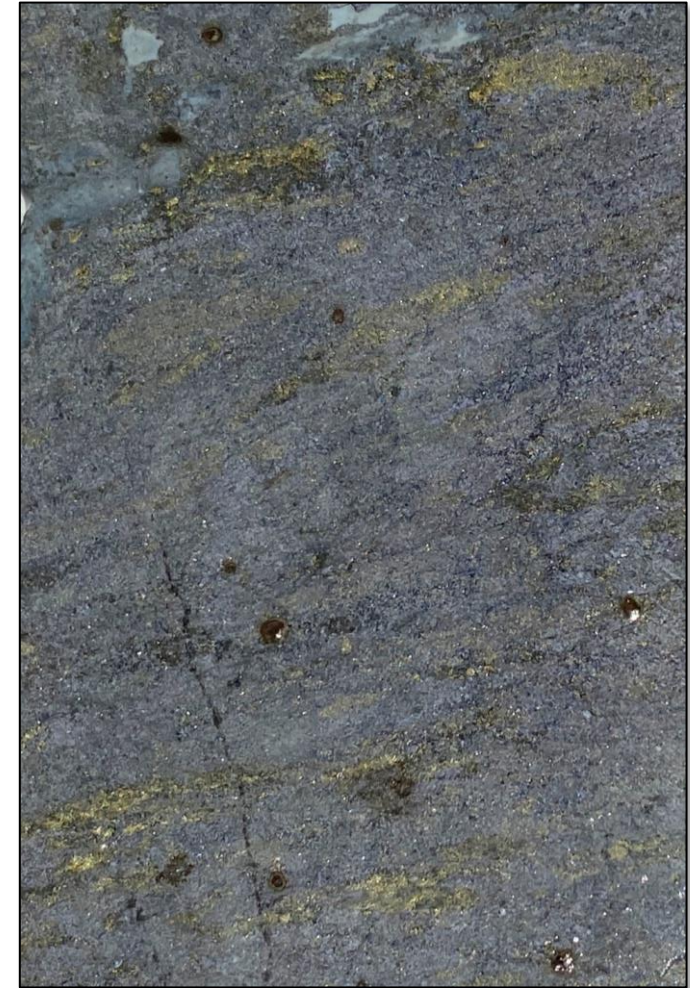
The performance of QMines may be influenced by a number of factors, risks and uncertainties, many of which are outside the control of QMines and its directors, officers, employees, advisers, agents and consultants.

BOARD APPROVAL

This presentation has been approved by the Board for release to the ASX.

Executive Summary

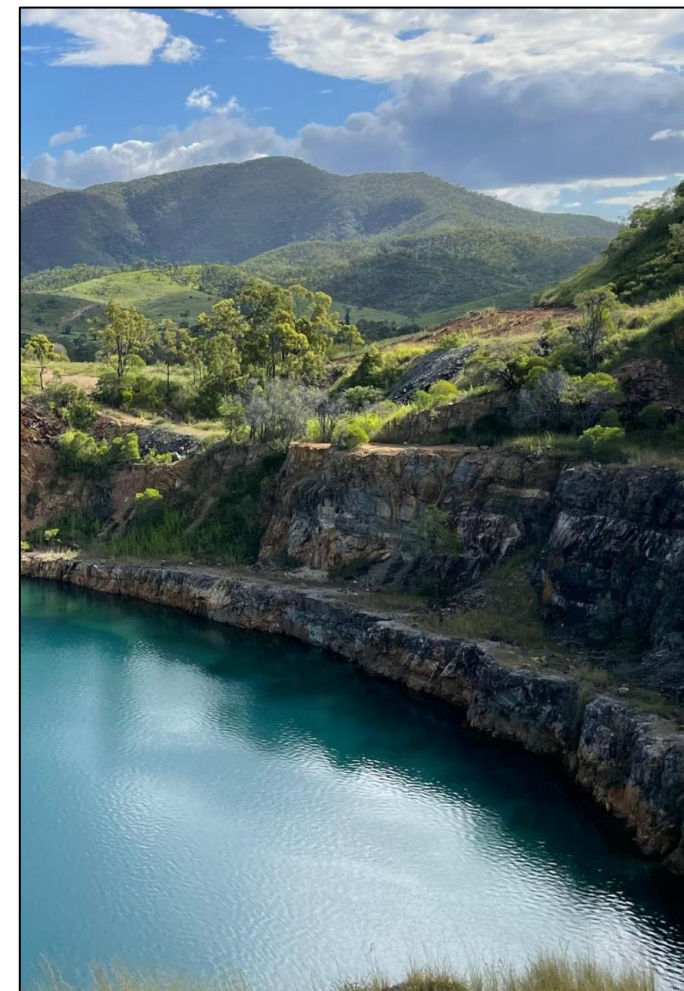
- QMines Limited is an ASX listed (QML) mining development company advancing the Mt Chalmers Cu-Au project to production
- Long history of sporadic production dating back to ~1860
- Current Resource of 11.86 Mt @ 0.76% Cu and 0.42 g/t Au, and Reserve of 9.6 Mt @ 0.63% Cu and 0.48 g/t Au
- Hosted in the Permian aged Berserker sub-province of the Yarrol Province, NEO
- Mt Chalmers is a Kuroko-style VHMS deposit with Cu-Au magmatic input
- Excellent regional exploration potential with ~40 VTEM & IP anomalies, Cu and Zn in soil anomalies.
- Skarn mineralisation identified at Artillery Road (causative intrusion yet to be identified)



About QMINES

Sustainable Australian Copper

- Queensland copper-gold focus
- Mt Chalmers - 100% Owned flagship development project – acquired in Dec 2020/Jan 2021
- Maiden Mt Chalmers Resource Feb 2021¹
- QMines Limited (ASX:QML) – Listed 6 May 2021
- Updated resource in Dec 2021², and in Nov 2022 (including Woods Shaft)³
- Acquired the Develin Creek project⁴ – August 2023
- Maiden Mt Chalmers Reserve⁵ - April 2024
- Certified Carbon Neutral⁶ - (one of only four ASX listed Resource Companies)



¹[Company Prospectus](#) – 16 March 2021

²ASX Announcement - [Mt Chalmers Resource Increases By 38% With 78% Now In Measured & Indicated](#) – 1 dec 2021

³ASX Announcement – [Resource Increases by 104% with 84% now in Measured & Indicated](#) – 22 Nov 2022

⁴ASX Announceent - [Acquisition of high-grade Develin Creek copper-zinc project](#) – 28 August 2023

⁵ASX Announcement - [Mt Chalmers PFS Supports Viable Copper & Gold Mine](#) – 30 April 2024

⁶ASX Announcement – [QMines Achieves Carbon Neutral Certification](#), 15 February 2022

Mt Chalmers Project

- Located 17 km E of Rockhampton & 520 km NNW of Brisbane
- Sealed road access, close to two ports (Gladstone, Alma), rail access to Mt Isa
- PFS completed in 2024¹
 - 10.4 yr mine-life @ 1 Mtpa
 - 65 kt Cu, 160 koz Au, 30.6 kt Zn, 1.8 Moz Ag
 - \$373M NPV_{8%}
- Additional satellite resource at Woods Shaft, Exploration Targets at Botos & Mt Warminster
- Large Cu-Zn in soil anomalies and ~40 VTEM and IP anomalies



¹<https://wcsecure.weblink.com.au/pdf/QML/02801647.pdf>

Mt Chalmers Resource & Reserve

Reserve ¹	Tonnes (Mt)	Cut Off (% Cu)	Cu (%)	Au (g/t)	Zn (%)	Ag (g/t)	S (%)
Mt Chalmers	9.6	0.3%	0.63	0.48	0.29	5.5	4.3

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Resource ²	Tonnes (Mt)	Cut Off (% Cu)	Cu (%)	Au (g/t)	Zn (%)	Ag (g/t)	S (%)
Mt Chalmers	11.30	0.3%	0.76	0.42	0.22	4.52	4.3
Woods Shaft	0.54	0.3%	0.50	0.95	-	-	
Total	11.86	0.3%	0.76	0.42	0.22	4.52	4.3

² ASX Announcement – [Mt Chalmers PFS Supports Viable Copper & Gold Mine](#), 30 April 2024. Rounding errors may occur.

Early History

- Gold first discovered in 1860 by Mr Hill with Mr Chalmers sinking the East Shaft in ~1861 and established a five-heads battery at New Zealand Gully.
- Copper mining started in 1896(?). Mt Chalmers Copper (1896-1899) and Great Fitzroy Mines (1907-1914) notable operators. Herbert Hoover was a Director of Great Fitzroy Mines¹
- Re-opened 1941-1943 by Mt Morgan Ltd



1860's (image credit: Mt Chalmers Historical Society)



1911 (image credit: UQ/QLD Govt queenslandplaces.com.au)



1976 (image credit: Richard Stringer)

¹Liggett, W.W (1932). *The Rise of Herbert Hoover*.

Recent History

- Modern open-pit mining by Geopeko between 1979-1982
- Ore transported to Mount Morgan where mining had ended



1981 - Geopeko (image credit: Julius Marinelli)

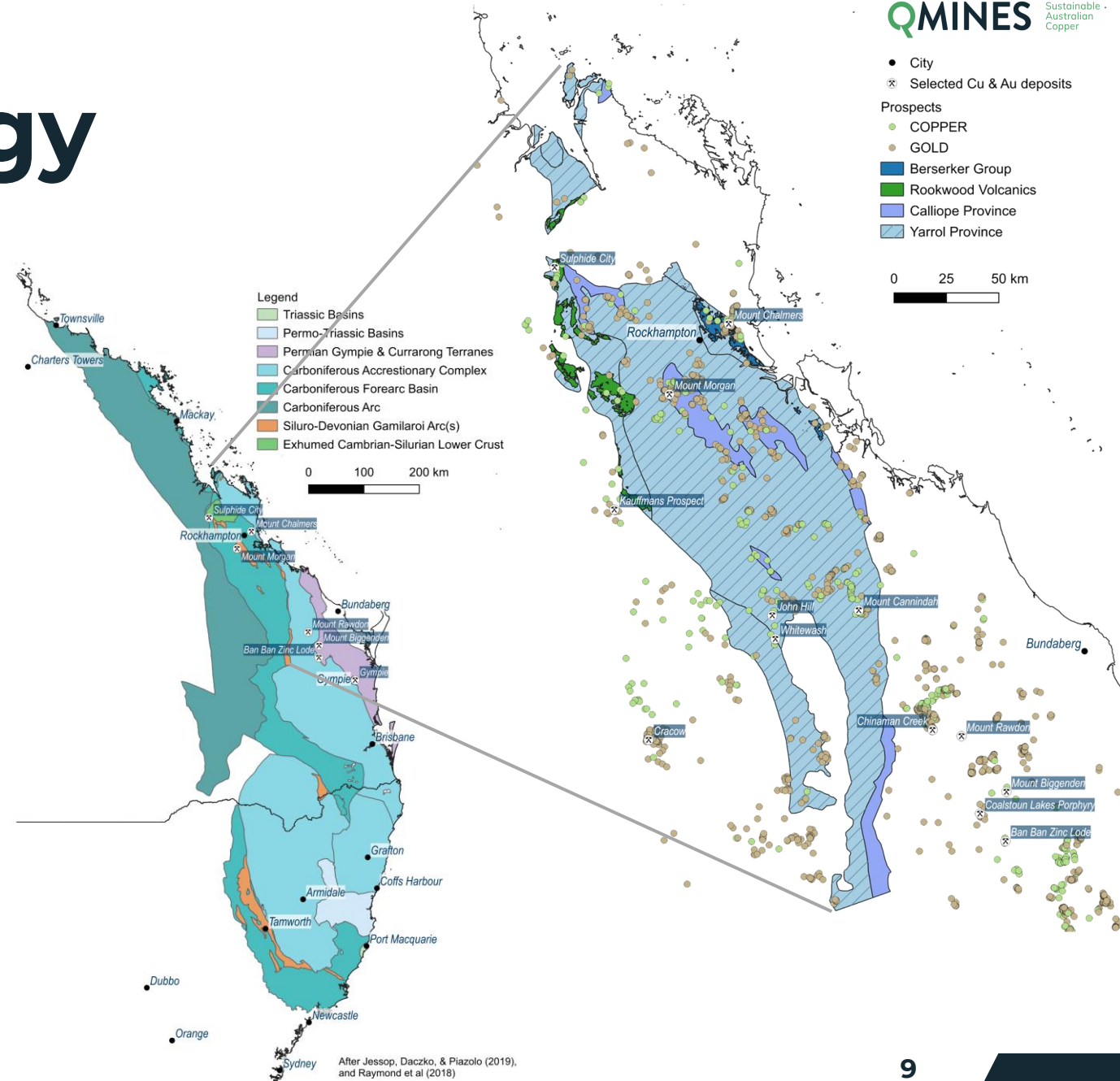


2023- Abandoned mine (image credit: Peter Caristo)

**Total Historic Production estimated:
1.2 Mt @ 3.6 g/t Au, 2.0% Cu and 19 g/t Ag**

Regional Geology

- Yarrol Province
 - Late Devonian to Early Permian fore-arc (or back-arc) basin succession
 - Volcaniclastic and siliciclastic sediments, limestone, calc-alkaline volcanic rocks
 - Early Permian extensional basins developed at the same time as the Bowen Basin to the west
- Berserker Sub Province (Mt Chalmers VHMS)
 - Fault-bounded rift basin, 110 km long, 5-15 km wide
 - Sediments deposited in back-arc environment close to active arc to the east
 - 600-800 m thick pile
 - Volcanics dated 268.2-277 Ma
- Grantleigh Sub Province (Develin Creek VHMS) on western margin hosts the mafic volcanic (Rookwood Volcanics) equivalent of the Berserker Group volcanics

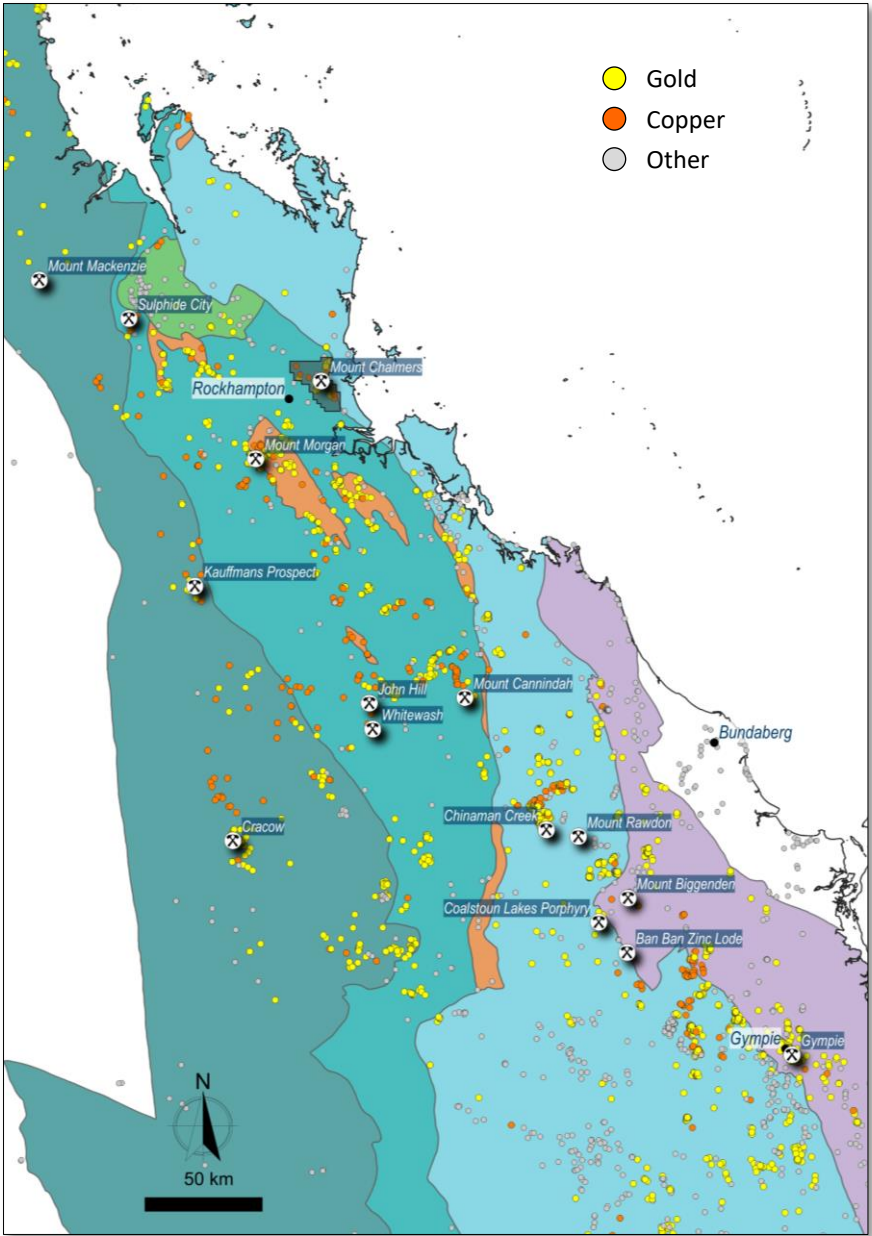


Regional Mineralisation

Triassic
Permian
Devonian

Hunter-Bowen
Tabberabberan

Name	Age (Ma) ¹	Type	Province	Resource/Production
Mt Cannindah		Bx/Porphyry	Yarrol	14.5 Mt @ 0.72 % Cu, 0.42 g/t Au
Coalstoun Lakes	231.5	Porphyry	Wandilla	26.9 Mt @ 0.38% Cu
Mt Rawdon	233	IRGS	Wandilla	Historic Prod: >2 Moz Au Current Res: 28.8 Mt @ 0.52 g/t Au
Gympie	245	Orogenic	Gympie	> 4 Moz Au
Mt Chalmers	277.1	VHMS	Yarrol	Prodcuton: 1.2 Mt @ 2.0% Cu & 3.6 g/t Au Current Res.: 11.3 Mt @ 0.63% Cu & 0.48 g/t Au
Cracow	291	LS Epithermal	Connors-Auburn	Historic Prod: > 2.5 Moz Au Current Res: 4.9 Mt @ 3.3 g/t Au
Mt Morgan	390	VHMS	Calliope	8.5 Moz Au, 400,000 t Cu

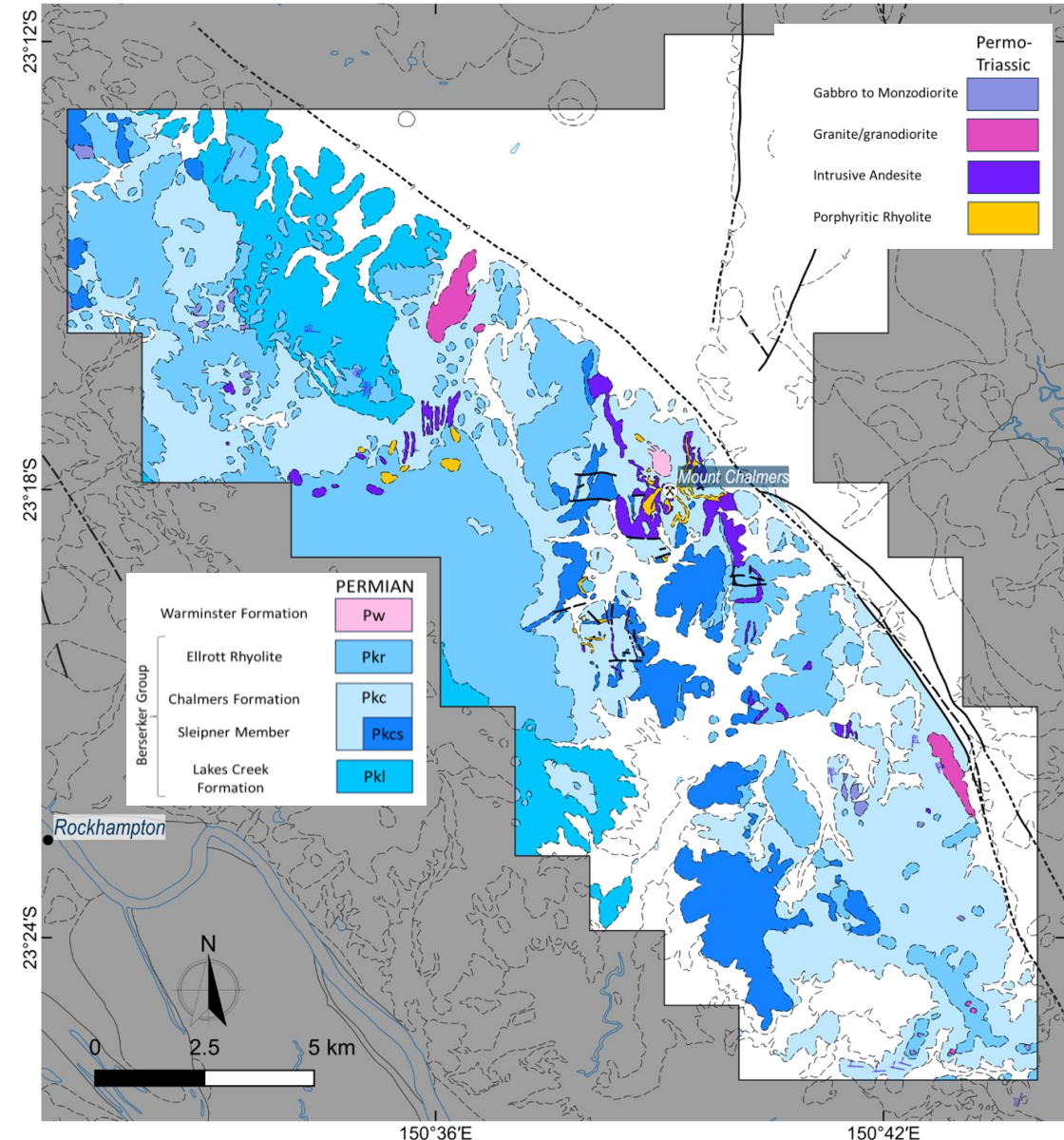


¹Huston, D. L., Doublier, M. P., Downes, P. M., 2021. Geological setting, age and endowment of major Australian mineral deposits - a compilation. Record 2021/20. Geoscience Australia, Canberra

Local Geology

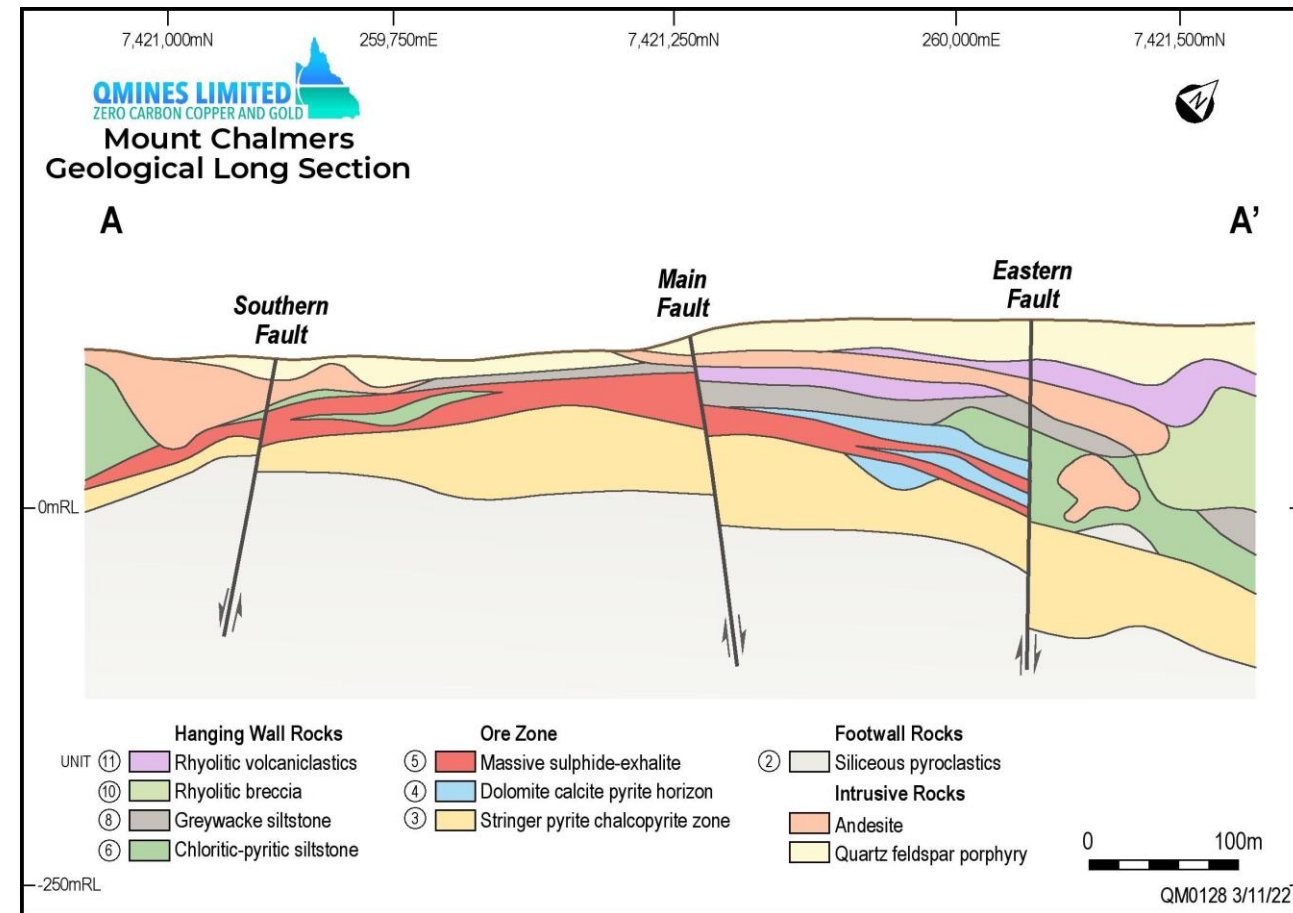
Oldest
↓
Youngest

- **Berserker Group**
 - **Lakes Creek Fm**: massive to medium bedded siltstone to quartzofeldspathic sandstone, derived from intermediate to felsic volcanics. Lateral equivalent of Mt Chalmers Fm
 - **Mt Chalmers Fm**: similar to Lakes Ck Fm with volcanoclastic rocks and pebble breccia. Volcanoclastics - medium to very thick bedded, crystal lithic & pumice clasts. Some calcareous sandstone.
 - **Sleipner Member**: upper half of Mt Chalmers Fm, lithic tuff with andesitic fragments up to 2 cm across, in a chlorite–epidote rich matrix.
 - **Ellrott Rhyolite**: rhyolite, dacite and possibly andesite volcanic domes, some of which may be extrusive. Domes are widespread.
- **Warminster Fm**: fine- to coarse-grained sandstone and massive, poorly sorted, matrix-supported, granule to pebble, polymictic breccia. Late Permian, disconformably overlies Berserker Gr



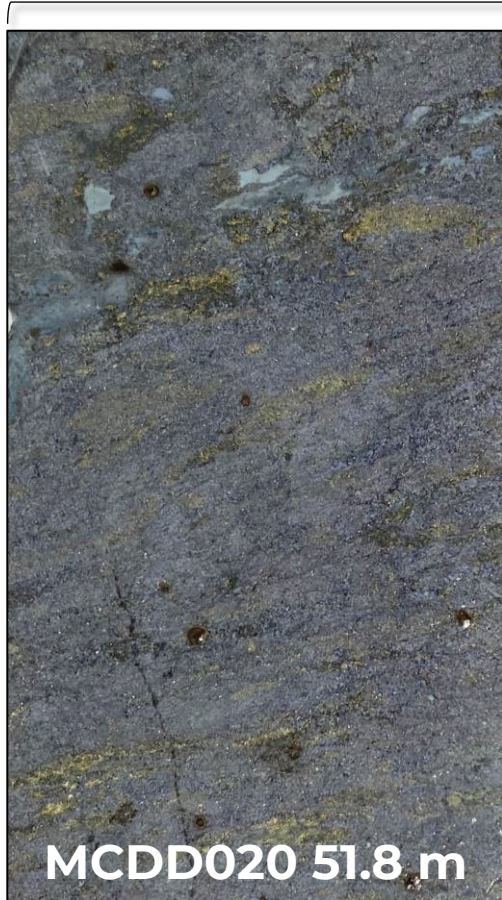
Mt Chalmers

- Relatively undeformed sub-greenschist facies Permian VHMS – geologically rare
- Economic mineralisation extends over 800 m by 350 m, and typically 30 m thick, elongated in a NE direction
- Zone of massive and semi-massive sulphides (Cu-Au-Zn-Ag-Pb) overlay a qtz-sulphide (pyr-Cu-Au) stringer zone.
- Sulphide mineralogy: pyrite-chalcopyrite-sphalerite-galena
- Silicious pyroclastic footwall with rhyolitic tuffs and breccias, volcanoclastic sediments, quartz-feldspar porphyry and intrusive andesite in the hanging wall.
- Depth of ocean was thought to be shallow (50-300 m based on fossils in hangingwall), with some evidence for boiling – however some workers propose a deeper water (>1,000 m) setting



Mt Chalmers - Mineralisation

Massive/exhalite zone

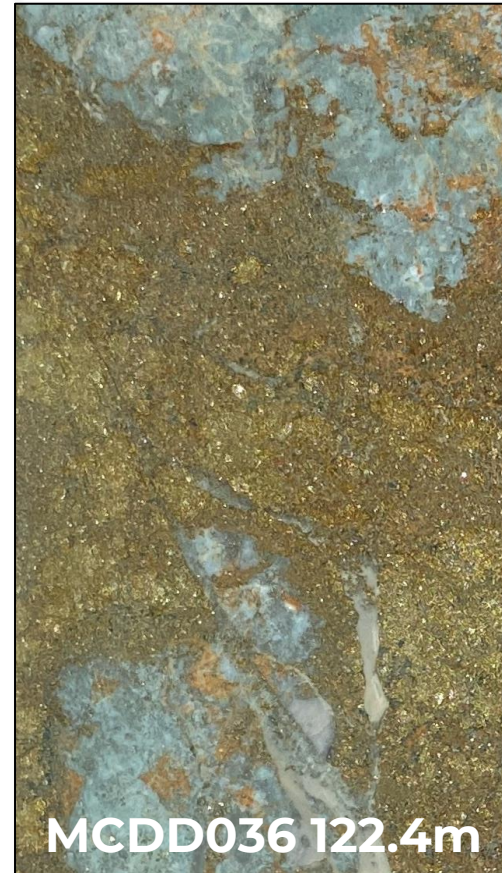


1.5m @ 2.04% Cu, 22.1% Zn, 12.65% Pb, 0.75g/t Au & 162 g/t Ag



1 m @ 8.4% Cu, 5.6% Zn, 3.1% Pb, 7.4 g/t Au & 199 g/t Ag

Stringer zone



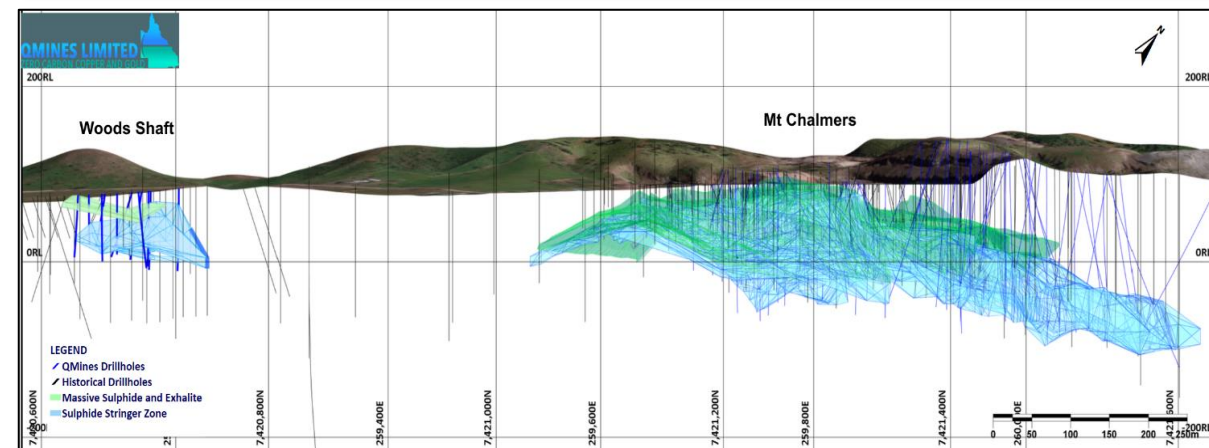
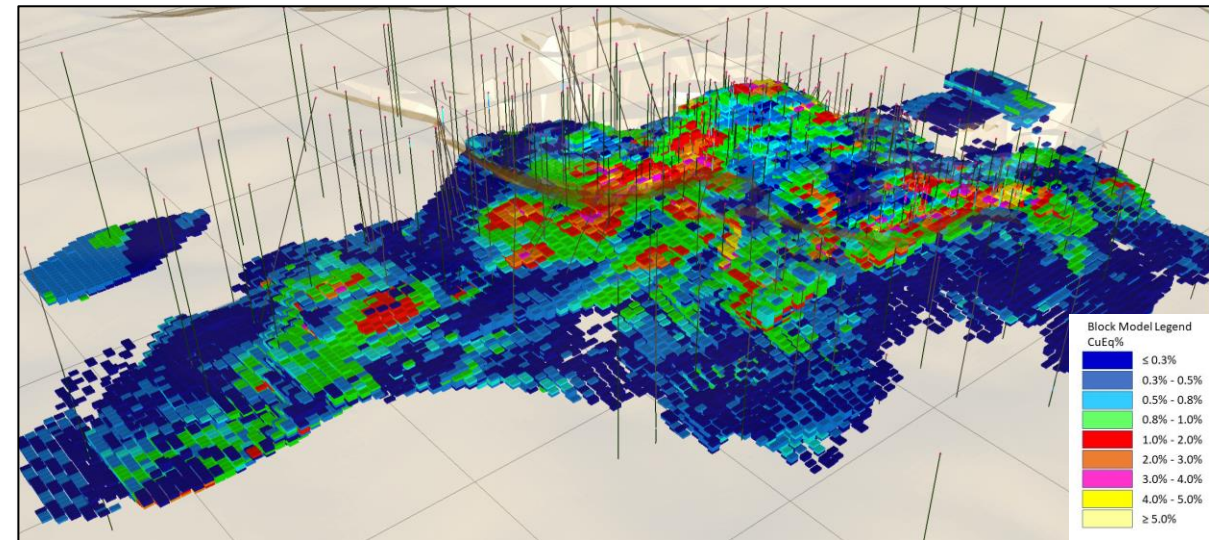
1.25m @ 2.74% Cu, 0.33g/t Au & 4.8g/t Ag



1 m @ 6.7% Cu

Mt Chalmers - Mineralisation

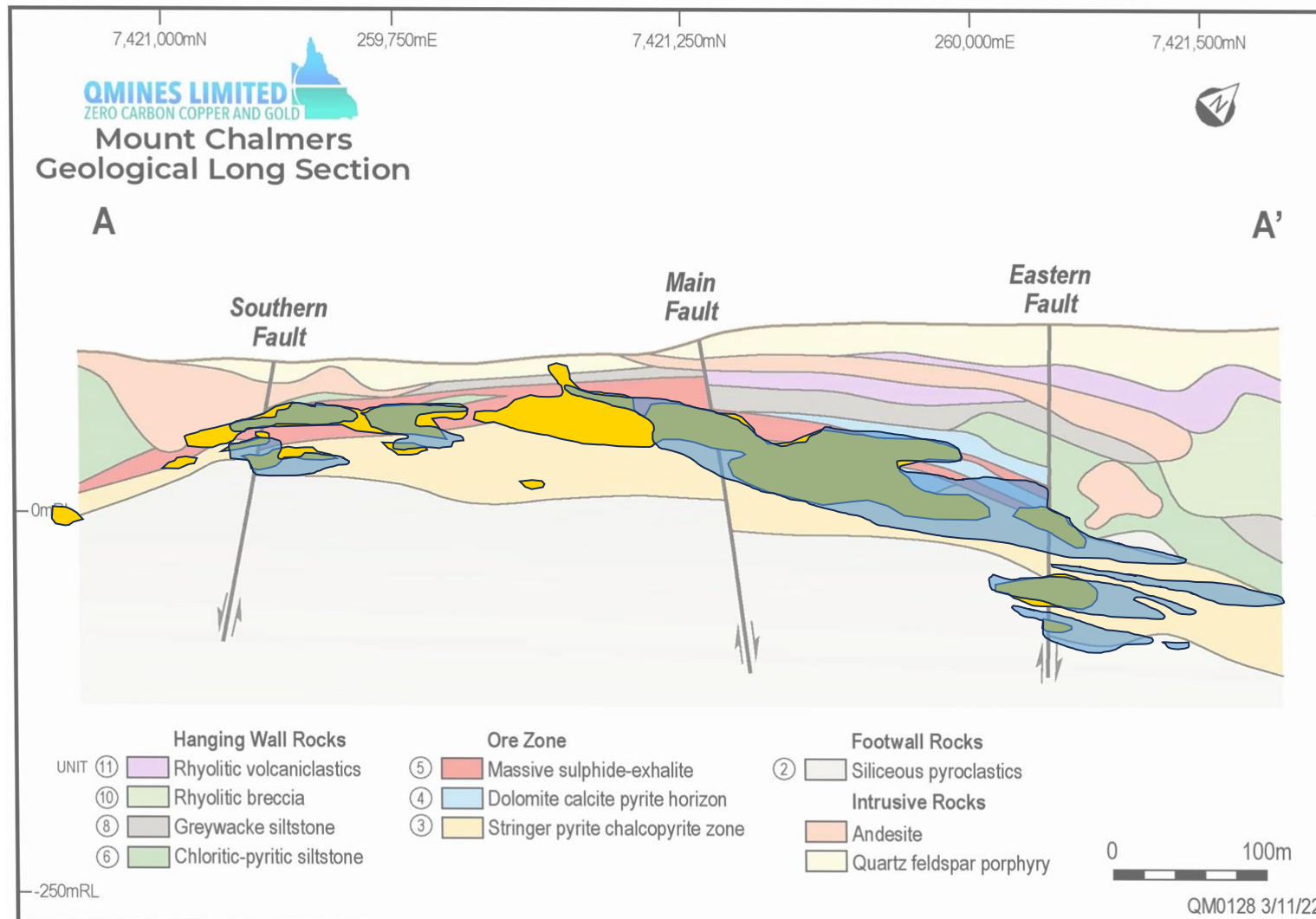
- Accepted to be Kuroko style VHMS
- 277.1 ± 3.5 Ma (zircon U-Pb SHRIMP - age of succession)¹
- Metal distribution not as expected for a typical VHMS – more complex than typical “stylised” metal distribution → potentially two metal pulses (Cu-Au and Zn-Pb-Ag)
- Cu-Au rich – thought to have evolved mostly from a K-rich fluids from a magmatic source rather than sea-water recirculation and leaching of footwall volcanics²
- Potential for Intrusion related systems



¹Huston, D. L., Doublier, M. P., Downes, P. M., 2021. Geological setting, age and endowment of major Australian mineral deposits - a compilation. Record 2021/20. Geoscience Australia, Canberra

²Zaw et al (2003). Microthermometry and chemical composition of fluid inclusions from the Mt Chalmers volcanic-hosted massive sulfide deposits, central Queensland, Australia: implications for ore genesis. University of Tasmania. Journal contribution. <https://hdl.handle.net/102.100.100/594327>

Mt Chalmers – Au-Cu Distribution

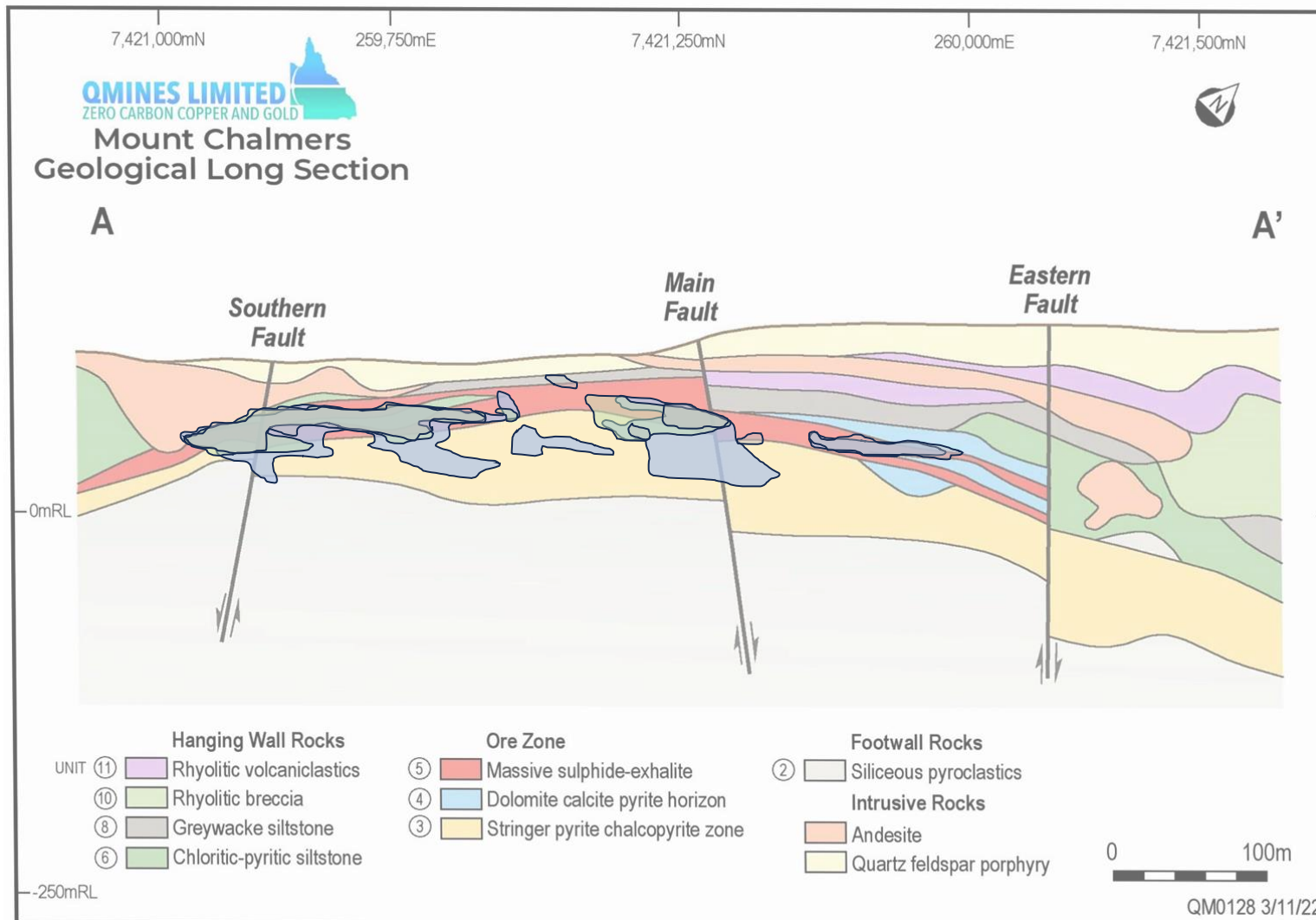


 Au > 0.3 g/t

 Cu > 0.3%

- At economic cut-off grades, very strong spatial correlation between Cu and Au
- Best Cu grades on the north side of the Main Fault
- Thickest & highest grade Cu north of each structure
- Au distribution less well defined by the structures

Mt Chalmers – Zn-Pb-Ag Distribution



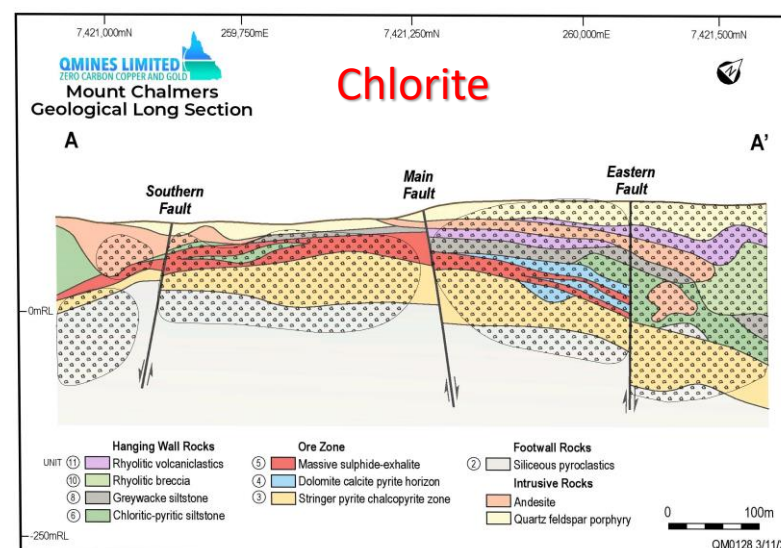
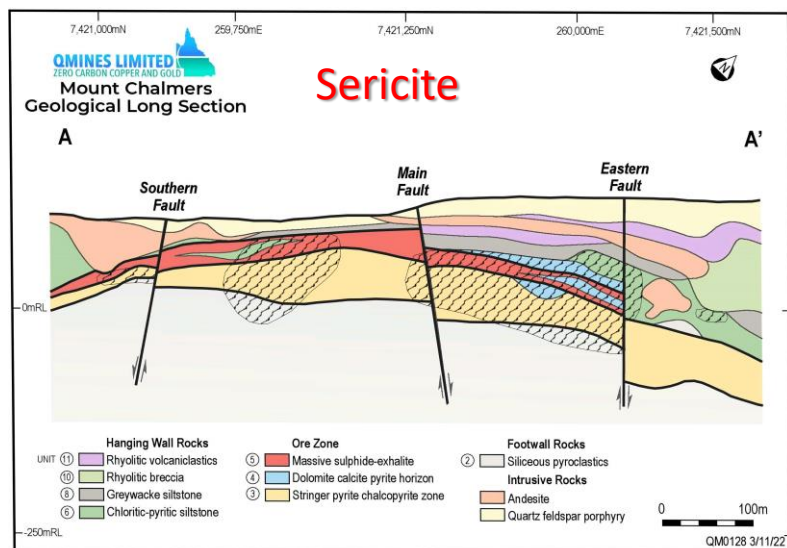
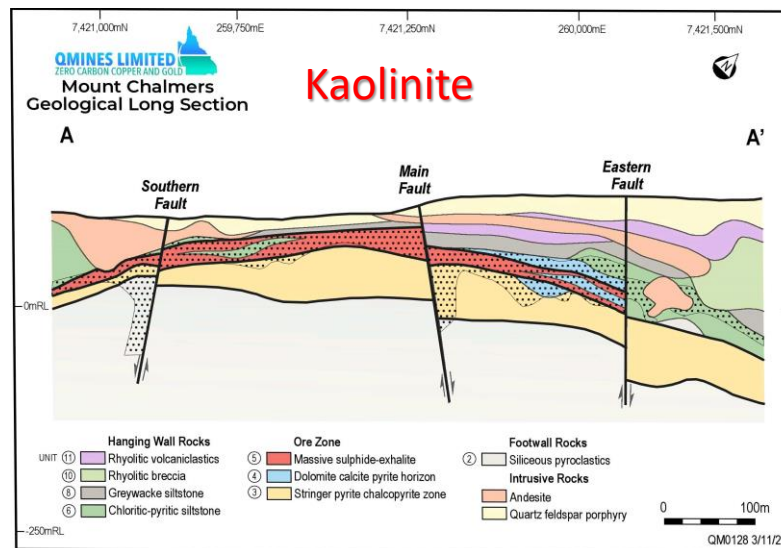
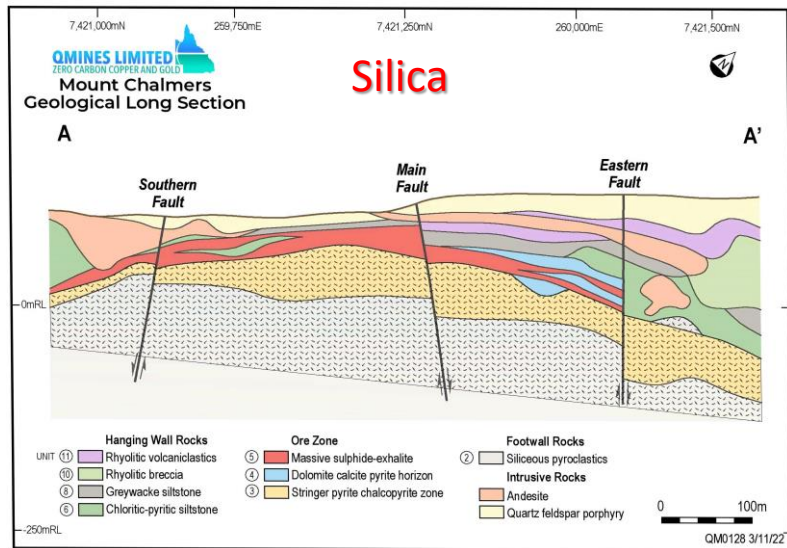
Ag > 10 g/t

Zn > 0.3%

Pb > 0.3%

- At economic cut-off grades, very strong spatial correlation between Ag-Zn-Pb
- Mostly confined between Southern and Main Fault
- Correlation with Au between Southern and Main
- Poor correlation with Cu

Mt Chalmers - Alteration

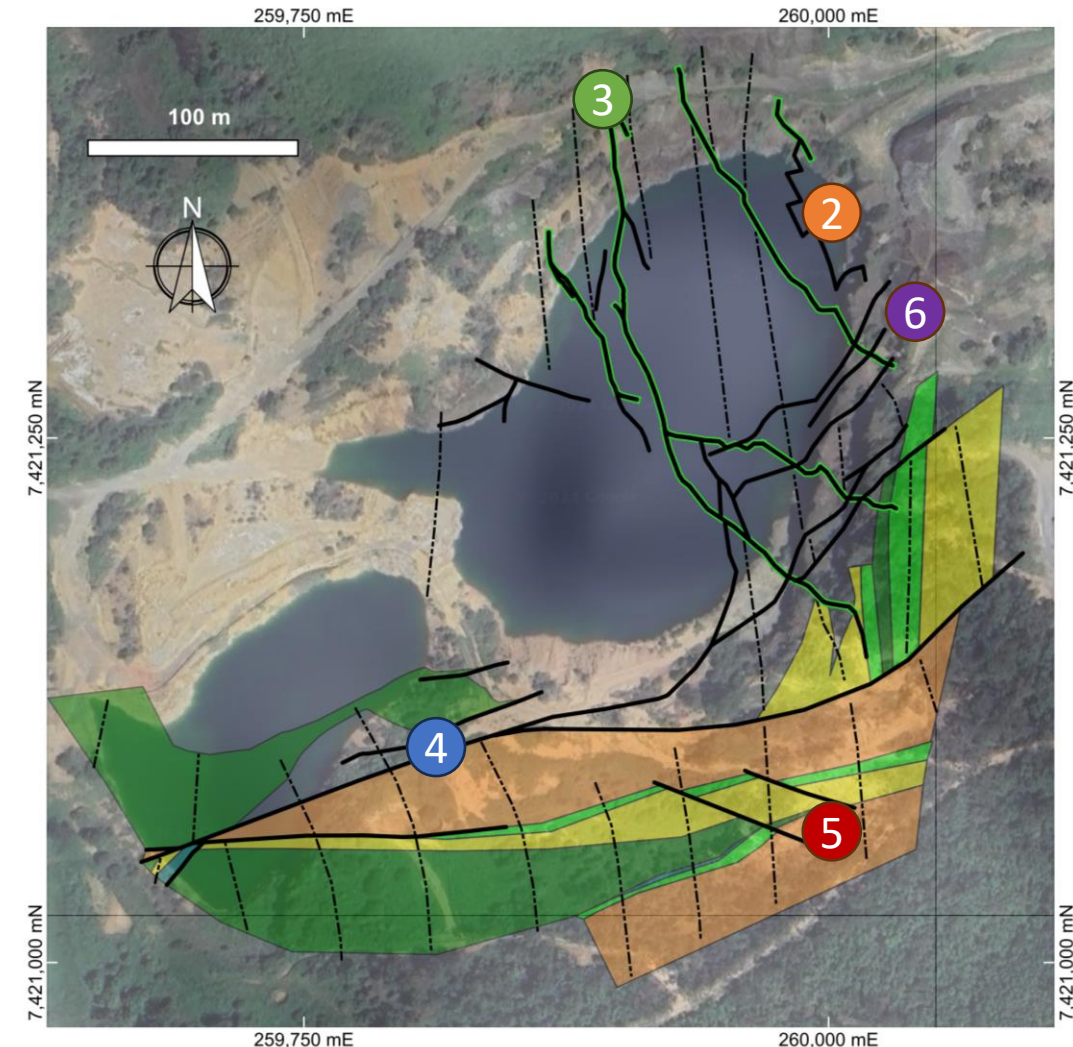
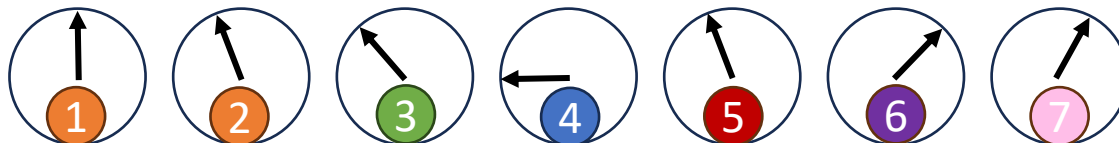


- Silica alteration(pre-min) confined to footwall of massive sulphide/exhalite
- Kaolinite (syn-min) strongly associated with massive sulphides/exhalite horizon and structure
- Sericite (syn-min) more strongly associated with Cu-Au zone between Main and Eastern Fault
- Chlorite more widespread – sudoite (dioctahedral chlorite) assoc. with ser-dol, trioctahedral chlorite throughout

Mt Chalmers - Structure

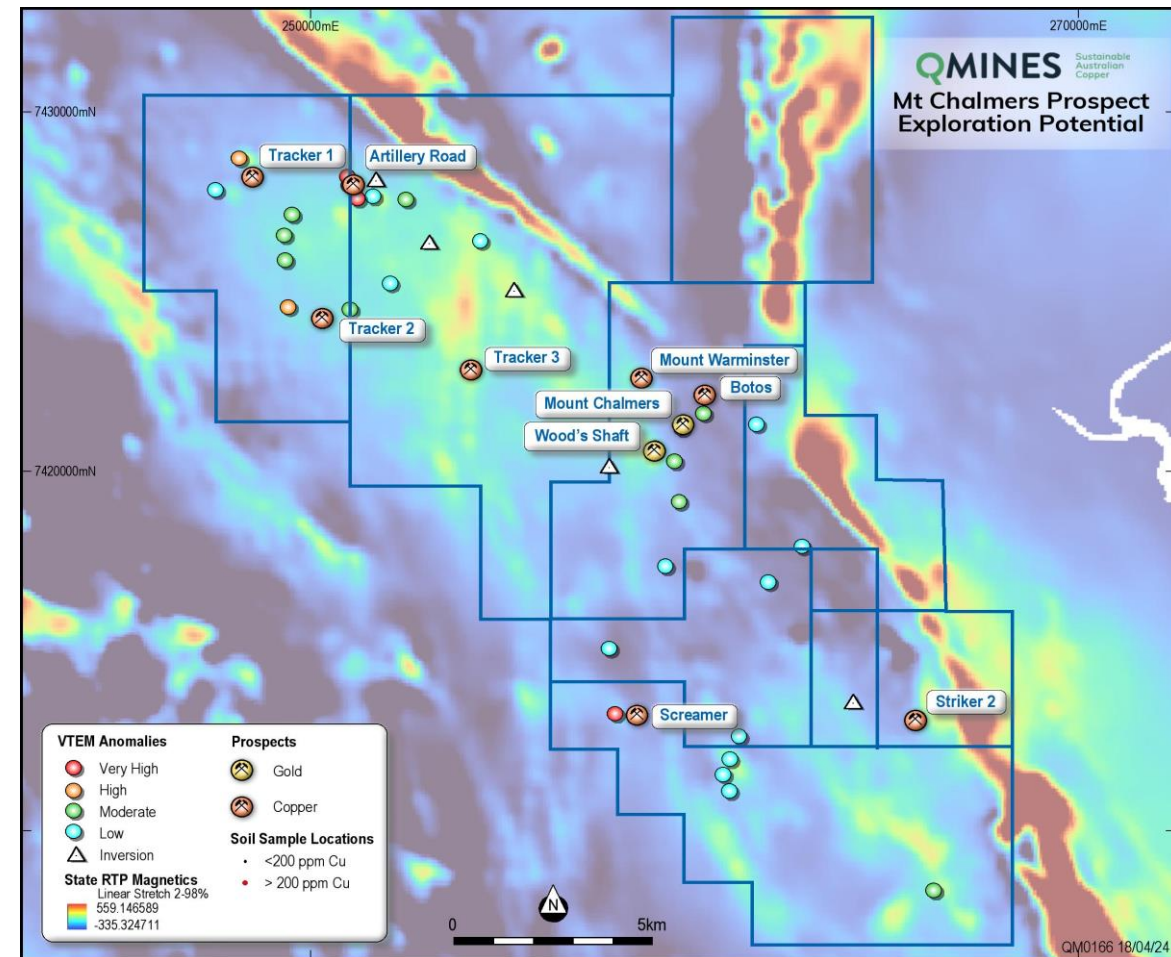
- Broad dome with mineralisation centred on the antiformal hinge, drag-folding adjacent to faults
- Seven (7) distinct fault populations noted (earliest to latest)

- 1 • Two early generations of sinistral ductile shears, N-S then 160° - 340° . Minor to 10s metres displacement
- 2 • Dip-slip dyke occupied faults 140° - 320° , small displacement, some movement post dyke
- 3 • E-W to NE-SW sinistral bounding fault to porphyritic rhyolite, up to 10's metres displacement
- 4 • WNW-ESE, dextral movement (several metres), possibly part of the above. Separates Main pit from West pit.
- 5 • NE-SW oblique sinistral (SE down), generally only metres movement (continuous with 4)
- 6 • ENE-WSW brittle fracture array, minimal movement, Fe-carb veining
- 7 • ENE-WSW brittle fracture array, minimal movement, Fe-carb veining



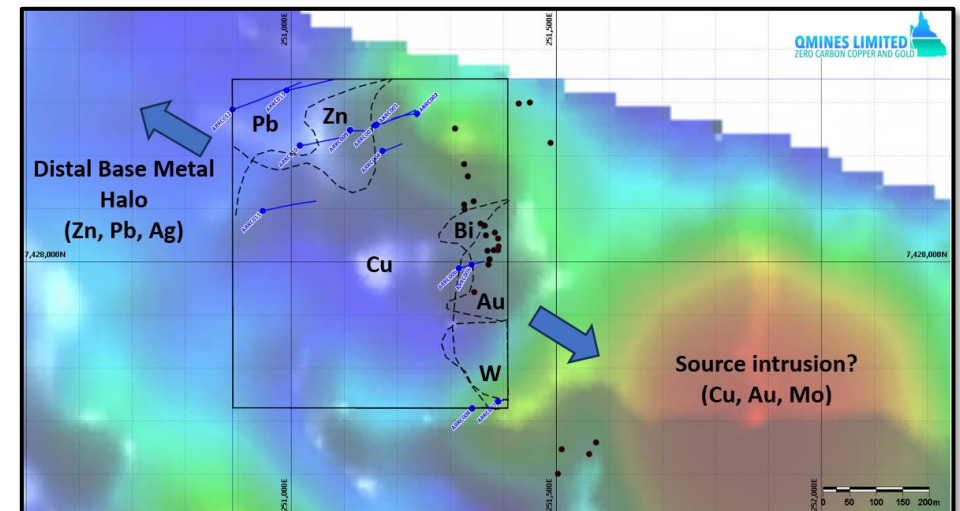
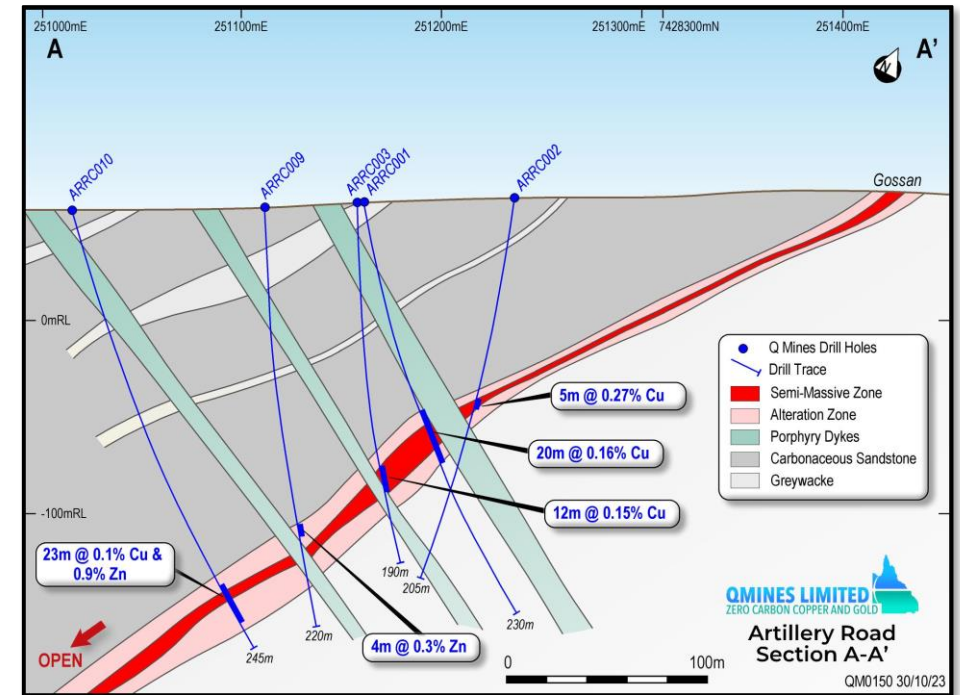
Regional Exploration

- Compilation of historic soil data – generated large Cu-Zn anomalies over Tracker 1, Tracker 2, Tracker 3, and Striker
- Detailed heliborne VTEM survey completed early 2023
- 34 anomalies identified (after screening) – including 4 very high-priority (3 at Artillery Rd)
- QLD CEI grant funded inversion of VTEM data to model IP effects → additional 6 targets generated



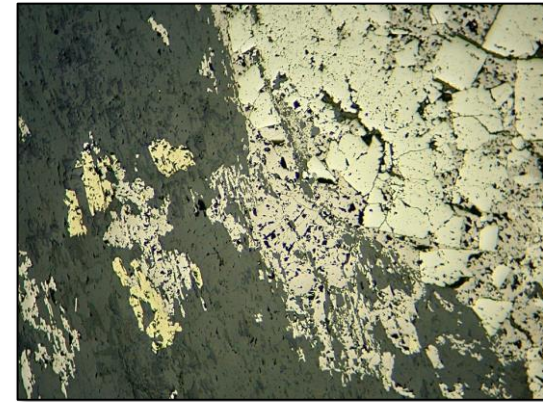
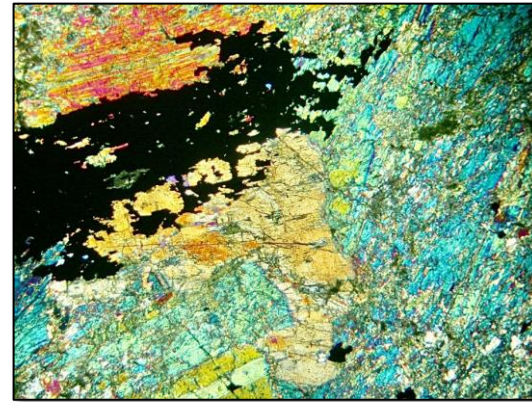
Artillery Road

- Three VTEM targets
- Drilling intersected a consistent 20-30 m thick skarn horizon interpreted to extend from gossan outcrops to at least 400 m down plunge to the west and a north-south strike of at least 700 m
- Semi-massive mineralised horizon within a skarn alteration zone with varying quantities of pyrite-pyrrhotite-chalcopyrite-sphalerite
- Skarn horizon is along the contact between a footwall greywacke and hangingwall carbonaceous sandstone (calcareous bed?)
- Cross-cutting dacite dykes thought to be pre-mineralisation
- Carbonaceous sandstone likely to strongly reduce the mineralising fluids – forming pyrrhotite rather than magnetite
- Better Results include:
 - 15 m @ 0.1% Cu and 1.8% Zn (1.0% CuEq) from 219 m (ARRC013)
 - 23 m @ 0.1% Cu and 0.9% Zn (0.6% CuEq) from 205 m (ARRC010)

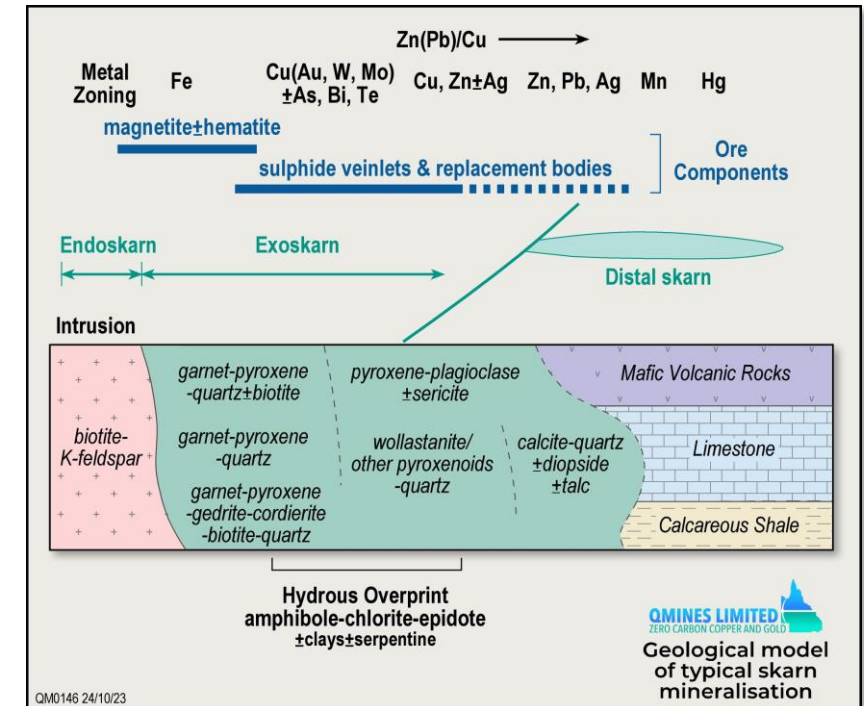


Artillery Road

- Skarn minerals intersected include actinolite-epidote-clinopyroxene (diopside);
- Sulphide minerals include Chalcopyrite-sphalerite-pyrrhotite-pyrite as disseminations/replacement and locally as veins;
- No garnets observed to date;
- Reducing nature of host rocks is masking the oxidation level of the causative intrusion/s, leading to pyrrhotite forming over magnetite – geochemistry to date suggests the source to be relatively reduced;
- Typical zoned system associated with reduced (less oxidized) I-type granites (from inner to outer):
 - Gold systems: Au-Bi-Te → W → As-Au → As-Sb-Au → Ag-Pb-Zn
 - Tin systems: Sn-W → As → Cu → Pb-Zn-Ag → Sb
- Lack of garnets, and geochemical assemblage to date suggests Artillery Road drilling has intersected a distal part of a large skarn system
- Permo-Triassic intrusion related?



Left: Coarse grained clinopyroxene with patchy replacement by pyrrhotite (black). Transmitted light, crossed polarisers, field of view 2 mm across.
Right: Sulphide replacement aggregate in clinopyroxene (dark). Sulphides include pyrrhotite (pale creamy brown), pyrite (pale creamy subhedra) and chalcopyrite (yellow at left). Plane polarised reflected light, field of view 2 mm

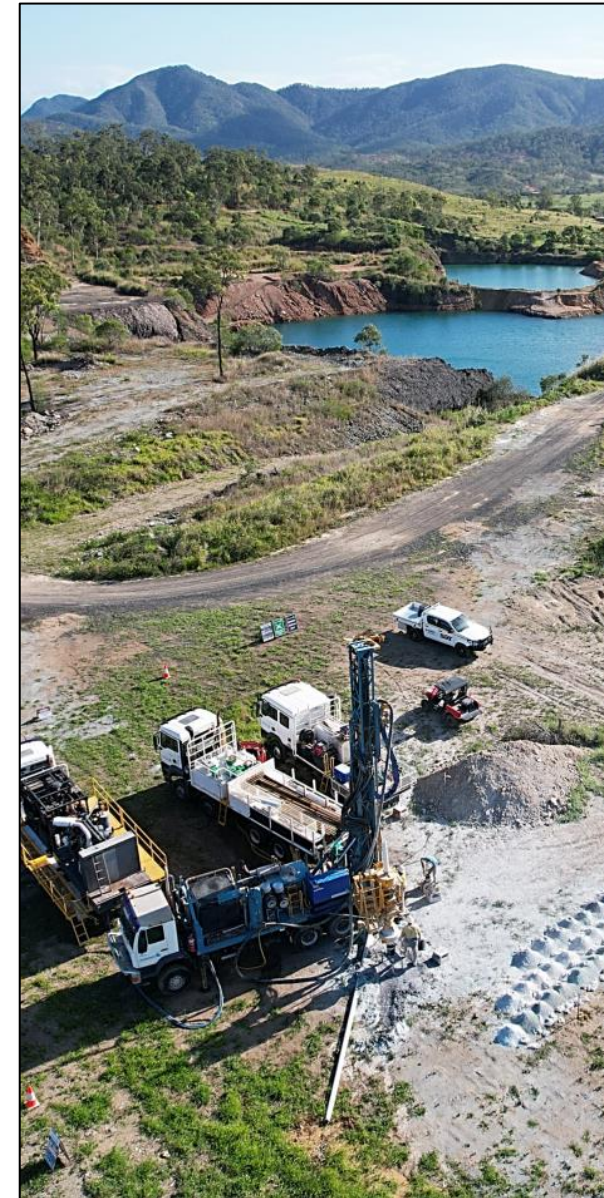


QM0146 24/10/23

After McQueen (2005)

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September 2024

Share in Our Exciting Future...



Appendix 1

Resource & Reserve Statements

Reserve ¹	Tonnes (Mt)	Cut Off (% Cu)	Cu (%)	Au (g/t)	Zn (%)	Ag (g/t)	S (%)
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Develin Creek	3.2	0.5%	1.05	0.17	1.22	5.87

³ ASX Announcement – [QMiners Delivers Fifth Resource At Develin Creek](#), 18 September 2023.