COPPER HILL PROJECT, NSW

INTEGRATION OF TRADITIONAL GEOLOGY AND NEW TECHNOLOGIES TO BUILD A DEPOSIT MODEL

Stuart Hayward , Glenn Coianiz , Greg Corbett, Bret Ferris

GOLDEN CROSS RESOURCES

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Mines and Wines 2015, Queanbeyan

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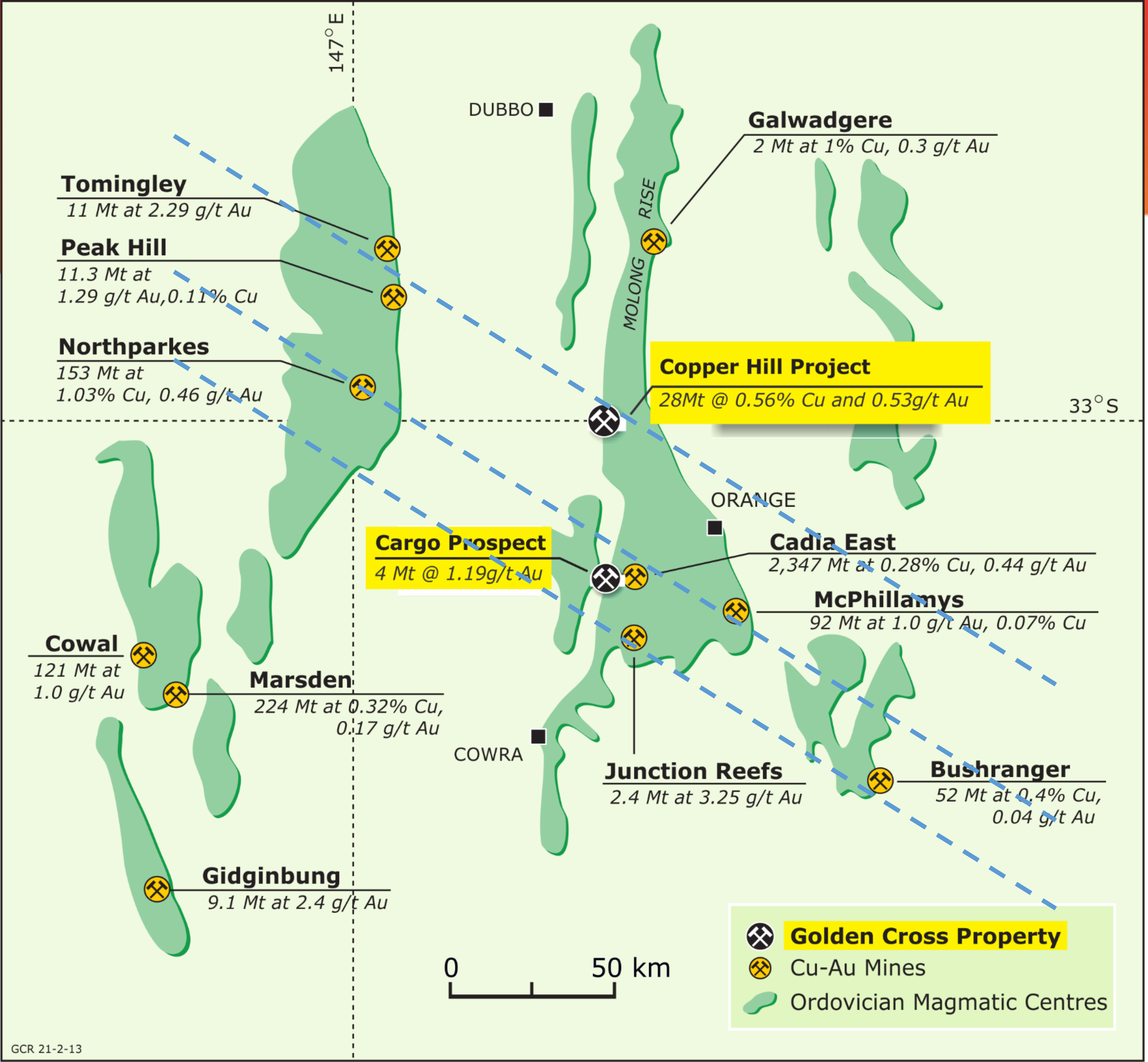
- The information in this presentation that relates to Exploration Results is based on information compiled by Mr. Kenneth Hellsten, who is a Fellow of the Australian Institute of Mining and Metallurgy (AusIMM). Mr Hellsten is an employee of Golden Cross Resources Limited, and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr. Hellsten consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.
- The update of the Mineral Resources for the Copper Hill Copper-Gold Project was co-ordinated by Mr Ken Hellsten, Interim CEO who is a Fellow of AusIMM and fulltime employee of Golden Cross Resources Ltd. The information in this report that relates to Exploration Results is based on information compiled by Mr Bret Ferris who is a member of the Australian Institute of Geoscientists. Mr Ferris is a fulltime employee of Ferris Metals Pty Ltd and consultant Exploration Manager to Golden Cross. The information that relates to database review was compiled by Mr Glenn Coianiz, who is a member and RPG of the Australian Institute of Geoscientists. Mr Coianiz is a fulltime employee of Exploris Pty Ltd and a consultant to Golden Cross. The statement of Mineral Resources was compiled by Mr James Ridley who is a member of AusIMM and an employee of Ridley Mineral Resource Consulting Pty Ltd and a consultant to Golden Cross. Each of Messrs Hellsten, Ferris, Coianiz and Ridley have sufficient experience relevant to the style of mineralisation and the type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined by the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Minerals Resources and Ore Reserves (JORC 2012).Each of Mr Hellsten, Mr Ferris, Mr Coianiz and Mr Ridley consent to the inclusion in this report on matters based on information compiled by them in the form and context in which it appears.

Copper Hill- A Long Lived Project

- Cu production 1845-1931
- Exploration 1966+
- GCR 1998+
- JORC 2012

Presentation Outline

- General Geological overview
- Traditional Geology Approach
  - Mineralisation model
- Structural Framework
  - Smartphone Technologies
  - Structural data collection & analysis
- 3D deposit model
  - Leapfrog implicit modelling
- Mineral resource estimate



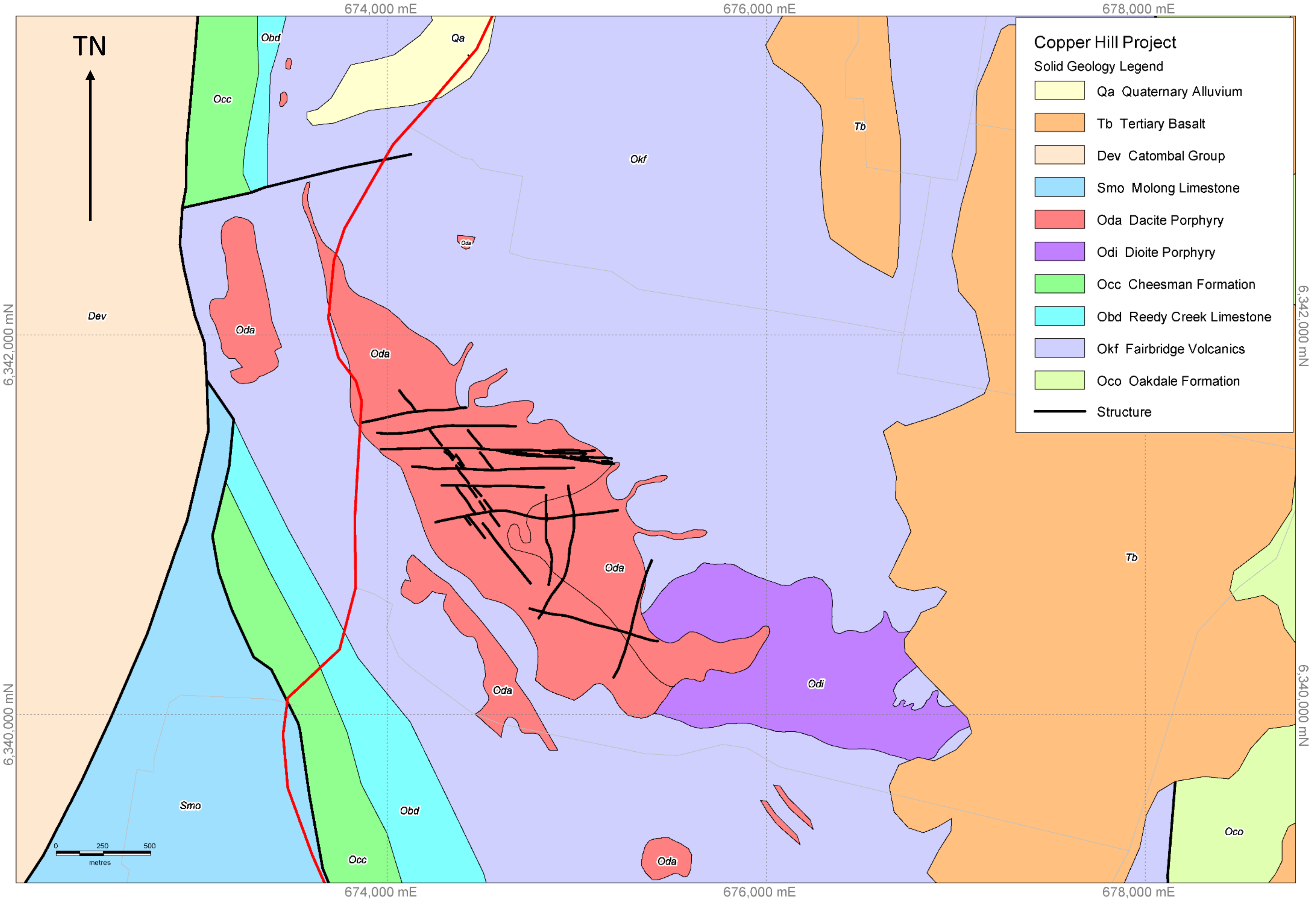
GOLDEN CROSS RESOURCES

- Corbett 2013-2014
  - Review Copper Hill system & potential
  - Target Generation

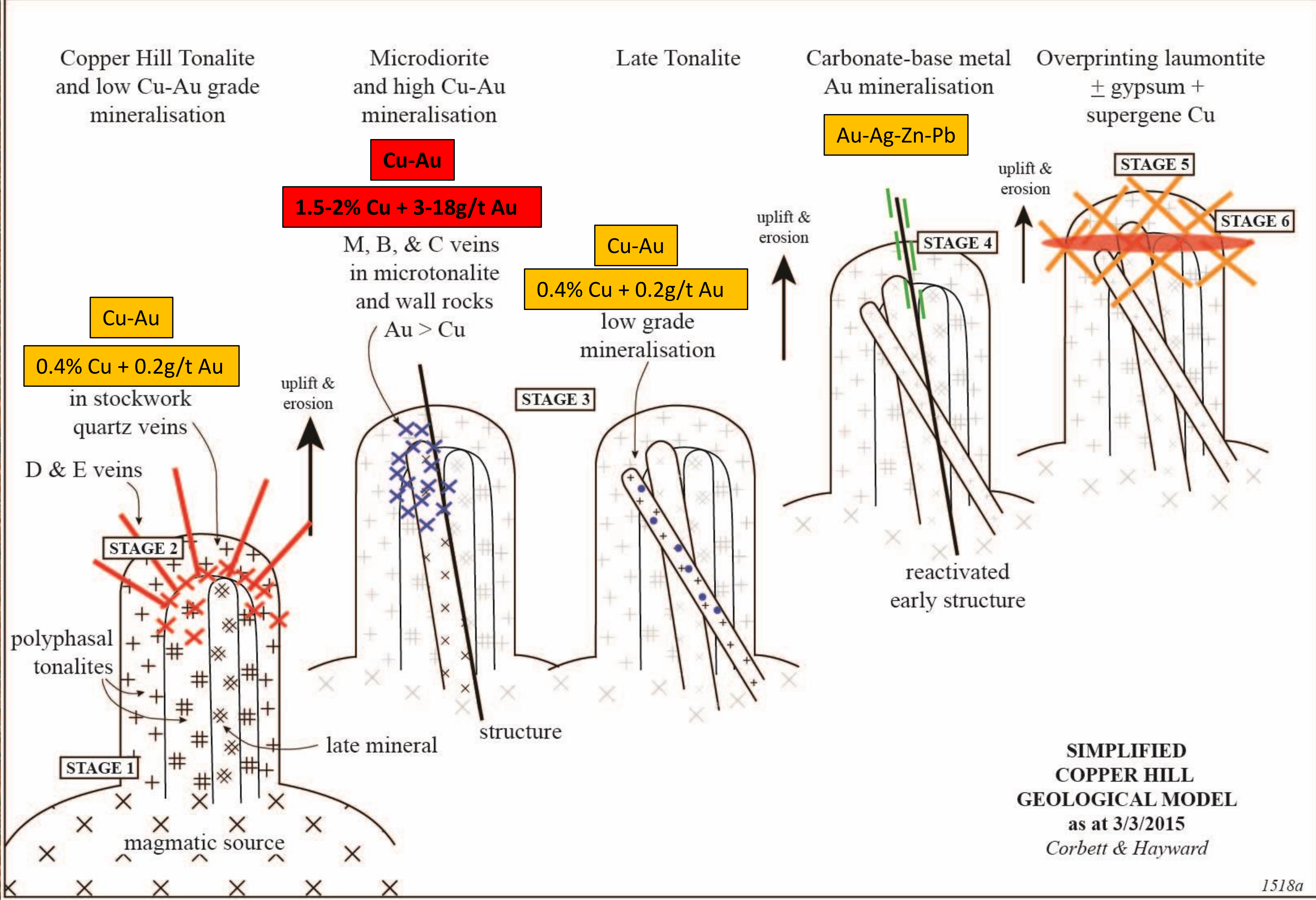
- 2014
  - 6 hole drilling program
  - High quality modern data collection
  - **Update geological understanding**
  - **Build an deposit model**
  - **Mineral resource estimate**

- Approach
  - Traditional geology techniques
  - Good science
    - Porphyry–epithermal environments
  - Modern 3D computer model development

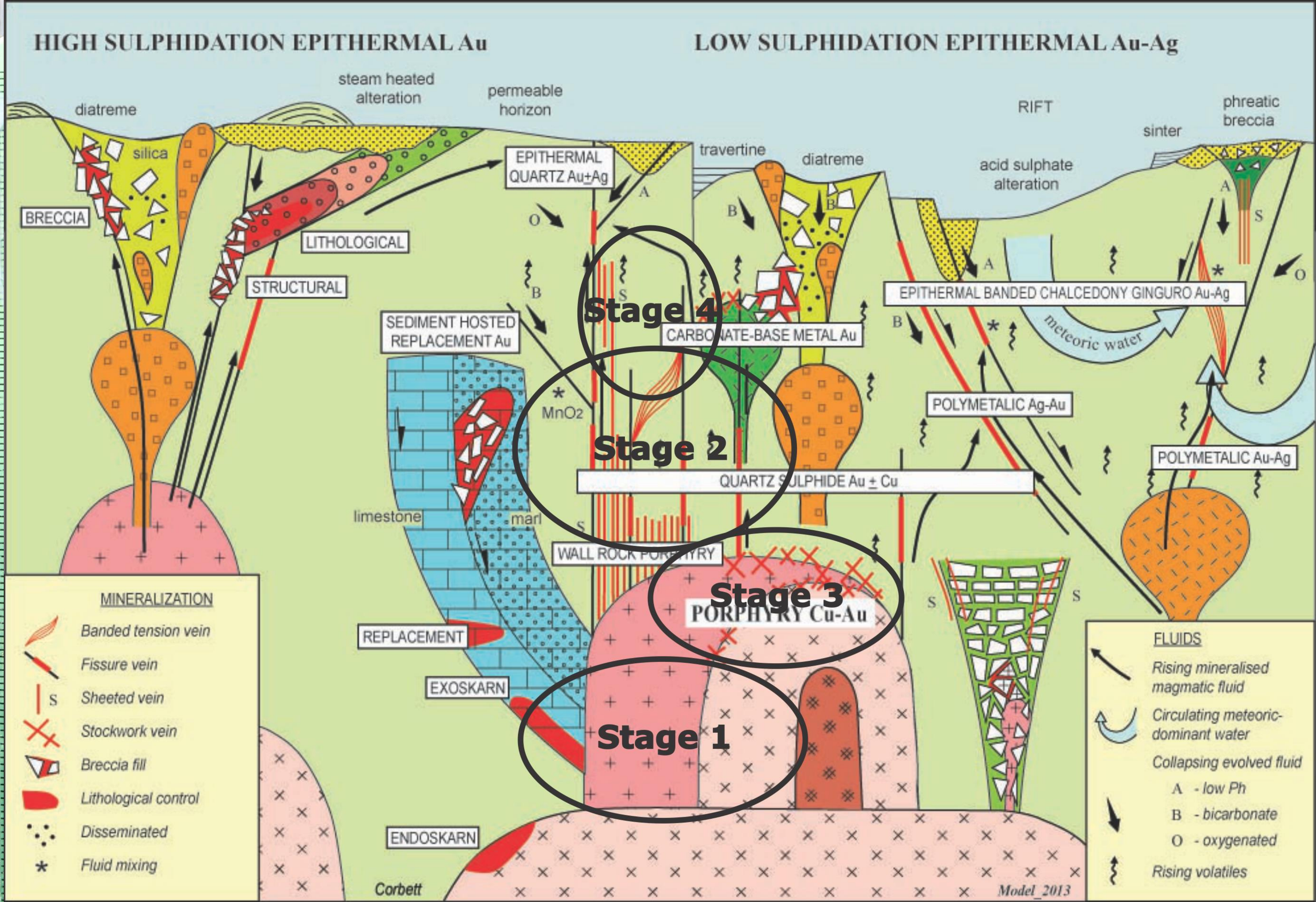

GCHD470 212.6m Fine grained Crowded Tonalite Porphyry weak mineralised


TN
674,000 mE
676,000 mE
678,000 mE
6,342,000 mN
6,340,000 mN
Copper Hill Project
Solid Geology Legend
Qa Quaternary Alluvium
Tb Tertiary Basalt
Dev Catombal Group
Smo Molong Limestone
Oda Dacite Porphyry
Odi Dioite Porphyry
Occ Cheesman Formation
Obd Reedy Creek Limestone
Okf Fairbridge Volcanics
Oco Oakdale Formation
Structure
Dev
Occ
Obd
Qa
Okf
Tb
Oda
Odi
Smo
Oco
0 250 500
metres

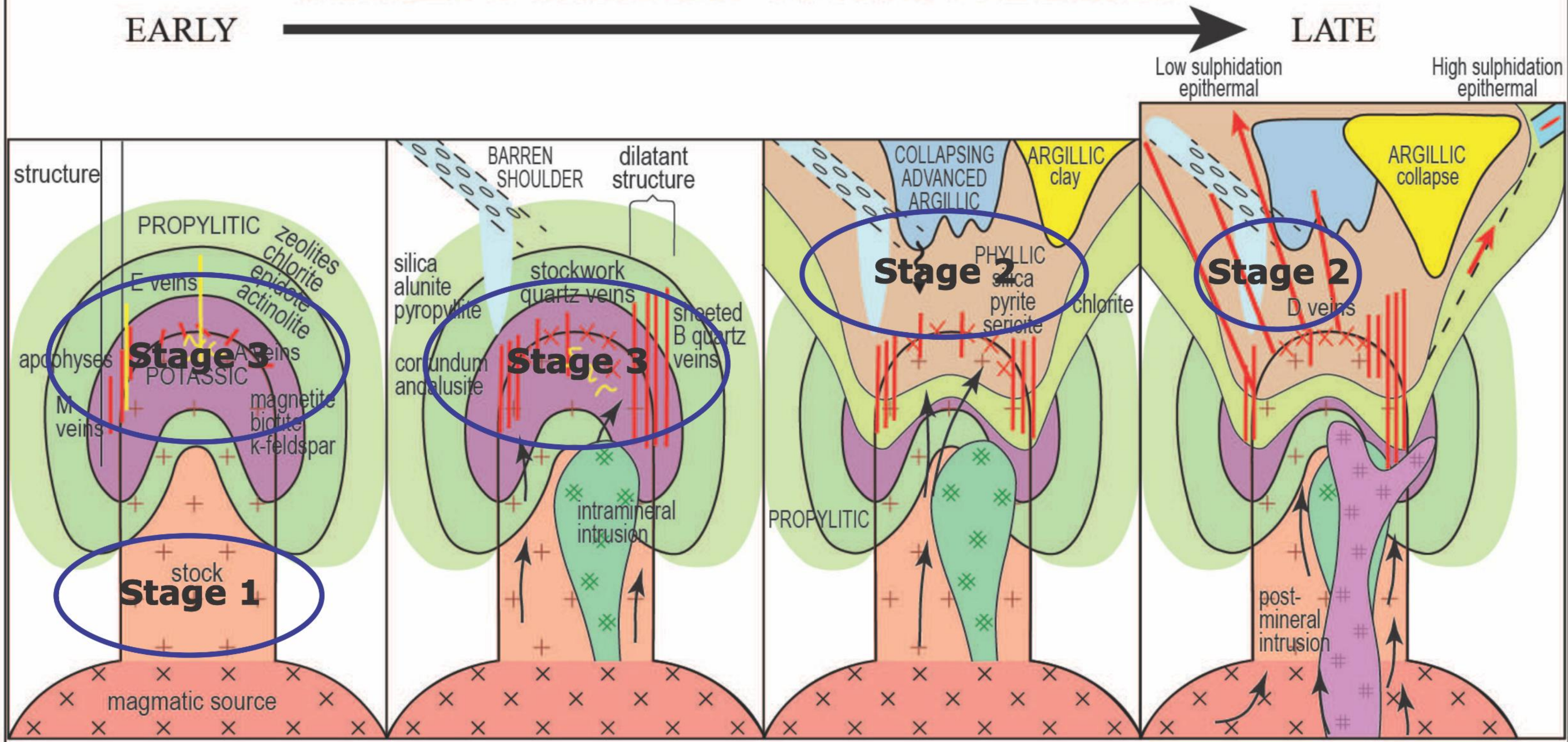

GCHR314 Barren Qz-Tonalite Porphyry


Copper Hill Tonalite and low Cu-Au grade mineralisation
Microdiorite and high Cu-Au mineralisation
Late Tonalite
Carbonate-base metal Au mineralisation
Overprinting laumontite ± gypsum + supergene Cu
Cu-Au
1.5-2% Cu + 3-18g/t Au
M, B, & C veins in microtonalite and wall rocks Au > Cu
Cu-Au
0.4% Cu + 0.2g/t Au
low grade mineralisation
Au-Ag-Zn-Pb
Cu-Au
0.4% Cu + 0.2g/t Au
in stockwork quartz veins
D & E veins
uplift & erosion
uplift & erosion
uplift & erosion
STAGE 1
STAGE 2
STAGE 3
STAGE 4
STAGE 5
STAGE 6
polyphasal tonalites
late mineral
structure
magmatic source
reactivated early structure
SIMPLIFIED COPPER HILL GEOLOGICAL MODEL as at 3/3/2015
Corbett & Hayward
1518a

GCHR050 227.6m Qz-veined Crowded Tonalite x-cut by Sparse To Po



STAGED PORPHYRY Cu-Au EVOLUTION



Intrusion emplacement and heat transfer with prograde alteration. E veins.

Initiation of A & M quartz vein formation and early mineralization.

B quartz vein formation.

Exsolution of magmatic volatiles and formation of barren shoulder.

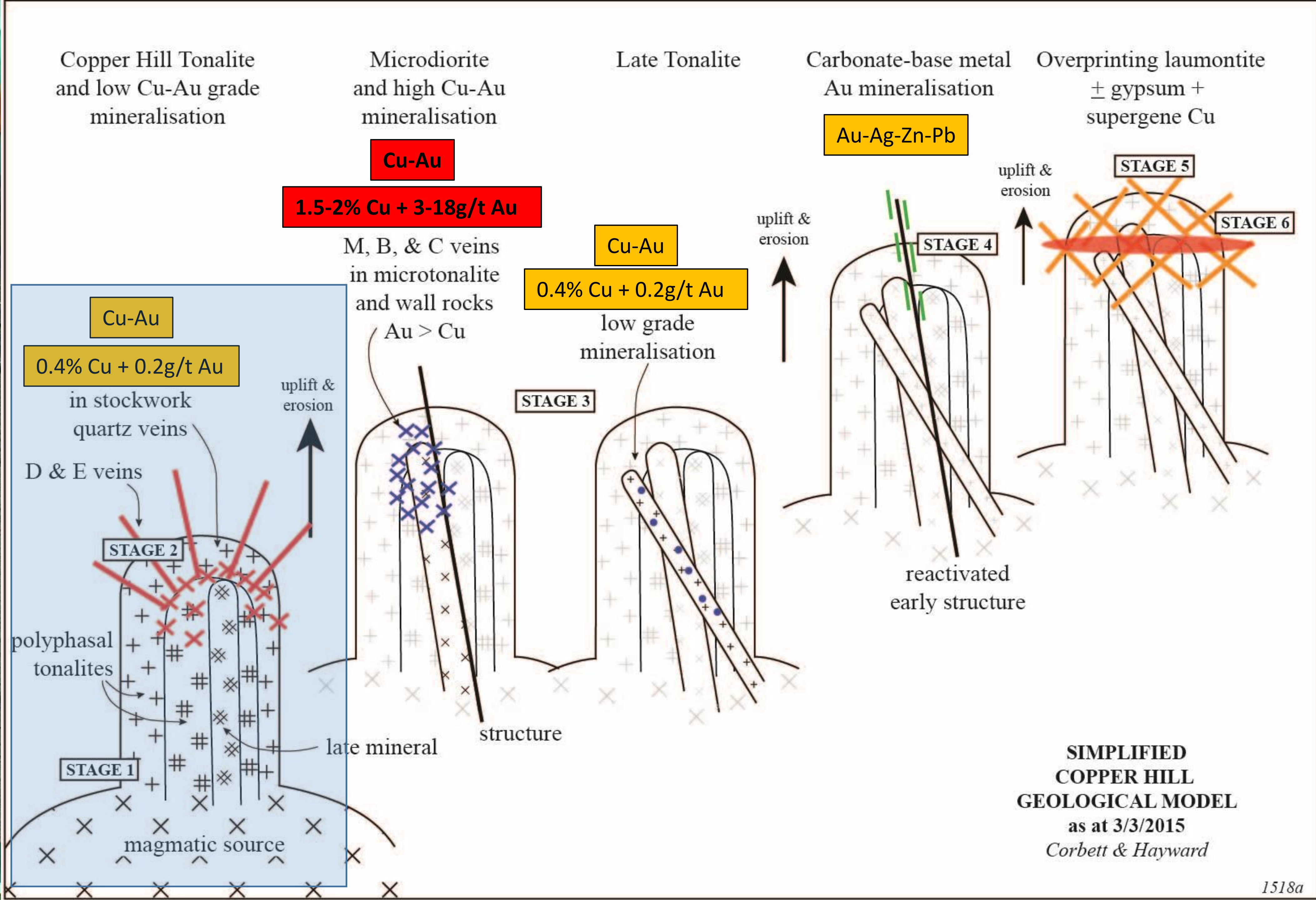
Cooling and collapsing of retrograde phyllic and argillic alteration and overprinting collapsing advanced argillic alteration..

Local retrograde alteration selvages to B grades.

Continued retrograde collapse. D vein mineralization, & post-mineral features.

Corbett SC2012_1465


GCHD470 71m Weak to moderate mineralised CTP intrusion within MTP (not visible)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Microdiorite and high Cu-Au mineralisation
Late Tonalite
Carbonate-base metal Au mineralisation
Overprinting laumontite ± gypsum + supergene Cu
Cu-Au
1.5-2% Cu + 3-18g/t Au
M, B, & C veins in microtonalite and wall rocks Au > Cu
Cu-Au
0.4% Cu + 0.2g/t Au
low grade mineralisation
Au-Ag-Zn-Pb
uplift & erosion
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STAGE 5
STAGE 6
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STAGE 3
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STAGE 2
polyphasal tonalites
STAGE 1
magmatic source
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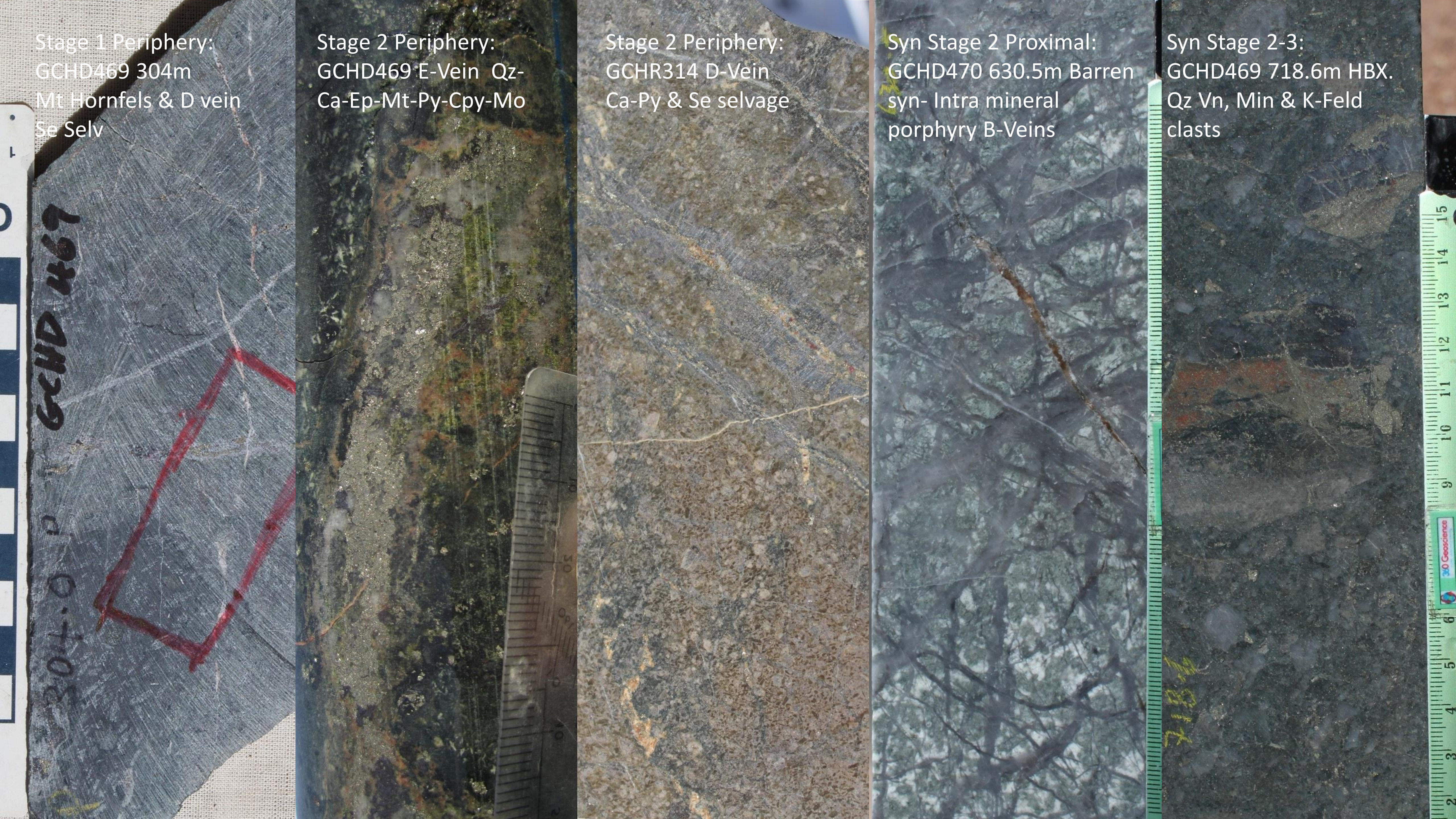
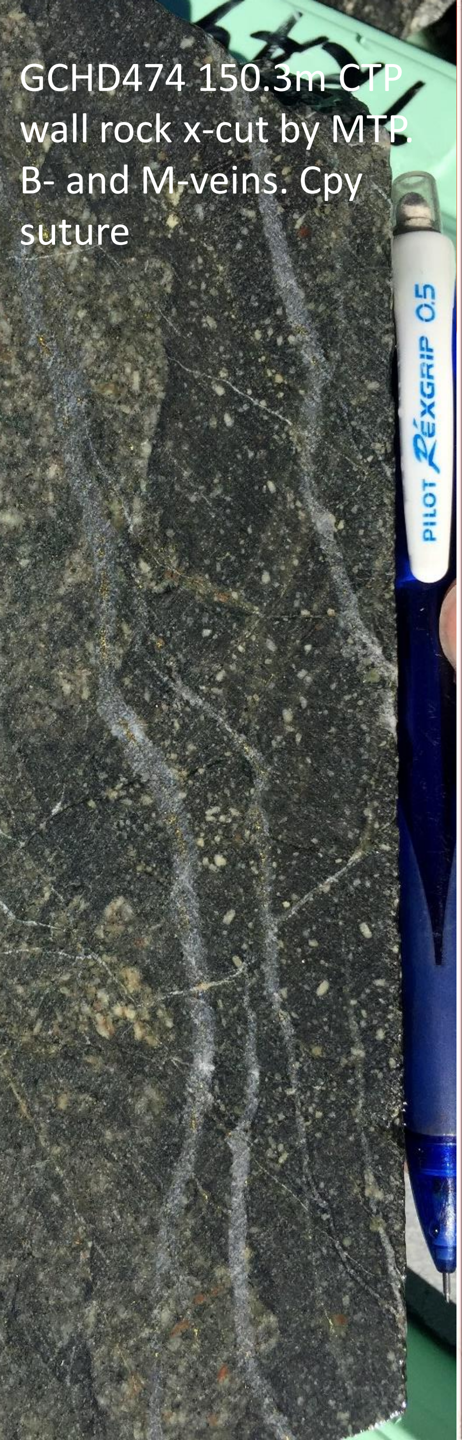
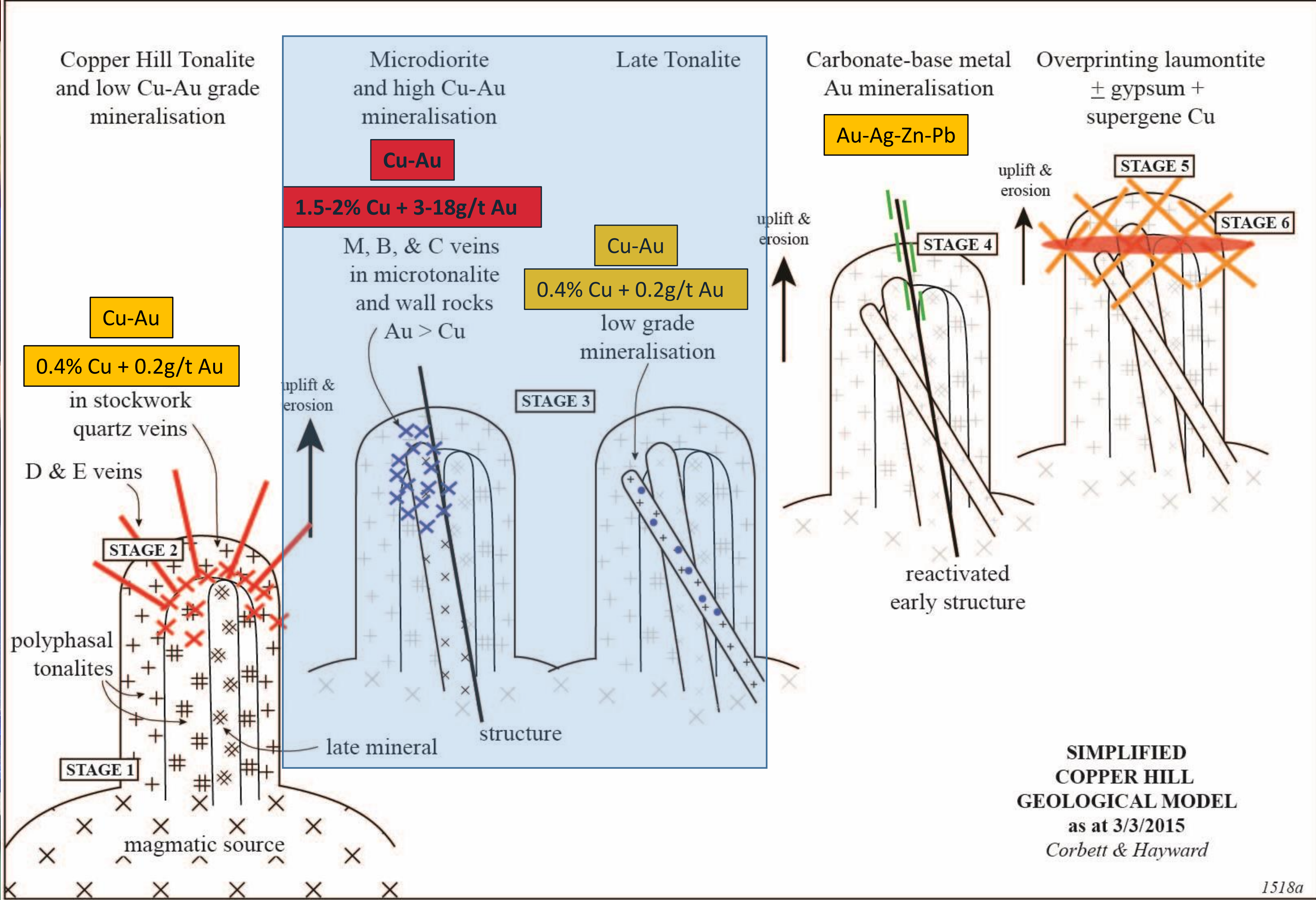

Stage 1 Periphery:
GCHD469 304m
Mt Hornfels & D vein
Se Selv
Stage 2 Periphery:
GCHD469 E-Vein Qz-
Ca-Ep-Mt-Py-Cpy-Mo
Stage 2 Periphery:
GCHR314 D-Vein
Ca-Py & Se selvage
Syn Stage 2 Proximal:
GCHD470 630.5m Barren
syn- Intra mineral
porphyry B-Veins
Syn Stage 2-3:
GCHD469 718.6m HBX.
Qz Vn, Min & K-Feld
clasts
GCHD 469


GCHD474 150.3m CTP wall rock x-cut by MTP B- and M-veins. Cpy suture
PILOT RÉXGRIP 0.5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0.4% Cu + 0.2g/t Au
in stockwork quartz veins
D & E veins
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STAGE 3
uplift & erosion
Carbonate-base metal Au mineralisation
Au-Ag-Zn-Pb
STAGE 4
reactivated early structure
uplift & erosion
Overprinting laumontite ± gypsum + supergene Cu
STAGE 5
STAGE 6
SIMPLIFIED COPPER HILL GEOLOGICAL MODEL as at 3/3/2015
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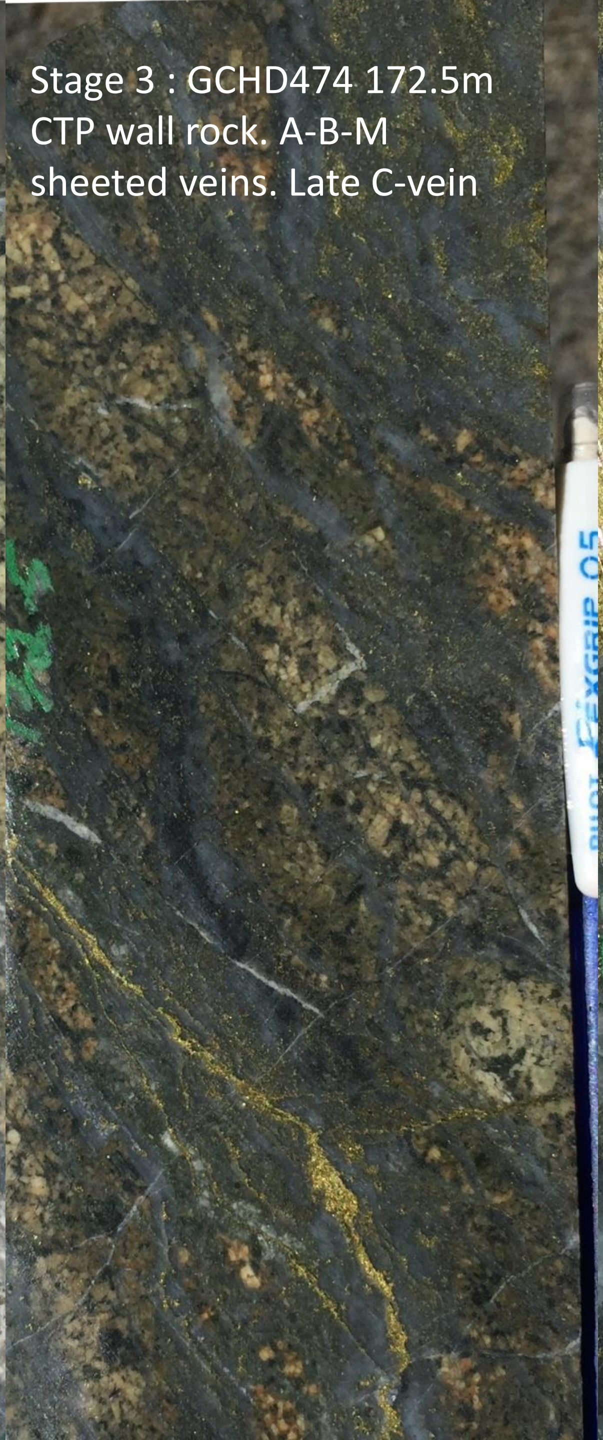
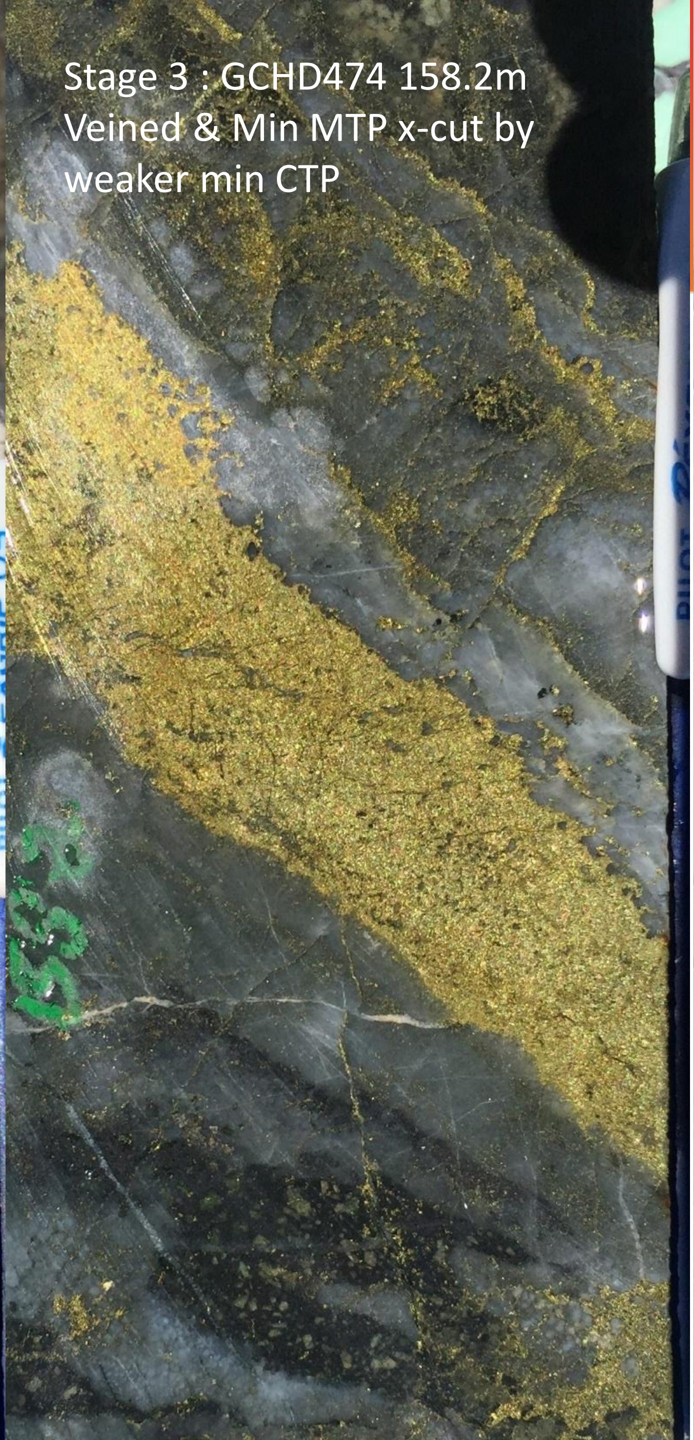
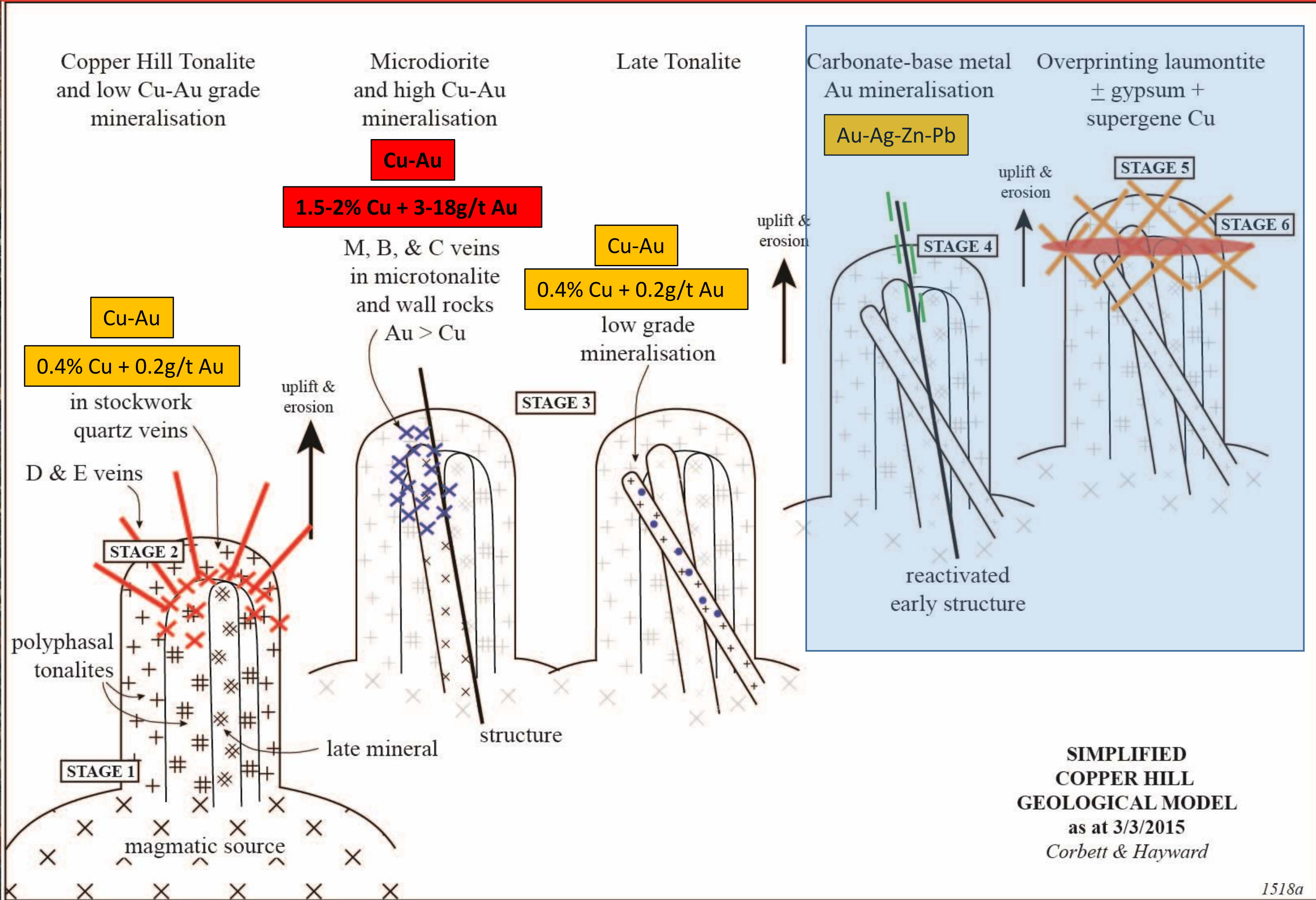
GCHD474 122.3m CTP.
Stage 2 D-Vein with Se. X-cut by Stage 3 Qz vein


Stage 3 : GCHD474 172.5m
CTP wall rock. A-B-M sheeted veins. Late C-vein


Stage 3 : GCHD474 158.2m
Veined & Min MTP x-cut by weaker min CTP


Stage 3 : GCHD470
Veined & Min MTP x-cut by weaker min CTP
July 2014
GCHD470


GCHD474 162.5m CTP wall rock x-cut by Qz & M-Veins. Later B- and C-vein suture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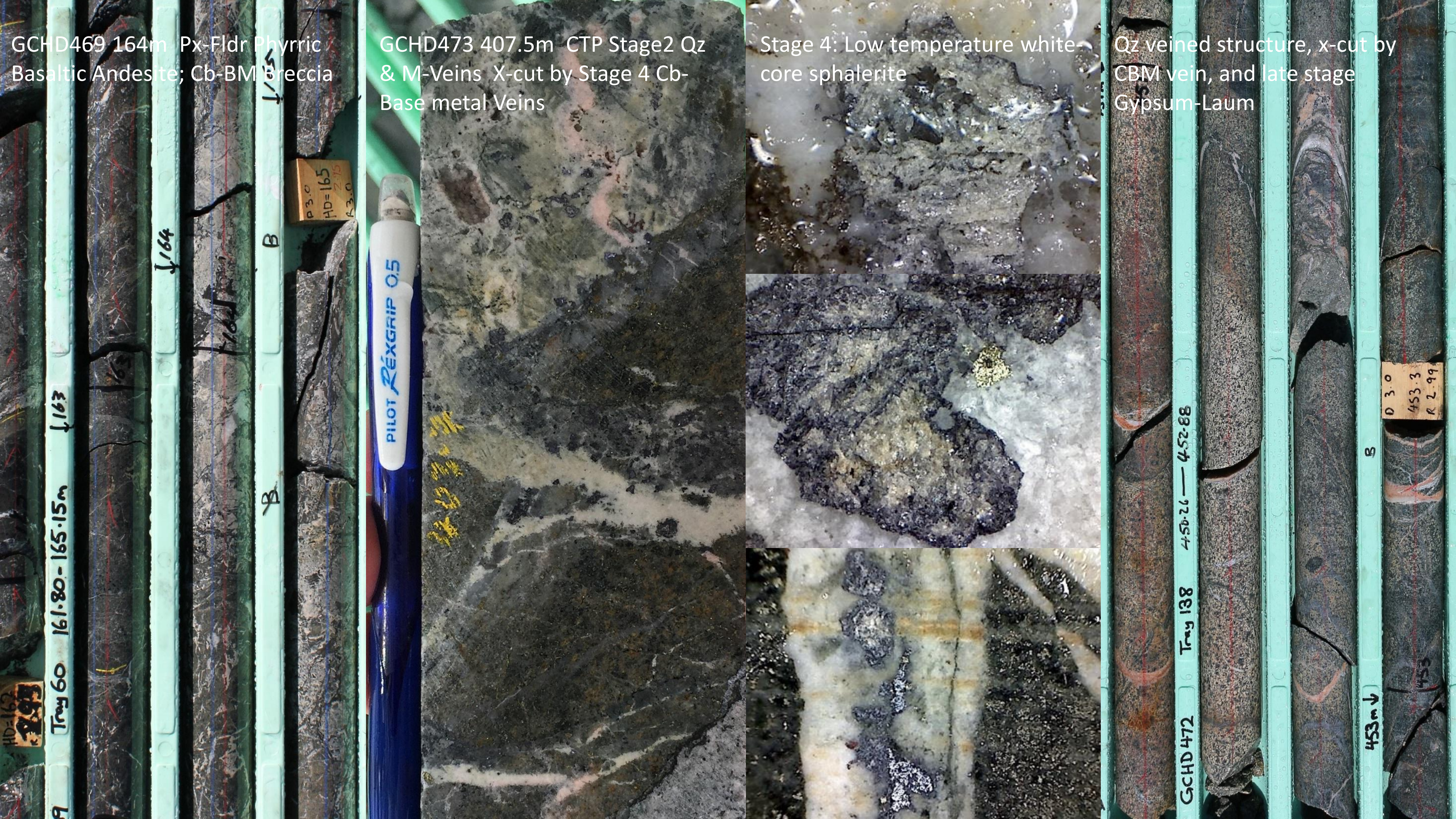
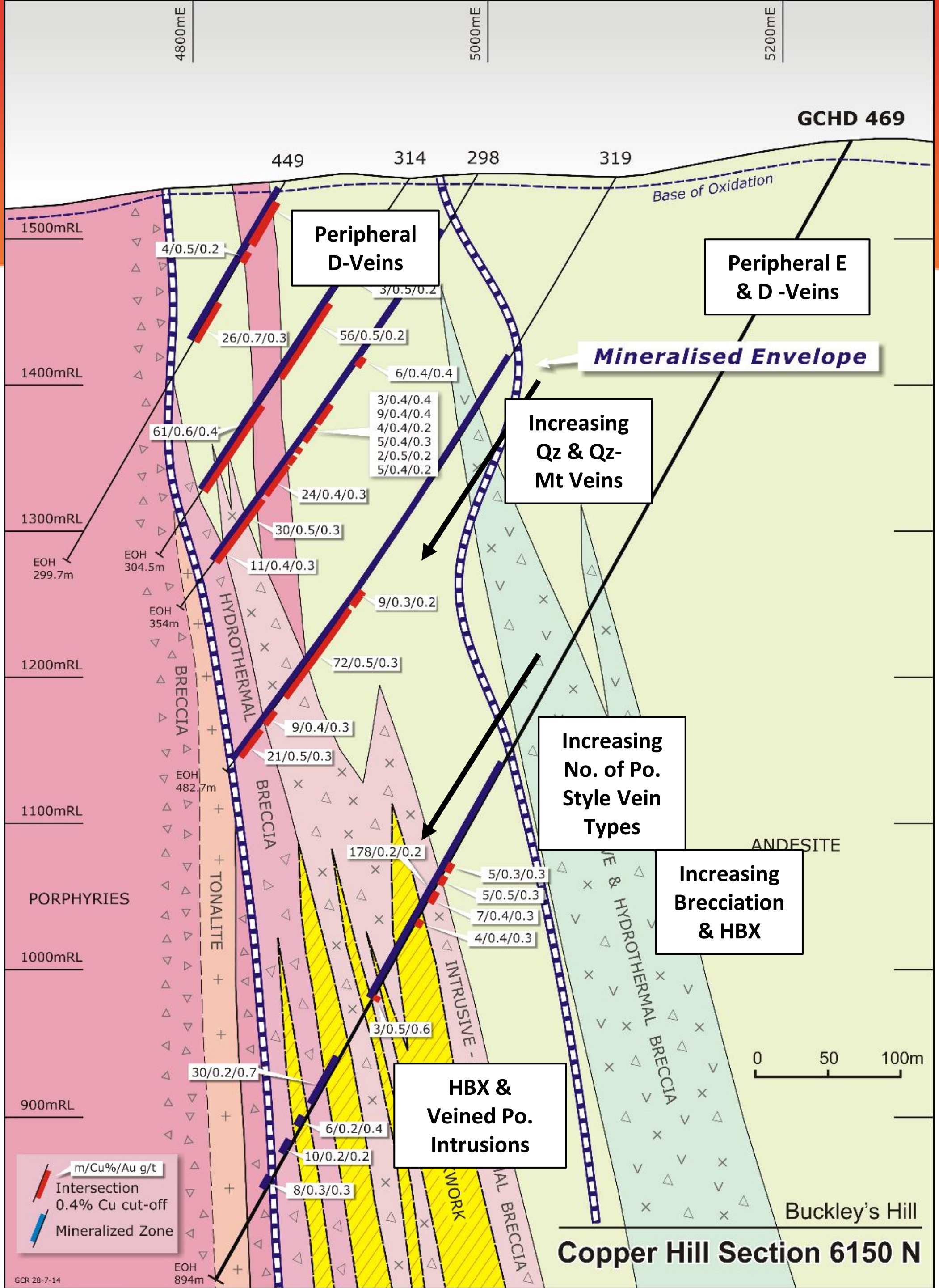

GCHD469 164m Px-Fldr Phyrric Basaltic Andesite; Cb-BM Breccia
Tray 60 161.80-165.15m
GCHD473 407.5m CTP Stage2 Qz & M-Veins X-cut by Stage 4 Cb-Base metal Veins
PILOT RéXGRIP 0.5
Stage 4: Low temperature white-core sphalerite
Qz veined structure, x-cut by CBM vein, and late stage Gypsum-Laum
GCHD472
Tray 138
450.26 — 452.88
453m

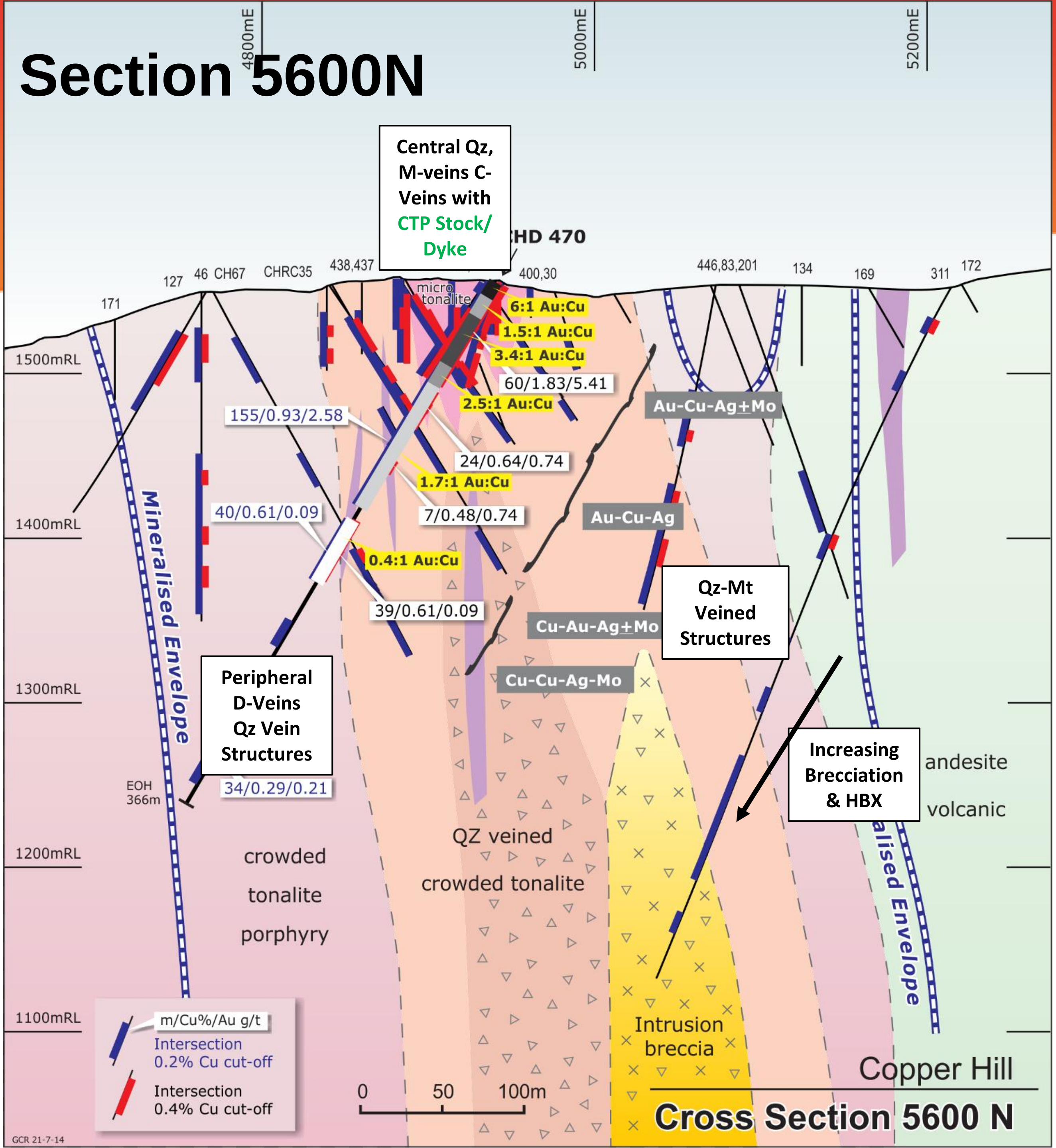
Section 6150N

Copper Hill GCHD469 460m:

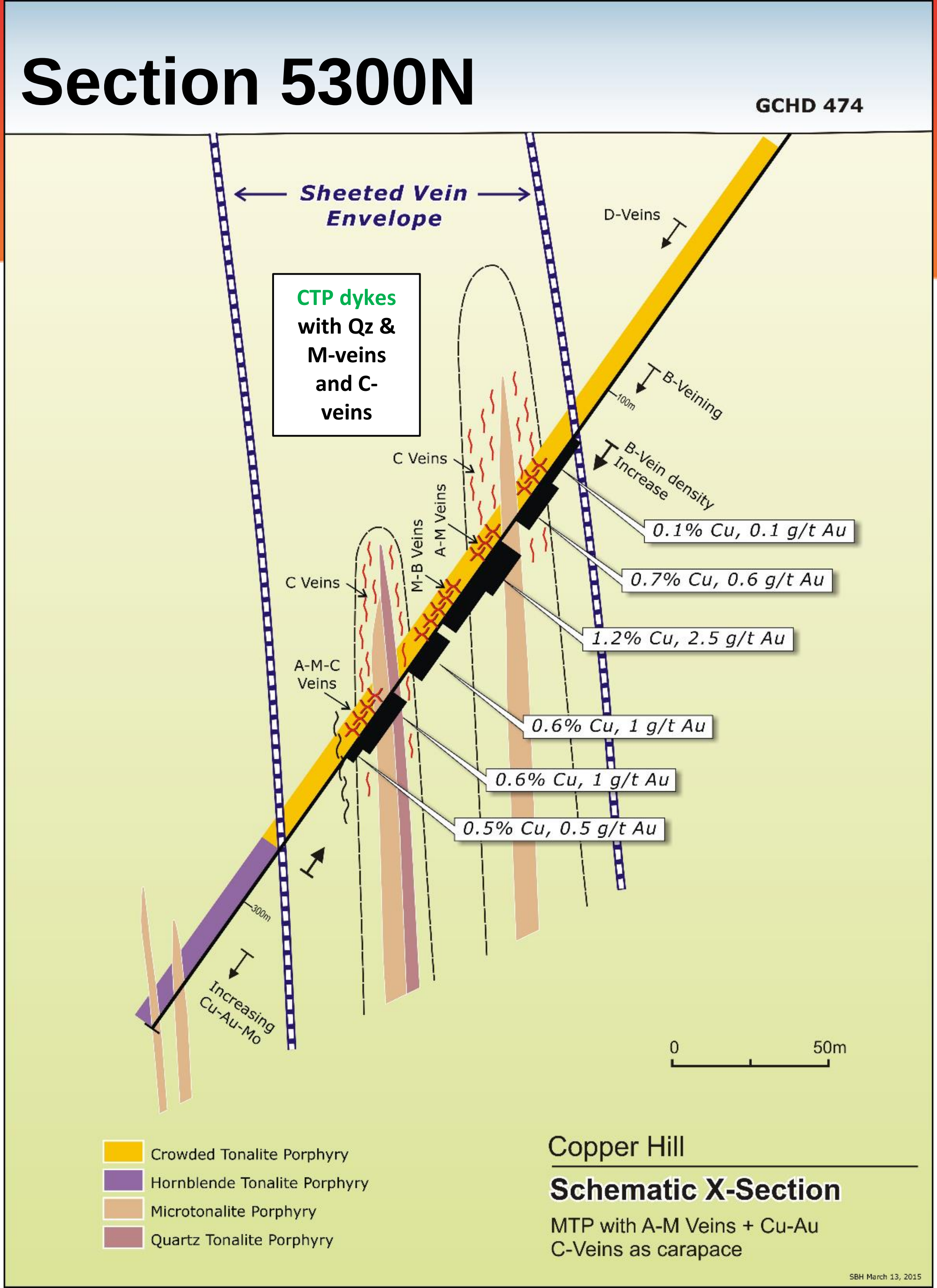
- Quartz (A-Veins) & quartz-magnetite (M-veins) veined tonalite porphyry (Unmineralised)
- Brecciation
- Quartz tonalite porphyry intrusion
- Late stage pyrite-calcite-chalcopyrite infill (low level copper mineralisation)



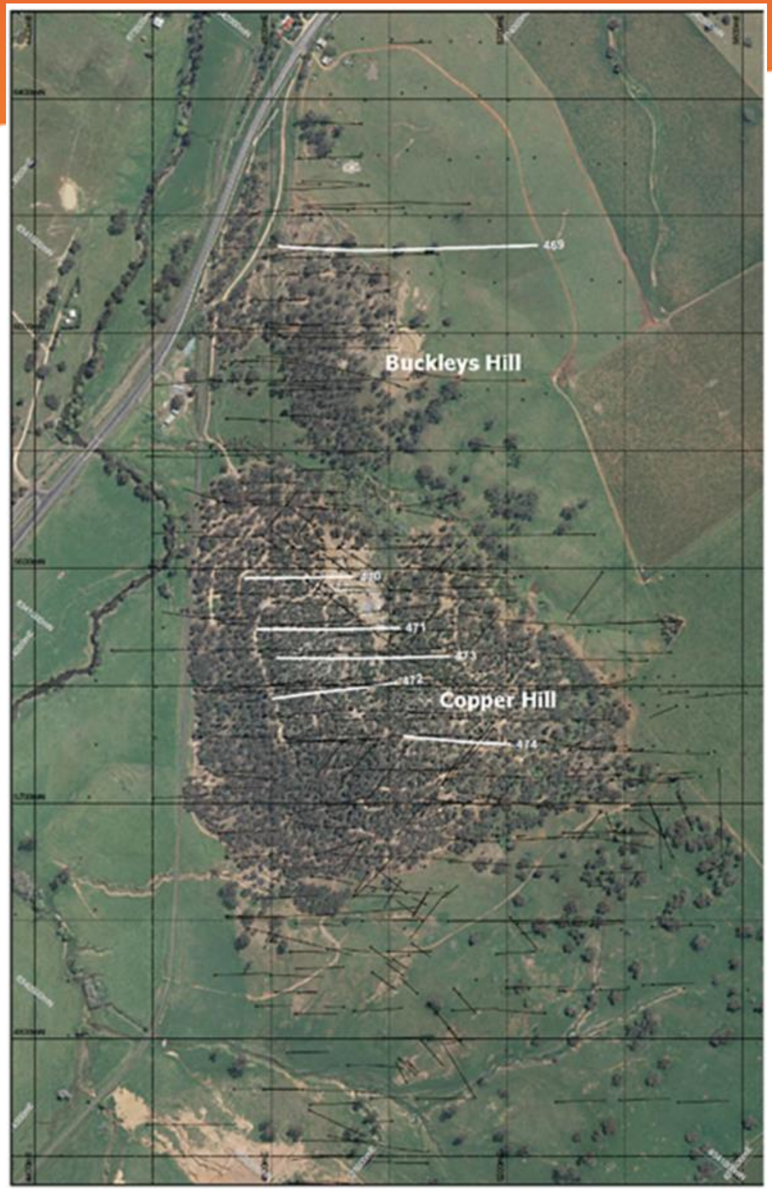
Section 5600N



Section 5300N



Geology Model Fundamentals



Approach

- Traditional observational geology
- 6 new drill holes
- Mineralised systems model

Outcome

- Well defined mineralisation paragenesis and conceptual deposit model
- Microtonalite porphyry intrusions associated with high grade
    - Potential for highly variability geometry over short ranges

Challenge: Conversion to 3D

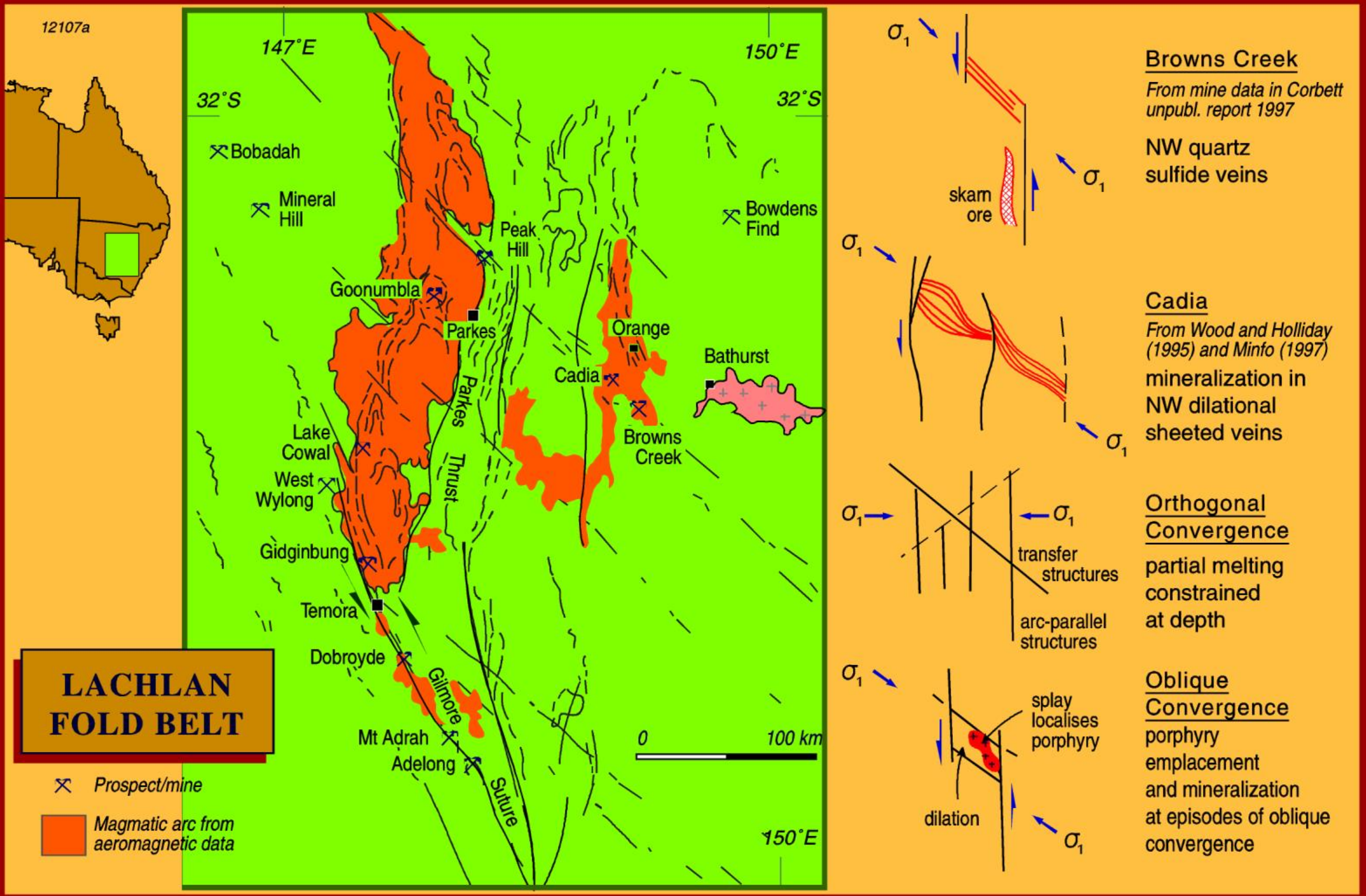
- **Key is integration of surface and drill core orientated structures**
- **New technologies to check and validate historical and new data**

Presentation Outline


Copper Hill open pit (looking to Sth)

- General Geological overview
- Traditional Geology Approach
  - Mineralisation model
- Structural Framework
  - Smartphone Technologies
  - Structural data collection & analysis
- 3D deposit model
  - Leapfrog implicit modelling
- Mineral resource estimate

Regional Structural Framework

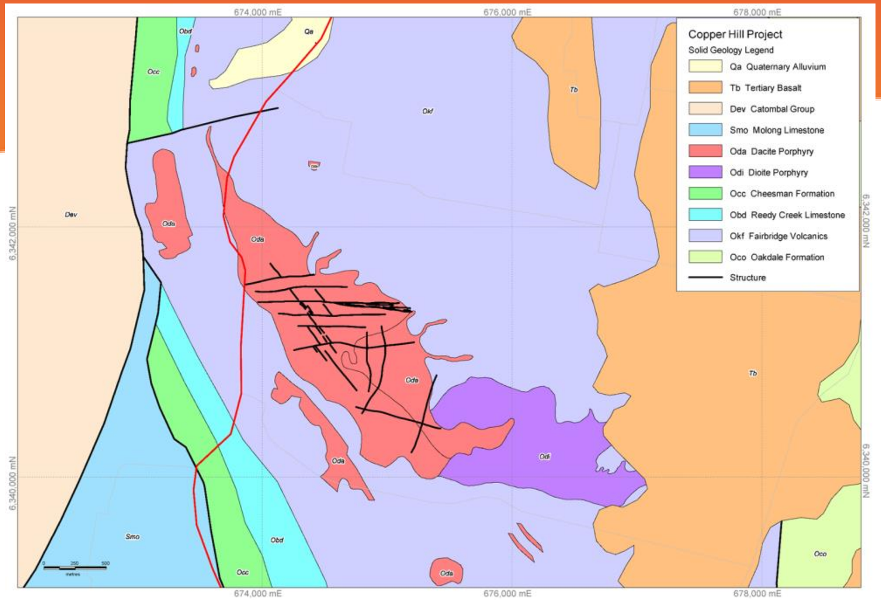


Regional Structure

- Regionally significant NS arc parallel structures

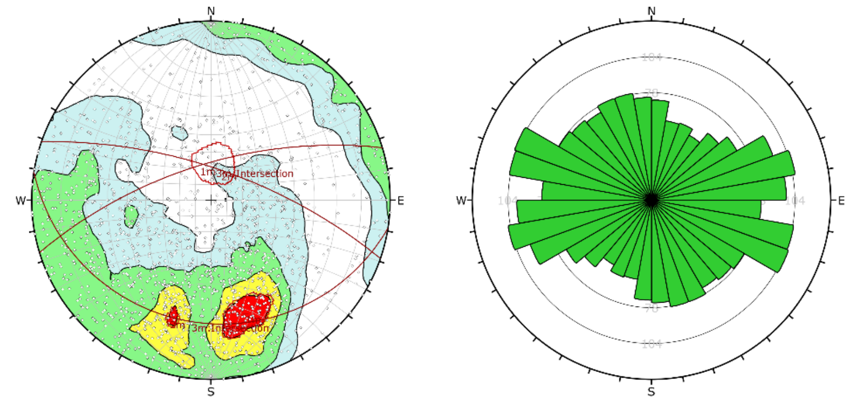
- Orthogonal convergence
  - NW trending transfer structures
- Oblique convergence
  - Dilation on NW structures
  - Porphyry emplacement
- Ongoing oblique convergence
  - Dilation on E-W structures

Project Structural Framework



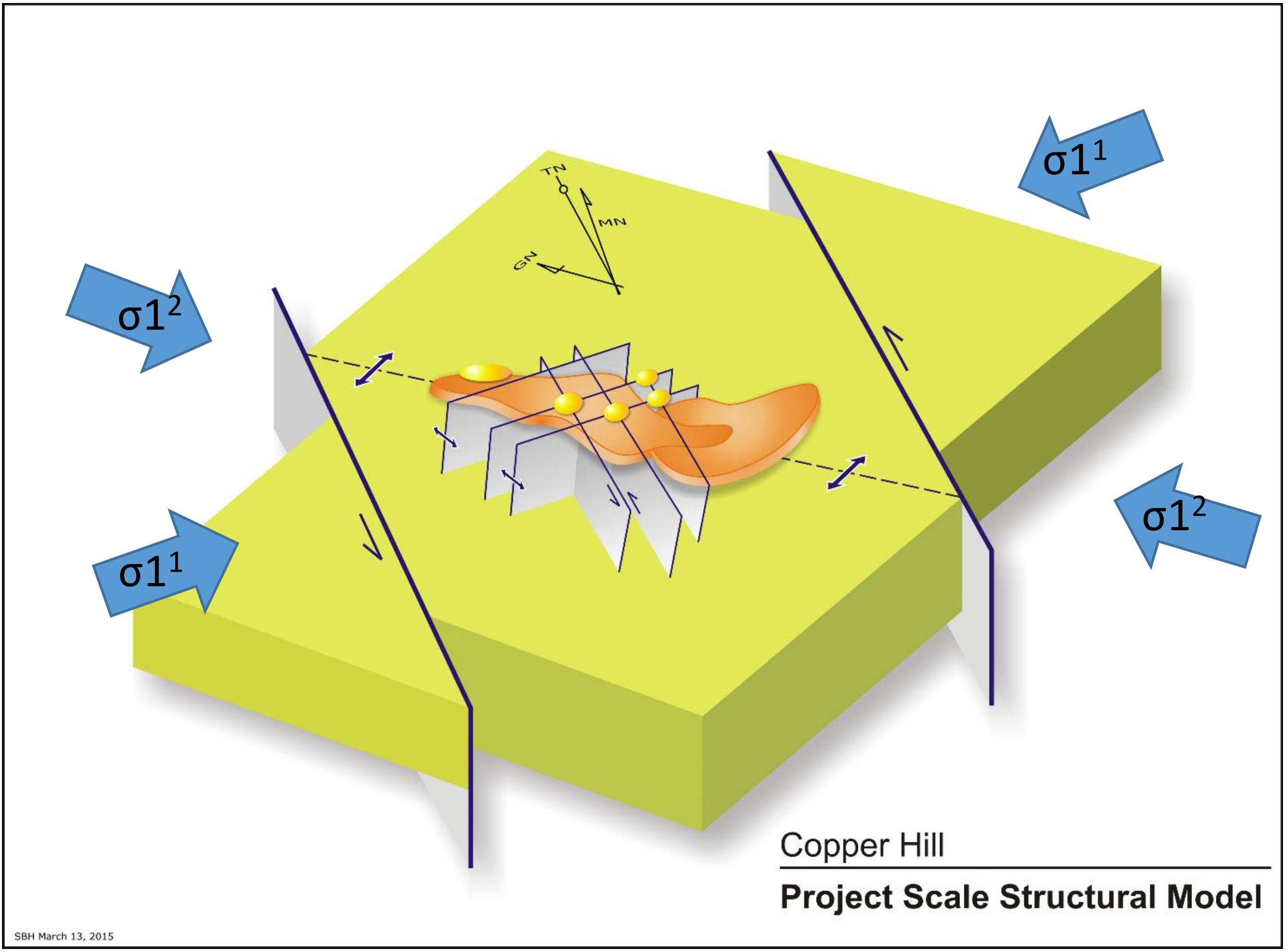
Approach

- 10,764 orientated DH measurements
  - ACE Tool
  - Gyroscope DH survey
- Smartphone technology
  - 404 surface measurements
  - FieldMove Clino®
- Dips® structural analysis



67° > 343°; 70° > 019° (MGA)

Project Structural Framework



Copper Hill

Project Scale Structural Model

Conclusions

Well defined internal structure framework

- E-W structures dominant (Dilatant)
- NW structures subdominant (Dilatant)
- NE structures least abundant (Compressional)

- Low grade early predominantly NW
- High grade copper-gold mineralisation is dominantly E-W trending
- Structural intersections are significant in localising intrusions

Challenge

- **How do we model this in 3D?**

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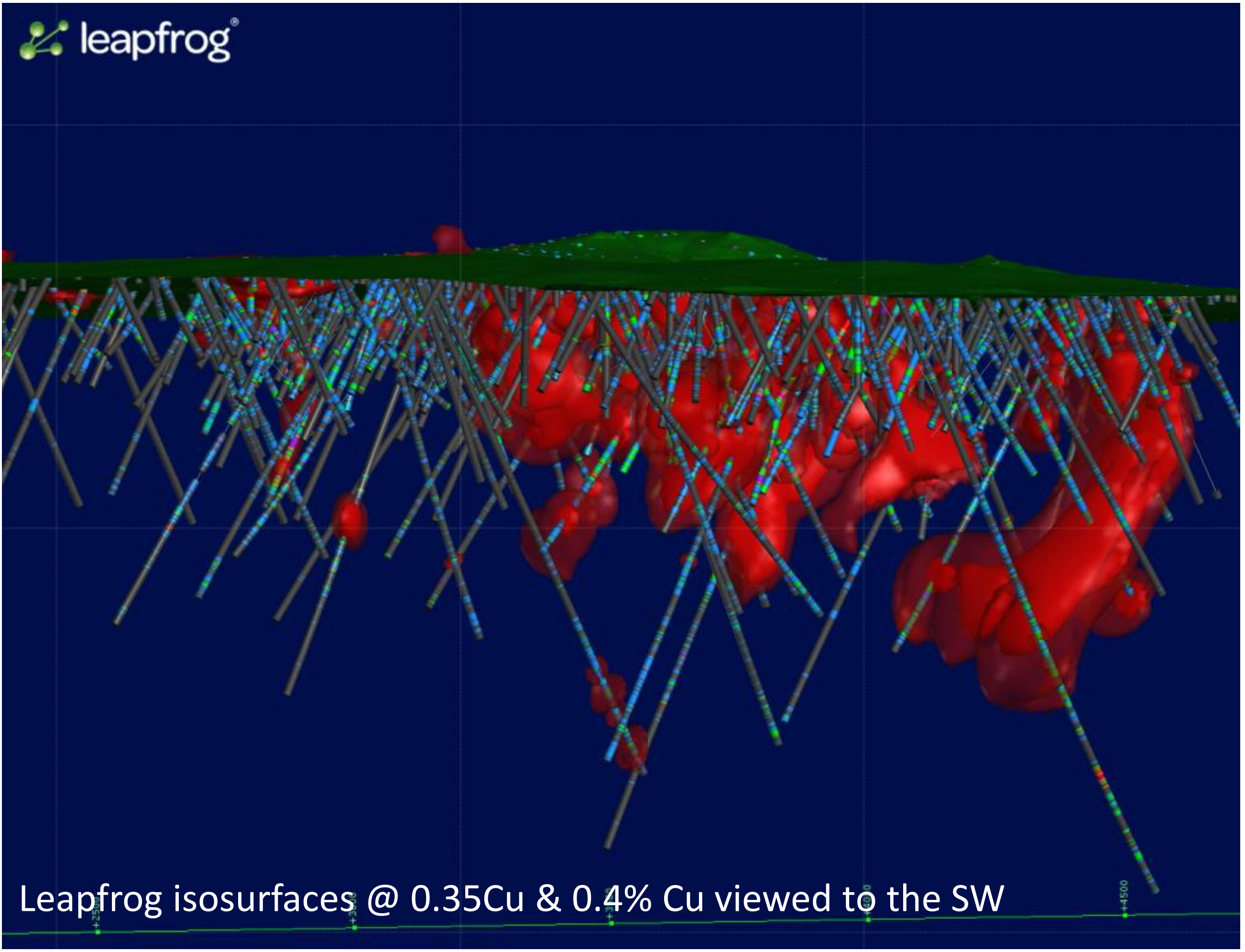
Leapfrog Implicit Model - Assumptions

- Copper and copper-gold mineralisation paragenesis, and structural and mineralogical controls have been determined and are robust
- Early Stage 1 lower grade mineralisation lies predominantly in the moderately dilatant northwest trending structures
- High-grade Stage 3 mineralisation is controlled by the more dilatant predominantly east-west trending structures
- Near surface leached zone that is copper depleted
- Supergene Cu and probably Au enrichment in the oxidised upper portions forming sub-horizontal higher grade zones

Leapfrog Implicit Model



Leapfrog isosurfaces @ 0.35Cu & 0.4% Cu viewed to the SW

Approach

- 5 key assumptions
- Key Cu-cutoff grades
  - 0.1%; 0.2%, 0.3%, 0.4%; 0.5%, 1%

1. Isotropic grade shells
2. Anisotropic grade shells - unconditioned
3. Anisotropic grade shells - conditioned by structures and geological surfaces

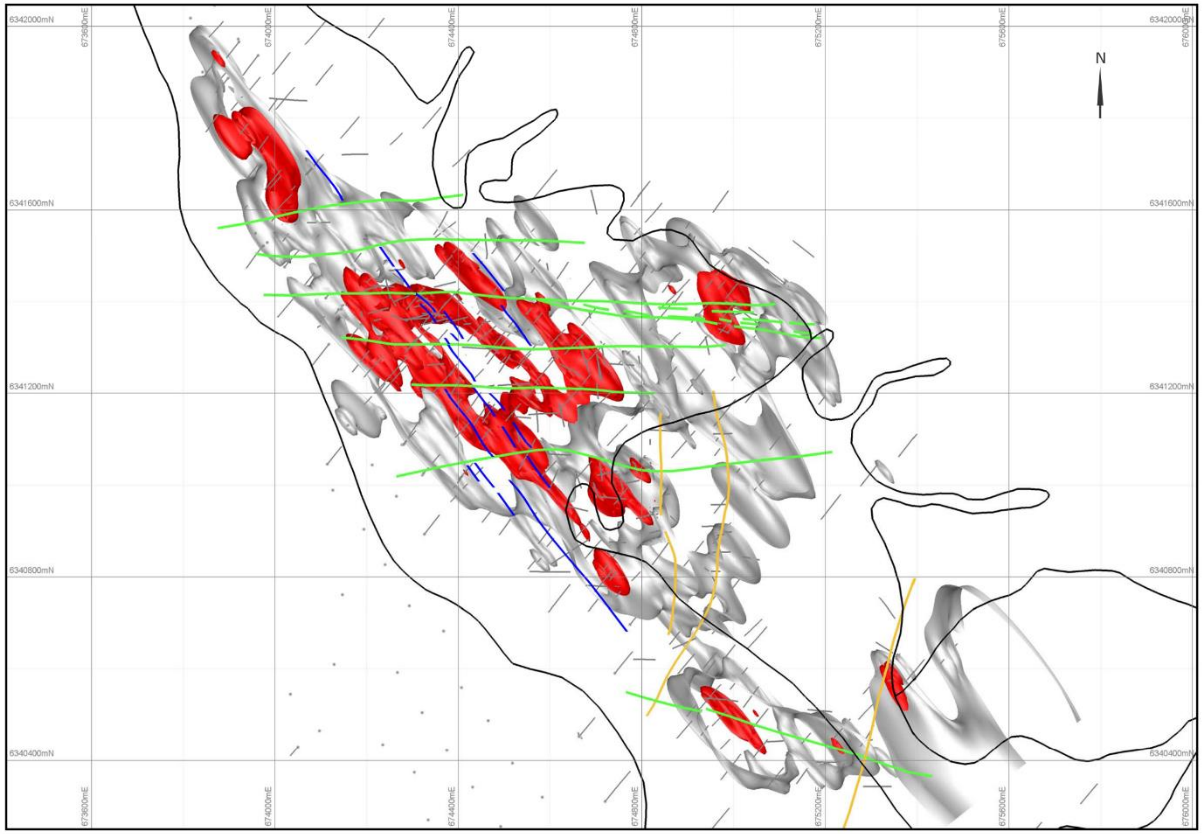
Outcome

- Multiple scenarios modelled
- Anisotropic shells conditioned by structures and geological surfaces best represent geology

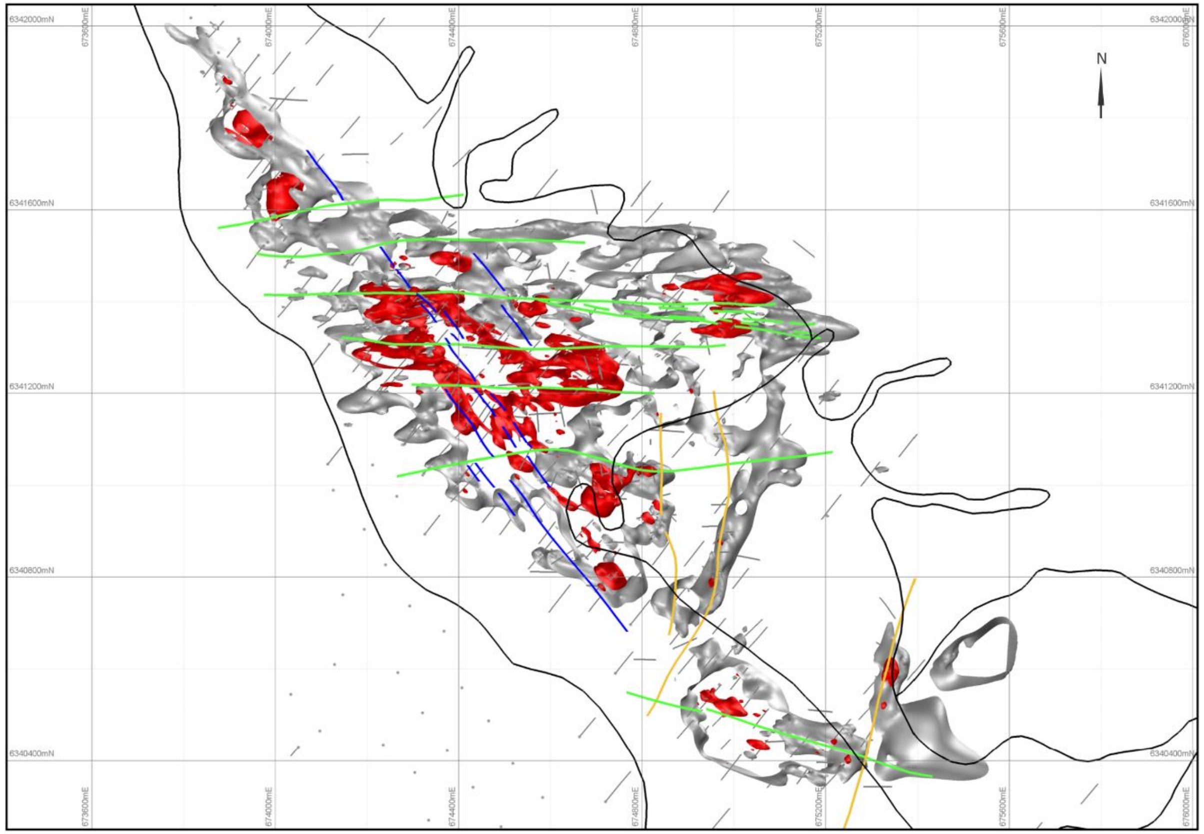
Challenge:

- **Construct geological based estimation domains**

Leapfrog Implicit Model

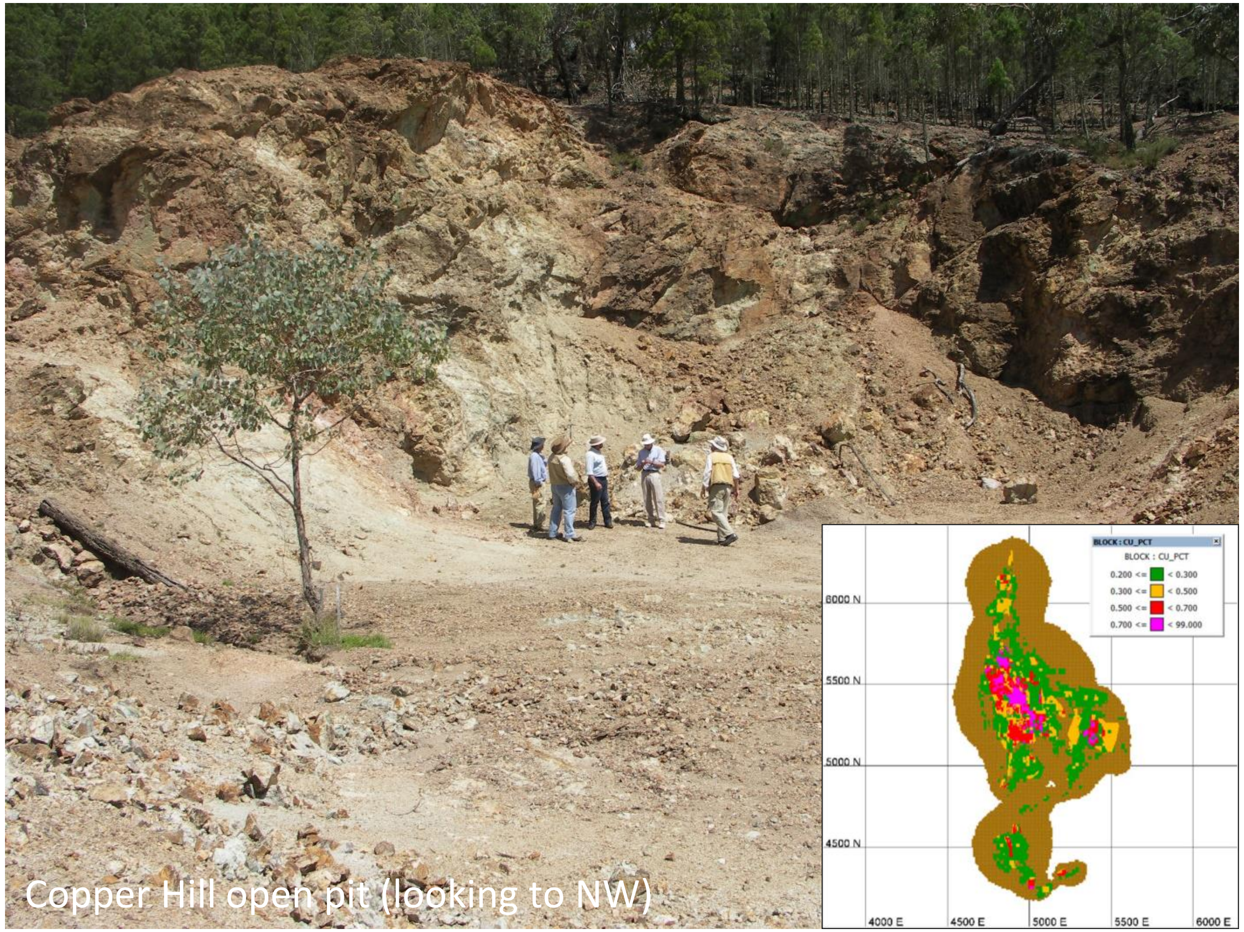


Isotropic



Anisotropic

Presentation Outline



Copper Hill open pit (looking to NW)

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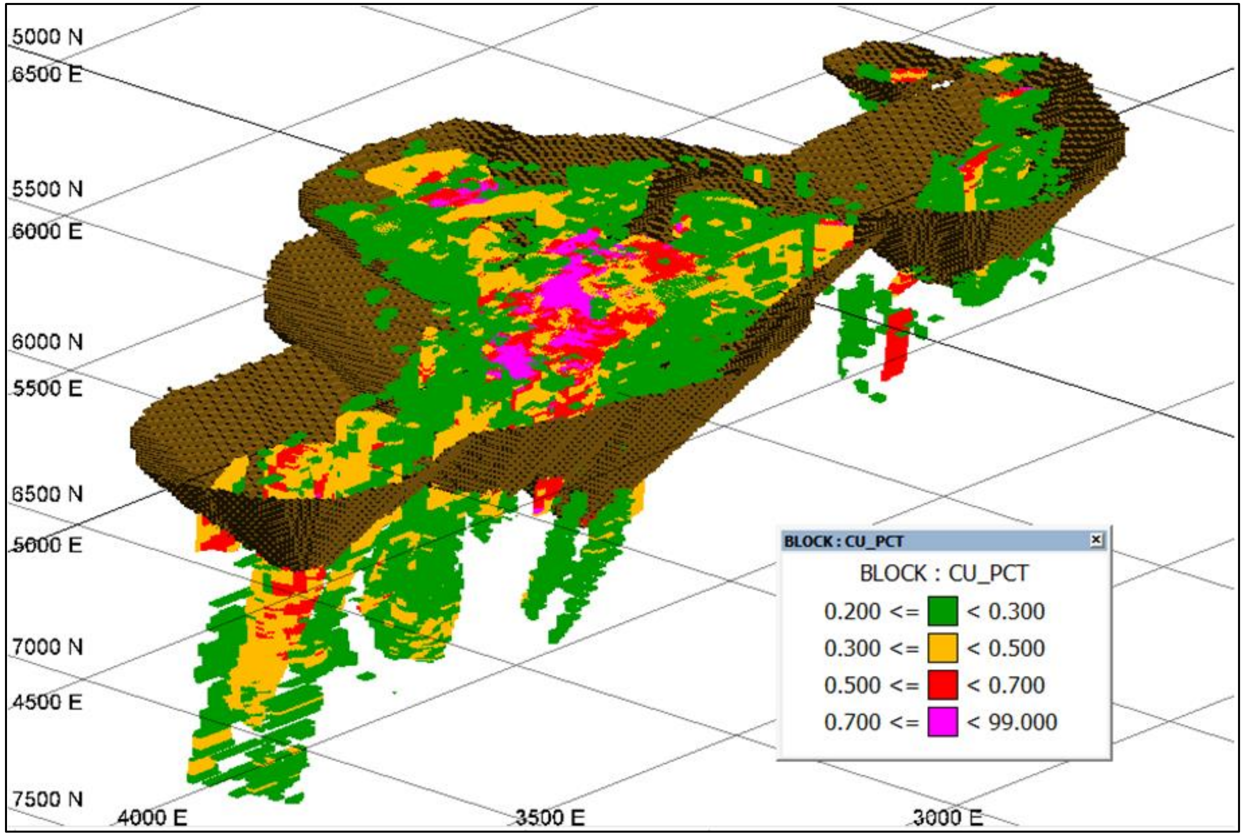
Mineral Resource Estimate



Oblique view towards the southeast of 2015 resource model blocks > 0.2% Cu and pit shell used to constrain resource classification (unclassified outside pit) GCR ASX Announcement

- Geology based domains
- Reflect controls on mineralisation
- 28Mt @ 0.56% Cu & 0.53g/t Au at 0.4% Cu cut-off grade
  - 160,000t copper metal (+1%)
  - 480,000oz gold (+9%)
- Meets JORC 2012 guidelines

Conclusions

- Using traditional geology approach Copper Hill has a well established geology and mineralisation model
- Modern technologies when combined with traditional geology approaches provide an opportunity to re-evaluate long lived projects
- 3D implicit models provide support for extension and expansion targets at Copper Hill
- Opportunity exists to further optimise the mineral resource and target ongoing scoping and feasibility study work programs

Acknowledgements

GOLDEN CROSS RESOURCES

- Golden Cross Resources
- Site field crew (Brenden Roberts and Mick Bates) for their patience in laying out and restacking voluminous amounts of drill core for review
- Co-authors for hours of entertainment talking about geology and good science

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