Wernecke Breccia & Fe oxide-Cu-Au

YUKON GEOLOGICAL SURVEY

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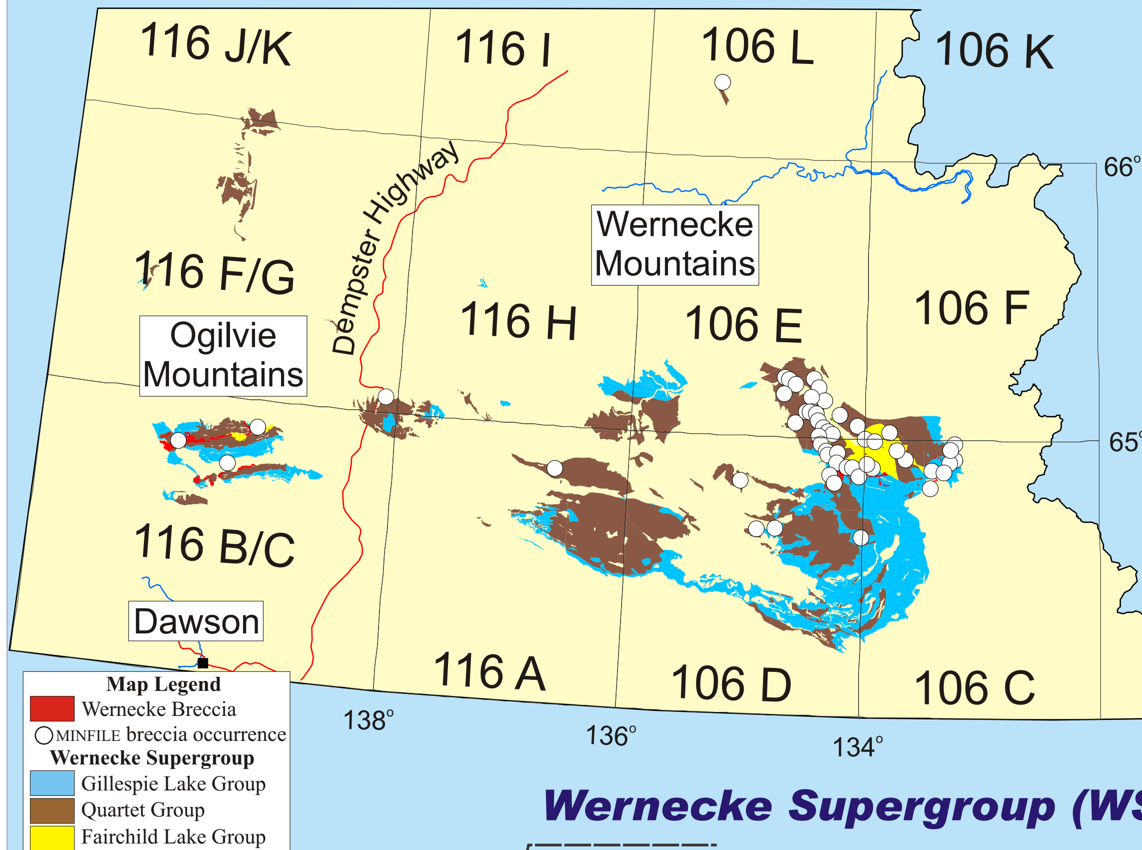
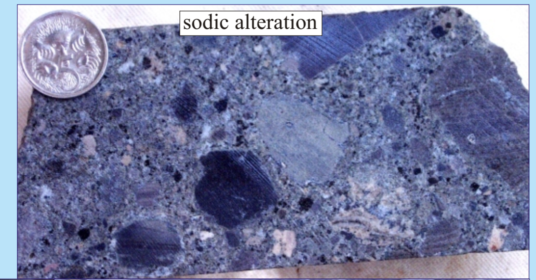
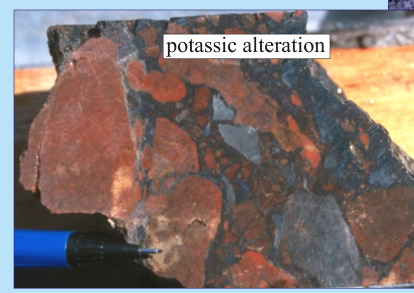




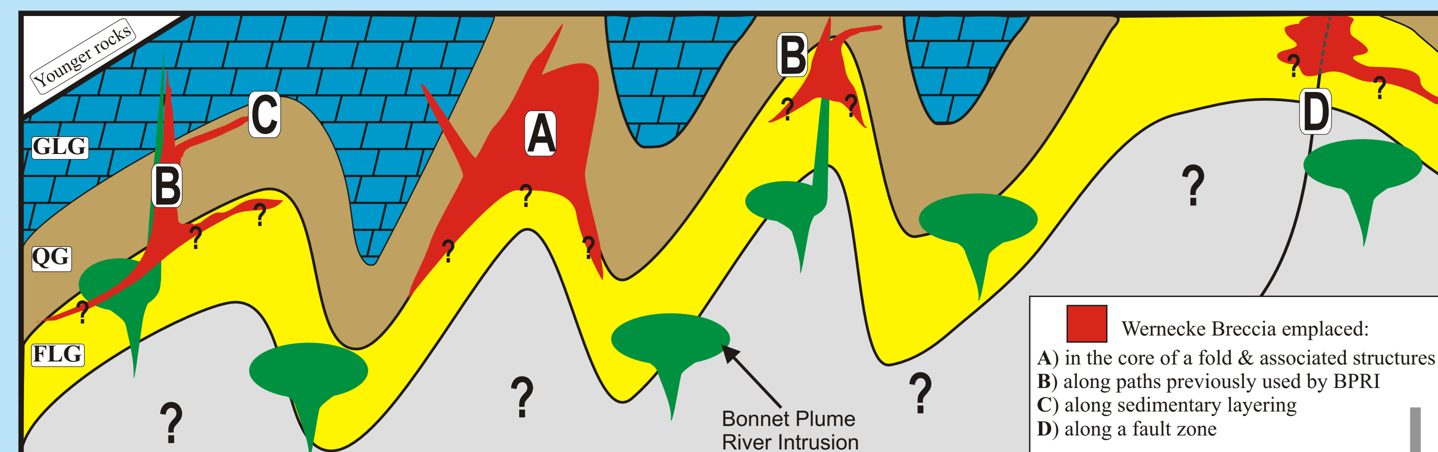


Wernecke Breccia is associated with extensive metasomatic alteration. The composition of the alteration appears to be stratigraphically controlled, i.e. breccia bodies in FLG are associated with dominantly sodic alteration (albite, scapolite); those hosted by QG have mainly potassic alteration (Kspar sericite); and those emplaced into GLG have largely carbonate alteration (dolomite).

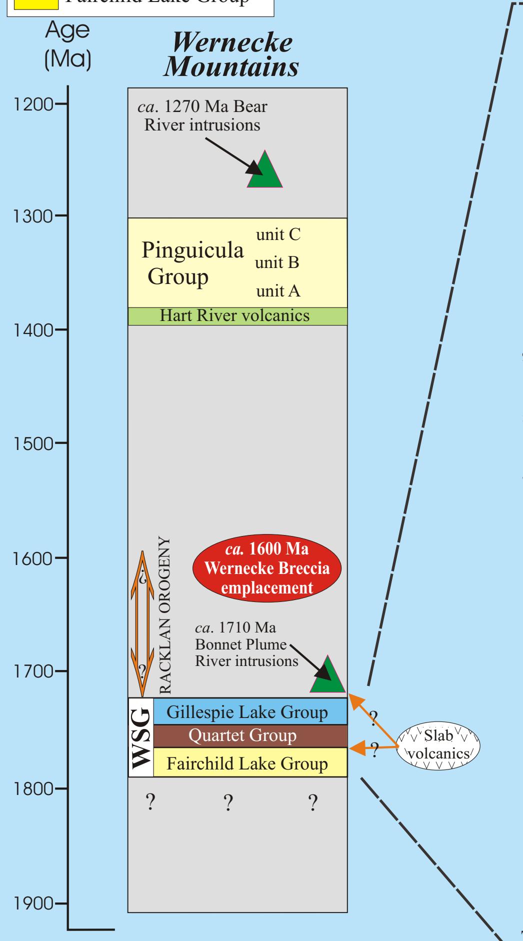
Wernecke Breccia

Wernecke Supergroup is cut by numerous Proterozoic breccia bodies collectively known as Wernecke Breccia. The breccia is largely made up of clasts of the Supergroup in a matrix of rock flour and hydrothermal precipitates; clasts of Bonnet Plume River Intrusions (BPRI) and Slab volcanics are abundant locally. Breccia was emplaced syn- to post-Racklan deformation and multiple phases of brecciation are evident.

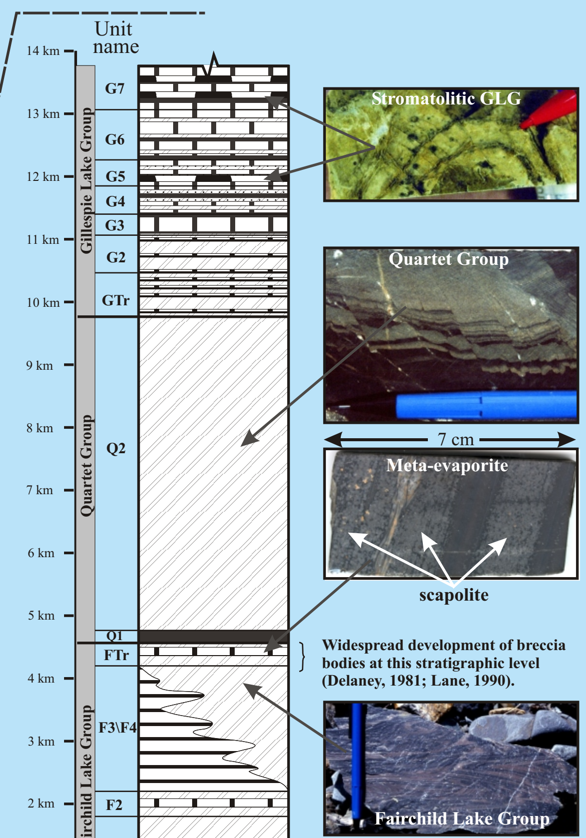
The location of the breccia bodies is stratigraphically and structurally controlled. Breccia occurs throughout the WSG but is most abundant in the upper FLG. Metaevaporites occur in this part of the stratigraphy and may have provided a permeable pathway for overpressured fluids that were responsible for breccia formation. Wernecke Breccia is spatially associated with faults on regional and local scales. For example, in the Wernecke Mountains breccia bodies lie on the southwestern edge of the Richardson Fault array, a series of large-scale, deep-seated, long-lived structures that mark a transition from relatively undeformed to strongly deformed rocks. At the local scale overpressured fluids made use of pre-existing permeable weak areas such as faults, shear zones, the cores of folds, permeable stratigraphic horizons and pathways previously used by BPRI as shown below.



Wernecke Supergroup (WSG)

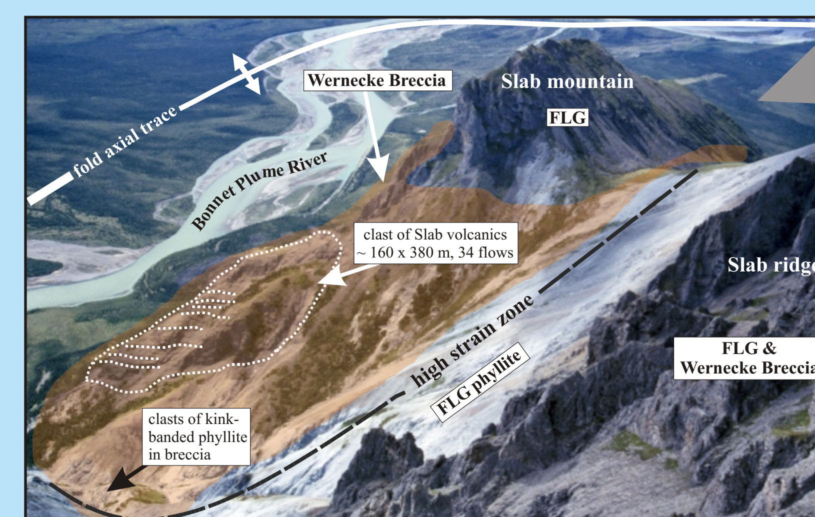


Stratigraphic column, modified from Thorkelson (2000)



WSG stratigraphic column modified from Hunt et al (2005). WSG information from Delaney (1981)

The Early Proterozoic WSG is an approximately 13 km-thick package of fine-grained marine sedimentary rocks and carbonates that were deposited during two clastic to carbonate grand cycles. The Fairchild Lake Group (FLG) was deposited during the first cycle and the Quartet (QG) and Gillespie Lake Group (GLG) during the second cycle.



At Slab Mountain Wernecke Breccia has been emplaced into A, B, C & D.

Further Reading

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Yukon Geological Survey website at www.geology.gov.yk.ca
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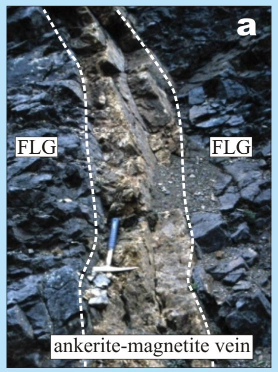
Acknowledgements

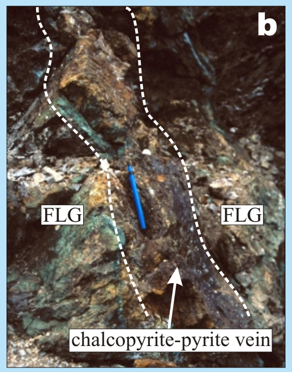
Funding for this project was provided by the Yukon Geological Survey, an Australian IPRS, a JCU scholarship and MRG, an SEG Student Research Grant and a pmd*CRC scholarship. Newmont Mining Corporation, Archer, Cathro and Associates (1981) Ltd, Equity Engineering, Pamicon Developments, Monster Copper Resources and Blackstone Resources kindly provided access to confidential data, drill core and/or properties.

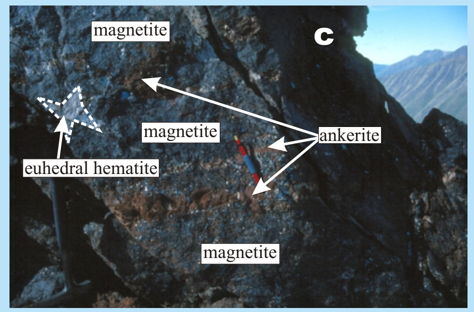
Fe oxide-Cu-Au Mineralisation

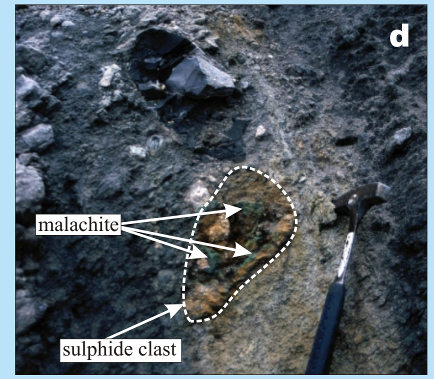
Yukon Geological Survey

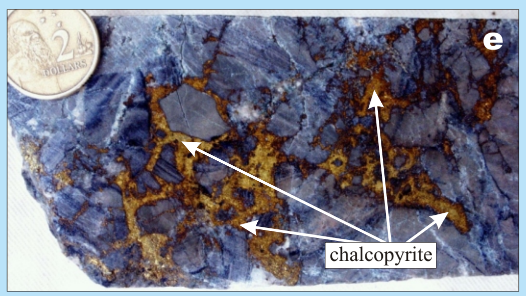
Wernecke Breccia-related Fe oxide-Cu-Au mineralisation



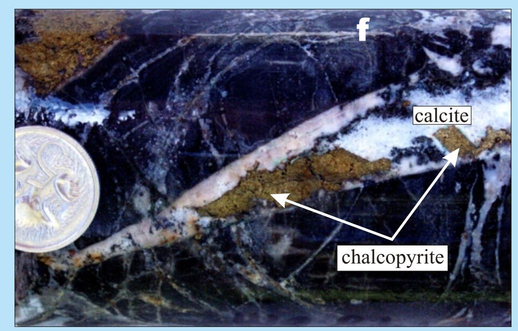




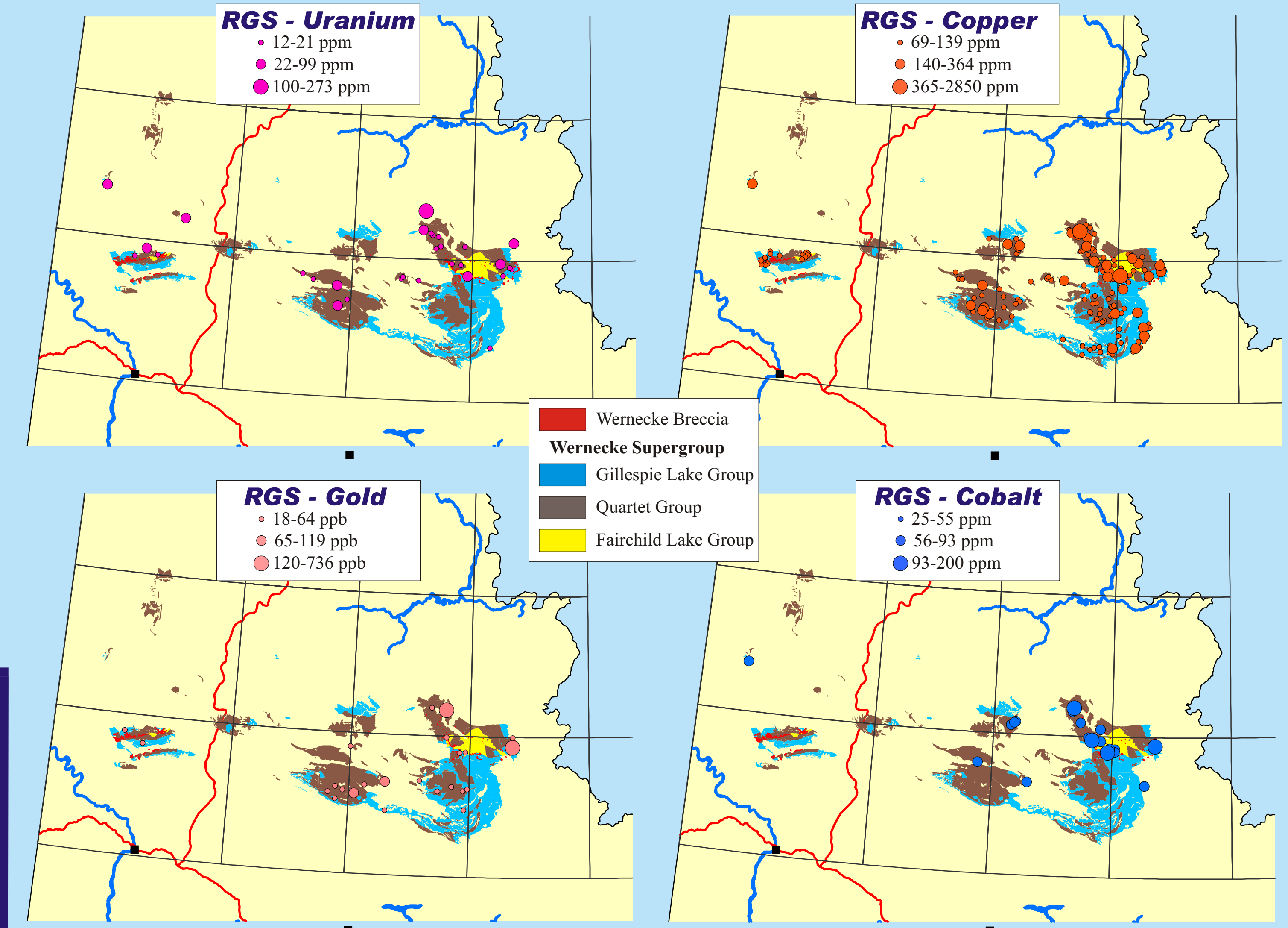




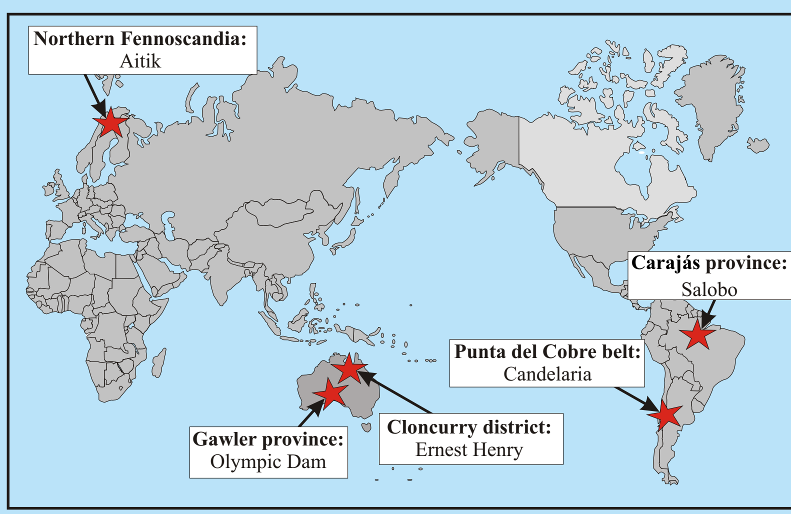
At least 65 bodies of Wernecke Breccia (WBx) are known (see map on other side) and all are associated with Fe oxide-Cu(±Au±U±Co) mineralisation. The mineralisation occurs as: disseminations and veins in WSG and WB (a,b,c); as clasts in WBx (d); in WBX matrix (e); and in carbonate veins that cross-cut WBx (f).



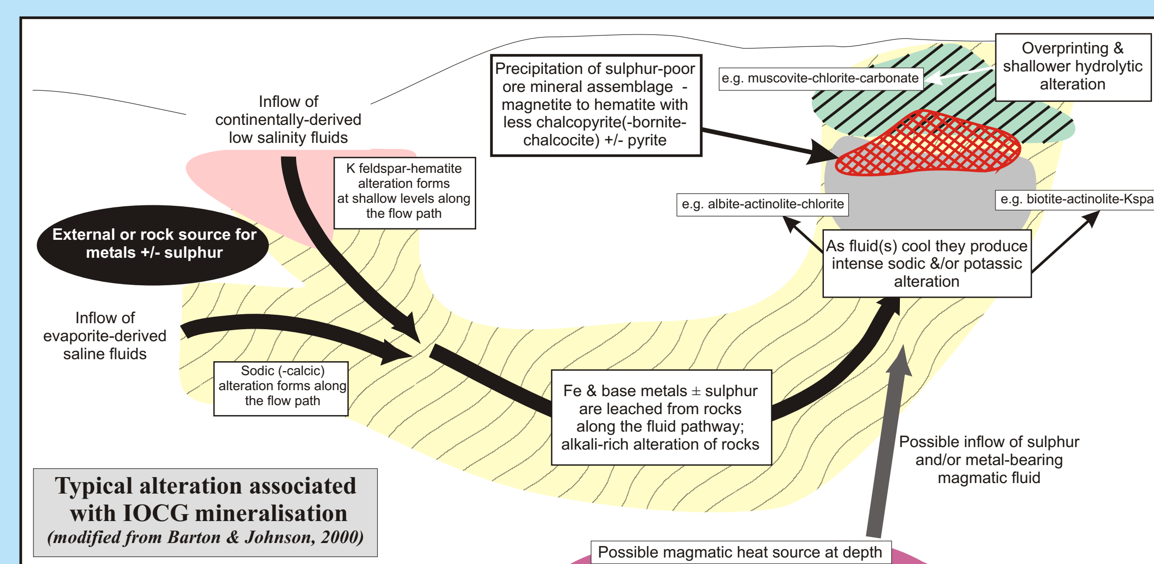
Regional silt geochemistry associated with Wernecke Breccia



Large IOCG deposits world wide



Deposit	Tonnes (x 10^6)	Commodity	Grade	Associated metals
Olympic Dam	2320	Cu (%) Au (g/t) Ag (g/t) U_3O_8 (kg/t)	1.3 0.5 2.9 0.4	Co, REE (dominantly La & Ce), Ni, As
Aitik	800	Cu (%) Au (g/t) Ag (g/t)	0.3 0.2 2	Mo
Candelaria	470	Cu (%) Au (g/t) Ag (g/t)	0.95 0.22 3.1	Zn, Mo, As, LREE
Salobo	450	Cu (%) Au (g/t)	1.15 0.5	Ag, U, Co, Mo, F, LREE
Ernest Henry	166	Cu (%) Au (g/t)	1.1 0.54	Co, Mo, U, REE, F, Mn, As, Ba



Typical alteration associated with IOCG mineralisation
(modified from Barton & Johnson, 2000)

Further Reading

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