

A STUDY OF THE PYRITE-CALC SILICATE RELATIONSHIP
IN THE MENINGIE WELL AREA, OLARY PROVINCE

BY

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ABSTRACT

The stratiform pyrite mineralization in the Olary Province is hosted by calc silicates, which form part of the metasedimentary sequence in the Olary Province. The calc silicates can be subdivided into three sub units:

- (1) Calc Silicates, which are mainly chemical sedimentation of impure carbonates;
- (2) Mixed Horizon, consisting of interbedded chemical and clastic sedimentation, with possible volcanogenic component;
- (3) Quartz-Feldspar-Mica Horizon, consisting of clastics.

The calc silicates have been metamorphosed at least two times, possibly three. Relict amphibolite facies minerals diopside, scapolite and andradite show mineralogical and textural disequilibrium with the retrograde greenschist facies minerals tremolite, calcite and actinolite. The absence of talc indicates high X_{CO_2} values during the retrograde metamorphism. For $X_{CO_2} = 0.75$, the range of P-T is from 550°C at 2 kb to 650°C at 5 kb.

Textural studies indicate that the pyrite is stratiform and syngenetic. Trace element values, especially Co:Ni ratios suggest that a volcanogenic exhalative component is probable for the mineralization. Cu rich and Zn rich domains are found in the pyrite horizons.

Mineralization appears to have been controlled by the sedimentation of the Mn and Fe rich impure carbonates. Superimposed on this, there has been a gradual change of environments in the basin from oxidizing to reducing, and from a carbonate shelf type facies to a more basinal facies with clastic sedimentation. If the volcanogenic model is real, then the Pyrite-Cu association is typical of shallow water shelf facies, proximal to the volcanic source, whilst the Pyrite-Zn is more basinal and distal from the source.