Organic Matter Distal to Macraes Gold Deposit, New Zealand

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A spatial association between organic matter and gold has been recognised for many years, leading to to speculation on the role that organic matter plays in the source, mobility, transportation and precipitation of gold. To investigate the effects of organic matter on gold transport, we examined rock samples distal to the Macraes Gold Deposit in New Zealand to investigate links between organic matter and the source of gold for the Macraes deposit.

Petrographic analysis and acquisition of Raman spectra (Figure 1), facilitated identification of four kinds of organic matter (OM) with varying maturity and origins. In prehnite-pumpellyite and pumpellyite-actinolite grade rocks, the lowest maturity OM1 coexists with framboidal pyrite. Well-crystallized OM 2 is also found in low grade samples and may have been deposited by fluids from deeper in the sequence. At the highest metamorphic grades studied (greenschist), well organised OM 3, interpreted as in-situ is interpreted to have formed from OM 1 with increasing temperature. The less-crystallized OM 4, which is also found in greenschist facies rocks associated with veins, may have precipitated from metamorphic fluids and is of interest as such fluids may also have transported gold.

Further analysis will focus on the gold distribution in organic matter. Results will contribute to a new understanding of ore-forming processes.

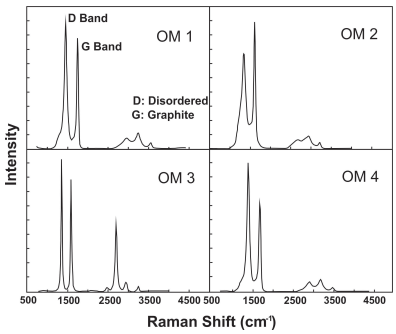

Figure 1: Raman spectra of the four types of organic matter