

New Ways of Doing the Business of Exploration: Project Development Using GIS based Prospectivity Modelling in Australia and New Zealand

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The new business models applied by major mining companies depend on the junior segment of the market to successfully carry out grassroots exploration. There is a significant problem with this approach due to most investment capital being used to develop mining operations rather than conceptual exploration. Current deposits are rapidly being depleted and there will be pressure for new discoveries in the coming years. In addition a significant amount of corporate knowledge has been lost with the recent globalisation of the minerals industry. Consequently the business of exploration, like the mining sector, has to develop new business models and use new innovative techniques to attract new investment to allow these discoveries to be made.

It is critical for exploration targeting that effective analysis of the available datasets is carried out with respect to each other, and that only the relevant factors to the exploration model being used are extracted and combined into a single mineral potential map by using recently developed spatial data modeling techniques (eg, Bonham-Carter 1994). These techniques have been successfully applied in New Zealand and Australia to develop new conceptual exploration targets for a variety of mineral deposits (Partington 2000, Partington et al. 2002, Partington & Sale 2004). Historic data were combined with new genetic models in a GIS to produce mineral potential maps at national and international scales highlighting those areas with the greatest probability of hosting mineralisation. These models were used to raise seed capital and attract investment to develop these targets. All targets were unrecognised and acquired 100% at the cost of pegging.

Geological data have proved to be fundamental predictors of mineral occurrences in all models developed to date. An understanding of the structure and temporal development of the geology of an area is critical, especially at a prospect scale. Unfortunately, although these data can often be cheaply acquired they are often overlooked. On-going fieldwork is proving the effectiveness of the modeling with new mineralisation being discovered in areas neglected by recent exploration (Aurora Minerals 2005). The potential to add significant value to these targets at the grassroots stage of exploration now is very high.

In summary, contrary to current beliefs, grassroots exploration can deliver significant added value to shareholders as long as basic geological data such as lithology, alteration and structural data are collected in the field and interpreted correctly. The use of new spatial data modeling techniques allows the calculation of probability values that can identify those areas with the best chances of exploration success. This reduces costs, allows integration of data at international scales and brings forward any return on investment hence enhancing value to share holders.

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