Towards an integrated model for alkalic porphyry and epithermal deposits in British Columbia

Alkalic mineral deposits share some features with classic porphyry and epithermal systems, but other aspects of their geology distinguish them from sub-alkalic systems. In contrast to classic alkalic deposits, less systematic work has been undertaken towards developing a coherent model that integrates the characteristics of various alteration styles that can develop in either a shallow- or deep-level alkalic setting. Recent discoveries have raised awareness of the economic importance of the alkalic class of porphyry and epithermal deposits, and have provided opportunities to better define the characteristics of these somewhat anomalous but potentially metal-rich mineral systems.

British Columbia is the type-area for alkalic porphyry deposits and consequently is the focus for our study. Case studies include the Mount Polley, Mount Milligan, Gahine Creek and Lorraine deposits. Collectively, the systems span the depth range of the porphyry environment, from high-level extensional hosted bodies to deeper intracrustal shear zone settings. In order to build a coherent model for alkalic porphyry, the integration of structural, paragenetic, alteration zonation and geochemical information is essential. As alkalic epithermal systems are under-represented in BC, three global examples are also being studied (Coadal, Australia; Pangere, Papua New Guinea) as an improved understanding of their characteristics may have exploration implications in BC.

Key characteristics and model development

- **Alkaline porphyry deposits in British Columbia**
- **Alkaline epithermal deposits**
- **Alkaline mineral deposits**
- **Towards an integrated model for alkalic porphyry and epithermal deposits in British Columbia**

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