

Project 2001-8: Metallogenic model for orogenic gold in the Abitibi Subprovince

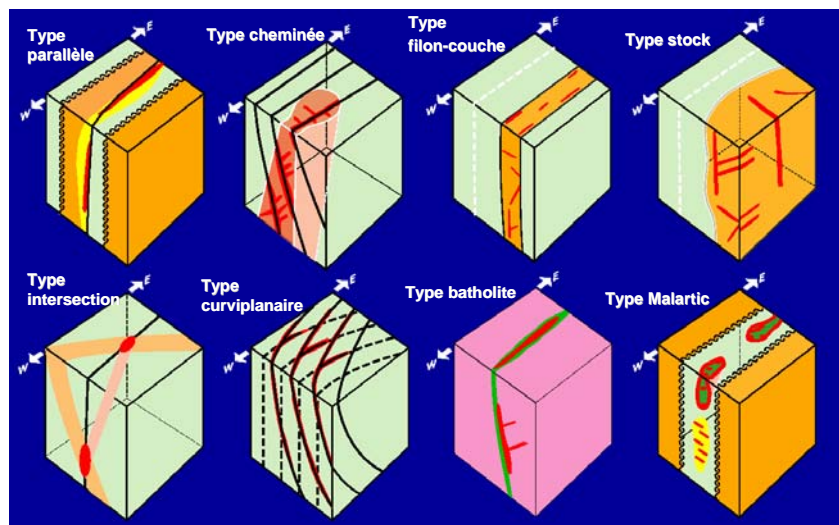
The present study is part of a joint project with MRNF (Ministère des Ressources naturelles et de la Faune) geologists to identify favourable parameters for orogenic gold mineralisation in the Abitibi. The parameters will then be integrated by the MRNF into maps of mineral potential (SPCPM), created using information obtained from SIGÉOM.

The Abitibi gold deposits are characterised by diversity in mineralisation styles, in structural contexts and age of mineralisation; this poses a challenge for integration into the SPCPM. One single metallogenic model cannot by itself reflect the overall gold potential of an area. To overcome this problem, the Val-d'Or – Malartic mining camp deposits were selected to carry out a test for establishing criteria.

Eight types of deposits were defined.

- *Parallel*-type deposits are defined by the level of parallelism between the gold-bearing shear zones and layering. Mineralisation is in QZ-CB veins located in single or multiple shear zones. Veins are associated with planar anisotropies, represented by mafic and felsic dikes contained in the shear zones.

- In *chimney*-type deposits (ex. Camflo), mineralisation is essentially concentrated in small, competent intermediate to felsic intrusions and are cylindrical and subvertical in shape. Mineralisation style is variable: disseminated, in veins and veinlets.



Subdivision of mineralised bodies based on the type of their control structure (planar, chimney, sill, stock, intersection, curvilinear, batholith and Malartic types).

- *Intersection*-type mineralisation (e.g.: Greene-Stabell) is characterised by a dip parallel to the intersection of a crosscutting competent unit and a gold-bearing shear zone. Mineralisation is found in QZ-CB veins.
- *Curvilinear* type of deposits (e.g.: Sigma) are defined based on the curved shape of sheared QZ-CB veins in plan section and by the presence of two shear families that define an anastomosed system.
- *Sill*-type deposits (e.g.: Sigma-2) are defined in terms of the nature of the country rocks. Gold-bearing QZ-CB veins have a variety of geometrical configurations and are hosted in mafic, regionally extensive sills.
- *Stock*-type deposits (e.g.: Bevcon) include QZ-CB veins and veinlets in various configurations and are hosted by intrusions several kilometres in size.
- The *batholith*-type deposit (e.g.: Beaufor) occurs as QZ-CB veins found in the Bourlamaque pluton. Shear veins appear singly or parallel and are associated with planar anisotropies that are mafic dikes.
- Lastly, *Malartic*-type deposits (e.g.: East Malartic) are defined on a spatial and geological basis. Gold-bearing disseminated pyrite mineralisation is hosted in intensely deformed zones, in association with mafic intrusive rocks (diortite) and in small or dismembered felsic porphyry dikes.

The proposed classification shows homogeneity among the deposit groups in terms of: 1) physical size; 2) exploitation depth; and 3) total gold tonnage.

Summary: Project 2001-8	
Objectives	<ul style="list-style-type: none"> To define metallogenic models for orogenic gold for inclusion in the SPCPM (Géologie Québec).
Results	<ul style="list-style-type: none"> Classification of gold deposits in the Abitibi into eight types showing homogeneity among the deposit groups in terms of: <ol style="list-style-type: none"> 1) physical size; 2) exploitation depth; and 3) total gold tonnage.
Tools and Innovations	<ul style="list-style-type: none"> Geological criteria determined for each defined metallogenic model → applications for the SPCPM of Géologie Québec.
Special Collaboration	<ul style="list-style-type: none"> Claude Dion, Pierre Pilote, Jean-Yves Labbé and Daniel Lamothe, MRNFQ Michel Jébrak, UQAM