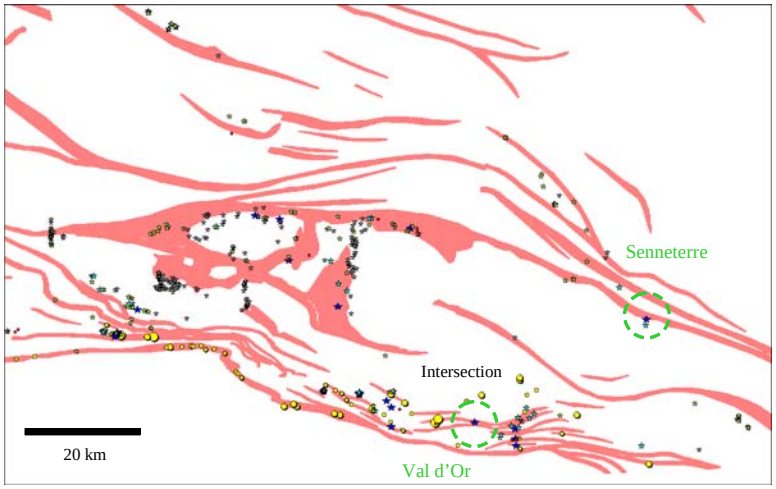
CONSOREM
Consortium de recherche en exploration minérale

Project 2001-5: Opportunity for possible Archean epithermal deposits

The purpose of this project is to provide a general characterisation of epithermal gold deposits and to document possible equivalents in an Archean setting. However, preservation of this type of deposit is very difficult and no single Archean deposit conforms completely to the descriptive and genetic criteria for epithermal deposits. Nevertheless, some Abitibi gold deposits have distinctive VMS and orogenic gold deposit characteristics.



Location of areas favourable for syntectonic gold mineralisation in the Val-d'or – Cadillac region.

Compilation of the characteristics of the epithermal deposits highlights the need for specific petrogenetic processes to generate gold enrichment. These processes are translated in the field as an association with calc-alkaline to alkaline rocks. A brief compilation of the distinctive characteristics of the deposits in Abitibi indicates that they are also associated with calc-alkaline environments. The deposits can be subdivided into 2 groups based on relative temporal relationships. One group of deposits is genetically associated with the construction of calc-alkaline volcanic edifices. Examples are: Doyon, Bousquet (1-2), Dumagami, LaRonde, Géant Dormant, Selbaie and Mouska. The other group includes gold deposits formed during tectonic accretion, in association with calc-alkaline to alkaline magmatism. These types of deposits are distributed along major fault zones and are commonly associated with albitisation of intrusions. Irregularities along the fault zones, such as fault intersections, flexures and pull-apart basins are the main elements controlling magmatism and thus, indirectly hydrothermalism. The Beattie, Holloway, Holt-Mcdermott, Douay, Young-Davidson, Ross, Mattachewan and possibly the Malartic mining camp deposits are examples.

Target areas for the potential of these two deposit types in the Abitibi were generated by using a combination of different physical and lithogeochemical factors. The lithogeochemical databank created for the project on intrusions (2001-3) was used for this purpose. For synvolcanic deposits, the regional selection of calc-alkaline volcanics and PER-alkaline index identified several areas of interest. In fact, the known deposits are associated with alkali leaching of the rocks. For syntectonic deposits, calc-alkaline intrusions were isolated along buffer zones restricted to 2 km from the faults. Alkaline intrusions cannot be isolated because of the changes in the alkali content produced by hydrothermal alteration. The Na/K molar ratio index was used to indicate the level of albitisation. Areas of high potential were identified based on the presence of intrusions with high albitisation index values in association with irregularities along the faults. Seven areas were targeted.

CONSOREM
Consortium de recherche en exploration minérale

Summary: Project 2001-5	
Objectives	• To document the characteristics of epithermal deposits and Archean gold deposits interpreted to be epithermal in origin. • To assess the opportunity for epithermal mineralisation in the Abitibi and to propose favourable exploration areas.
Results	• The characterisation of the epithermal deposits showed a specific petrogenetic setting indicated by the presence calc-alkaline and alkaline rocks. • In the Abitibi, two distinctive deposit groups are associated with calc-alcaline to alkaline rocks: 1. syntectonic Au deposits associated with intrusions along major faults; 2. synvolcanic Au deposits associated with volcanic complexes. • 7 areas were targeted for their potential in syntectonic gold mineralisation. • Several areas were identified as having potential for synvolcanic Au deposits.
Tools and Innovations	• Classification and characterisation of atypical deposits in the Abitibi and proposal of guidelines for exploring for them.