

## Project 2001-7: Opportunity for gold deposits associated with intrusions in the Abitibi

Felsic intrusions are well known for their role as favourable hosts for gold mineralisation, because of their contrast in competence with volcanic rocks. However, the genetic link is a more debated topic. The Abitibi subprovince is composed of a large proportion of felsic plutonic bodies of different size, age and composition whose gold potential is poorly or completely unknown. We also recognise a whole series of small porphyritic intrusions located within or near major fault zones.

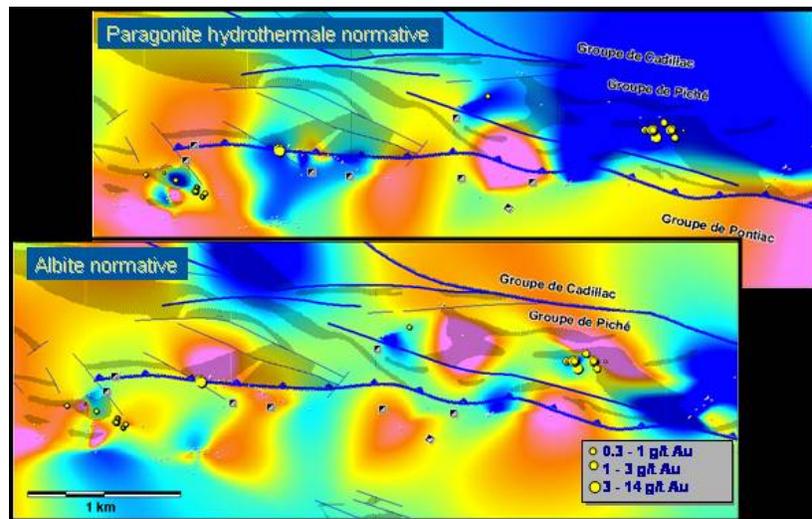
In some Archean belts, such as in Zimbabwe, felsic intrusions contain rich quartz vein or disseminated sulphide-type mineralisation. Also, in the more recent igneous belts, such as in Alaska and Yukon, several gold deposits are described in association with intrusive rocks rich in lithophile elements. The question raised is whether there is a more specific link (genetic?) between some types of intrusions and gold which would justify the use of the lithogeochemical composition of the intrusions as exploration criteria.

This project aims to establish criteria (or a variety of criteria) for this type of mineralisation, to suggest possible ways of responding to the previous question and to verify the potential for this type of gold deposit in the Abitibi Subprovince.

The literature survey part of the project aims to characterise the context of the Archean gold deposits in the three largest greenstone belts, namely the Abitibi, Yilgarn (Australia) and Midlands (Zimbabwe).

The Malartic gold camp, well known for mineralisations associated with a string of small porphyritic intrusions, was chosen for the second part of the study. It was used to test the relationships derived from the literature survey. The geophysical signature and the geochemistry of the porphyries were characterised in the Malartic region. A statistical

study focused on the BAROQ geochemical databank (provided by F. Fallara) to characterise better the hydrothermal alteration on the scale of mine sequences. Lastly, correlation of the major and trace elements, a principal component analysis and a spatial analysis of the alteration was carried out in order to improve the tools appropriate in exploring for this type of deposit.



*Characterisation of the alteration in the Malartic gold mineralisation associated with porphyritic intrusions.*

### Summary: Project 2001-7

<p><b>Objectives</b></p>	<ul style="list-style-type: none"> <li>• To document the main characteristics of gold deposits associated with intrusions.</li> <li>• To document case studies in the Abitibi (Malartic camp).</li> <li>• To assess the opportunity for this type of mineralisation in the Abitibi.</li> <li>• To suggest favourable areas for exploration.</li> </ul>
<p><b>Results</b></p>	<ul style="list-style-type: none"> <li>• Documentation of the setting of Archean gold deposits in the three largest greenstone belts: Abitibi, Yilgarn (Australia) and Midlands (Zimbabwe).</li> <li>• Characterisation of the geophysical signature and the geochemistry of porphyries in the Malartic area:             <ul style="list-style-type: none"> <li>- Correlation established between gold and potassic alteration (biotite and paragonite), as well as an association with alkali leaching.</li> <li>- Magnetic anomalies and albite are good indicators for locating porphyritic intrusions.</li> </ul> </li> </ul>
<p><b>Special Collaboration</b></p>	<ul style="list-style-type: none"> <li>• Francine Fallara, URSTM-UQAT</li> </ul>