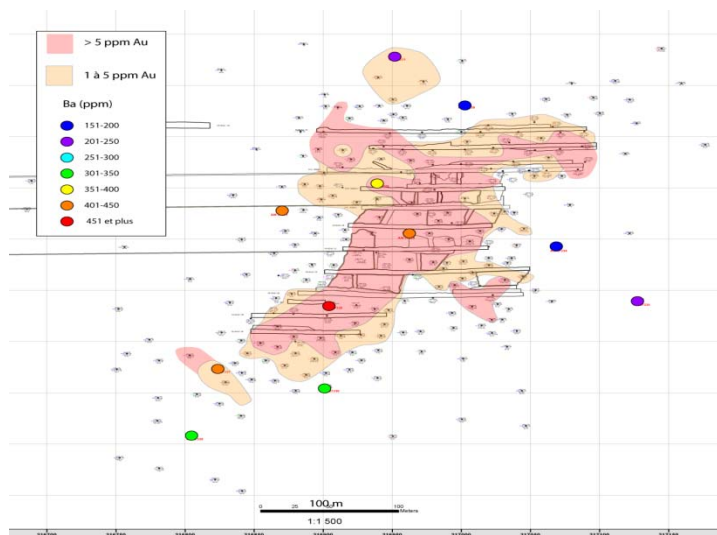


## 2010-02: Gold fertility in shear zones

The objective of project 2010-02 was to define geochemical criteria for evaluating the gold fertility of a shear zone that does not have *a priori* evidence of mineralisation. It is understood that such a tool would be useful in exploration and would help find the extension of structures showing positive signals.

A secondary objective was to define criteria that can also provide pointers to the mineralisation.

To achieve the objectives, statistical analytical methods were performed on geochemical data from the Bourlamaque Pluton located in the Val-d'Or area. This setting was chosen because of its relatively simple geology and because of the many gold mines and showings hosted in the shear zones that cut a relatively homogeneous host rock.



**A map of barium values (ppm) in relation with zone S3 of the Lac Herbin Mine (data: Alexis Mines)**

The available geochemical data indicate that for the case in question, the nickel content of fertile shear zones is greater than 20 ppm. Combined Ni + Co contents greater than 30 ppm are also indicators. The evaluation of the correlation coefficients showed that zinc, loss on ignition (LOI) and chromium have strong correlations (positive and/or negative) with nickel. This led to the development of Ni/Zn vs Ni/LOI and Ni/Zn vs Ni/Cr plots that may be considered to be useful for determining the nature of gold fertility of shear zones in the Bourlamaque batholith.

The distribution of the available samples did not allow for a detailed study of the geographical relationships of the samples with respect to mineralisation. Samples from the Lac Herbin mine suggest an increase in barium towards the mineralisation, but it is not possible to determine if this trend extends to more than 80 metres from the gold-rich zone. Regionally, samples located along the Ferderber shear zone show a slight increase in sericitisation (increased aluminium levels) towards the mineralisation. However, sample distribution does not allow us to confirm this trend.

Project 2010-02 touches on a complex and always topical issue. Although the findings are incomplete and applicable to one specific case (Bourlamaque), they are an interesting starting point for any future work. Some avenues were already known (such as Co content in pyrites), but the current results suggest that standard chemical results can also permit discrimination, making it a faster and easier tool.

<b>Project 2010-02: Summary</b>	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• To define geochemical tools for determining the gold fertility of a shear zone.</li> <li>• To define geochemical tracers to establish exploration vectors for orogenic mineralisation.</li> </ul>
<b>Results</b>	<ul style="list-style-type: none"> <li>• Nickel content is greater than 20 ppm in shear zones fertile in gold.</li> <li>• Ni+Co content is greater than 30 ppm in shear zones fertile in gold.</li> <li>• Ni/Zn, Ni/Cr and Ni/LOI ratios can be used in binary graphs for evaluating fertility.</li> <li>• Barium appears to be a good element to define vectors (local) leading to gold mineralisation.</li> <li>• Sericitisation (high aluminium content) appears to be higher (regionally) close to mineralisation.</li> </ul>
<b>Innovations</b>	<ul style="list-style-type: none"> <li>• Ni/Zn vs Ni/PAF and Ni/Zn vs Ni/Cr plots help distinguish fertile from sterile shear zones, at least in the Bourlamaque batholith, Val-d'Or.</li> </ul>