

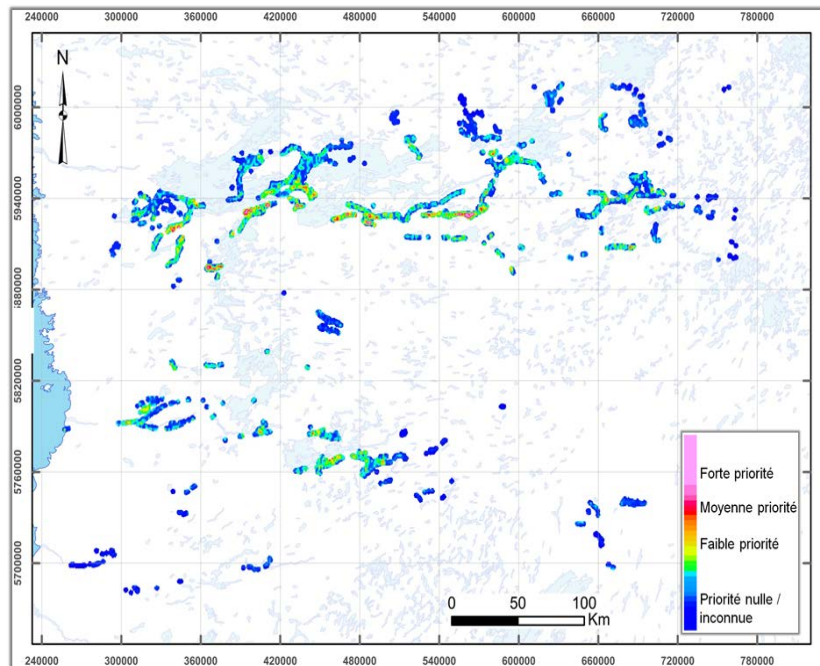
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## THE CONTEXT FOR GOLD MINERALIZATION IN IRON FORMATIONS

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**DETAILS** Gold deposits held with iron formations belong to the orogenic gold family. Documenting the characteristics of these gold deposits and the analysis of, mainly public, geological information, allowed for the proposal of two exploration models in Quebec: one within the territory of James Bay, the other in the Labrador Trough. For James Bay, statistical treatments (e.g., PCA, spatial regression) based on the lithogeology, the geochemistry of bottom sediments of lake and streams, public data, SIGÉOM 2015, private data, and the member companies of CONSOREM, led to the distinction of 1) fertile volcano-sedimentary assemblages (e.g., Guyer, Marbot, Auclair), and 2) areas favourable for gold in iron formations. Other indicators of favourable conditions, such as the presence of structural nodes (complex folding and shear zones) and the coexistence of grunerite/cummingtonite, garnet, pyrrhotite ± arsenopyrite, within metamorphic facies (in particular amphibolitic facies), allows for the targeting of areas of interest. The methodology selected to identify areas of interest is a weighting of layers of favourable elements that, when added together, define a prospectivity map. In total, 150 targets are proposed on this gold prospectivity map for the James Bay iron formations (**attached figure**). Among these, 44 are a priority.

In the Labrador Trough, several favourable areas are identified using an analog approach, based on lithologic, mineralogical, and structural elements. Zones of anticlinal hinges of antiforms dipping weakly to the south-east in the folded structural domain of Thévenet in the eastern portion of the lithotectonic Gériido Zone, are areas favourable for gold when iron formation of the Baby Formation is found. Veins of late (non-distorted) quartz cutting across the fold hinges and encased in iron formations having iron carbonate and sericite facies are markers for areas of interest. Alteration not being exclusively confined to the Middle Baby iron formation, the search for carbonate and sericite alteration halos in the surrounding gabbros—for which these alterations are unusual—could provide efficient exploration tools. In terms of metamorphic conditions, although statistically-speaking the upper greenschist facies are more favourable, there is a potential within distorted and altered iron formations within the lower amphibolite facies, precisely the contact region between the Gériido and Rachel-Laporte zones.



Map of gold prospectivity in the James Bay iron formations.

## SUMMARY SHEET

### *Objectives*

- Document the characteristics of gold mineralization in the context of iron formations.
- Propose exploration strategies for Quebec.
- Assess the mineral potential for Quebec.

### *Results*

- Identification of critical parameters for gold mineralization in iron formations.
- Reinterpretation, through a geophysical approach, of iron formations in James Bay and the Labrador Trough.
- Identification of exploration guides for gold in the iron formations of James Bay.
- Identification of exploration guides for gold in the iron formations of Labrador Trough.

### *Innovations*

- Recognition of new iron formations using a geophysical-based statistical approach.
- Development of a method to identify sulphide alteration halos in iron formations within a longitudinal profile and, therefore, potential gold zones.
- Establishment of close links between the Labrador Trough and the Homestake Sector, with the possibility of applying the Homestake criteria to the trough.