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EXPLORATION STRATEGIES FOR PGE-AU-CU (AND NI-CU) DEPOSITS IN THE LABRADOR TROUGH

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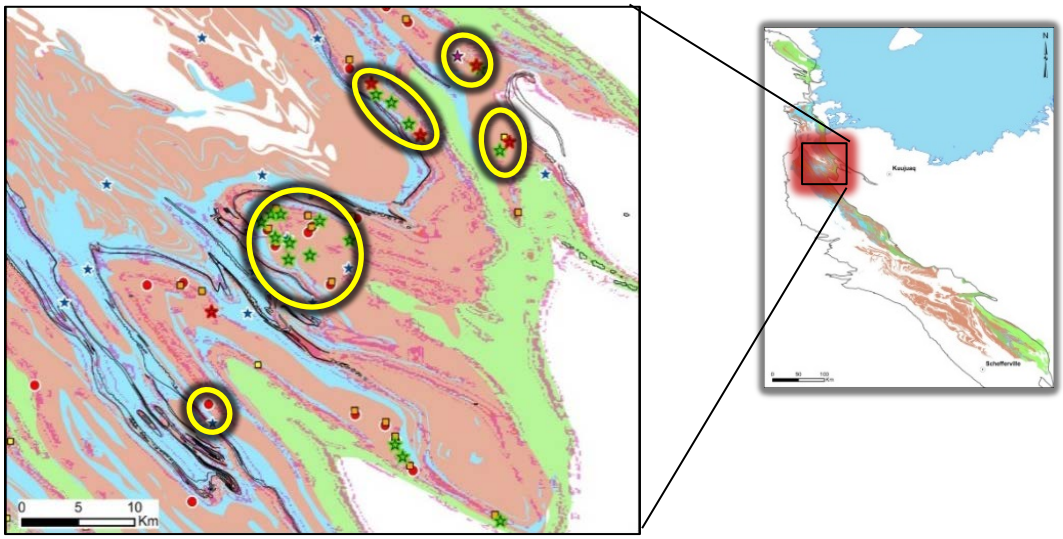
DETAILS

The project mandate was to revisit existing data from the Labrador Through using new approaches, to re-evaluate the PGE-Au-Cu potential, and propose exploration strategies for these substances. In the Gérido lithotectonic zone, two structural domains appear to control the distribution of PGE-Au-Cu and Ni-Cu deposits. The Ni-Cu deposits are in a field of nested rocks (western Gérido) *a priori* devoid of iron formations, whereas the PGE-Au-Cu deposits are in a folded domain (eastern Gérido - Thévenet) richer in iron formations. Through a calculation of contrast, we identified close links between the PGE-Au-Cu mineralization and proximity to the Middle Baby iron formation (≤ 1 km). The Montagnais sills, located less than a kilometre from this iron formation, then become more promising sectors to explore, and a potential is even greater when pegmatitic textures are identified within these sills.

In the southern portion of the Labrador Trough, contacts between the Montagnais sills and the Cycle 2 pelitic, sulphide, and/or graphitic sedimentary rocks (e.g., Thompson Lake Basin) are the regional metallotects for Ni-Cu mineralization. However, we propose a new perspective that is to consider not only the contacts with these Cycle 2 basins but also the contacts of the Montagnais sills with the sedimentary basins having similar characteristics to Cycle 1. In overlapping the interpreted textural elements and electromagnetic anomalies, several areas of interest, in particular the eastern contact of the Denault-Menihek Basin with the Montagnais sills of the Hurst area.

Evaluation of the behaviour of the magnetic signal in relation to the content in Pd-Pt-Au-Cu-Ni in the Montagnais sills produced an unusual result and suggests a new method for determining direct targets in PGE at the local level. A longitudinal profile in three PGE-Au-Cu deposits (Idefix, Lac Lafortune, Paladin) contained in the Montagnais sills indicate that high concentrations of Pd-Pt-Au-Cu-Ni (sum of normalized elements) are well correlated with magnetic depressions.

A global geochemical approach based on the lithogeochemistry of mafic to ultramafic rocks, and on the analysis of lake sediments has helped to identify areas having metal potential.



Favourable areas identified by combining geophysical, analog, and geochemical elements.

SUMMARY SHEET

Objectives	• Re-evaluate the potential and propose exploration strategies for PGE-Au-Cu deposits.
Results	• PGE-Au-Cu program: o Evidence of an inverse relationship between the metal content (PGE-Au-Cu-Ni) and the magnetic signal within the Montagnais sills. o Indirect targeting of environments conducive to PGE deposits within vertical and horizontal gradients. o Recognition of conducive sills: proximity of the Middle Baby iron formation in the Thévenet Folded Zone and when pegmatitic facies are observed. o A maximum PGE potential to the south of the Payne Zone. o Identification of favourable samples in gabbros based on geochemistry diagrams. o Recognition of favourable sectors from concomitant As-Sb-Cu-Ni anomalies in lake sediments. • Ni-Cu program (special collaboration with the MERN): o Identification of direct targets for massive sulphides in pentlandite and/or pyrrhotite based on electromagnetic surveys. o Indirect targeting of favourable environments based on MAG, the vertical and horizontal gradients, and the derivative tilt. o Identification of lithological and textural elements of interest: contacts between the Montagnais sills and Cycle 1 pelitic/sulphidic/metalliferous/graphitic sediments. o Potential Raglan-type Ni-Cu maximum in the Payne (North) lithotectonic zone. o Identification of targets for Ni-Cu in the Payne Zone using Barnes diagrams.
Innovations	• PGE program: o New geophysical approach for the direct targeting of PGE within sills. o Targeting through a multidisciplinary geophysical, geochemical, and analogous approach. • Ni-Cu program: o Interpretation of EM surveys carried out in the Labrador Trough since 1980, and distinguishing of signatures favourable to the mineralization of massive sulphides into pentlandite and/or pyrrhotite.