

# Recommendations for Exploration in the Sudbury District

## NAME OF PROPERTY OR AREA:

Huronian-Nipissing Magmatic Province (Belt)

## AREA WHERE LOCATED:

1. East Bull Lake - Agnew Lake
2. River Valley
3. Nipissing Gabbro sills:
  - a. east of Wanapitei Lake
  - b. in the Penokean Fold Belt

## COMMODITIES OF INTEREST:

Platinum Group Metals (PGM), Ni, Cu

## DESCRIPTION:

Nickle-copper sulphide mineralization has been well documented from the above areas since the early 1900's. Most of these occurrences are small and undeveloped, and as such, received only cursory attention until the recent interest in PGM exploration.

The Huronian-Nipissing Magmatic Province was emplaced in two distinct magmatic episodes. The first phase generated early Huronian Supergroup intrusive bodies such as the East Bull Lake, Agnew, and River Valley intrusions (ca. 2450 Ma) [locations 1 and 2, above]. The second phase produced Nipissing Gabbro intrusions (ca. 2220 Ma) that were emplaced within Huronian Supergroup sedimentary rocks [location 3].

The early intrusions are essentially composed of differentiated leucogabbroic and gabbroic rocks and contain significant PGM mineralization, as most recently discovered by a number of junior exploration companies. There are two distinct styles of sulphide mineralization, namely: (i) disseminated magmatic sulphides, particularly within inclusion leucogabbroic; and (ii) disseminated to massive, structurally controlled sulphides. Both types are enriched in platinum, palladium, copper, nickel and gold. However, the magmatic sulphides are more strongly enriched in PGM.

The Nipissing Gabbro intrusions consist of rocks ranging from chilled diabase, gabbro, gabbroic, and vari-textured gabbro, to pegmatitic gabbro. East of Wanapitei Lake [location 3a], PGM are present in significant quantities in magmatic massive sulphides at the Rathbun Lake occurrence in the Wanapitei intrusion, and in disseminated sulphides, particularly along the contact with the Huronian Supergroup metasedimentary rocks, in the Kukagami Lake and Chiniguchi River intrusions. South and west of Sudbury in the Penokean Fold Belt [location 3b], PGM occurrences are known to occur in disseminated sulphides within the intrusion and along the contacts with the host rocks.

The reader is also directed to Ontario Geological Survey Open File Report 6000, Summary of Field Work 1999, chapters 30, 31, and 33 for greater detail and recent analytical results.