

# The Kwyjibo Cu-REE-U-Au-Mo-F Property, Quebec: A Mesoproterozoic Polymetallic Iron Oxide Deposit in the Northeastern Grenville Province

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## Abstract

The Kwyjibo deposit is the most significant of a number of examples of the iron oxide-copper-gold class of deposits to have been found in the Grenville. It is a Mesoproterozoic Cu-REE-Mo-F-U-Au iron oxide occurrence located approximately 120 km northeast of Sept-Îles, Quebec. The deposit, which comprises different textural facies of magnetite and hematite mineralization, occurs along the southeast margin of the Canatiche granitic complex. Porphyroidal leucogranite and volcanic equivalents of the Canatiche Complex are the main hosts of the mineralization. Calc-silicate rock and hornblende-biotite gneiss, possibly belonging to the supracrustal Manitou Complex, flank the deposit to the southeast and south. Magnetite is ubiquitous in the Canatiche granitoids and generally occurs as disseminations and fine agglomerations. Near the deposit, magnetite becomes progressively more abundant, forming veinlets, veins, stockworks, and pseudobreccias, culminating in locally brecciated massive magnetite, the dominant type of iron oxide concentration. Specular hematite occurs locally as disseminations and veinlets.

Mineralization at Kwyjibo is complex and multiphase and is divided into early granophile, magnetite, main polymetallic, and specular hematite stages. The main polymetallic mineralization, comprising chalcopyrite, pyrite, molybdenite, fluorite, and REE-bearing minerals, is superimposed on preexisting magnetite-rich rocks and shows little evidence of deformation. The Kwyjibo deposit has a number of features in common with other polymetallic iron oxide deposits around the world, including granitic host rocks of within-plate affinity, various textural facies of iron oxide mineralization styles, and sodic and potassic alteration zones. A close spatial association with a major deep seated structure is also postulated.

The Grenville province hosts a major anorthosite belt and is a world-class titaniferous metallogenic province. The Proterozoic era, and especially its anorogenic periods, are the main metallogenic epochs both for iron oxide-copper-gold deposits and anorthosite-hosted Ti-rich iron oxide deposits. Empirical observations suggest a possible petrogenetic relationship between these two important ore deposit types.

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