

From the Mineral Inventory Files

Editor's note: Beginning with this edition of the *Minerals Update*, our Mineral Inventory staff will feature specific mineral occurrences or associations of occurrences in Nova Scotia. The articles will be somewhat light and written for any reader of the *Minerals Update*, whether or not you are a geoscience professional. Topics of interest will include subjects such as exploration history, geological and mineralogical features, and pertinent characteristics of the deposits that may have a bearing on current exploration models. It is hoped that these articles will result in renewed interest in specific deposits, but if not they will at least highlight some fascinating aspects of the mineral resources of Nova Scotia.

Copper Associated with Mafic Plutonism, Antigonish County

Unless you were involved in mineral exploration in the Province of Nova Scotia during the boom years of the 1970s, the names Copper Lake and College Grant will probably not be familiar ones. You are also unlikely to know that these mineral deposits may have a genetic relationship with the nearby stratiform copper deposit at Lochaber. All three Antigonish County deposits share an association with Lower Devonian mafic plugs and dykes. If this perks your interest, please read on and learn a bit more about this association.

At Copper Lake, several fissure veins of brown siderite, chalcopyrite and pyrite, the most prominent being about 3 m thick, intrude a fault zone in Lower Devonian slate. A small mafic intrusion occurs nearby and is thought to underlie the deposit. The prospect consists of several abandoned shafts but since the early part of this century only exploration and underground sampling have taken place. Copper assays from the veins were generally in the order of 5-10% Cu. Dumps on the former mine site are renowned for spectacular samples of siderite breccia. The world-famous Wards Scientific Co. once acquired some of this dump material for hand specimens to go in their student education kits.

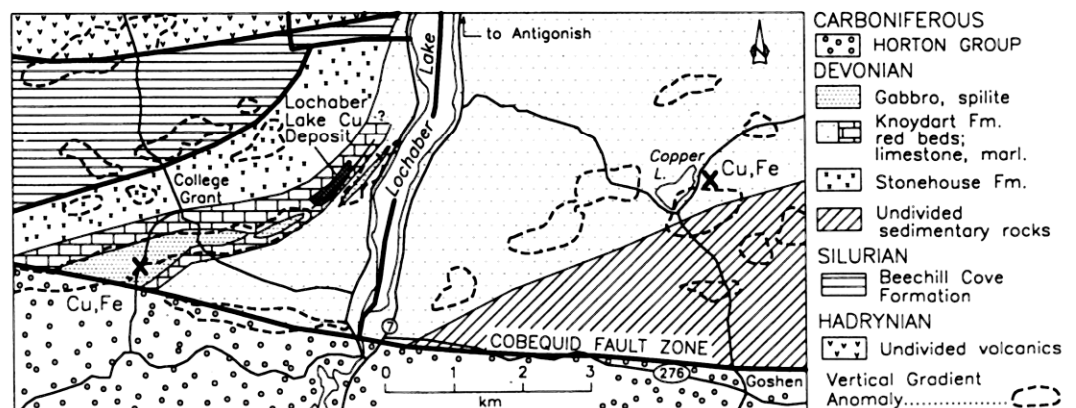
The College Grant Cu-Fe deposit, originally discovered in 1874, has been abandoned since the turn of the century. The deposit consists of numerous

quartz-carbonate veins containing chalcopyrite, pyrite and specular hematite in a small, chloritized mafic plug and the adjacent sedimentary rocks. The veins range from 0.6 to 1.8 m in thickness and contain an average of 10% Cu.

Copper sulphides in interbedded marl, calcareous shale and limestone were discovered at Lochaber Lake in the 1950s. In 1972, Great Horn Mining Syndicate Inc. defined a deposit of 2.29 million tons of 0.33 % Cu, with potential for an additional 3.44 million tons. The deposit consists of bedded, finely disseminated pyrite, chalcopyrite and bornite in the basal 90 m of a 200-m-thick carbonate sequence within the Lower Devonian Knoydart Formation. Of particular note is the association of the bedded mineral deposit with mafic dykes or sills and zones of mineralized, brecciated limestone. These and other features suggest that mafic plutonism played a role in the genesis of this deposit.

The map below shows an association of the three mineral occurrences with airborne vertical gradient magnetic anomalies. Most noteworthy is the northeast extension of the anomaly underlying the College Grant Cu-Fe deposit to include the carbonate sequence hosting the Lochaber Lake deposit. Diamond-drilling and trenching between the two deposits verify that Devonian mafic dykes or sills intrude the carbonate sequence along the entire length of this anomaly. Evidence suggests that mafic plutonism was the source of the fluids and metals that formed the deposits. Given that mafic plugs and dykes are commonplace along the entire length of the Cobequid Fault Zone, knowledge that they have exsolved a metal-rich hydrothermal fluid during their emplacement sets these mafic intrusions apart as viable exploration targets.

George O'Reilly



Map of copper deposits in southern Antigonish County.