

**Preliminary geochemical interpretation of metalliferous sedimentary rocks  
in the Miramichi Anticlinorium, New Brunswick**

David R. Lentz, Steven R. McCutcheon and James A. Walker

*New Brunswick Geological Surveys Branch, P.O. Box 50, Bathurst, New Brunswick E2A 3Z1, Canada*

Connell and Hattie subdivided sedimentary rocks from the Miramichi Anticlinorium by rock type into Ordovician maroon to red argillite and shale (n = 50), maroon chert (n = 14), green to grey shale and chert (n = 23), and black shale and chert (n = 89), as well as Cambro-Ordovician maroon shale (n = 7). This analysis of their litho-geochemical data was conducted in order to help elucidate the processes responsible for the geochemical characteristics of these different rock types. In general, the immobile-element contents are a function of the Al<sub>2</sub>O<sub>3</sub> contents, which are in turn inversely related to the proportion of quartz that may

be either detrital, biogenic or hydrothermal in origin. Fe, Mn, Cu, Pb, Zn, (Ag), Co, and Ni are enriched by hydrothermal processes, although their deposition is related to redox variations within the stratified ocean. Fe/Mn contents reflect the degree of oxygenation with low values indicative of oxic conditions, high values of anoxic conditions, and intermediate values of the redox transition zone. Manganese and cobalt are enriched in rocks with low Fe/Mn contents, whereas Fe, base-metals, U, V, Mo, Cr, and to a lesser extent Ni, contents are higher in black shales, which have high a Fe/Mn ratio.