

Evaluation of hercynite and gittinsite as indicator minerals, Voisey's Bay area, Labrador, Canada

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The use of indicator mineral surveys has become a standard mineral exploration tool in surficial sediment-covered regions. The concept for this method is that robust minerals exhibiting distinctive physical and chemical features associated with mineralization, or from alteration associated with mineralization, can survive weathering and erosion. Identifying and examining these minerals, with the knowledge of the direction of sediment transport, may provide a vector back towards the source of mineralization. In this study I am examining two potential indicator minerals; hercynite and gittinsite in till and stream sediment samples collected around the Voisey's Bay (VB) Ni-Cu-Co deposit in northern Labrador in a previous study. Hercynite has previously been identified as a common spinel phase associated with the country rock assimilation that ultimately led to the formation of the Voisey's Bay (VB) troctolite-hosted massive sulphide deposits. Hence determination of its presence in a surficial sediment might suggest that the sediment was derived from the erosion of a VB-like deposit. The other indicator mineral to be examined in this study, gittinsite, has been identified as the most common rare earth element (REE) phase in the Strange Lake REE deposit over 100 km to the west of the VB deposit. Hence its presence in surficial sediment may point toward potential REE mineralization. The 31 samples for this study have been analysed using Scanning Electron Microscope - Mineral Liberation Analysis (SEM-MLA) techniques to map and identify any examples of these two indicator minerals and to examine any textures or relationships present. These MLA maps will be used to further examine the mineral chemistry of these grains will be analysed using both the Electron Microprobe Analyzer (EPMA) and the Laser Ablation Inductively Coupled Plasma - Mass Spectrometer (LA-ICP-MS). To confirm that these phases mapped by the MLA minerals in the surficial sediment are "indicator" minerals, hercynite in whole rock samples from the VB deposit and gittinsite in whole rock samples from the Strange Lake REE deposit will be analysed by SEM-MLA, EPMA, and LA-ICP-MS. [Poster]