Application of Pre-Concentration Technologies in Sublevel Stope Mining

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ABSTRACT

In recent years, due to increased energy costs, reduced water resources, lower grades of existing deposits and increased costs of transportation, processing and smelting, the extraction of ore deposits has become more expensive and challenging. Hence, many initiatives have been introduced by the industry to reduce the environmental risks and increase overall sustainability of the mining operations. One of the most recent approaches is the implementation of pre-concentration systems into mining operations prior to main processing activities that potentially offer several advantages such as opportunity for early waste disposal, increased head grades and significant increase in profitability. This paper reviews the technical concepts of integration of pre-concentration technology into underground mining operations and formulates a set of required specifications for the implementation of such technology in both regular and massive sublevel stope mining operations. The results of this investigation shows that the optimum integration of this technology in a sublevel stope mining operation should follow the requirements for backfilling and waste management through detailed design and planning.

Keywords: _Underground mining; Pre-concentration; Sustainability; Backfilling; Sublevel stope Mining; Waste management._