Underground Metal Mining

Ore Body Modelling - Basic Concepts and Methods

Introduction

- Mine Planning decisions are contingent upon the successful development of a precise " Ore Body Model" (OBM) that is representative of all the Physical, Geological and Mineralogical dimensions of the ore body.

- The ore body model is constructed by interpolating between "sample points" and extrapolating onto the volume beyond the sample points. Hence accurate data of the core drilling logs and the physical and chemical parameters, form a crucial link in the entire process of developing OBM

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Components of OBM

- The three important dimensions of development of an OBM are:
- (a) The "Physical geometry" of the geologic units that formed and host the ore body
- (b) The " attribute characterisation" in terms of Assays and geo-mechanical properties of all materials to be mined.
- (c) The " value model" in terms of economic mining of the ore body.
- The ore body is conceived as an array of blocks arranged in the three dimensional X, Y Z grid system.

Modelling Practices

- The range of modelling practices can be grouped under two broad categories :

- (i) Conventional Methods : These are tools for quantitative and qualitative estimation based on the geometry and sample configuration

- (ii) Geo-Mathematical methods: These involve fitting a mathematical function, $f(x)$ to define adequately a mineral deposit with respect to the distribution of its size, shape, grade, density, thickness and other geological attributes.