

3. MINERAL TECHNOLOGY

Introduction

The world-wide primary concern is to discover blind or concealed ore deposits, as existing mineral resources are depleting fast. To meet this challenge for the development of mineral sector in India, especially in coming decades, the applicability of new exploration techniques and the use of old techniques in an improvised manner is essential.

The country is largely covered by what can be described as metallogenetically favourable Precambrian Shield and large areas within it characterised by greenstone belt geology. It should also be noted that obvious and easily recognised mineral occurrences have been explored. Presently, the search is essentially concentrated on, with almost no indications, yet hope that inquiry might lead to the discovery of hidden mineral occurrences.

The increasing importance of environmental concerns which sometimes forces international companies to shift exploration to less environmentally sensitive areas and even away from countries with strict environmental controls. Examples can be cited in India from areas such as those covered by tropical forests in the Western Ghats (part of Karnataka, Goa, Maharashtra), Orissa and parts of Andhra Pradesh etc.

Technology Services

Geochemical Survey

Geochemical Survey is one of the exploration methods available. The modern approach (especially with the availability of sophisticated instruments) is to analyse samples for several or multi-elements (twenty or more elements) to locate targets. An understanding of multivariate statistics and software is needed to perform the necessary computations and to process multi-elemental data and relate to the geological setting.

A unique electrogeochemical method for base and precious metal exploration developed in the erstwhile USSR had a limited application in this country. This technique "CHIM method (an acronym derived from three Russian words meaning - partial extraction of metals) has been successfully used in Russia in exploration for gold, lead-zinc, copper, copper-nickel and beryllium deposits under vastly different conditions of geologic environment, overburden and depth of burial. Several deposits have been detected to depths of even 400 m, which are difficult or impossible to detect using surface geochemical or geophysical methods.