

## A REVIEW OF MINERAL RESOURCE ASSESSMENT METHODS



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### ABSTRACT

Mineral resource assessment refers to the estimation and evaluation of mineral materials in the ground both discovered and undiscovered. Numerous methods of mineral resource assessment have been modeled and published by many geoscientists, but few have been put to practical use. Generally, mineral resource assessment methods are classified into two broad categories according to area(s) of application and form(s) of product. These are extrapolation and Analogy methods. Within each broad category are more specific subcategories. To some extent, extrapolation methods use analogy and analogy methods use extrapolation. Irrespective of the method employed, all resource assessments usually follow a four-step process thus: (i) identification of the geologic environment; (ii) determination of mineral deposit types that could reasonably be expected to occur in this environment, (iii) determination of descriptive model of these deposit types and (iv) synthesis and evaluation of the areal distribution and the favorability for occurrence of each deposit type. Recently, geostatistical analysis is increasingly employed in mineral resource assessment with the use of computers and sensors, but many geologists believe that, on the basis of only indirect geological evidence, credible quantitative estimates cannot be made of totally speculative resources well away from known deposits. Thus, emphasis in resource assessment remains on qualitative judgment rather statistical analysis.

### INTRODUCTION

Looking around us, we will find quite a number of some potentially useful raw materials, these materials only become resources if our technological expertise first devise a use for them and then enables us to get them. It thus implies that most of what is now regarded as mineral resources may not have been considered so century ago.

Wright (1973) gave a clear explanation for this when he described Aluminum as a mere scientific novelty used by jewelers in the early days until technology enabled its cheap extraction to qualify it as a resource. Mineral resources therefore include all non-living, naturally occurring substance that are inorganic or organic. Thus, all natural solids, fossil fuels as well as waters of the earth and gases of the atmosphere fall under this definition of mineral resources.

Classification of mineral resources is done on the basis of their uses into two main groups – the metallic and non-metallic mineral resources. According to Skinner (1976), the metallic mineral resources are subdivided into the abundant and scarce metals while non-metallic mineral resources are subdivided as shown in tables 1a and 1b.