EDITORIAL

Relevance of potential field technique in mineral exploration

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Editorial

It is no news that mineral is one of the major sources of raw materials which global advancement is built on. As such, most communities thrive on its ability to explore the earth for different kinds of minerals that would yield economic wealth for her people. A country's greatness is usually the reflection of not only the abundance of mineral resources but how her resources are explored and managed for the good of her citizens. Countries that are graced with ample minerals become developed nations, if these resources are duly explored, exploited and harnessed leading to its industrialization. Her ability to explore the earth for optimal appreciation of these minerals has become a concern of interest as several researches and technological advancement has been conducted in this regard.

Minerals are often deposited beneath the earth surface. Hence, detecting them depends largely on the characteristics or properties they possess which differentiate them from the surrounding media. These properties determine the best geophysical method to be adopted in any survey.

However, what is experienced in most places of the world is that the mineral exploitation is usually done by unskilled miners and artisan who use very crude techniques, lack the technological know-how neither do they conduct exploration in a suitable manner. Inevitably, they ruin the landscape which in turn affects the environment and its resources such as water, soil, food crops and the health of humans and animals.

Geophysical surveys which are the application of physics principles or methods to study earth are used to identify a target of interest, or to harmonize the spatial variation of values of rock properties with variations in the geology. Survey aids in getting valuable information on the geology and to find targets of economic interest. The two types of geophysical techniques are the potential field method which uses the earth's natural field and artificial field method which requires inputting into the earth surface an artificially generated energy source.

Potential field techniques such as magnetic, gravity and resistivity method has no degrading impact on the environment and plays a vital role in mineral investigation. Its application has proven effective in structure delineations - detecting possible areas of ore deposits making it a useful tool in exploring minerals since minerals are structurally and lithologically controlled, hydrocarbons occurrence, groundwater investigations, and geothermal potentials. Besides this usefulness, these techniques have been used in solving problems that are basement related. Thus, its application in delineating structures plays a key role in mineralization localization.

Interpretation of the anomalous pattern presented by the applications of these methods leads to map productions which give guidance to exploration procedures and an idea of the mining potential of the region. They also serve as useful tools for reconnaissance survey. Its role has continued to gain relevance in assessing prospective area in recent times as a result of its distinctiveness.

However, application of a singular method for target detection has proven to be incomprehensive, since similar geophysical anomalies could be related to an anomalous source having different physical properties, mode of occurrence pattern and nature.

Thus, for a more precise result, integration of a minimum of two or more of these geophysical methods has become necessary in order to reveal and characterize these hidden targets of interest.

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