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# OPTIMAL DIRECTIONS OF MINING BLOCK STONE DEPOSIT WITH APPLICATION OF GIS TECHNOLOGIES

The high competition in today's global market of natural stone necessitates self-cost reduction of extracted blocks from natural stone which is possible only by reducing the costs of extraction. This reduction can be achieved primarily through the introduction of modern and efficient technologies of stone mining using high-technology and productive equipment, as well as on the base of comprehensive study of structural features of solid natural stone.

In today's world, more and more companies working in the field of geology and geotechnology use special software and information systems in their work. The use of these systems can significantly speed up processing and analysis of information. Such systems can automate the processing and interpretation of geological data and use them to model fields.

For mining we should consider all possible details of mined rocks that can increase their value in the market. Taking into consideration the fact that a large number of indicators derived from the exploration describe the structure of deposits, it is expedient to solve various geological problems using computer design to display characteristics of deposits on diagrams, plans, tables and graphs. The rationality of mining process, the selection of mining methods, as well as economic feasibility of mining and capital works development depends on these indicators.

The purpose of this research is to determine the optimal areas of mining gabbro deposits with application of modern information systems.

Geometrization of gabbro deposits using GIS technologies is the object of the research process.

One of the issues to be solved in the course of geological research and in the process of block stone geometrization is the study of a deposit structure, such as shape, size and position in bowels.

Geometrization of mineral deposits is the method to study geological forms and conditions of their occurrence, properties of matter, substances filling these forms, as well as processes occurring in bowels, and to depict these characteristics in drawings (maps, posters, sections, charts, etc.).

The method of geological sections and profiles, the method of isolines and the method of three-dimensional models are the main methods to study and image graphically various indicators of a deposit.

Geometrization of mineral resources capacity is made by building isopower plans. Isopower plans can be used in planning mining works and costs for deposits development, as well as in the process of minerals extraction, etc.

Three-dimensional modeling allows us depicting mineral deposits, which in turn, promotes the most complete visual presentation of geological body structure. Modern computer technology of deposits modeling is an effective tool for analysis and processing information on geological prospecting.

GIS is a logical extension of databases that helps to complement visual information presentation and enables to solve problems of spatial analysis.

The most important characteristic of GIS is the ability to link cartographic feature (objects that have shape and location) with descriptive, attribute information relating to these objects which describes their properties.

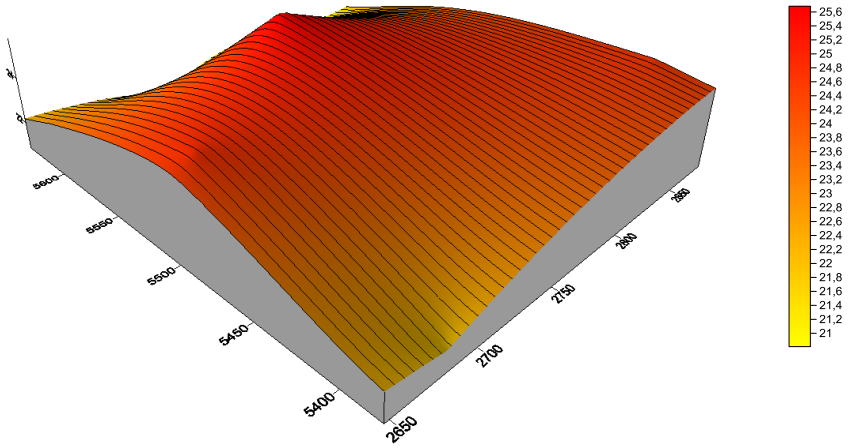


Figure 1. *Three-dimensional model of minerals thickness*

Having the data on prospecting wells we perform the interpolation of values obtained by software SURFER 11 and get volumetric three-dimensional model of a deposit (Figure 1).

Analyzing three-dimensional image (Figure 1) we can determine thickness of the layer of minerals in any part of a deposit and define areas of maximum and minimum values.

Conclusion. The development and implementation of modern information technology help to increase the efficiency of mining enterprises in the market economy, to reduce financial costs and provide economic feasibility of mining. This will present comprehensive geological information based on geological models and digital plans of deposit topography.