Conclusion

The monograph is devoted to methodology, to a new approach to developing and improving the stability of the quarry sides, new ways to increase the stability of the slope of the ledges by strengthening and strengthening them, is the result of three years of research.

In the course of the work, an analysis of the world experience in the study of the geomechanical state of the mountain massif in complex mining-geological and mining conditions during the mining of mineral deposits by the open method is carried out. Based on the analysis, it can be concluded that mineral deposits developed by the open method are characterized by a great variety of mining, geological, mining, geomechanical and technological conditions.

The influence of structural-tectonic features and physicomechanical properties of rocks on the stability of slopes with the factor of time and mass explosions was investigated. From the variety of factors affecting the stability of slopes with enclosing rock and semi-rock rocks, three main factors have been identified that require compulsory registration in the study of geomechanical processes.

Based on the study of the fracture of the tectonics of the deposit, developed by the open method, the types of work were determined: field work, drawing up and processing of point and other diagrams based on field measurements to identify crack systems; study of physical and mechanical properties of rocks; laser scanning; geophysical research. It is recommended to conduct local researches of a pit slope placed in the limit position, in the area of which drilling and blasting operations are planned, and to find out the depth of disturbance (cracks, shears, discontinuities, etc.) using the method of thermometry.

A number of repeated experimental studies using the method of thermometry were carried out on various rock samples both integral and with fine fracturing. Dependences of the output voltage of the photodetector on the temperature of the sample surface—emitters for different rocks are obtained.

K.-K. Kassymkanova et al., *Geomechanical Processes and Their Assessment in the Rock Massifs in Central Kazakhstan*, SpringerBriefs in Earth Sciences,
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To prevent deformation of rocks, artificial reinforcement is proposed, which makes it possible to provide the necessary stability of the slopes of the ledges of the non-working sides of quarries and in some cases to prevent possible collapse of rocks in weakened areas, in others—to significantly reduce the amount of stripping work.

A distinctive feature of the work is that new methods for developing the composition of cementitious solutions for hardening and strengthening pit slopes have been explored and proposed in detail.