

## ENVIRONMENTAL PROBLEMS OF THE MINING INDUSTRY

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***Annotatsiya.** Maqolada tog‘-konchilik sanoatining turli tarmoqlarini faoliyati natijasida atrof muhitga ta‘sir ko‘rsatadigan omillar va ularning salbiy oqibatlari ko‘rib chiqilgan. Tog‘-konchilik sanoatining atrof muhitga ta‘sirini kamaytirishni takomillashtirish bo‘yicha tavsiyalar keltirilgan.*

***Kalit so‘zlar:** Ekologiya, tog‘-konchilik sanoati, xomashyo, qazib chiqarish, mineral resurslar, texnika, texnologiya.*

***Аннотация.** В статье рассматриваются факторы, влияющие на окружающую среду в результате деятельности различных отраслей горнодобывающей промышленности, и их негативные последствия. Даны рекомендации по улучшению снижения воздействия горнодобывающей промышленности на окружающую среду.*

***Ключевые слова:** Экология, горная промышленность, сырьё, добыча, минеральные ресурсы, техника, технология.*

***Annotation.** The article examines the factors affecting the environment as a result of the activities of various branches of the mining industry, and their negative consequences. Recommendations are given to improve the reduction of the impact of the mining industry on the environment.*

***Keywords:** Ecology, mining, raw materials, mining, mineral resources, machinery, technology.*

The modern stage of the world economy is characterized by an increase in the scale of use of natural resources, a sharp complication of the process of interaction between nature and society, and an acceleration and expansion of the scope of occurrence of specific natural-anthropogenic processes due to the man-made influence on nature.

It is impossible to imagine the development of any society without the active consumption of natural resources that ensure scientific and technical progress and social well-being. In this case, all resources are renewable (soils, plants, animals, part of hydropower resources, etc.) and non-renewable (including almost all mineral resources, oil, gas, etc.), coal, precious metals, jewelry and precious stones, etc.) can be divided into types. Extraction and processing of resources, as a rule, is accompanied by a number of factors that affect the habitat and human activity.

The mining industry is a complex of production branches for geological exploration of minerals, their extraction from the ground and preliminary processing (enrichment). The man-made impact of this network on the natural environment is increasing year by year. Because the extraction of mineral resources is carried out in difficult conditions - from a great depth, in difficult conditions, with a low amount of valuable components, etc. [1].

The peculiarity of the use of natural resources within the mining industry is that suitable enterprises are established in the mining area itself; their production capacity and service life mainly depend on the size (volume) of mineral reserves. The mining industry is characterized by scalability and high specialization of production, so the principle of expansion of mining companies is preserved. The extractive industry is a very large consumer of material resources, first of all, natural resources, and is accompanied by a large impact on the natural environment.

In the zone where mining enterprises operate, land is withdrawn from agricultural circulation, the integrity of the subsoil and the water regime are disturbed, the surface of the earth, water sources and the air basin are polluted; after all, in most cases, new landscapes are formed that do not meet the conditions of normal life activity of people.

Mining of minerals by open or underground methods, as a rule, is accompanied, on the one hand, by the formation of cavities and depressions (which cause landslides and subsidence of the earth's surface), on the other hand, by the formation of huge "empty" rocks. produces waste. In the conditions of the development of the modern mining industry, billions of cubic meters of rock mass are mined every year in the world, but we are surrounded by mostly unstable landscapes everywhere. In addition, the tendency to increase the depth of mining and develop mines with a low amount of useful components will further strengthen these processes. All of the above, in one way or another, is related to the change of the earth's surface, its morphology, relief, and the formation of new man-made landscapes [2].

The following are the main types of activities that cause environmental degradation in mining:

- passage of mining facilities serving mineral extraction and mining operations;

- transportation of mountain mass by railway, conveyor, car or hydraulic method;
- mineral processing;
- placement of minerals and mineral waste in warehouses and their subsequent disposal;
- ventilation of mountain structures, neutralization and neutralization of harmful substances released into the atmosphere during the operation of machinery and equipment;
- purposeful change of the properties of the mass of mined rocks (solidification, buffering, thermal exposure, etc.);
- energy supply of mining enterprises;
- recultivation and construction works;
- drainage and drainage measures.

The main negative factors affecting the environment include:

- use of natural and energy resources;
- subsidence of the earth's surface as a result of mining operations;
- formation of a significant amount of enrichment waste when separated for storage;
- release and disposal of substances harmful to the environment [3].

During the extraction and processing of mineral raw materials, the atmosphere is polluted during the process of crushing and burning natural and artificial materials, in which up to 2% of the mass of the processed material can enter the atmosphere. The main waste is dust and gaseous waste. Mining, drilling and blasting, loading and unloading of rocks and minerals, their transportation, crushing, ore processing, waste disposal lead to intensive dusting. Mineral enrichment produces waste consisting of mineral and rock particles.

Open-pit exploitation of mineral deposits is usually characterized by more intensive pollution of the atmosphere with harmful substances: with dust and gaseous products generated during mass explosions and the operation of transport.

During the use of mineral deposits, a significant amount of loose rocks are mined together with them, and large collections of them are formed on the surface of the earth. According to the rule, the mined raw materials are processed. If, for example, the ore has 30% of useful substances, the remaining 70% of it is free rock, which is separated during the beneficiation process. Then the concentrate, which has about 60% of the useful component, goes into technological processing, as a result of which waste appears again. The accumulation of waste creates man-made formations on the surface of the earth. Waste often becomes the cause of the formation of a catastrophic ecological situation in the region.

The expansion of mineral extraction, the construction of engineering and transport communications leads to a sharp increase in disturbed soil and relief areas. It is known that open mining of minerals is economically feasible. In this case, labor productivity is 5-6 times higher, and the cost of the product is 2-3 times cheaper compared to the underground method. However, open-pit mining is accompanied by a significant disturbance of the landscape and hydrogeological conditions of the mining area or a complete loss of soil cover in significant areas. Therefore, the expansion of mining operations in the existing technologies, the increase in the extraction of minerals always ends with the reduction of biologically productive land and the disruption of the existing ecological balance.

Enterprises of the mining and chemical industry are energy intensive and energy consuming. The main type of fuel used today is natural gas (alternatively - fuel oil). In addition to electricity and fuel, enterprises consume thermal energy in the form of heated steam and boiling water. For the production of heat carriers in the form of heated steam, boiling water and heat agents, taking into account the technologies available in the world today, direct burning of fuel is mainly used, which is not considered an optimal option [4]. The main share of used fuel and energy resources is electricity.

In the problem of protecting the environment from the harmful effects of the mining industry, one can give an example of unresolved issues related to a number of objective and subjective reasons, including:

- Inadequate justification of environmental restrictions in mineral extraction and processing technology;
- the qualitative difference of matter and energy circulation in artificial (economic) systems compared to natural (ecological) ones;
- insufficiently developed methods of economic assessment of natural resources and the damage caused by the mining industry to the elements of the biosphere;
- insufficient knowledge and skills of mining industry workers in environmental issues.

If at the end of the last century, environmental protection meant only the development and implementation of precautionary measures, today the level of development of production requires the expansion of this concept, taking into account the planned management of the use of natural resources.

The introduction of modern, reliable, and energy-saving technologies is aimed at an uninterrupted supply of all types of energy [5].

Greening of the mining industry implies the following:

- improvement of existing mining techniques and technologies and development of new ones to increase the level of extraction of mineral raw materials from the ground and to be involved in the extraction of mineral reserves;
- reduction of production resource consumption due to improvement of production technologies;
- reduction of man-made impacts on the environment related to the use and production of mineral deposits;
- increasing the number of people employed in industrial production by expanding the branches of the industry for the secondary processing of raw materials;
- expansion of the industrial production structure due to the use of high eco-technological equipment for cleaning and processing of secondary raw materials;
- introduction of closed and multi-stage technologies that minimize the amount of waste in production, efficiently use electricity, and reduce the level of impact on the environment.

A successful solution to the greening of the mining industry will provide an opportunity to obtain additional volumes of raw materials; reduce costs for the development of new raw material regions; stabilize the price of mineral raw materials; significantly reduce the scale of the impact of the mining industry on the environment and at the same time creates conditions for effectively overcoming the negative traditions of the development of the mining industry.

Thus, careful and comprehensive consideration of the quantitative and qualitative indicators of the impact of the mining industry on the environment will reduce its harmful manifestations to a minimum. The formation of an eco-friendly mining industry makes it possible to use mineral resources relatively fully, optimize the level of anthropogenic effects on the environment, and achieve significant economic efficiency in the national economy.

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