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PROPERTIES OF COAL, PROCESSES IN COAL MINING COMPANIES, METHODS OF COAL MINING IN THE WORLD

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NOTES:

Coal is a strategic and important source of quality of life, energy security and sustainable development. It is the cheapest energy source, second only to oil, which produces 40% of the world's electricity. the extraction of conventional coal fuel can pose a threat to human health by polluting the air and water. It can damage the earth and contribute to global warming. Impact on the environment Coal mining and consumption associated with traditional methods can affect all components of the environment, and these effects can be beneficial. harmful, permanent or temporary, irreparable or irreparable and reversible or irreversible in nature. These effects require thinking about changing coal production and consumption on a technological basis. Coal mining. Practices can have a quantitative and qualitative impact on mining systems and surrounding water systems. Considers the impact of coal mining on the development of water resources. Landslides, disturbances in hydrology, canals, floods, pollution of water resources, and declining water levels are the main effects measured in mining activities in the hydrological environment.

Keywords: coal mining, coal energy, groundwater quality, environmental impact, sustainable development

INTRODUCTION:

The development of the economy depends on the country's natural resource potential. These are the main factors influencing the sustainable development of natural resources and the environment. For decades, great attention has been paid to mining and sustainable development. Research for scientific and public policy institutions has been conducted around the world. Coal is the cheapest fuel.

Energy security:

Among natural resources, coal is one of the three main energy resources and is used to produce 40% of the world.

Areas of Power Supply:

Coal consumption looks like this. It has increased by 50% so far this year. Since 1961, coal and coal-based power plants have brought prosperity to countries around the world.

Hundreds of millions of people have started coal mining since the mining and energy industries began to be used. However, coal mining and processing has had a negative impact on the environment, human health and climate change. For example, in the process of global mining of 7.8 billion tons, coal damaged 39% of global production of CO2 and methane and killed millions of people. Coal and water are two interrelated sources. The most important component for the mining industry. The hydrological consequences of coal mining are important and complex, as mining can be reduced, leading to water tables disrupting the natural water flow regime, and to surface and underwater surfaces.

Pollution:

The impact of prospecting and excavation work on water quantity and quality can lead to disruptions or delays in the mining process in various studies. Water surface instability, potential flooding, uncontrolled utilization and collapse of landfills pose significant challenges for sustainable mining. Overall, more than 50% of the world's largest coal producers or consumers are exposed to water pressure. For example, large coal producers, such as Japan, Indonesia and South Korea, have developed rapidly. Floods as a result of coal mining (flooding of the mine); and are recognized as states with high water pressure.For example, abandoned coal mines in Pennsylvania from acid mine drainage (AMD) have been in decline. Every year, the level of 8,800 km of rivers can change dramatically, which has a serious impact on the mining process and leads to the closure of the deposit. Development of coal mining trends and impact on water resources (i.e., specific value of coal). It causes processes that cause the layers to crack and sink. Coal resources are extracted through surface and underground mining. Both of these methods disrupt aquifers, which can also increase the velocity of water leaving the deposit. There is a very complex interaction between coal mining and water resources, which leads to potential. It also affects hydrology and water quality. A five-year intensive study in Pennsylvania found that the decline in coal mining in the region had a direct impact on the supply of 9 percent of total water. Different natural properties and mining methods include different types of wastewater sources. Aquifers and rocks, the geochemistry of the coal seam and its auxiliary aquifers, the topography of the mountains are also processes that lead to changes in location. Hydrogeochemical processes, including; cation exchange reactions, interactions, and water flow also affect geochemistry and evolution. The volumes produced can also be large: The coal mining industry also produces large amounts of coal, while the mining process generates solid waste. It is one of the largest sources of solid waste and accounts for 40% of total solids. For example, waste produced in China. This coal waste covers an area of 15,000 hectares. Coal wastes usually contain sulfide and iron minerals. For example, pyrite (FeS2), chalcopyrite (CuFeS2), sphalerite (Zn, Fe) S, galena (PbS), troylite (FeS) and pyrrhotite (FeS), siderite (FeCO3), illite (K, H3O) (Al, Mg, Fe) 2 (-Si, Al) 4O10 [(OH) 2 (H2O), ankerite (Ca (Fe, Mg, Mn) (CO3) 2). Under oxidation conditions, these sulfide minerals decompose as follows. acid-forming equation.

$$FeS_2 + 3.75O_2 + 3.5H_2O = Fe(OH)_3 + 2SO_4^{2-} + 4H^+ \quad ($$

Coal-bearing AMD can also have relatively high metal concentrations of Ag, As, Cd, Cu, Cr, Hg, Mn, Mo, Ni, Pb, Sb, Se, Zn. shows. Components of coal will probably appear. Aqueous pH, temperature, Fe and O2 content, water saturation level, chemical activation energy and rate of biological degradation have been shown to be the main control means of AMD generation.

Coal-fired AMD can be Neutralized:

A) To study the formation of an acid-forming reaction, the effect of oxygen and water on pyrite and other sulfide minerals. b) reactions with carbonates (aragonite, calcite, dolomite and siderite), silicates, aluminosilicates and Fe and Al hydroxides. Such alkaline mineral waters are produced, for example, by neutralization and coal.

$$CaCO_3 + H^+ = Ca^{2+} + HCO_3^-$$

Carbonate-AMD reactions, for example, are associated with the release of high amounts of Fe content.

Mn, Ca^{2+}, Mg^{2+} and. It has a negative impact on the quality of groundwater associated with coal mining.

1.2. Impact of Landslides on Regional Water Systems:

Neotectonic movements of underground processes can cause subsidence, subsidence and uplift of infrastructure. During surface and underground excavations, 100 m of overburden was removed from the soil or rock layers. The dispersion of deformed and displaced waste rock puts pressure on the greater subsidence of the surface, alters permeability, porosity, and changes the hydraulic gradient and water level of the layers. Coal mining in various areas leads to landslides. One of the important factors influencing the subsidence surface due to coal mining processes is the structures and water resources. Sedimentation is the movement of surface and subsurface, horizontal and vertical surface to voids can be small or large scale, generalized or local. , speed, and method of extraction. In many parts of the world, coal is mined underground. Sinking occurs due to a steep slope (at an angle of 40 '). Similarly, the long wall of coal mining in Australia since 1982 has led to the destruction of infrastructure as a result of landslides. The cracking and subsidence of these common layers increases the interaction of water permeability. In the Rivulet holder in Sydney, for example, in Australia it has been proposed to deposit metal elements in water of high concentrations. Decreasing the ground level also changes the slope of the surface, which affects drainage. This can also reduce the thickness of the aquifers during natural storage, and create a permanent. Sedimentation has also increased the efficiency of mud retention. Sedimentation affects surface waters by disrupting and diverting river channels, cracking river bottoms, and destroying and reducing floods and water bodies. Flow rate, and induction of surface mixing groundwater, resulting in deteriorating water quality. For example, sediments formed as a result of subsidence as underground deposits are heavily polluted by water bodies in Huainan Province (China) with Cr, Co, Ni and As.

1.3. Disruption of Hydrological Pathways:

Mining requires smaller volumes of water than mineral processing (dust removal, equipment cooling, and firefighting); but during the large-scale movement of heavy machinery and the development of mining, the material can significantly disrupt the natural landscape and affect the water regime of the area. The main factors that control water flow include the hydrogeology of the area, permeability, landscape, topography, coal depth and height, and the size of the mines. These factors have a greater impact on water. Charging, discharging and storage capacity. In this case, the impermeable soils of Barapukuriya (Bangladesh) are artificial lakes in the subsidized areas around the coal deposits, which reduce the water level and the water quality in this area deteriorates. Everywhere, the rocks are constantly deformed. The deposits significantly change the topography and impact. Permeability by disrupting local flow patterns and storage capacity of water pipelines. For example, coal mine waste is stored in dryers, refilled with mines, dumped into built dams, or

dumped nearby. In some cases, there are losses as a result of intensive coal mining. affects the rate of evapotranspiration of the extracted and hydrological cycle, as well as the storage capacity of unconsolidated aquifers. may come. As a result, open fields are flooded, deep lakes are formed, and mines are submerged. Groundwater may require an active pump, especially in areas with high rainfall and low evaporation rates.

1.4. The Drop in the Surrounding Water Level is a Dehydrated Zone:

Areas where coal is mined by the surrounding aquifers are usually deeper. It decreases over time. Large volumes of often load layers are removed to facilitate underground coal mining. This requires mining waste and heavy mechanics. Mining has led to soil compaction. These properties further reduce the rate of infiltration. One example of a water table is a landfill in Leslie County, Kentucky, where groundwater levels have declined in another mining area. Another study in Pennsylvania found that a total of 2,800 water supply canals 9% of mines with a radius of 61 m reduced water. However, the study of long-wall excavation. It is affected by dewatering or leakage of underground mining cavities.

Filling and Dehydration: Causes of Flooding

In the case of groundwater, it leads to large-scale mining, cracks and fissures, over / under layers, where additional stress and the addition of these properties lead to subsidence and causes of landslides. In order to survive, this flood requires dehydration. Precise properties of aquifers, geological properties and failure of mining strata. About 80% of water flow cases are zones associated with geological faults. This causes the water structures to rise in height. The water level known as the return of groundwater. This rebound is a rise in groundwater that stops pumping operations, as well as passive (internal flooding) or active flooding (external flooding) in which water flow occurs. In the example of France, where half of the coal basins are flooded per year, the mine water of these French deposits flows to the surface, and the water basins, including rivers (95%), lakes (4%) and seawater (1%) If we take China, the main categories of water flow phenomena can be divided into four, i.e. 1) floods due to calcareous aquifers (92.3%), 2) flooding of surface waters (4.9%).), 3) alluvial flooding of water (1.4%) and infiltration of sandstone (1.4%). equalized. This groundwater recovery process depends on the coal seam, volume, and geological characteristics of the areas to be mined. For example; for example, observations of the Ruhr (Germany) have shown that the rate of recovery of permeable clay mineral structures in the extracted areas is increased. through the rotation of surface water channels, the system acquires these important hydrological and ecological properties. Continuous mining and dewatering can reduce the impact of depression cones and hydrology gradient, and therefore require replenishment. Now, if the water level is towards the river, i.e. the hydraulic gradient of the aquifer is towards this river, the groundwater is poured into the river. When the opposite situation occurs and the water flows from the river to the stream of water.

Creating a new hydrological environment

As a result, new hydrological environments are being created due to land degradation, impermeable or less permeable conditions, local charging and mixing groundwater and surface water movements. For example, due to the large massif, the sinking surface of shallow coal deposits collapsed into water bodies. Near these reservoirs, the effects of surface water and precipitation have been turned into swamps. Similarly, drowning around the Barapukuriya coal mining area has artificially turned Bangladesh trenches. It also replenishes as a result of excavation of underground deposits (removal of mountain peaks), altered local

channels of water flow. In this case, the fillers act as an empty aqueous layer. The hydraulic barrier inside the pipe increases the storage capacity of the shape of the rough layers, which in turn increases the shelf life and enhances the additional effect of the water stone. Such an event occurs in the city of New South Wales in southern coal mines, Australia, where surface and groundwater intensify the interaction of aquifers. These aqueous rokinteractions may involve the dissolution of carbonates by mountain air and oxidation-reduction. The reaction of metals with oxides and alkalis enriches the solids and metal content in which they are dissolved. As a result, more chemical modifications are formed from shallow groundwater. In another, for example, the dewatering of the Upper Silesian coal deposits leads to the outflow of Polish alkaline water. Na^+, SO_4^{2-}, and Cl^- concentration. Similarly, in Spain, coal was formed as a result of dewatering of flooded deposits. New hydrological system with high concentration basic ions (HCO_3^{2-}, SO_4^{2-}, Ca^{2+}, and Mg^{2+})

2. MAJOR WATER-RELATED ACCIDENTS IN COAL MINING:

Coal mining can be a complex and disastrous process. It can be caused by traditional and poor mining practices. Heavy accidents and deaths of miners. These events are caused by mudslides, coal dust and gas explosions, poisoning and suffocation, roof and accidents and floods. Causes and various socio-economic and environmental problems associated with accidents. Approximately 80% of coal-related deaths worldwide are recorded in China, the world's largest coal producer. The mortality rate is 7.22, 1.27, and 0.02, respectively, per million tons of coal in Turkey, China and the United States. Mine safety measures implemented by 2001-2010 will be improved. The Chinese government has reduced the death rate, but the highest rate is 0.25 deaths / million tons, 10 and 87 times reported deaths for India and the United States. Causes of coal mining in China include gas-related explosions and explosions, poisoning and suffocation, flooding, mine flooding and fires. Among these catastrophic events, gas explosions were reported to be the most severe. The 2015 Soma coal mine accident in Turkey is one of the most horrific incidents recorded in the last 6 years, with 300 causes and more than 80 injuries. The Central Mining Fund of Pakistan reported an average of 100,200 workers each year. These accidents occurred as a result of untrained workers and poor mining practices. About 328 people were killed, and accidents (with 354 deaths) were recorded.

3. MEASUREMENTS AND TECHNOLOGICAL PROCESSES:

Coal plays an intermediate role in the urbanization process. Industrialization and modernization, but its mining, transportation and disposal have had serious environmental impacts in many areas. Coal mine water is contaminated and drained by surface bodies, with the separation of useful metal (loid) elements and the reduction of recycled or residual waste rock. Such measures reduce soil erosion and water runoff and improve soil, water and air quality in the area. An example of this is the Jhariya coalfields (India), where reforestation using selective planning is a process of soil erosion and reduction of pollutants around mining areas. In terms of recycling, the coal mine is used as a waste rock from China's Tiefa coal mines (CMWR) in brick production, power generation, sediment recovery, and as a fuel mixture. These brick factories produce 1.6 billion bricks a year. net profit of 49.43.5 to 1.377 Mt yuan / year using CMWR. This brick production facility was rehabilitated on 2.67 hectares of land from CMWR. The net benefit for power generation is 9

yuan and the fuel mixture is 19.53. Here, the transition to advanced and modern has led to a decline in transfer practices.

4. CONCLUSION:

Coal is an important global energy fuel, but the coal mining industry is facing major global challenges that need to be addressed. We have presented here an overview of the published data on measurable items to focus on the development of environmentally friendly resources of coal mining. Industrial acid mining drainage, landslides, floods, new hydrological zones, deteriorating water quality and declining water levels are the main problems of coal mining. At the same time, it is moving forward. Sustainable mining can lead to the improvement of industry. Growth, protection of the environment and human health Protect the surface and underground environment.

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