

A REVIEW ON COAL MINING AND THE ENVIRONMENT

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ABSTRACT

Coal mining, particularly surface mining requires large areas of land to be temporarily disturbed. This raises a number of environmental challenges, including soil erosion, dust, noise and water pollution, and impacts on local biodiversity. Steps are taken in modern mining operations to minimize impacts on all aspects of the environment. By carefully pre-planning projects, implementing pollution control measures, monitoring the effects of mining and rehabilitating mined areas, the coal industry minimizes the impact of its activities on the neighboring community, the immediate environment and on long-term land capability.

Key Words: Coal mining; Surface mining, Soil erosion, Dust, Noise, Water pollution

INTRODUCTION:

The following effects may cause by coal mining to environment.

Land Disturbance

In best practice, studies of the immediate environment are carried out several years before a coal mine opens in order to define the existing conditions and to identify potential problems. The studies look at the impact of mining on surface and ground water, soils, local land use, native vegetation and wildlife populations. Computer simulations can be undertaken to model impacts on the local environment. The findings are then reviewed as part of the process leading to the award of a mining permit by the relevant government authorities.



Mine Subsidence

Mine subsidence can be a problem with underground coal mining, whereby the ground level lowers as a result of coal having been mined beneath. A thorough



understanding of subsistence patterns in a particular region allows the effects of underground mining on the surface to be quantified. The coal mining industry uses a range of engineering techniques to design the layout and dimensions of its underground mine workings so that surface subsidence can be anticipated and controlled. This ensures the safe, maximum recovery of a coal resource, while providing protection to other land uses.

Water Pollution

Mine operations work to improve their water management, aiming to reduce demand through efficiency, technology and the use of lower quality and recycled water. Water pollution is controlled by carefully separating the water runoff from undisturbed areas from water which contains sediments or salt from mine workings. Clean runoff can be discharged into surrounding water courses, while other water is treated and can be reused such as for dust suppression and in coal preparation plants.



Acid mine drainage

Acid mine drainage (AMD) can be a challenge at coal mining operations. AMD is metal-rich water formed from the chemical reaction between water and rocks containing Sulphur-bearing minerals. The runoff formed is usually acidic and frequently comes from areas where ore- or coal mining activities have exposed rocks containing pyrite, a Sulphur-bearing mineral. However, metal-rich drainage can also occur in mineralized areas that have not been mined. AMD is formed when the pyrite reacts with air and water to form sulphuric acid and dissolved iron. This acid run-off dissolves heavy metals such as copper, lead and mercury into ground and surface water.

There are mine management methods that can minimize the problem of AMD, and effective mine design can keep water away from acid generating materials and help prevent AMD occurring. AMD can be treated actively or passively.

- Active treatment involves installing a water treatment plant, where the AMD is first dosed with lime to neutralize the acid and then passed through settling tanks to remove the sediment and particulate metals.
- Passive treatment aims to develop a self-operating system that can treat the effluent without constant human intervention.

Dust and Noise Pollution

Dust at mining operations can be caused by trucks being driven on unsealed roads, coal crushing operations, drilling operations and wind blowing over areas disturbed by mining. Dust levels can be controlled by spraying water on roads, stockpiles and conveyors. Other steps can also be taken, including fitting drills with dust collection systems and purchasing additional land surrounding the mine to act as a buffer zone. Trees planted in these buffer zones can also minimize the visual impact of mining operations on local communities. Noise can be controlled through the careful selection of equipment and insulation and sound enclosures around machinery.



Rehabilitation

Coal mining is only a temporary use of land, so it is vital that rehabilitation of land takes place once mining operations have stopped. In best practice a detailed rehabilitation or reclamation plan is designed and approved for each coal mine, covering the period from the start of operations until well after mining has finished.



Where the mining is underground, the surface area can be simultaneously used for other uses - such as forests, cattle grazing and growing crops - with little or no disruption to the existing land use. Mine reclamation activities are undertaken gradually – with the shaping and contouring of spoil piles, replacement of topsoil, seeding with grasses and planting of trees taking place on the mined-out areas. Care is taken to relocate streams, wildlife, and other valuable resources. As mining operations cease in one section of a surface mine, bulldozers and scrapers are used to reshape the disturbed area. Drainage within and off the site is carefully designed to make the new land surface as stable and resistant to soil erosion as the local environment allows. Based on the soil requirements, the land is suitably fertilized and revegetated. Reclaimed land can have many uses, including agriculture, forestry, wildlife habitation and recreation. Companies carefully monitor the progress of rehabilitation and usually prohibit the use of the land until the vegetation is self-supporting. The cost of the rehabilitation of the mined land is factored into the mine's operating costs.



Using Methane from Coal Mines

Methane (CH_4) is a gas formed as part of the process of coal formation. It is released from the coal seam and the surrounding disturbed strata during mining operations. Methane is a potent greenhouse gas, with a global warming potential 23 times that of carbon dioxide. While coal is not the only source of methane emissions – agricultural activities are major emitters – methane from coal seams can be utilized rather than released to the atmosphere with a significant environmental benefit.



Conclusion:

Coal is a very important mineral present in the universe .it may be used for various purposes right from the generation of electricity and producing steam to run the various thermal power stations and also the steam engines. This coal is extracted from various mining methods used worldwide .hence it should be extracted in proper way to avoid from waste it and to leave power source to coming generation

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