

ECONOMIC BENEFITS OF CBM DRAINAGE

There are many mining benefits that accrue from a methane drainage system. Coal-bed methane drainage systems can: (1) enhance coal productivity because of less frequent downtime or production slowdowns caused by gas; (2) decrease fan operating costs because of reduced air requirements for methane dilution; (3) reduce shaft sizes and number of entries required in the mains, (4) increase tonnage extracted from a fixed-size reserve as a result of shifts of tonnage from development sections to production sections; (5) decrease dust concentrations due to reduction of velocities at the working face; (6) improve mine safety resulting from lower methane contents in the face, returns, gobs and bleeders; (7) reduce problems with water; (8) improve worker comfort through reduction of velocities in the working faces; and (9) provide miscellaneous other benefits. Other benefits, such as reduced dust concentration, improved safety, or improved worker comfort, are difficult to estimate; while they constitute a real and significant benefit.

(1) Reduced Downtime – Enhanced coal productivity is probably the most significant benefit to be obtained from methane pre-drainage systems where coal-bed methane is encountered in significant quantities. The benefits come in the form of added production that occurs when downtimes or slowdowns resulting from high methane occurrences are avoided using methane drainage.

(2) Ventilation Power Cost Savings – The power costs associated with the mine ventilation system will ordinarily be the second most significant benefit associated with the addition of a methane drainage effort. In many mines, ventilation to ensure continuous production is quite expensive. Methane drainage would normally be used instead of increased ventilation because the overall costs associated with drainage will be lower than the costs associated with ventilation.

(3) Reduced Development Costs- Another important issue in assessing the costs and benefits associated with mining is the possibility that a reduction in the ventilation requirements will result in a reduced requirement for development openings. This can result in two types of cost benefits. The first benefit is the reduction in the size and number of shafts and other development openings connecting the coal seam to the surface. This can at times result in a significant level of economic savings. The second benefit results if the coal from the development entries of a mine is more costly on a cost/ton basis than that in the production sections. In a longwall mining operation, the coal produced from development openings will be much more costly than that produced in a longwall panel.

(4) Increased Reserve – The benefit of an increased reserve is also provided in a mining operation when a gas drainage system allows for a reduced number of entries in the development of mains, submains, headgates, and tailgates of mining layouts. This results in an increased number of tons of coal that can be extracted from a fixed-size coal block. The extra tonnage is derived from the fact that only about 50% of the coal in development sections is extracted while production sections may extract 85% to 95% of the coal under good conditions. The extra coal extracted when this occurs is an economic benefit of significant value under many conditions. Thus, it should be evaluated as a potential benefit in every operation where degasification is considered.

(5) Mine Safety - The effect of a methane drainage system on the safety of a mining system will certainly result in positive benefits. Any high-methane operation will incur a higher level of hazardous operating conditions than an equivalent mine with a methane drainage system in place.

(6) Reduced Dust Problems – The relationship between gas drainage activities and the costs of providing proper dust control in a mining section is another possible source of cost benefits from gas drainage.

(7) Reduced Water Problems - The presence of water in coal mine roof strata can be a costly source of delays in some underground mining operations. The most sizeable delays will ordinarily be encountered in the development sections of the mine and will be quite variable depending upon the geologic parameters of the roof strata. The water in the roof, when occurring in conjunction with high methane contents, can be mitigated by a methane drainage system.

(8) Worker Comfort - The level of comfort of work in a mining environment deteriorates if high air velocities are required to keep methane contents below the regulatory limits. The difficulty of working in an air velocity above 600 ft/min is that ordinary tasks become more difficult and the high velocities will generate more dust.

Thus, extraction of coal-bed methane provide lot of economical benefits in running coal mines, apart from providing cleaner environment by preventing release of major greenhouse gas, methane, in the atmosphere and recovering extra energy source as well.