

# **THEORETICAL EVALUATION OF BLASTCASTING TECHNIQUE IN STRIP MINING MULTIPLE PHOSPHATE ROCKS**

Salah A. Taqieddin  
Associate Prof. of Civil Engineering  
Department of Civil Engineering  
Jordan University of Science and Technology  
Irbid-Jordan

## **ABSTRACT**

Blast casting or trajectory blasting, as it is sometimes called, is an innovative mining technique that has been receiving increasing acceptance among operations of surface coal mines and quarries as a means of offsetting the rising cost of mechanical excavation of overburden with a high overburden-to-ore ratio. Many similarities exist between geological characteristics of overburden formations of phosphate beds and the formations that conceal coal seams. Both are sedimentary origin and are removed for mining in an identical manner (i.e. use of a dragline or shovel to strip or cast the overburden aside). Furthermore, both commodities are subjected to market demand fluctuations, while the labour and equipment costs for extraction of both commodities rise year by year. Previous investigation conducted by (Taqieddin, 1992) considered the applicability of blast casting on mining activities of a single-bed phosphate ore body at two operating mines in the southern part of Jordan. In this study, the possible application of blast casting in Shidiya phosphate deposits is considered. The phosphate formation is made of four beds interbedded with sterile materials. The economic ore reserve of this area exceeds 2 billion tones which constitutes the largest phosphate reserve of the whole country. Minimal environmental restrictions are enforced since the mining activities are made in the midst of southern Jordanian desert far away from residential areas. Furthermore, an explosive factory that will start its production should enhance the adoption of blast casting technique. The study deals with the mining design parameters such as bench height, sterile materials dump site, sequential phosphate beds mining, and blast design parameters such as blast round, timing, powder factors and others. Finally an economic comparison between blast casting and the existing dragline process is made to explore the feasibility of adoption of this technique in this multiple phosphate mining activities.