**Mining project risk analysis of the impact of schedule types of open pit mining on mine value**

**Dr R. A. Halatchev1, Dr D. A. Gabeva2 , A. R. Halatchev3**

1. Director Mining, AusGEMCO Pty Ltd, Brisbane, QLD, 4078. E: [ross@ausgemco.com](mailto:ross@ausgemco.com)
2. Managing Director, AusGEMCO, Brisbane, QLD, 4078. E: [deliana@ausgemco.com](mailto:deliana@ausgemco.com)
3. Secretary, AusGEMCO Pty Ltd, Brisbane, QLD, 4078. E: [info@ausgemco.com](mailto:info@ausgemco.com)

Key words**:** production scheduling, schedule types, sustainable mining, mine value, mining project risk analysis

# **ABSTRACT**

Open pit mining enjoys a renaissance nowadays due to the increased demand of base/precious metals and critical minerals. This gave incentives to large amounts of investments, which need to be managed efficiently. A major factor for achieving such a management is the development of optimum production schedules which are the skeleton of any financial model. This specific feature lays down the requirement for correct understanding of the impact of different production schedule types on mine value and importance of mitigating the mining project risk over the life-of-mine.

The current paper presents an analysis of the existing types of production schedules in open pit mining and their impact on the mine value. The analysis incorporates a case study to illustrate the impact of the schedule types on the mine value. The efficiency of each schedule type is assessed with representative criteria including the Factor of Waste Deferment, which assesses the degree of implementation of the principle of waste deferment in the optimum mine sequence. A mining project risk assessment is performed based on a discounted cash flow analysis to account for the variables exhibiting a stochastic behavior and contributing to the overall project uncertainty. The Monte Carlo simulation technique is used for modelling the risk of not achieving positive net operating discounted cash flows at any time step of the discretisation of the cash flows. The risk model also provides a solution for the risk estimate of mine investments over the payback period, which is of a particular interest to mine investors.