

TA3060 Mining Engineering
Final Exam, November 4th, 2009
Open Pit Section – Time 1.5 hours
This is an open book exam

Students are required to answer any three of the following five questions. All questions are of equal value.

1.
 - A. In the design of an open pit in a polymetallic orebody an important first step is to assign revenues to the block model. Discuss briefly two approaches to accomplishing that task and how each might lead to a less than an optimum economic solution.
 - B. Describe three cut-off grade decisions which have to be made from the design to the operational phases of an open pit.

2.
 - A. Outline the process of establishing a final pit limit using the floating cone computer algorithm and describe exactly what this “ultimate” pit outline means in terms of its effect on the final project economics.
 - B. Discuss two important processes which should now be employed to optimize the economic results of an operation based on the ultimate pit.

3. Large open pit mining has been successful in reducing mining costs which has allowed the extraction of lower grade or deeper material at a profit. Outline five factors which have either contributed to this success, which may threaten this profitability in future, or future systems which may be helpful in ensuring ongoing profitability. You can include items from open pit coal if desired.

4.
 - A. Discuss how the required pit geometry and safety regulations place a limitation on increasing the wall angle of an open mine.
 - B. Describe why one would wish to increase the bench height of an open pit mine but give two limitations on doing so.
 - C. How do you modify the burden and spacing of a blast through the use of differing blast layouts?

5. Answer the following short questions on defining and reporting ore reserves and resources.
 - A. What are the essential items in moving ore from a resource to a reserve category?
 - B. Several jurisdictions have adopted the concept of the “qualified person” in reporting mineral resources and reserves. Why is this seen as essential and what are the important qualifications of such a person?
 - C. Describe three important factors in establishing a diamond drill exploration program and comment briefly as to why each is important.
 - D. What is meant by the term “net smelter return”?
 - E. Describe the three factors which define the revenue calculation from a mining operation and how the risk of each might be managed.