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Slope stability prism monitoring: a guide for practising mine surveyors.

Thomas, Huw Gareth

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SLOPE STABILITY PRISM MONITORING: A GUIDE FOR PRACTISING MINE SURVEYORS

ABSTRACT

In designing an open pit mine to optimise an orebody, numerous considerations are made. These include geological, geotechnical, mining method and equipment selection considerations. To achieve the optimisation of an orebody depends on sound mine design principles and adherence to the mining sequence with employee's health and safety being of paramount importance. Mining steeper slope angles for economic gain, mining slope angles steeper than design or ignoring the presence of weak geological structures may seriously increase the likelihood of slope instability leading to slope failure and possible mineral loss (sterilisation), property damage, mine closure, accidents and fatalities. It is not the objective of slope design to eliminate all slope instability, as slope failures can prove desirable to verify design assumptions. Slope failures are desirable as long as they can be predicted and managed and that the risk to personnel, equipment and production is mitigated to a tolerable level. Slope stability monitoring is an important tool in confirming the mine design. Slope stability monitoring in the field of mine surveying has ensured the continuous advancement of state-of-the-art spatial measurement technology and techniques. Today's survey instruments enable the mine surveyor to measure slope movement to a high degree of accuracy and with confidence. It is essential that the slope stability monitoring equipment selected is capable of measuring the degree of movement as determined by the geotechnical engineer. The requirements for a slope stability monitoring system are outlined in this research report with guidelines for establishing and maintaining a slope stability monitoring system. The guidelines have been compiled based on the findings of operational reviews of slope stability monitoring systems. This research report should serve as a reference to mine surveyors involved in slope stability monitoring, focusing primarily on prism monitoring.