



High Resolution 2D Seismic Exploration of Poly-Metallic Massive Sulfide deposits at Garpenberg, Central Sweden

O. Ahmadi and C. Juhlin

Uppsala University, Uppsala, Sweden (omid.ahmadi@geo.uu.se)

The Garpenberg mine is a VMS stratabound deposit in central Sweden which is located in the main mineralized part of a palaeoproterozoic felsic magmatic province in the Baltic Shield. It has been mined for centuries and continues to date, therefore shallow deposits will soon be mined out. The seismic reflection method has been used recently in mineral exploration for imaging the subsurface by many researchers around the world. Therefore, to explore and evaluate the deeper potential, a 2D seismic profile was acquired over parts of the mining area. Due to the complexity in the structural geology of the area, a high resolution was desired along the profile and 5 meters spacing for shots and receivers was used. Underground activity and traffic on the surface generated significant noise, so that it was not possible to observe reflections on shot gathers easily. To attenuate coherent noise on shot gathers, an F-K filter was applied followed by deconvolution and a spectral weighting filter to improve the data quality. Most of the reflections on stacked section emanate from out of the plane and require a cross-dip correction to be imaged optimally. Velocity analysis, DMO and migration further improved the images. This study has shown that the reflection seismic method has potential in imaging complex structures in this challenging environment. The cross-dip correction is an important tool to enhance dipping and sub-horizontal seismic reflections and diffractions. Interpretation of the reflections shows that there is good correlation between the migrated seismic stacked section and some geological features.