In Legnica-Glogow Copper District in south-west Poland the copper ore exploitation, carried out in three underground mines, is accompanied by intense seismic activity. The strongest mining seismic events, of magnitude more than 4 are capable of producing a peak ground acceleration of 0.2g or more. Mining seismicity affects, among others, the Zelazny Most ore flotation waste repository, one of the largest mineral waste dumps in the world. To ensure safety of this critical structure ground motion monitoring in its region has been carried on since 2002, and the seismic hazard is re-analyzed whenever needed because of mining conditions changes. The acquired ground motion database, which presently amounts more than 1300 high quality three-component acceleration signals, is a perfect data for constructing precise local ground motion prediction equations (GMPE-s). Using this data the values of acceleration elastic response spectra are determined separately for the ground motion horizontal and vertical component, for a number of natural frequencies. GMPE-s for peak values and spectral amplitudes for the aforementioned natural frequencies are developed separately for horizontal and vertical ground motion. An analysis of the residual values of the GMP-s shows substantial diversity of site effects in spite of small distances between the monitoring stations. In this connection alternative GMPE-s are developed for the peak values and all the spectral ordinates, which account for relative values of local amplification. Finally, the region under study is divided into microzones, each of the relative local amplification value being approximately constant.