



Ефективност на електротомографските изследвания за детайлно геоложко картиране по трасето на проектирана галерия (рудник “Елаците”)

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Effectiveness of the electrical tomography studies for detailed geological mapping along the route of designed gallery (open pit “Elacite”). Stefan Shanov, Ivan Vasilev, Zlati Vasilev, Marlena Yaneva, Konstantin Kostov, Gabriel Nikolov

The study presents the results from the studies along the route of the future mining gallery for draining and preventing from pollution the waters from the local river Negarshitsa at the western part of the open pit “Elacite” for copper ore mining (Central Balkan Mountain area). The aim of the study was the clarification of the geological and tectonic conditions at the area along the gallery. Because the difficult relief, the important soil and vegetation cover, as well as the impossibility for preliminary tracing of the profiles, the only effective geophysical method was the 2-D electrical tomography. This electrical resistivity method is applicable for detecting covered fault structures and for mapping the rocks according to their electrical properties. Additionally applied method was the “induced polarization”, based on the fact that after switching off of the DC power, the charged rocks are not losing their potential immediately. The decreasing of the potential is slow for the rocks with high conductive minerals (as ore bodies). If the electrical conductivity is related to fluids (ion conductivity), the polarization is missing. The used equipment was Terrameter – ABEM SAS 1000. The distance of 5 m between the electrodes and the measuring scheme (Schlumberger) allowed to get information to 75 m depth from the surface along the executed profiles. The geophysical processing was done with the software Res2Dinv. Corrections for the topography were included as well. The final result from the geophysical interpretation gives the necessary information for the rock diversities that will be crossed by the gallery and the related facilities, as well as for the fault structures in the area, the thickness of the deluvial cover and the thickness of the weathered rocks layers beneath the soil. A detailed geological map along the route of the future gallery has been created.