



Hydraulic properties of fractured rocks determined from fluid logging

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Detailed information on fractures or fracture zones and their hydraulic properties plays an important role for the decision if the examined rock medium can be used for deposition of radioactive wastes from atomic power plants. Fracture zones are characterized by decreased formation density, by lower value of seismic waves velocity and increased seismic energy attenuation, by formation resistivity decrease (or formation conductivity increase) and by higher content of water (consequently also of Hydrogen) in the rock volume unit. Identification of fracture zones in the borehole profile is now relatively easy using the formation resistivity, formation density, neutron porosity and acoustic logs. The problem is that every fracture need not to be a way for water flow in the rock medium. Fractures with natural water flow are very dangerous for waste depository. From this point of view the detailed study of water flow in the borehole and in the fractured formation together with determination of hydraulic properties of individual fractures or fracture zones is very important. Our contribution discusses the appropriate set of logging methods, corresponding field and interpretation procedures for detailed studies of water dynamics in boreholes, their significance for identification of fractures with water flow and determination of their hydraulic properties (hydraulic head, transmissivity and storage). The trend in the prospecting of fractured rocks is now oriented to complex field tests in two or more boreholes in order to characterize hydraulic properties of the rock medium for greater distances (decades of meters). Examples from selected localities in the Czech Republic document the practical use of logging for these purposes. The research project is financially supported by the Grant Agency of the Czech Republic under the No. 205/07/0777.