

The processing and the interpretation of the geophysical data measured by the author of this thesis in the Bedřichov gallery (municipal of Liberec) is the main goal of this diploma paper. Earlier data measured in the gallery by G IMPULS Praha spol. s r.o. staff members in the period between 2003 and 2010 are further used to support the assessment.

The tunnel which serves to convey water from the Josefův Důl storage reservoir to the water treatment plant in Bedřichov is driven in the granites. These rocks are considered as a highly appropriate host medium for the future deep repository of radioactive wastes in the Czech Republic hence the gallery could be an appropriate place for testing of geological, geotechnical and geophysical methods for purposes of deep repository. The tunnel was driven using two different methods, which allows assessing of the impact of the driving type on the rock disturbance. The tunnel is open for a similar period, which is being considered between the start of operation and the closure of the deep repository hence it's possible to consider time-changes in the goaf. First chapters of this thesis present a brief insight into the problems of the development of the nuclear waste deep repository.

The results of the measurements, which are interpreted in this diploma paper, were carried out by two geophysical methods, i.e.:

- the seismic method,
- the method of electrical resistivity tomography.

The geophysical measurements in the conditions of a goaf in solid rocks bring certain specificities, which are not encountered in standard observations on the ground surface. The interpretation is based on the classical processing procedures of shallow seismic and electric resistivity tomography. With regard to the fact that the measurements were conducted in not entirely standard conditions, i.e. in the conditions of the underground gallery, also the data processing was performed using alternative techniques. These are mainly based on processing of the primary data, which are not influenced by the interpretation programmes.

The multielectrode resistivity method demonstrated time variations in the resistivities, probably caused by the presence and the character (mineralization) of the groundwater. The results of the thesis confirm the anticipation that one of the main factors, which influence the behavior of the massif, is system of joints and the movement of the groundwater in this system.

The anticipation of a stable behavior of the EDZ – phenomenon was confirmed by the seismic method. Changes on the seismic signals, which could be predicated by the time-variations in the massif, weren't found. Practical possibility of repeated and reliable measurements by the seismic method (mainly with the comparison of the seismic traces in time) is discussed in the conclusions of this thesis.