

# ASSESSMENT OF RADON RISK IN OSTRAVA DISTRICT VIA GIS ARC/INFO

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The problem that continually deteriorating the environment even from the point of view of increasing radiation load on inhabitant is, in general known. Therefore the government institutions released an Instruction of Ministry of Health No. 76/1991 CR, which involves the demands for limits of illumination of radon and other natural radionuclides. This instruction among others in paragraph no. 4 demands the protection of buildings against the penetration of radon from the basement layer, the buildings which are built outside the territory with low risk of radon. It means that before the start of each new building it is necessary to carry out the measurement radon in the building area and determine the category of radon risk. Since it is necessary to evaluate the basement soil. Objectivity some problems rise, thanks to the influence of the other factor, the result of which can mistaken the determination of radon risk category with all known all consequences. However, this task is resolvable only by the use of computers, and suitable information system GIS ARC/INFO, since we want to assess the urban surface where something is going to be built on.

The methodical works connected with construction of proposed digital radon map can be divided into two areas - geologic and radiometric. In the first case, is the application of geologic information in GIS ARC/INFO. It is principally information seven by geological map of Quaternary formation in the scale 1:25 000. (This map has been chosen as a basic source of geological information). Therefore it was necessary to transform the geological data into selected GIS by the help of these steps, suggestion of the structure of spatial data (3D) and attributes, digitalisation of map documentation, creation of topological structures, spatial database, attachment of attributes, correction of mistakes - created owing to the connection of spatial database and attribute database, transformation into real co-ordinates, presentation of data (out put of mapping composition).

Information from Quaternary maps of Ostrava region are divided into 3 layers order to have better orientation. The first layer gives information about the rocks outcropping on the surface the second layer depicts the boundaries of the uppermost sediments, the third layer is the underlying quaternary sediments. The whole ARC/INFO system enables the work with every layer separately, it means that the stored data can be used for other activity than the Evaluation of radon risk, for instance during the projection works, the building planning, urban planning, etc. The above mentioned map documentation can be added with the results direct geological research work, that could be subsequently used.

The data about the radon measurements (determination of the volumetric activities, categories of radon risk) is part of the fourth layer that presently completes other three geological ones, which enables to carry out the evaluation of the magnitude of volumetric

activity of radon independence of various types of geologic basement. The results of the activity mentioned above are two structures of attribute databases for geological and radon data.

For aforementioned purposes the following forms of results from SRM will be sufficient (Radon Map).

- The map of study area which will include both geological condition as well as hitherto results of VAR measurements. The density of particular documentation point is changeable (but it is determined by the demands to characterise each type of basement soil from the point of view of radon risk category).
- Copy of the results of measurements in a certain land.
- A map of certain territory in which the land is distinguished where radon has already been measured (in can be differentiated graphically according to the purpose of measurements).
- A map with graphically differentiated lands according to the rate or intensity of radon risk in the area.
- From the analysis of the results of measured radon inside houses and lands we can obtain precise knowledge and make a link with the data about geologic basement. The results of this will be the determination of areas that are from the point of view of radon penetration from the basement to the building more risky.

Determination of the probability of occurrence of houses afflicted by radon in various party of district and evaluation of radiation load on the inhabitants of Ostrava district and its DP.

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