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Hydrodynamic conditions of the circulation of thermal and therapeutic groundwaters in the Cenomanian aquifer of the Miechow Trough and the central part of the Carpathian Foredeep.

The main objective of the thesis was to determine the hydrogeological conditions of the Miechów Trough and the central part of the Carpathian Foredeep in the part covered by the research area. The most important was to determine the hydrodynamic conditions of groundwater circulation in the Cenomanian aquifer in this region. The Cenomanian aquifer is a reservoir of sulphurous therapeutic and thermal groundwaters. This groundwaters are not only valuable, natural and unique groundwater resources but also deposits which can be used for economic purposes. Examples of using groundwater for this reason is the Busko-Zdrój region where there are three mining areas: Busko II, Las Winiarski and Busko-Północ. The research area has been defined within the structural and hydrodynamic boundaries. The southern border is the Vistula river, the northern - the Mierzawa and the Nida rivers. The western and eastern borders has been set the range of the Jurassic sediments of the Miechów Through.

The PhD thesis consists of six chapters. The first chapter is the introduction to the work. The second chapter provides a widely characteristic of the research area - description of hydrographic and climatic conditions, geological structure, hydrogeological conditions and physicochemical properties of therapeutic and thermal goundwaters. The third chapter presents the history of therapeutic and thermal groundwaters exploitation in the research area and their current use. In addition the third chapter discussed the principles of managing of the resources of therapheutic groundwaters and designing the exploitation of the thermal groundwater deposits. The fourth chapter presents the research methodology of. Chapter contains a description of the hydrogeological conceptual model of groundwater circulation. The following is an outline of the mathematical modeling methodology. The next has been described actions of modeling on a regional scale with the Visual MODFLOW simulator using. Particulary are presented: division of the research area into blocks and calculation layers, boundary conditions, the way of mapping in the model individual elements of the hydrogeological system, simulation calculations and model calibration. In the next part has been described the methodology of modeling of the local area of Busko-Zdrój and Solec-Zdrój. Chapter was completed with description of the simulations of the exploitation of sulphurous therapeutic groundwaters from the Cenomanian aquifer in the vicinity of Busko-Zdrój and Las Winiarski. The fifth chapter contains a description of the research results and a discussion of the conclusions which has been developed on the basis of the groundwater flow budgets and groundwater table maps. The thesis has been finished by a summary and conclusions.