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## MODELS AND INFORMATION SYSTEMS OF ECOLOGICAL AND ECONOMICAL RISKS WITH DECISION MAKING ON THE CLOSURE OF COAL MINES

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**Purpose.** Development of decision support system based on simulation results of underworking of surface and selection of rational way of remediation.

**Methods.** The studies were carried out by simulating the processes of lowering the earth's surface by it underworking and closing the coal mines by the finite element method. A model was developed for the decision-making algorithm for minimizing environmental and hydro-economic risks when closing mines.

**Finding.** Were analyzed software products based on finite element methods for modeling the processes of earth surface lowering by it underworking and identified flooding areas in mines closed by the method of wet preservation. The analysis of the basic techniques for calculating the area of lowering of the surface is performed. Has been developed a database of three-dimensional coordinates of coal seam mining for specific mining geological conditions of the Ternovskaya mine JSC "Pavlogradugol". Has been developed a model of an underworked surface with flooding zones, which makes it possible to determine the necessary remediation works and their cost.

The results contain studies that were conducted under the project GP-489, which is funded by the Ministry of Education and Science of Ukraine.

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## ENERGY EFFICIENCY AND ECONOMIC ASPECTS OF USE OF LAMELLA THICKENER OF RECYCLED WATER

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**Purpose.** To explore the possibility of development of technical and technological justification of the use of recycled water processing plants at an economically efficient level.

**Methodology.** The research was conducted by justifying the parameters of lamella thickener of recycled water of processing plants with the use of flocculants.

**Findings.** The scheme of the thickener for the process of clarification of recycled water is considered and described. The design of the plant for necessary technological process which is designed to close the water slurry schemes of mining enterprises and to maintain the optimal level of solid component in circulating water is analyzed. The design is used for processing pulp in a wide range of performance, having dimensions of several meters. Economic evaluation of the proposed means confirms the feasibility of using compact devices for small, medium and large production lines, including mobile units.

They contain the researches, which were conducted within the project GP – 498, financed by Ministry of Education and Science of Ukraine.

**Key words:** clarification, thickener, recycled water

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