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OPERATIONAL CONTROL SCENARIOS FOR A WATER INTAKE SYSTEM WITH AN ARTIFICIAL RECHARGE

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Abstract

In the management of modern water supply facilities, it is essential to achieve the objectives of sustainable development. Recent monitoring devices, together with Information and Communication Technology tools, enable the design and use of methods ensuring that a variety of requirements will be met. This paper presents an original methodology for creating control scenarios for a water intake with managed aquifer recharge while meeting a set of operational criteria. An operational scenario is understood as the control of pump operation in the process of water intake from wells in barriers consisting of several dozen pumps each. The most important criterion is the need to collect infiltrated water from the aquifer evenly over the entire length of the wells in barriers; this is enabled by the introduction of the Sum of Neighborhood Factors. The development of the method was preceded by the identification of objects and processes together with the determination of control and controlled parameters to establish limitations and criteria. The proposed solution was implemented in the form of an algorithm that takes into account the current state of the facility and uses an established knowledge base as a function of a Decision Support System. The proposed methodology was applied to an exemplary water intake facility with an artificial recharge system. The topic of this paper refers to the problem of applying expert systems in the management of water supply systems.

Key words: control system, water intake, artificial infiltration, decision support, water management

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