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Optimal Planning of Drinking Water Production

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Abstract

The water system is one of the most important issues for life and the planetary ecosystem, which is widely recognized by society and synthesized as one of the current research problems of the United Nations. One of the problems involved with this system is related to the treatment of water in treatment plants in a context of sustainable development. This article focuses on the problematic of the raw water treatment system for purification, through a mathematical programming model and a solution procedure for the optimal planning of the treatment system in its different steps and in a two objectives context. The linear model considers two objectives, the first maximizes profits and the second minimizes emissions of pollutants. As restrictions are considered: mass balances, production capacities of the different stages of water production in their different conditions, supply of water, demand and the permissible technical levels of pollutants, which are proposed in a generic manner, independent of the technologies and productive alternatives. The model by its nature allows to solve almost any instance of the problem in excellent CPU times.

Keywords: optimal planning, production and treatment of drinking water, linear programming.
