

Adapting uncertainties into a wastewater reuse network model

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When designing wastewater recycling/reusing system various types of uncertainties should be considered to maintain credibility of the system. Several researches had dealt with this issue but the results were considered rather unrealistic by potential users in industrial field, mainly because of their lack of consideration for actual conflicts and fluctuations.

In this study we tried to bring a practical side into wastewater reuse system development. To figure out current situations and possible drawbacks we gathered information from various sources including research papers and administrative documents. By classifying and analyzing wastewater reuse cases we drew major uncertainty issues and key factors related to them. Based on the survey we revised our mathematical model for wastewater reuse network design from our previous research. Three types of major uncertainties related to water quality were classified; weather, production fluctuation and false information. Each case was formulated as a probabilistic term and adopted into the model. The system was optimized via either deterministic or metaheuristic method, then results were compared with the previous ones.