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EFFICIENT CHLORINATION SCHEDULE FOR A WATER DISTRIBUTION NETWORK WITH MULTIPLE PUMPING STATIONS

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Abstract

The present study proposes a chlorination schedule calibrated for the Drinking Water Distribution Network (DWDN) of Buzau – a medium sized city, in South-Eastern Romania. The numerical model of Buzau's DWDN was set up in EPANET, considering the main pipes of the network that interconnect 4 pumping stations and 45 booster stations (viewed here as end-users). The calibration of the numerical model was based on real-time recordings available for January and July 2014. The chlorination scheduling was simulated at each reservoir supplying a pumping station, by a variable injection pattern added to the EPANET DWDN model. The injected amount of chlorine was determined by values of the chlorine concentration obtained at 4 key monitoring points, spread over the network. The simulations were performed over an extended time period of 72 hours. The system behaviour has been analysed for two cases: with all pumping stations in operation, and with the biggest pumping station shutdown. For each case, the proposed schedule corresponds to the injection in the network of less chlorine than the corresponding recorded values for January and July 2014, and yet obtaining at the 4 key points a chlorine concentration variation similar to the recorded one, while the chlorine concentration at the end users was within the admissible range, across the whole DWDN.

Key words: chlorination, drinking water distribution network, EPANET, pumping station, water quality

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