

Kulbik, M. Assessing the Efficiency of Unidirectional Flushing of Oversized Water-Pipe Networks in Terms of Washings Quality. *Ochrona Środowiska* 2008, Vol. 30, No. 1, pp. 31–38.

Abstract: Relevant investigations were conducted within the Bilgoraj water distribution system (77 km in length) in 2006. The unidirectional flushing method used for the purpose of the study consisted in the execution of flushing scenarios established by computer simulations. A set of 254 washings samples collected in the course of water-pipe flushing was analyzed for turbidity, total solids and iron compounds. The results showed that the variability in the quality of washings was primarily due to the number of water exchange cycles in the course of flushing. The values of the parameters examined, which were found to be the highest in the first cycle of water exchange, showed a downward trend in subsequent cycles. Flushing efficiency was assessed using a multi-criterion method which involved simulation-based mapping of the course of flushing, assessments being also conducted of the hydraulic condition before and after flushing of the pipes chosen. The criterion adopted for quantitative assessments included the load of pollutants passing to the sewer system *via* the discharge pipe, as well as the mass of iron compounds and total solids removed. As can be inferred from the balance, the mass of total solids removed exceeded 5 tons (including approx. 50 kg of iron compounds). The increase in the hydraulic efficiency of the pipes was found to depend on their function in the water distribution system, their diameter and the material they were made of. The highest values were obtained with the flushing of distribution network pipes made of cast iron. The lowest values were those of solids removal from the water main.

Keywords: Water-pipe network flushing, washings quality, site investigations, operational diagnosis, computer simulation.