عنوان مقاله:

Efficiency Assessment of Conventional and Innovative Wastewater Treatment Methods – Case Study: Ekbatan Wastewater Treatment Plant

محل انتشار:

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خلاصه مقاله:

The limited nature of water resources and the importance of water management and recycling have led to the field of wastewater treatment being in progressive demand globally. Consequently, several technologies with certain benefits and drawbacks have been introduced over the past decades to address this issue. The advent of new technologies makes it necessary to identify the most suitable methods for specific applications. In this study, results from three of the most promising technologies in wastewater treatment – MBR, SBR, and Biolak – have been put against that of a more conventional, but still widely used, method – CAS – and an objective argument has been presented. An exclusive pilot for each of the mentioned methods has been constructed and installed at Ekbatan wastewater treatment plant, located in west of Tehran, and data from extensive experiments has been gathered over a period of approximately one year. Furthermore, an exhaustive set of criteria, namely, treatment quality, operation simplicity, initial cost, land occupation, maintenance, and development opportunities, coupled with more location-specific guidelines, regarding the unique conditions of Tehran, have been exploited in order to establish an objective, yet comprehensive, view. pH values of input and output flows, MLSS, MLVSS, and removal percentage of key parameters such as BOD, COD, ammonium, nitrate, nitrite, and nitrogen were among the data measured from experiments. The maximum BOD removal percentage was achieved by the MBR pilot; moreover, the MBR pilot required the least hydraulic retention time to effectively remove ammonium. The SBR pilot reached the maximum removal percentage of COD. Furthermore, assessment matrix of Waterford wastewater treatment plant was introduced as a reference for quantitative evaluation. Finally, it was determined that the MBR or the SBR method is the most suitable option for Ekbatan plant.

کلمات کلیدی:

Wastewater, Activated Sludge, MBR, SBR, Biolak, Ekbatan