Quality assessment of treated wastewater in Kuwait and possibility of reuse it to meet growing water demand

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ABSTRACT

Kuwait’s water resources are insufficient and will become the limiting factor for sustainable development in the future. The need for water supplies in Kuwait is extremely high and expected to be growing due to increasing population growth. To face this challenge Kuwait has introduced a new element in water management system by considering and reusing treated wastewater. Currently, huge amounts of municipal wastewater are treated in four main treatment plants located at Regga, Jahra, Um Al-Haiman and Sulaibiya. In general overview on Kuwait’s water resource, water demand and wastewater treatment plants (WWTPs) is presented. In addition, data of treated effluent quality was collected from three main sources; namely; available publications and records within Kuwait, and the results of a wastewater-monitoring program involving survey, collection and analysis of samples from selected wastewater streams. Data reveal that the treatment plants at Jahra, Regga and Um Al-Haiman provide wastewater treatment up to a tertiary level with sand filters following the conventional activated sludge process. All three plants produce excellent effluent quality at a tertiary level of treatment. The advanced WWTP at Sulaibiya treats wastewater beyond tertiary level with advanced facilities of ultrafiltration and, reverse osmosis producing super quality of effluent with insignificant traces of pollutants. The COD and TSS removals are above 90% for all the plants. Sulaibiya in particular achieved almost 100% COD and TSS removal. The utilization of Sulaibiya plant effluent for recharging ground-aquifers is a viable option to store treated effluent for future need.

Keywords: Water demand; Advanced treatment; Wastewater reuse

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