



RIVER BANK FILTRATION FOR WASTEWATER REUSE IN IRRIGATION: ADAPTATION TO CLIMATE CHANGE

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Abstract. In the context of adaptation of the water resources sector to climate change, water reuse is widely proposed and encouraged especially in arid and semi-arid areas like the Middle East. We consider riverbank filtration (RBF) an appropriate technology that efficiently and dependably procure quality water from Zarqa River thus making a contribution to protect Jordan's remaining surface and ground water resources. The river is contaminated with treated domestic and industrial wastewater principally from the city of Amman, but still serves as a main source for irrigation water.

Since 2007, a riverbank filtration (RBF) well field consisting of six wells was installed along the Zarqa river, Jordan. Salt tracers were released to the hyporheic zone and were detected in a RBF well (5 m distance from the river) during subsequent pumping. From the tracer test data (pumping rate: 10 m³/h), rapid travel times were approximated (14 m/min). Additional sampling demonstrated that fecal indicator bacteria and bacteriophages were removed from river water by RBF at the Zarqa River field site by up to 4.2 log₁₀, which is a significant improvement of the river water quality. This implies that public health risks from exposure to riverbank filtrated water, like consumption of raw vegetables that are irrigated with this water, may be reduced by 2000 to 2500 times as compared to using river water directly. These results suggest that riverbank filtration is an appropriate technology which can enhance the safe reuse of treated wastewater.