



Evaluating the Effectiveness of Bank Infiltration in Removing Escherichia coli and Total Coliforms from the Muda River in Kedah and Penang, Malaysia



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Abstract

Bank Infiltration (BI) is a natural and cost-effective method for improving water quality by allowing surface water to seep through riverbanks into groundwater production wells, thereby removing contaminants. In this study, BI wells developed by the National Hydraulic Research Institute of Malaysia (NAHRIM) were constructed along the Muda River in Kedah and Penang to explore the potential of BI as a sustainable alternative water supply source and to establish a practical model for BI application in Malaysia. The main objective of this preliminary study was to evaluate the effectiveness of the BI process in removing *Escherichia coli* (*E. coli*) and total coliforms (TC) from surface water. Water samples were collected from four BI wells and the Muda River before and after a one-hour pumping test. Various physicochemical and microbiological parameters were measured and analyzed, including temperature, turbidity, dissolved oxygen, total suspended solids, pH, salinity, *E. coli*, and TC. The results showed a significant reduction (at the 95% confidence level) in *E. coli* and TC counts after undergoing the BI process, with removal efficiencies exceeding 99.6%. These findings demonstrate the effectiveness of BI as a natural treatment method for reducing microbiological contamination and improving the quality of river water in the Muda River region of Kedah and Penang.