



Treatment of Taman Beringin landfill leachate using the column technique

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ABSTRACT

Landfill leachate is currently a major environmental concern because it contains high concentrations of organic and inorganic contaminants. Leachate treatment using natural materials, such as aquifer sand, peat, and the commercial material BIRM (Burgess Iron Removal Media), was performed through column experiments. Aquifer sand was taken from Kg Teluk, Kelantan, peat was taken from Peatland Paradise, and BIRM was bought from a supplier. The heavy metals (Fe³⁺, Cr, Ni, and Cu) from natural leachate were selected for this experiment. The concentrations of Fe, Cr, Ni, and Cu before the experiment were 11, 1.27, 4.535, and 3.293 mg L⁻¹, respectively. The physical and chemical parameters of leachate and surface water at the Taman Beringin Landfill have been studied to understand the impact of pollution in the area. The results show that leachate samples at the bottom of the landfills have the highest pollution. Both the physical and chemical parameters of leachate exceed the limits of Interim National Water Quality Standards for Malaysia. Experimental test results were also analyzed in terms of breakthrough curves and percentage of heavy metal removal. The results show that the BIRM sample has a higher adsorption capacity for heavy metals, including Fe, compared with aquifer sand and peat.

Keywords: Open tipping; Landfill leachate; Contaminant treatment; Natural materials; Efficiency

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