ABSTRACT

Study on the Effectiveness of Biosand Filter (BSF) Utilization to Improve the Water Quality of the Tarum Barat Irrigation Canal River

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To improve the water quality of the Tarum Barat Irrigation Canal River, this study was conducted by evaluating the effectiveness of the Biosand Filter (BSF) device, which was tested for 15 days with 5-day intervals for checking pollutant parameters in the laboratory. The BSF filter was designed according to the CAWST guidelines with the addition of activated carbon on the top layer of the filter. The pollutants tested were Turbidity, TS (TDS and TSS), BOD, and Fecal Coliform. The research object is located at the confluence of Kali Bekasi and the Tarum Barat Irrigation Canal River. The improvement efforts were simulated using SWMM with data from the BBWS Ciliwung-Cisadane and Citarum cross-sections. The results of the SWMM simulation analyzed are the Link Pollutant Load results for each pollutant for return periods of 2, 5, 10, 25, 50, and 100 years. The testing showed a reduction of Turbidity by 96.77%, TDS by 16.03%, BOD by 22.86%, and Fecal Coliform by 99.999%. The SWMM simulation found that Fecal Coliform was the only parameter with significantly different results between the Link Pollutant Load before and after applying the BSF filter. This study concludes that the BSF device is suitable for use as a point-of-use device for improving river water quality but is less efficient in enhancing the overall water quality in the study area.

Keywords: *Biosand Filter, Tarum Barat Irrigation Canal River*, *water quality*.

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