

The decrease of organic substance concentration (KMnO_4) and turbidity in well (ground) water using biosand filter reactor reactor

Abstract

The main source of water options in most urban and rural areas for Samarinda was well (ground) water. Samarinda is a developing city and most highly populated located in the East Borneo province of Indonesia. Meanwhile, the location and characteristic of land in Samarinda was swampy areas with organic substances concentration (KMnO_4) and high turbidity, a poor drinking quality to might have health problem. In this study established potential of BSF for efficiency removal organic substances concentration (KMnO_4) and turbidity. (Unit biosand filter was made from 8 mm rectangular glass with the medium used inside BSF reactor as sand local, gravel and supported by aerator for supply O_2 to growing biofilm at the layer of fine sand and also diffuser plate to maintain the flow rate of water into the BSF reactor unit. Then, BSF was using flow rate (0.2 and 0.4 m h⁻¹) and paused period (6 and 12 h). Efficiency decrease in the concentration of organic substances, the first biosand filter the average efficiency by 76.82%, the second biosand filter average efficiency of 74.17%, at the third biosand filter efficiency by an average of 71.28% and the fourth biosand filter average reduction efficiency is 73.29% and while the turbidity of the average efficiency for the first biosand filter by 96.56%, the second filter biosand average efficiency of 94.08%, the third biosand filter average efficiency amounted to 96.52% and the fourth biosand filter average efficiency of 95.03%. Significant impact of this study was conducted. The BSF design, construction, operational and maintained as technology become solution in urban and rural area to provide safe water and drinking water in developing countries.