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Remediation of municipial solid waste landfill leachate by using subsurface flow constructed wetland with low permeable reactive media

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Abstrak

This research was carried out to investigate the efﬁciencies of leachate treatment by using subsurface ﬂow constructed wetland (CW) with low permeable reactive media and guinea grass (Panicum maximum TD 58). Pilot scale CW was examined at hydraulic loading rate (HLR) of 0.028 m/d and hydraulic retention time (HRT) of 10 d. Two different types of media in CW were used i.e. system 1: clay and sand mixture at ratio of 40:60 (%w/W) and system 2: clay, iron sludge and sand mixture at ratio of 30: 10:60 (%w/w). The results showed that the performance of system 2 was better in terms of pollutant removal efficiencies. Average BOD, COD and TKN removals were 76.1, 68.5 and 73.5% respectively. Methane, carbon dioxide and nitrous oxide emissions during the treatment of CW were 23.2-52.1, 69.1-601.8 and 0.04-0.99 mymzd respectively. The use of CW with reactive media in system 2 and vegetation resulted in lower GHG emissions. The results show that CW with low permeable reactive media could be effectively used to remediate leachate from the landﬁll site.