Thesis Title Preliminary Investigation of Modified Anaerobic Filter for Treatment of Hospital Wastewater

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Date of Graduation 5 November B.E. 2534 (1991)

Abstract

The purpose of this study was to determine the efficiency of a modified anaerobic filter (MAF) for treatment of wastewater of 30-bed-hospital, at Nampong Hospital. A cylindrical concrete tank 2.00x1.80m with the concrete covered at both ends, sitting in the soil 1.60m in depth was constructed and used in this study. The tank consisted of two compartments. The first compartment was empty and received the wastewater influx of buildings. The second compartment was filled with gravels 35 to 55 mm in diameter approximately 45 percent of the tank having the void volume of 2.2 m^3. The 30-bed-hospital wastewater treatment has currently installed by using a septic tank incombination with seepage pit. The MAF system was introduced to incorporate with

septic tank for the expectation of an efficient wastewater treatment and healthy environment. Observation was made to record the flow rate in 24 hours, and determine the organic removal in terms of BOD, COD, TSS, VSS, SS and total coliform bacteria. The pH, temperature, alkalinity and oxidation-reduction potential were performed to determine the condition of the treatment system. The grab samples were taken daily at 8.00am, 12.00am and 4.00pm.

The result indicated that there was a significant BOD removal when the wastewater was treated by MAF system. The BOD removal was 31.60 percent while the detention time calculated was 5.9 hours. Base on the values of oxidation-reduction potential, TSS, and BOD/COD, SS/VSS fraction which were -52.25 mV, 256.08 mg/l, 0.56 and 0.01, respectively, the treatment system was considered low efficiency. The rate constant (K_1) of system was 2.0677 day^{-1}. Total coliform bacteria were 2.57×10^7 MPN/100ml. A significant reduction in total coliform was observed when the wastewater was treated by the system. The steady state of TSS and VSS of the effluent indicated a good performance of the system. In addition, the advantage of the MAF system found was easy to operate and maintain. However, the improvement of this system for treatment of wastewater of 30-bed-hospital should consider extending the longer detention time to be at least 20.89 hours or up to 59.70 hours for the standard domestic effluente type B. Another way for increasing efficiency of 50 percent BOD removal was 11.61 hours for the detention time of this system.