

Chalanda Semsayun 2013: Removals of Microorganisms in Treated Domestic Wastewater by Floating Media in Coupled with Ultrafiltration System. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Associate Professor Wilai Chiemchaisri, D.Tech.Sc. 138 pages.

This study aims to investigate the performance of the filtering systems in removals of total coliforms (TC), fecal coliforms (FC) and coliphages (CP) in treated domestic wastewater. Beside microbial risk assessment of diarrheagenic *E. coli* in reuse of filtrated effluent was evaluated. It was found that chemical effluent qualities of all filtering systems were considered in good standing based on standard of water reuse. However, microorganisms removals were largely different among filtering systems. The floating media filter in coupled with ultrafilter membrane and ultrafilter membrane only gave high TC, FC and CP removal efficiencies in range of 90 to 99 % of $0.6 \text{ m}^3/\text{m}^2 \cdot \text{d}$ at 6 and 24 h operation. The floating media filter (FMF) $6 \text{ h}, 15 \text{ m}^3/\text{m}^2 \cdot \text{h}$ operation gave FC, TC and CP removals of 50 %, 40 % and 64 % respectively, and when extended the operation to 24 h, better efficiencies of 78% CP, 60% FC and 56% TC removals were achieved. For sand filter (SF) at $5 \text{ m}^3/\text{m}^2 \cdot \text{h}, 6 \text{ h}$, it gave consistently in performance over an operational period, and effectively in removals of TC, FC and CP equivalent to 26%, 32% and 49%, respectively. Finally, the results of risk assessment of diarrheagenic *E. coli* disease using the Beta Poisson and Exponential models reveals that only the effluents of the FMF and SF could give the risk in enterogenic poisoning $> 1/10,000$.

Student's signature

Thesis Advisor's signature