

## CHAPTER V

### CONCLUSION AND RECOMMENDATION

A laboratory investigation was carried out with the primary objective to determine the efficiency of a variety of soils to be used in septic tank soil adsorption system. Seven representative soil series were selected in the study due to their wide distribution in the area of Bangkok and its neighbourhoods. They were the Sattahip, Muak Lek, Ban Bung, Chon Buri, Klaeng, Kampaeng Saen and Thon Buri series. The simple method of study was adopted by passing domestic wastewater through soil columns for 45 days. Certain physical, chemical and biological characteristics of soil and wastewater before and passing through soil columns were determined. The measured properties were used in determining the efficiency of soils in removing certain plant nutrients and fecal coliform found in wastewater. From the results of the investigation the conclusion could be drawn as followed.

1. The Permeability of soil to wastewater could be arranged in the following sequence-the Sattahip > Muak Lek > Ban Bung > Chon Buri > Klaeng > Kampaeng Saen > Thon Buri soil series. There were no effluents from Kampaeng saen and Thon Buri soil series. Therefore, their permeability was considered very low. The results obtained could be closely related to the soil texture i.e. the coarser soils are more permeable.

2. The Sattahip, Muak Lek, Ban Bung, Chon Buri and Klaeng soil series from both range of depth 0-50 cm, 50-100 cm could

eliminate 96-99 % of total bacteria and 71-92 % of the COD concentration in domestic wastewater.

3. The Aerobic conditions predominated, in the soils with higher permeability, the Sattahip, Mauk Lek and Ban Bung series within 0-50 cm depth only. This is evidenced by the transformation of  $\text{NH}_4\text{-N}$  to  $\text{NO}_3\text{-N}$  found in the effluent.

4. About 5 mg/l or 15% of  $\text{NH}_4\text{-N}$  could be found in the effluents which had passed through all soil columns.

5. The Sattahip, Muak Lek and Ban Bung soil series could virtually remove all the  $\text{PO}_4\text{-P}$ , total phosphate and fecal coliform after 5 and 21 days, respectively.

6. The pH of the effluents from the Sattahip, Muak Lek and Ban Bung soil series was slightly alkaline despite their initial soil pH. And the pH of the effluents from Chon Buri and Klaeng series were acid. This is probably due to the efficiency to remove bases from the influent.

7. The efficiency of high permeable soils for wastewater disposal were enhanced to a certain extent after passing the wastewater through them for a certain period of time. This may be due to the increase in retention time so that the ions could be drawn out of the water.

8. The application of this project, using soil columns as wastewater disposal could be pointed out in many aspects. The following are the examples.

8.1 Once the characteristics of soil at a certain area are determined the appropriate designs for the waste disposal using the original soils can be planned regarding for example location, type of waste and depth.

8.2 Mixing of soils as quite possible to obtain the suitable texture for the wastewater disposal if the original soils are, at first, not of a proper type.

8.3 The use of soils as waste water disposal can be done in both small and large scale. For the first case, it has been already stated in the text particularly the domestic use. The latter could be applied to the industrial scale such as the designing of the proper wastewater pond.

8.4 The precaution in contamination of wastewater through the underground water layers could be established regarding to the known depth, soil types, the location of the site and others.



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