CHAPTER V

DISCUSSION OF RESULTS

The experimental results obtained are shown in CHAPTER IV and the following evaluations will be considered.

The preceding results are expressed in terms of the length of filter run and the causes of termination due either to floc breakthrough or to excessive headloss. The experiments demonstrated that the multimedia bed can effectively remove suspended matter from turbid water and produce a high quality effluent as shown in Fig. 21-23. The time, during the influent passing through the media, is enough for the filter to function as a flocculation reactor and a floc storage. This statement can be proved by comparing the effluent adding with alum and those without alum. Influent, after mixing with alum, give effluent of not more than 0.5 JTU, while those without alum give effluent of 4 to 6, 7 to 10, and 15.5 to 24 JTU for 10, 25, and 47 JTU respectively. So the addition of alum appears to have resulted in an immediate and significant decrease in effluent turbidity.

The time rate of clogging, as measured by the loss of head, varies for different media and conditions of flow, and is by no means constant. The turbidity penetrates the entire depth of media under all conditions of flow, and there is a gradual reduction in turbidity all along the depth. The final turbidity of the filtrate depends much more on the rate of flow than on the size of media. The effluent turbidity is high for higher velocity.

Difficulties were experienced during measurements of headloss for it was noticed that some silica sand and garnet sand found their way into the passage of the needles used to tap the filter column. But it was believed that this would not contribute any appreciable error to the manometric readings since there were the hydrostatic heads at various points that were being measured.

After each backwash was completed and media allowed to settle. Although the beds were sufficiently stratified, it was noticed that an appreciable amount of mixing between adjacent media took place and this probably resulted in changes in slopes of the headloss versus depth curves found in figures 6 through 17 at depths different from the should-be boundary lines.

Curves in figures 18, 19 and 20 compare filter runs for different loadings. It is clear that the length of filter run increases with decreases in loading. However, when rough computations of amount of water filtered during those periods were compared, they were found to be almost the same. In other words, the total amount of filtered water for each filter run was independent to the filter loading.

However, when the length of the filter run in this experiment was compared with that of a conventional rapid sand filter at Sam Sen Water Works, it was found that for influent of equal turbidity, the multi-media filter gave about 2-4 times as long as filter run.