

AN ABSTRACT OF A THESIS

A COMPARISON OF ULTRAFILTRATION AND MICROFILTRATION TREATMENT WITH CONVENTIONAL MUNICIPAL WATER TREATMENT

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This thesis contains results from the pilot study conducted at the Duck River Utility Commission, Tullahoma, TN, from February 2000 to June 2000. The existing conventional treatment plant at the site was compared to pilot scale membrane systems. The parameters taken into account for this comparison were UV – 254, total organic carbon (TOC), trihalomethane formation potential (THMFP), iron, manganese, turbidity, and particle counts. To come up with the most suitable system for expansion of the existing facility, a comparison was made between the percentage removals of each of the above parameters by the ultrafiltration (UF), microfiltration (MF), and conventional treatment.

Analysis of the data indicated that UF with conventional coagulation performed better than the MF system in removing organics. Without pretreatment, neither UF nor MF showed good reduction of TOC, THMs, or UV – 254. Performance of the conventional treatment system was more consistent than the UF and the MF systems in removal of organics. UF and MF gave very high removal of turbidity and particle counts but the study was not conclusive on the system providing a complete shield against particles. The conventional system provided good turbidity removal but the performance of membrane systems was better. All the systems gave excellent iron removal efficiencies. The manganese concentration in the effluent of all the systems was always below the EPA standards.