

Title: Attachment of Biofilms/Biological Anaerobic Fluidized Bed

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Objectives:

The anaerobic fluidized bed is currently being tested on a pilot scale at the University Pilot Plant for the treatment of primary effluent. The impetus for developing this process is great due to lower sludge production and methane production.

The major problem with any anaerobic fixed film process is start up. Thus it is proposed to examine means of improving biofilm attachment and improving speeding-up start-up times for the anaerobic fluidized bed.

Procedure:

This work will be done in the laboratory in serum tubes with sand particles as the biofilm supports. Various factors such as substrate concentration, pH, use of polymers, and use of previously established matrices will be examined. Scanning and Transmission Electron Microscopy, done in cooperation with the UMASS Department of Microbiology, will be used as a diagnostic tool to study film morphology. In addition, the microbiology of the fixed films will be examined in terms of population balances among the fermentative, acetogenic, and methanogenic bacteria. This will be particularly important in studying colonial succession.

Expected Results:

A technical report will be prepared from the results of these laboratory studies. This will be valuable information in an area where little information exists. While there exists some knowledge concerning film dynamics and kinetics of substrate removal, little is known concerning biofilm attachment - particularly anaerobic biofilms. This should help in reducing start-up time.

Cost: \$50,000