

AN ABSTRACT OF A THESIS

CELLULOSE, LIGNIN, AND BMP TESTS CONDUCTED ON MUNICIPAL SOLID WASTE FROM THE WILLIAMSON COUNTY, TENNESSEE, AERATED BIOREACTOR LANDFILL

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Master of Science in Chemical Engineering

In Williamson County, Tennessee, an aerated bioreactor landfill is equipped for the recirculation of leachate as well as for the influx of atmospheric air throughout the landfill waste. Samples of waste were collected from the landfill on July 2000, November 2000, and July 2001. Various properties of the samples of solid waste were examined to see if the rate of biodegradation increased due to the introduction of leachate and air. The properties tested were percent total solids, percent volatile solids, percent cellulose, percent lignin, and biochemical methane potential.

It was determined experimentally that, through the course of the year from which the samples were evaluated, the concentration of the majority of the tested parameters did not change. The percent total solids was the only parameter that changed during the time of testing. It was concluded that the change during testing was because the recirculation of leachate began in June 2000, increasingly saturating the landfill. The parameters, volatile solids, cellulose, lignin, and biochemical methane potential, statistically showed no decrease over the one-year study interval. It was concluded that not enough time had transpired to effectively decrease the concentrations of these parameters.

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CERTIFICATE OF APPROVAL OF THESIS

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