BIOLOGICAL CONVERSION OF BIOMASS TO METHANE

QUARTERLY PROGRESS REPORT
for Period June 1, 1976 - August 30, 1976

John T. Pfeffer
Department of Civil Engineering
University of Illinois
Urbana, Illinois 61801

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September 1976

Prepared for

THE U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
UNDER CONTRACT NO. E(11-1)-2917

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Introduction

This is a status report for the purpose of reporting the progress being made in meeting the contract objectives. The initial task in the contract is the construction of the experimental system necessary to conduct the study. The contract has been modified to include some additional work not covered in the original contract.

Contract Modifications

Modification 1 is an additional study being conducted to determine the effect of reactor design on the efficiency of converting organic material to methane. This modification was approved on July 30, 1976. Three separate 50 liter reactors have been constructed to evaluate the fermentation process performance. The reactor designs consist of (1) complete mix, (2) 4 series complete mix tanks to simulate plug flow and (3) a two stage unit. These units have been completed except for the mixer drive mechanisms. There has been slight delay in obtaining this mechanism. Operation of these units should start by mid September.

Substrate for these studies will consist of shredded paper, 30 percent news print and 70 percent bond paper. Nitrogen, phosphorus and alkalinity will be added to the substrate to provide the nutrients and buffer for pH control. This combination of paper was selected to produce a feed with about 10 percent lignin. This will provide a substrate that is representative of most biomass fibers.

Modification 2 requires the installation of variable speed mixers on the fermentation tanks. At the June 23, 1976 Coordination Meeting of the contractors working on the fuel gas from animal waste activity, the lack

of any data on which the base mixing requirements was identified as a significant deficiency in the data base. Therefore, a modification in the original scope of work was proposed to include mixing studies. Variable speed drives are being installed on the fermentation units. This speed range associated with these drives will allow variation of the power input by two orders of magnitude. Recording watt meters have been installed in the electrical circuit to measure the power consumption.

Equipment Installation Status

Equipment acquisition has been erratic due to a number of problems. To date, all of the equipment required to complete installation of the fermentation system has been received. Delays have resulted from two sources. First, a problem in placing the purchase order for the stainless steel fermentation tanks resulted in a 30 day delay in receiving these units. They arrived on site on September 3, 1976. Inclusion of the variable speed mixers required redesign of the mixing system. A delay was encountered in obtaining the required variable speed drives. These drives finally arrived on September 9, 1976. Because of the size of this equipment, it is necessary to construct a substantial support for the mixers. As soon as these supports are complete, the installation of the fermentation system can be completed. At present, operation is expended prior to October 1, 1976.