

## **Modification of Anaerobic Digestion Model No. 1 for Accumulation and Biomass Recycling**

Dr. Durmus Cesur

San Antonio River Authority, 100 East Guenther, San Antonio TX 78229

Dr. Maurice L. Albertson<sup>1</sup>

Civil Engineering Department, Colorado State University, Fort Collins, CO 80523

**Abstract.** In this paper, modification of Anaerobic Digestion Model No. 1 (ADM1), developed by the International Water Association (IWA) Task Group, to accommodate effects of accumulation of waste in the digester is explained. The modification includes incorporation of a physically-based methodology to ADM1 to account for an unsteady state. The methodology is used to estimate the decrease in the operating volume and the increase in retention time consecutively due to biomass recycling in the reactor caused by the accumulation of particulate matter and operational variations. The methodology considers both the reduction in the operating volume, and the increase in retention time due to the accumulation, and accompanied biomass recycling. By the evaluation of The Modified Model outputs and comparison with the Original Model outputs, the methodology, developed in the research, is found to be necessary and suitable for simulation of the anaerobic digestion in a Colorado Pork anaerobic digester.