RESEARCH ABSTRACT

ENVIRONMENT

Title: Odor and Dust Reduction of Swine Building Exhaust Air
NPB# 01-039

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ABSTRACT:

A mechanical-biological-chemical system for removing odor and dust from swine building ventilation air was designed and developed by researchers in the Department of Agricultural and Biosystems Engineering at South Dakota State University and the Chemistry and Chemical Engineering Department at the South Dakota School of Mines and Technology. A prototype chemical absorption system that used a weakly acidic solution to preferentially remove ammonia and a significant fraction of the dust from an exhaust air stream was modeled, designed, constructed and tested under laboratory conditions. Average ammonia removal level from air with initial ammonia levels similar to that found in swine facilities was 97.7%.

A prototype mechanical-biological filter that uses a wetted plastic mesh to establish environmental conditions conducive to biological degradation of odor and dust from swine ventilation air was designed, constructed and tested under both laboratory and swine production conditions. This unit removed up to 100% of the dust from air in a swine confinement building. Additional research is needed to develop the parameters and criteria required to allow commercialization of this unit.