NITRIFICATION PERFORMANCE OF A MODIFIED AERATED LAGOON

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ABSTRACT

The performance of a modified wastewater lagoon and the factors affecting the treatment process are discussed. This study was conducted over a period of twelve months at the Kingdom City, Missouri lagoon. A polyethylene fixed film media was incorporated in the lagoon to modify its waste treating ability. However, further study of the performance of the lagoon would be required to assess the effectiveness of the media in treating the wastes. The study recognizes the affect of seasonal changes on the treatment process. Analysis of various characteristics of wastewater such as ammonia, biochemical oxygen demand (BOD_5), nitrites, nitrates, total suspended solids (TSS), volatile suspended solids, chemical oxygen demand, and alkalinity were performed during the study period. The parameters of pH, dissolved oxygen concentration, and temperature were monitored at the time of sample collection in the field. Results indicate that the average ammonia removal rate was 87% and 98% removal rates were achieved during the summer. It was observed that nitrification is greatly influenced by temperature. Eighty four percent of BOD_5 was removed on an average and the lagoon was able to maintain low BOD_5 values during 2006. The concentration of nitrate was consistent with nitrification levels. An average of 86% of TSS was removed from the lagoon during the study period. The study provides good preliminary data for evaluating the performance of a lagoon. The advancement of wastewater treatment technology in lagoons with the help of fixed films can be achieved by further studies and monitoring of the lagoon based upon the current observations.