

EVALUATION OF A MUNICIPAL WASTEWATER TREATMENT PLANT BASED ON STABILIZATION PONDS COUPLED TO A COMPARTMENT ANAEROBIC REACTOR

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ABSTRACT

The objective of this research is to evaluate the performance of a wastewater treatment plant (WWTP) originally based on a series of stabilization ponds which has been expanded. The enlargement was carried out through the desludging and improvement of the stabilization ponds. The expansion consisted of the implementation of an anaerobic baffled reactor (ABR), an improved pre-treatment system which includes screens, a mechanical sieve, a sand trap with degreasing chamber, and beds for drying sludge from the ABR. The WWTP currently serves a population of approximately 20 000 inhabitants and treats a flow of 2 416 m³/d. The newly implemented ABR contributes mainly to the reduction of BOD, COD and especially TSS. The conditioning of the stabilization ponds improved the treatment capacity of the WWTP. The global efficiency of the WWTP is: 55, 67, 54, 80, 15 and 26% for BOD₅, total COD, soluble COD, TSS, N-NH₃ and P. With the addition of the ABR and the enhancement of the stabilization ponds, the efficiency of the WWTP has increased from 52 to 67% in the removal of COD. These parameters demonstrate that the implementation of a ABR before the ponds to expand the treatment capacity of a stabilization pond system is a suitable alternative. Additionally, the importance of maintaining the ponds and regularly removing sludge to optimize their operation is highlighted.

Keywords: Wastewater Treatment, Stabilization Ponds, Upgrading, Anaerobic Baffled Reactors (ABR), Design, Evaluation, Capacity Increase.

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