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SCIENTIFIC & RESEARCH PROJECTS

Project No.: 05 **Year:** 2013

Project Field: Exergy Analysis

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Project Title:

Application of Exergy Analysis for Quantification of the Environmental Performance in Wastewater Treatment Plant

Abstract:

This paper presented a new approach to estimate the degradation of environmental resources in a Wastewater Treatment Plant (WWTP) using exergy analysis. In first part, a method was described to calculate various quantities of the wastewater exergy. Furthermore, units were analysed to determine the most defective unit. In second part, a case study was analysed based on the environmental exergy concepts. Two environmental indexes include Environmental Exergy Efficiency (EEE) and the Total Pollution Rate (TPR) were considered for quantification of environmental impacts. In third part, the primary clarifier was determined as the most defective unit. At least, the optimised network was presented to performance improvement and environmental impacts reducing. EEE and TPR indexes were changed from 6.14 and 0.14 to 1.79 and 0.36, respectively. In addition, the results of this paper showed that exergy analysis can be used as a tool for quantification and optimization of WWTP.