

Performance, compliance and reliability of Waste stabilization pond: Effluent discharge quality and environmental protection agency standards in Ghana - DTU Orbit (08/11/2017)

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Measuring performance has been arguerably, one of the metric with many facets with different school of thoughts, as there exist different approaches of measuring it. Several of the existing approaches measure such metric by comparison with standards esherined in policy documents and as a result, takes less look to its compliance and reliability of values being matched to an established standards. This study seeks to integrate reliability and compliance into measuring of performance of Waste Stabilization Pond (WSP) and Treatment Plant (TP) as well as to generate the appropriate standard chart tables using the Ghana Environmental Protection Agency (EPA) approved discharge values for physico-chemical and some biological parameters to account for these shortfalls on over reliance of EPA discharge standards. Probability distribution density function was applied on the lognormal distribution function to establish the relationship between the statistical coefficient of variation and the coefficient of reliability based on r^{th} moment about the origin in the moment of generation function to generate the functions of the mean and standard deviation, properties of the standard Z normal distribution were used to establish the coefficient of reliability relationship depending on the coefficient of variation influenced by the standard of deviation. Discharge values of Physico-chemical Parameters measured from the WSP were found be performing acceptably based on the EPA standards, whereas only four of the TP were acceptable. Discharge Values of physico-chemical and biological parameters which are found to be accepted under comparison with EPA standards were found to have compliance levels below what is generally accepted for Waste Stabilization Ponds (WSP) designed compliance. Based on these shortcomings, reference charts were develop to serve as reference points in assessing the various characteristics of compliance and performance of WSPs in Ghana on (28) physico-chemical and biological parameters. These charts are intended to make it easier to assess the performance of WSPs and its corresponding reliability and compliance level to compensare for overreliance on EPA standards alone.

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