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**PERFORMANCE OF THE WASTE STABILIZATION
POND SYSTEM AT DIGANA**

**A Dissertation submitted in partial fulfillment of the
requirement for the Master of Engineering Degree in
Environmental Engineering and Management**



By R.A.P. Rupasingha

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**This Thesis has not been previously presented in whole or part to any
University or Institution for a higher degree.**

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Abbreviations

WSP	- Waste Stabilization Ponds
DP	- Duckweed Ponds
SP	- Stabilization Ponds
BOD	- Biochemical Oxygen Demand
COD	- Chemical Oxygen Demand
TSS	- Total Suspended Solids
DO	- Dissolved Oxygen
WW	- Wastewater
HRT	- Hydraulic Retention Time
BWSP	- Baffled Waste Stabilization Ponds
FC	- Fecal Coliform
MCM	- Million Cubic Meters



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Abstract

This dissertation describes an investigation into the performance of a waste stabilization pond system designed to treat the wastewater at Digana village, near Kandy. This system was designed, constructed and put into operation in 1980 as a combination of anaerobic pond followed by a facultative and a maturation pond.

The main objective of this study was to evaluate the performance of the pond system in relation to the design and to suggest methods of improving the efficiency. A secondary objective was to prepare some guidelines for operation and maintenance of the pond system.

With respect to the design, the only data available were that the pond system was to function as an anaerobic, facultative and maturation pond in series, with the total HRT of 21 days and expected to produce a final effluent BOD of less than 20 mg/l. Hence the study concentrated firstly on determining the existing physical state and capacities. Based on the outcome of the above study, interpond connections were closed to operate only half the pond system to study the performance related to removal of BOD, COD, TSS and Nutrients.

The study indicated that due to the capacity reduction caused by the accumulation of sludge in combination with the entire flow being treated only by half the pond system, the effective total HRT was only 6.27 days. Further it was revealed that the first pond was not fully anaerobic, desirable algal species were absent and the anaerobicity in the detention well contributed to the lowering of the final effluent quality.

However, the performance of the pond system was reasonably good inspite of a few disadvantages. These shortcomings are identified and discussed in the report and detailed recommendations have been made regarding the operation and maintenance of the system in addition to suggestions made for immediate remedial measures to improve the performance.