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FACULTY OF INDUSTRIAL TECHNOLOGY

DEPARTMENT OF INDUSTRIAL ENGINEERING

*Thesis title: Opportunities for minimization of process wastewater through application of Cleaner Production in Sugar Refining: A case study.*

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE MASTER OF ENGINEERING DEGREE IN MANUFACTURING ENGINEERING AND OPERATIONS MANAGEMENT.

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## **Abstract**

The world today is focusing on ways of creating sustainable communities and cities while protecting global common goods such as the climate, water resources, and the environment. In view of this global concern, this research study was undertaken. It focussed on the quantitative and qualitative approaches to minimisation of wastewater in the sugar refining process. The quantitative approach helped us to analyse the quantities of water the plant is handling in terms of volumes used in the plant for the production process and quantities released as wastewater. Opportunities for reduction of water usage were explored. The qualitative approach was useful in the characterisation of the different effluent streams so that there could be selective application of cleaner production techniques.

A water audit was carried out for the whole manufacturing plant by monitoring the usage of water for the different sections of the plant using simple water meters for measuring. The audit results were then used in the analysis of the different sections on the ways the use of water can be maximised and thus also consequently reduce the wastewater produced.