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Discharge of Hazardous Wastewater from Analytical Laboratories in Colombo and Suburbs

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Abstract

Adequate assessment has not been made to measure the appropriate discharge of effluents from analytical laboratories in Sri Lanka. Such information is vital for the decision-making process of environment conservation. Therefore, the present study was conducted to investigate the methods of hazardous wastewater discharge from laboratories in Colombo and suburbs. A questionnaire survey was conducted for 26 randomly selected analytical or research laboratories in Colombo and suburbs within 20 km from Colombo. All the 24 laboratories responded perform chemical testing for physico-chemical parameters including Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solid (TSS) and oil and grease. However only 9 laboratories engaged in microbiology tests while 2 were involved in clinical wastewater tests. Approximately 50% of the surveyed laboratories possess a treatment system while nearly 40% of the laboratories operated without any form of treatment system and the rest did not respond to the particular question. Nevertheless 85% of laboratories carried out heavy metal analysis. The average monthly wastewater discharge of majority of the laboratories lies in the range of 200-500 cm^3. However 58% of the surveyed laboratories dispose sludge generated from treatment plant with chemicals, and out of it 77% did not dispose the sludge through a Central Environmental Authority approved facility. Around 70% of laboratories discharge wastewater directly to septic tanks or soakage pits with or without treatment. Only 1 laboratory possess a treatment plant with reuse system for the wastewater generate in the laboratory. Two of the laboratories were connected to Colombo Municipal Council central sewer system or the wastewater line of National Water Supply and Drainage Board. As most of the laboratories discharge the wastewater to soakage pit or septic tank with or without treatment, there is a high potential for environment pollution due to laboratory waste water seepage. Analytical tests performed on wastewater of selected laboratories showed, BOD, COD, oil and greases exceeded the general standards for discharge of industrial effluent into inland surface waters set by the Central Environment Authority. The study demonstrates that the majority of the surveyed laboratories in Colombo and suburbs are releasing hazardous wastewater without adequate treatment and may contribute largely to polluting the natural environment. Several actions such as awareness to laboratory owners, strict regulations, methodical monitoring and implementation of penalties are recommended.

Keywords: Effluents, Hazardous, Laboratories, Monitoring, Pollution, Treatment