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Rectification of wastewater treatment plant design to remediate pollution of water sources in the Katunayake Export Processing Zone

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Due to rapid industrial development, pollutants of the Katunayake Export Processing Zone (KEPZ) cause irreparable damage to the ecosystem of the surrounding area including water ways. The waterway, Kimbulapitiya Oya, located close to Katunayake town was considered in this study to assess the degree of pollution due to wastewater discharge. Water samples of tributaries to the Kimbulapitiya Oya were assessed to investigate the pollution levels. The results revealed that the flow from the wastewater treatment plant at the KEPZ comprised maximum BOD of 144 mg/L and COD of 410 mg/L exceeding the discharge limits stipulated by CEA.

In order to rectify the poor performances of the treatment plant, the plant performance was assessed. Influent and effluent water quality analysis of the existing treatment plant showed that the highest BOD and COD were 250 mg/L of 690 mg/L respectively. Assessment of the performance of the treatment plant revealed that the aerated lagoon concept adopted in the plant design was underprovided to remove BOD efficiently.

Therefore, the influent of the wastewater treatment plant at KEPZ was analyzed twice a month over a period of six months, while the relevant data were compiled for the redesign of the plant. For rectifying the operational shortcomings, an appropriate process was proposed to reduce the BOD load of the plant. To increase the removal efficiency, recirculation of activated sludge was introduced and thereby the higher bio mass concentration in the modified aerating tank was maintained. In addition, inclusion of a flow type aerator to the modified aeration tank was proposed while retaining the existing lagoons and floating aerators. The estimations showed that the proposed design would reduce BOD of treated water to the stipulated water quality standards for discharging into inland waters.

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