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New Dimensions in Palm Oil Mill Effluent (POME) Treatment Using Biotech Based Treatment System*

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Most Malaysian palm oil mills have adopted the open lagoon method as their effluent treatment system. There are numerous problems confronting these mills as far as effluent discharge is concerned. In Sabah, the Malaysian Department of Environment (DOE) requires final effluent discharge of Bio Oxygen Demand (BOD) below 20 mg per litre. Currently available in the market are a few technologies which use a standalone or a combination of the mechanical, chemical and biological methods. Most systems fail to consistently and continuously meet the official requirement. A pilot project study in a 45-tonne per hour palm oil mill situated in Sandakan, managed to obtain a 20 months continuous result of BOD below 20 mg per litre. The treatment system in the study primarily uses biological treatment method, i.e. a combination of anaerobic, aerobic digestion process and for final polishing, a multistage activated carbon chambers. One of the key elements is the introduction of Biomass Extract (BME), a proprietary product, to the digestion process. One very distinctive characteristic of the system is the absence of bad odour in the entire lagoon area. The BME proved to eliminate malodour which is due to the presence of hydrogen sulfide, ammonia gas and abnormal build-up of acetic acids in POME during the acidification process of anaerobic digestion. Future research also aims to study the potential reduction of the Greenhouse Gas (GHG), methane, from the source (for most of the methane is a result of consumption of these acids by microbes) which is of paramount importance in the compliance of the sustainability of oil palm industry with respect to RSPO/MSPO.
Keywords: POME, BOD, odour reduction, biomass extract, biological treatment and methane.