



MBBR Wastewater Facility for Landfill Leachate Treatment

Background

Established in 2006, the Waste Custodian Management had a simple yet noble vision: to provide the most modern and state of the art waste disposal solutions and address the need for a suitable and eco-friendly facility to cater the different types of waste disposal programs of Local Government Units (LGUs) and private entities.

The company has now evolved into a formidable corporation as WACUMAN, Incorporated. In compliance with standards set by the Department of Environment and Natural Resources (DENR), it is considered to be a key player in promoting environment-friendly solutions for the problems of waste disposal faced every day.

Importance of landfills in waste management

In 2004, the “Garbage book”, a study by the Asian Development Bank revealed that nearly 3,700 health care facilities in Metro Manila generate an estimated 47 tons of medical waste per day, with 56 % of this waste considered potentially infectious. With 80 % of the waste disposed on their landfill being hospital waste, Wacuman Inc. specializes in the secure disposal of treated medical waste.

QUALITY THAT NEVER QUILTS™

Customer: Wacuman Philippines Inc.
Industry: Industrial, Landfill Leachate

If there is no treatment necessary, which is the case for left over foods, residual waste, or packaging, a direct line between the generator and the landfill is possible. But companies often produce a high amount of waste which exceeds the municipality’s capacity. So they use the services of landfill operators, such as Wacuman Inc., for the disposal of their waste.

KEY FACTS

- **Wastewater Flow:** 50 m³/day (0.013 MGD)
- **BOD₅:** Design influent 282 mg/L
Final effluent < 50 mg/L
- **COD:** Design influent 496 mg/L
Final effluent < 100 mg/L
- **TSS:** Design influent 371 mg/L
Final effluent < 70 mg/L
- **pH:** Influent 8
Effluent 6.5 – 9.0
- **Temperature:** 29 °C (84.2 °F)



Wacuman Sanitary Landfill in Norzagaray, Bulacan, Philippines – most developed sanitary landfill in the world

Wacuman Landfill Disposal Facility

Wacuman sanitary landfill facility is an 18.8 hectare piece of property located in mountainous region of Norzagaray, province of Bulacan. As a Category 4 landfill (and thus the best ranked), the Wacuman Sanitary Landfill can accept a minimum volume of 200 tons to a maximum volume of 2,000 tons per day.

The sanitary landfill is Philippines' most modern facility, on par with the most developed sanitary landfills in the world. It was designed and constructed as a "world-class" sanitary landfill facility through meticulous research by the company's reliable team of geological and ecological experts/consultants from the University of Los Baños, Laguna.

Wacuman Inc. decided to operate a new waste water treatment system for the leachate using the moving bed biofilm reactor (MBBR) technology process from USA-based Headworks BIO™ Inc.

Headworks Bio Inc. MBBR Wastewater Treatment Facility

The Headworks MBBR process was the ideal choice given the requirement for an easy to operate system with a minimal footprint which could handle the strong leachate wastewater generated by various toxic and non-toxic wastes, including certain heavy metals.

MBBR is a fixed film biological wastewater treatment process. Headworks BIO's proprietary biocarriers are small poly-ethylene geometric shapes designed to maximize internal surface area for biofilm growth. Micro-organisms grow in biofilms attached to biocarriers. Moving freely throughout the liquid of the reactor (basin), the biocarriers provide a highly effective environment for biofilm growth. As a result, through moving bed bio film reactor removal efficiencies better than those of conventional activated sludge plants are realized, with smaller facility footprints.

Design and Inauguration

The MBBR facility at Wacuman is designed to treat 50 cubic meters per day of wastewater. The major advantage of the MBBR is a self-sustaining biological process, eliminating the requirement to supply a dilute return activated sludge and the need to periodically waste sludge. Further the operation is simplified due to the self-regulating nature of a fixed film system, substantially reducing the complexity of operator intervention.

The system assures that the water coming off the landfill is clean. In fact, only one step in the filtering process is missing to make it actually potable water, says Arwin Magpantay, Assistant General Manager at the Waste Custodian, Management Incorporated (Wacuman Inc.).

The Wastewater Treatment Facility was inaugurated on 18th February 2014 and was attended by 300 visitors including the Bulacan Governor, Mr Wilhelmino Sy-Alvarado and DENR Director Lormelyn Claudio.



MBBR tank (16 m³) loaded with a 44 % fill fraction of ActiveCell media

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