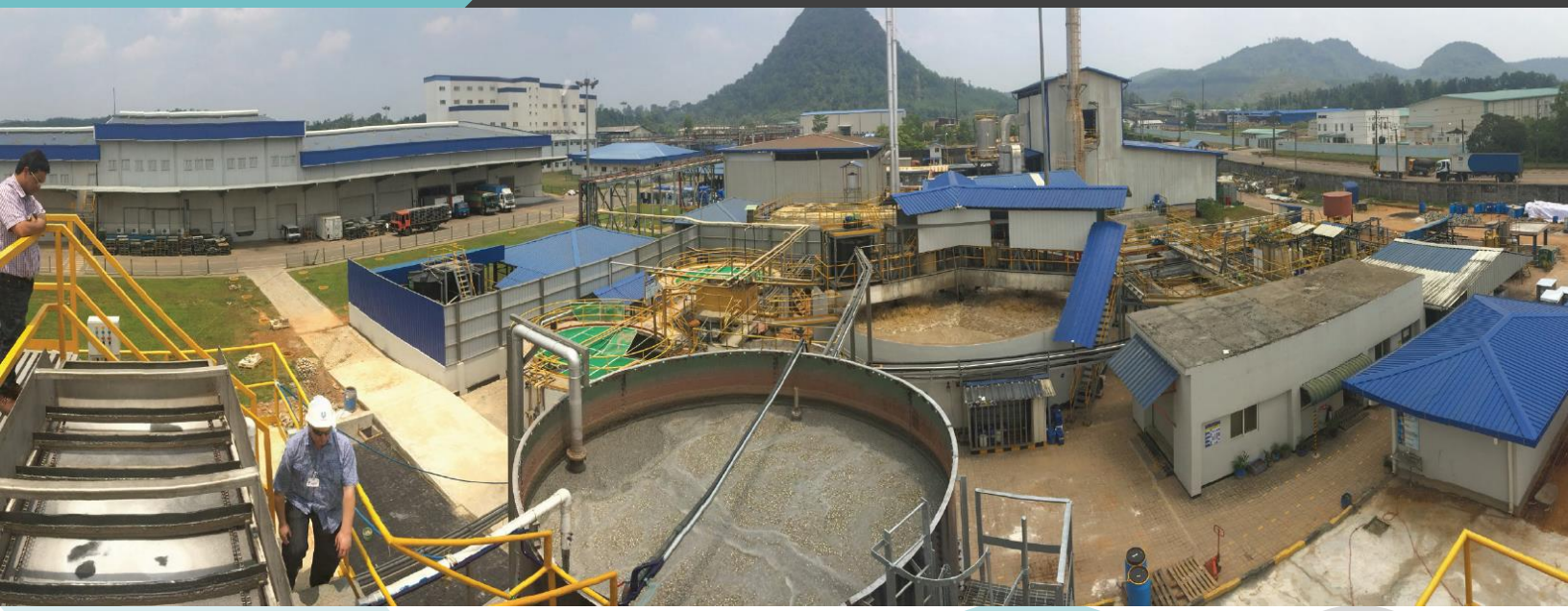
Headworks® INTERNATIONAL

CASE STUDY: **Unilever Horana** HORANA, SRI LANKA



Headworks BIO's ActiveCell™ Biofilm MBBR Process for Unilever

Customer: Unilever
Industry: Industrial, Consumer Products

Introduction

Unilever Sri Lanka was incorporated in 1938 with brands such as Sunlight, Lux and Pears Rose. Today it is home to 29 strong brands that are leaders in the categories that they operate in. This plant manufactures Home Care, Personal Care and Foods, all in one complex.

There was an existing effluent treatment plant (ETP) that was designed based on two stage activated sludge process. The flow had increased and due to the nature of varying influent the ETP was not performing up to the standards.

Challenge

Since this ETP is fed from four different manufacturing processes, the influent parameters vary widely. Even with a retention time of 9 hours in the equalization tank, shock loads are seen quite often. The inlet COD (chemical oxygen demand) varies from as low as 1,000 to as high as 14,000 mg/L.

KEY FACTS

- **Design Flow:** 400 m^3/day (0.106 MGD)
- **BOD_5:** MBBR influent < 2,000 mg/L
  Effluent < 750 mg/L
- **COD:** MBBR influent < 5,600 mg/L
  Effluent < 3,000 mg/L
- **TSS:** MBBR influent < 100 mg/L
  Effluent < 900 mg/L
- **FOG:** MBBR influent < 15 mg/L
- **pH:** 5 - 10
- **Temperature:** 20 – 30 °C (68 – 86 °F)

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Design

The earlier proposal was to set up a parallel two stage activated sludge process. Headworks was invited to propose alternate robust treatment technology to counter the challenges as described above.

Headworks proposed a primary dissolved air flotation unit (DAF) followed by a roughing reactor MBBR. The DAF removes the excess total suspended solids (TSS) and the moving bed biofilm reactor (MBBR) roughing reactor absorbs all the shock loads and gives a steady load to the existing two-stage ASP.

By implementing the DAF and MBBR, the existing two-stage activated sludge process delivers high quality effluent. The MBBR roughing reactor was designed in such a way, that the long run, one additional reactor followed by a secondary DAF would replace the entire two-stage activated sludge process system, which has 4-5 times the volume of the MBBR.

Headworks BIO's Inc. roughing reactor based on moving bed biofilm reactor (MBBR) – MBBR is a self-sustaining biological process, eliminating the need to periodically waste sludge and the requirement to supply a dilute return activated sludge

Installation of Headworks ActiveCell mobile biofilm carries to support very high concentration of attached biomass

Existing two stage active sludge process (ASP)

Primary dissolved air flotation (DAF) – removes 90 % of influent TSS and 9 % of influent BOD