



## Revolutionizing wastewater treatment with innovative membrane distillation technology for ACG

Enables **ACG** to Achieve ZLD



### **The Client:**

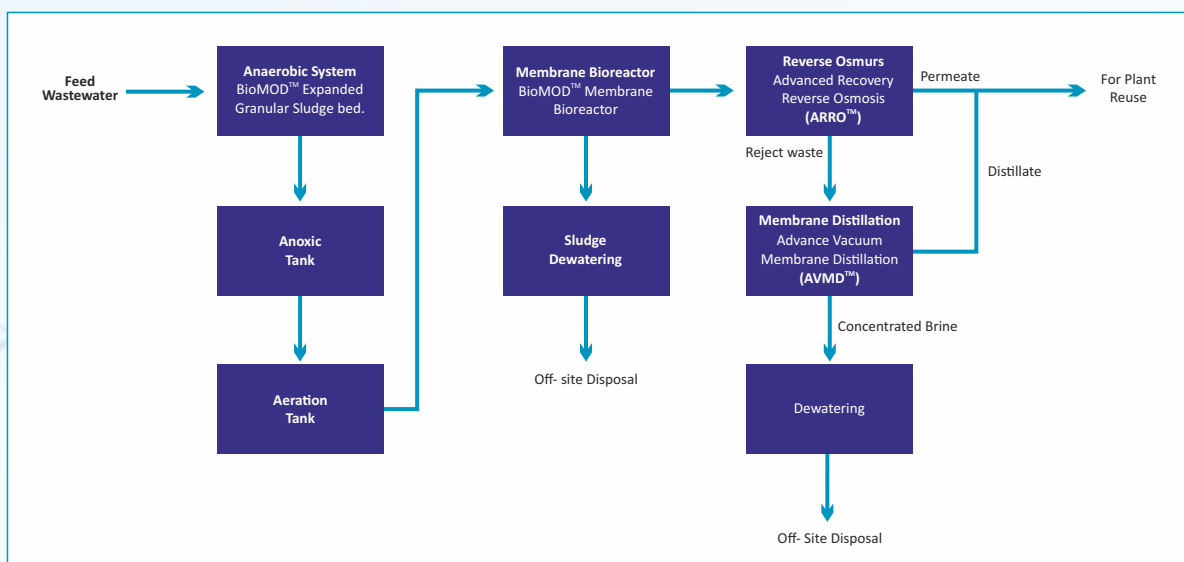
ACG is the world's largest integrated supplier of pharmaceutical empty capsules, granulation, tablet coating, capsule filling, and packing films globally.

### **The Challenge:**

ACG's new greenfield formulation facilities in India generate complex waste streams with high organic content from multiple processes, which must be treated in compliance with strict zero liquid discharge (ZLD) regulations.

## The Solution:

To achieve this, ACG has partnered with Aquatech to develop a robust ZLD solution for its wastewater at its manufacturing facility in Dahanu, India. Aquatech's innovative solution combines biological wastewater treatment with high recovery reverse osmosis (RO) and advanced membrane distillation to operate a 350 m<sup>3</sup>/day zero liquid discharge plant. The advanced combination of expanded granular sludge bed (EGSB) treatment, anoxic treatment for denitrification, membrane bioreactor, and high-recovery RO were deployed. This was alongside Advanced Vacuum Membrane Distillation (AVMD) technology, which combines the advantages of thermal distillation and membranes to achieve high water quality at lower energy consumption. It is the first full-scale plant integrating advanced vacuum membrane distillation for membrane evaporation and an agitated thin film dryer for dewatering. This project has set the stage for similar developments across other ACG locations.



**Process Flow Diagram**

## The Results: Saving Power, Generating Green Energy & Achieving ZLD:

Combining an innovative biological wastewater treatment and membrane distillation process to achieve water sustainability goals enables ACG to:

- Save power and generate 400 Kwh/d of green energy through biomethane production
- Recycle and recover over 95% water for reuse
- Achieve ZLD with minimal energy footprint



Winner of  
**Brave Blue World Foundation Lighthouse Award, 2023**



Nominated for

**INDUSTRIAL PROJECT OF THE YEAR 2023 BY GLOBAL WATER INTELLIGENCE**