Water & Waste Management

BioRemove™ FOG

Food & Beverage

Case study: Fungal filaments controlled in food processing plant

Rethink Tomorrow

novozymes®

BioRemove™ FOG helps improve floc formation and settling.

Benefits

- **SV30 reduced from 950 to 450 in 10 days**
- **Decline in fungal filament abundance from a rating of 6 (on a 0-6 scale) to 3 without the use of chlorine**
- **No deterioration of BOD or TSS effluent quality**

Background

A food processing company was experiencing bulking in the secondary clarifier that resulted inincreased solids loss in the effluent. The company thought the problem was due to filamentous bacteria and utilized a chlorination program to resolve the situation. The chlorination program was not able to correct the situation. The company called Novozymes to see if they could come up with an alternative solution.

Novozymes evaluates the system by first trying to understand the biological community. By doing this, a better understanding of the causes of the issues a facility is dealing with can be uncovered. Novozymes evaluated the system and identified several potential problems such as low nitrogen and phosphorous levels relative to BOD concentration, low pH of 6.0 in the EQ and aeration basin, and the filamentous organisms responsible for bulking were identified as fungi, not bacteria. In addition, the abundance of filaments were rated as 6 (0-6 scale) implying there was more filament biomass than floc biomass. Novozymes was contacted for assistance.

Application

Novozymes recommended a program of operating changes, higher wasting rates to remove filamentous bacteria, chlorination to lower filamentous count, and bioaugmentation to improve BOD removal. Since fungi are associated with pH below 6.5, the first part of the plan involved changing the pH of the EQ basin to 7.0. Also, nitrogen and phosphorous were added to the influent to satisfy a BOD:N:P ratio of 100:5:1. A bioaugmentation program using BioRemove™ FOG was recommended to enhance BOD removal as the fungi were pressured out of the system by the pH adjustment.

Fig. 1. System flow diagram.

Flow	208 m3/day (55,000 GPD)
Configuration	SBRs (Figure 1)

Table 1. System flow diagram.

Results

After ten days, the filamentous abundance rating had declined from 6 to 3 without the use of chlorine and SV30 had dropped from 950 to 450. There was never a loss in BOD removal.

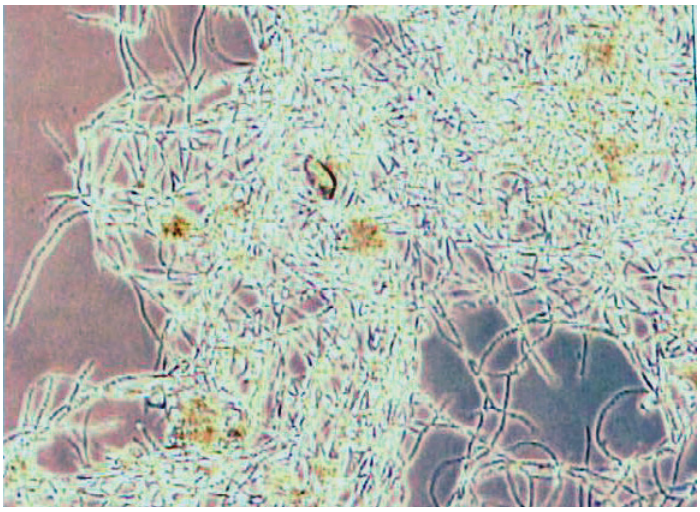

Fig. 2. Filamentous abundance was rated as 6 during the initial evaluation

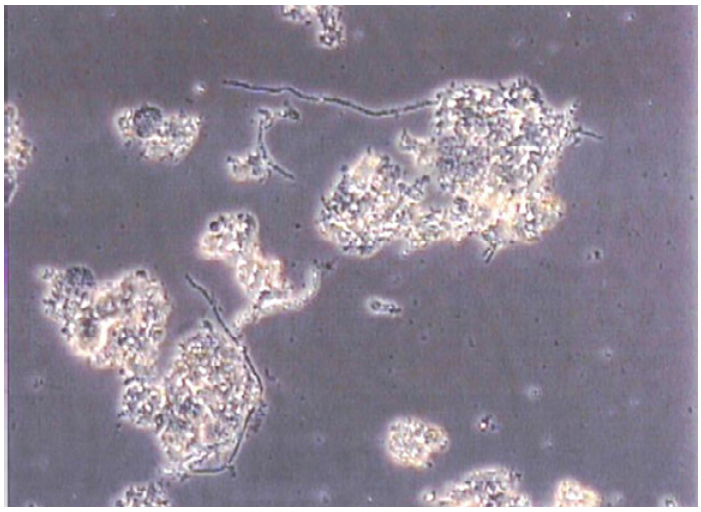

Fig. 3. Ten days after the program started, filamentous abundance was significantly reduced

Conclusion

Novozymes' biological program was easy to implement and provided significant benefits over other disposal alternatives. Novozymes' thorough understanding of microbiology allowed them to design a preferred solution for the facility. The use of BioRemove™ FOG resulted in:

- **Reduced use of chemicals**
- **Improved plant efficiency**

About Novozymes
Novozymes is the world leader in biological solutions. Together with customers, partners and the global community, we improve industrial performance while preserving the planet's resources and helping to build better lives. As the world's largest provider of enzyme and microbial technologies, our bioinnovation enables higher agricultural yields, low-temperature washing, energy-efficient production, renewable fuel and many other benefits that we rely on today and in the future. We call it Rethink Tomorrow.

Novozymes A/S
Krogshoejvej 36
DK – 2880 Bagsvaerd
Denmark
Tel. +45 4446 0000
http://biosolutions.novozymes.com/industry/wastewater
water@novozymes.com

novozymes.com