Malatech Water Trading & Service, Ltd.
Address: 1/E Vanyi way, Alsonemedi, 2351 Hungary • Telephone: +36 30 377 8089
E-mail: info@malatechwater.com • Web: www.malatechwater.com

Case Study - Malatech Bioaugmentation

Municipal Wastewater Treatment Plant of a city with 20 000 inhabitants, and nearby villages

Q=2 000 m^3/d

Targets: The activated sludge WWTP has full biological nutrient removal capabilities, but the facility is very old, its mechanical, and electrical infrastructures are outdated. It was unable to handle the cumulative load it received from the city, and nearby villages. Part of the raw wastewater is poorly pre-treated industrial wastewater (food-processing industry), which makes the situation even worse. The aim of the operator was multiple: by bioaugmentation we need to significantly lower the environmental fines, so we need to improve effluent quality, and also we focused on reducing excess sludge production to lower their OPEX in sludge dewatering, transportation, and disposal

Author: Malatech Water, Ltd.

Title: Municipal Wastewater Treatment Plant Optimization

Layout

Anaerobic-anoxic-aerobic layout without primary clarifier.

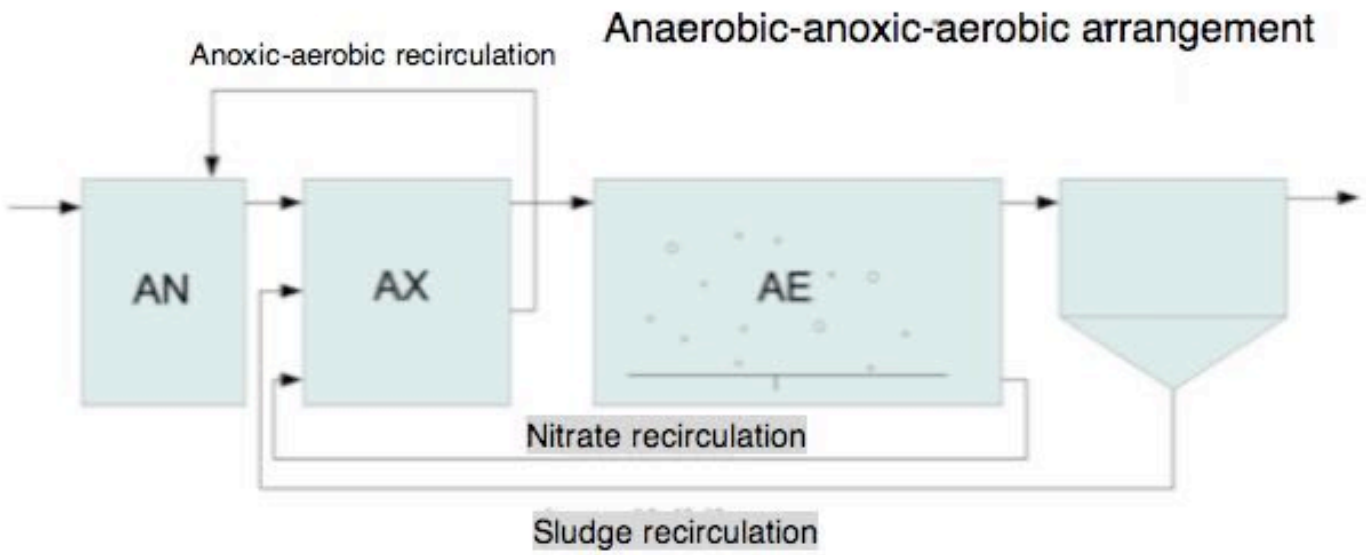

Figure 1 - Schematic diagram

Application used:

In order to improve the treatment efficiency **Bioclean TM** has been applied in a shock dose of 10 kg/day in the first week subsequently reduced to 1.5 kg/day in 6 weeks which has remained the maintenance dosage.

Main goals:

1) Effluent quality improvement because of continuous discharge limit violations (COD, BOD, NH4+, TN, TP)

2) Reduction of dewatered excess sludge quantity

Sludge production

The **average quantity of the dewatered sludge was 132 m^3/month before** the biotechnological optimization. This quantity considerably decreased during the treatment, **so after the startup phase, the average amount has been reduced to 64 m^3/month**. The plant has no primary clarifier, and due to this, also the decomposition of the organic particles has further decreased the excess sludge's quantity.

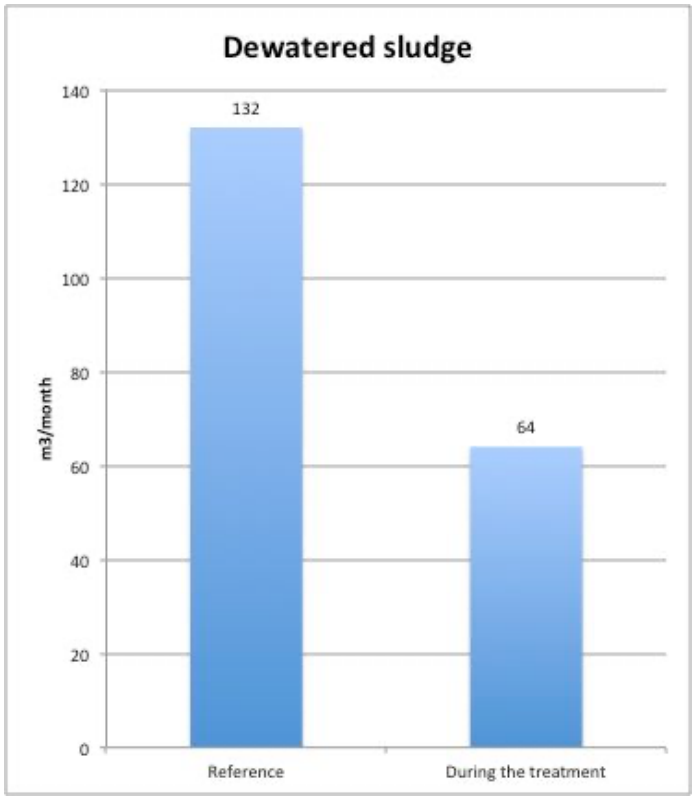

Figure 2 – Monthly quantity of the dewatered sludge

Effluent Parameters

The quality of the effluent water has improved due to the more efficient organic matter removal and the more stable nitrification, the fluctuation of the parameters has been reduced as well. The operation of the secondary clarifiers got stable by the floc structure's improvement, which also reduced the suspended solids content of the effluent water. **The effect of Bioclean TM is the most visible on organic breakdown (COD improvement), biological Phosphorus removal enhancement (TP improvement) and TN removal.**

Parameter	Average reference level	Average level during the treatment
COD (mg/l)	170,1	64,4
TP (mg/l)	3,3	0,9
TN (mg/l)	53,4	40,0

Table 1- Effluent water parameters

Polyelectrolyte Consumption

The quantity of the polyelectrolyte used for dewatering the sludge **has been reduced from 297 kg/month to 189 kg/month.**

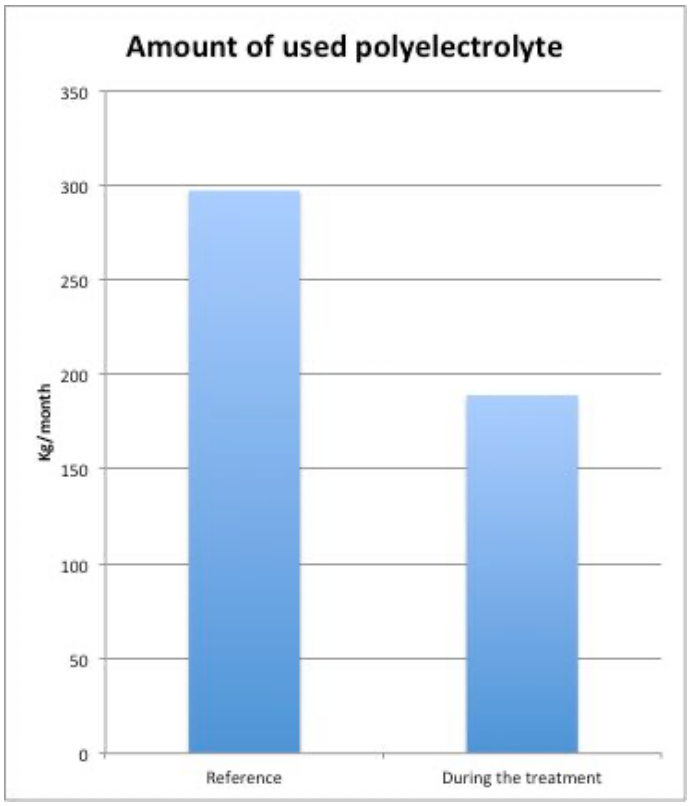

Figure 3 – Quantity of monthly used polyelectrolyte