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

1 300 m3/d Municipal Wastewater Treatment Plant of a city

Goals of bioaugmentation:

1. Increasing the treatment capacity of the activated sludge biology of the extremely old plant to lower NH4-N, and Total Nitrogen helping the operator to lower fines
2. Saving OPEX on energy consumption, chemical usage, excess sludge dewatering, transportation, and disposal

Author: Malatech Water Ltd.

Title: Municipal wastewater treatment plant optimization

The municipal WWTP operator client operates this outdated facility built in the nineteen eighties. The plant has a fine screen, sand trap, a hyperboloid-aerated small aerobic biology followed by a post-aerobic treatment of a surface+submerged-aerated old oxidation ditch, ending with a secondary clarifier with sludge recirculation to the 1st aeration basin. The plant has been fined for effluent violations of mainly NH4-N, and TN parameters recently since nitrification, and denitrification both fluctuate due to technical failures, and increased cumulative load, especially wintertime.

Our focus was on increasing the treatment capacity of the biology, and lower the fines as much as possible, OPEX reduction was secondary target, despite it has shown massive results as shown below..

Dosages:

Bioclean TM as our core technology has been applied, with occasional use of BioGuarde I, and Ammonia Guarde.

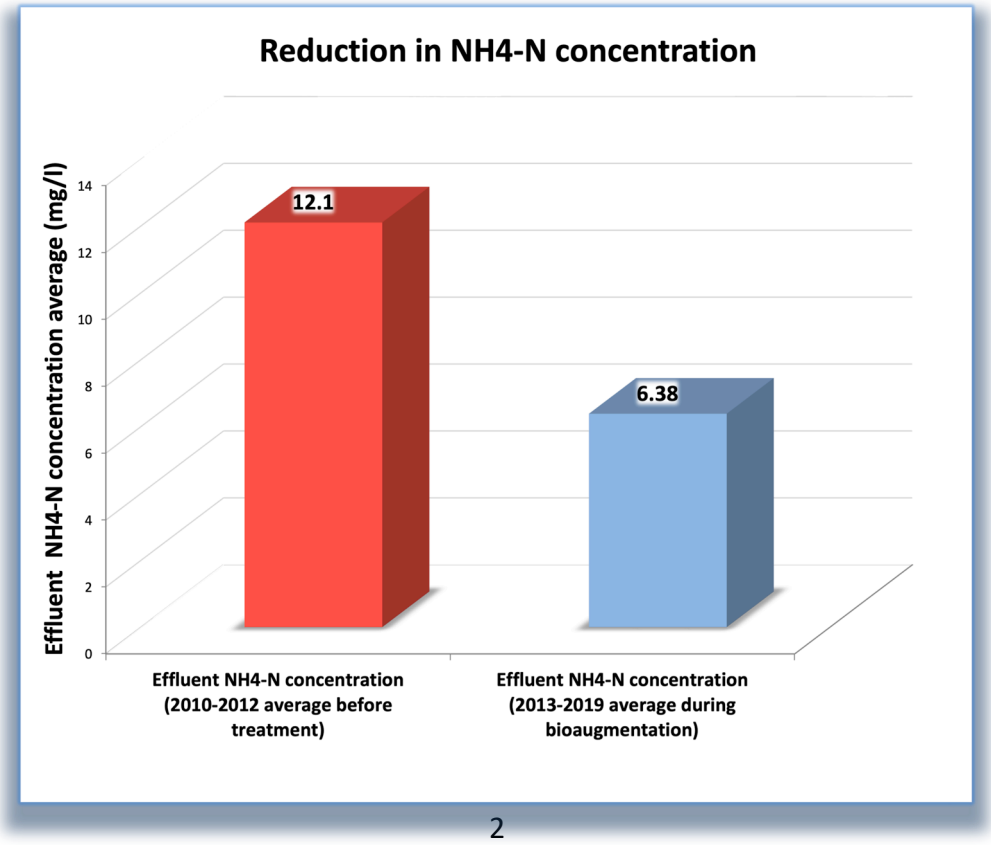
The shock dosage of Bioclean TM was 8 kg/d on week 1, followed by 6 kg/d on week 2, then 4 kg/d on week 3, and 2 kg/d on week 4. The maintenance dosage was 0.5 kg/d, dosed into the raw influent after pretreatment.

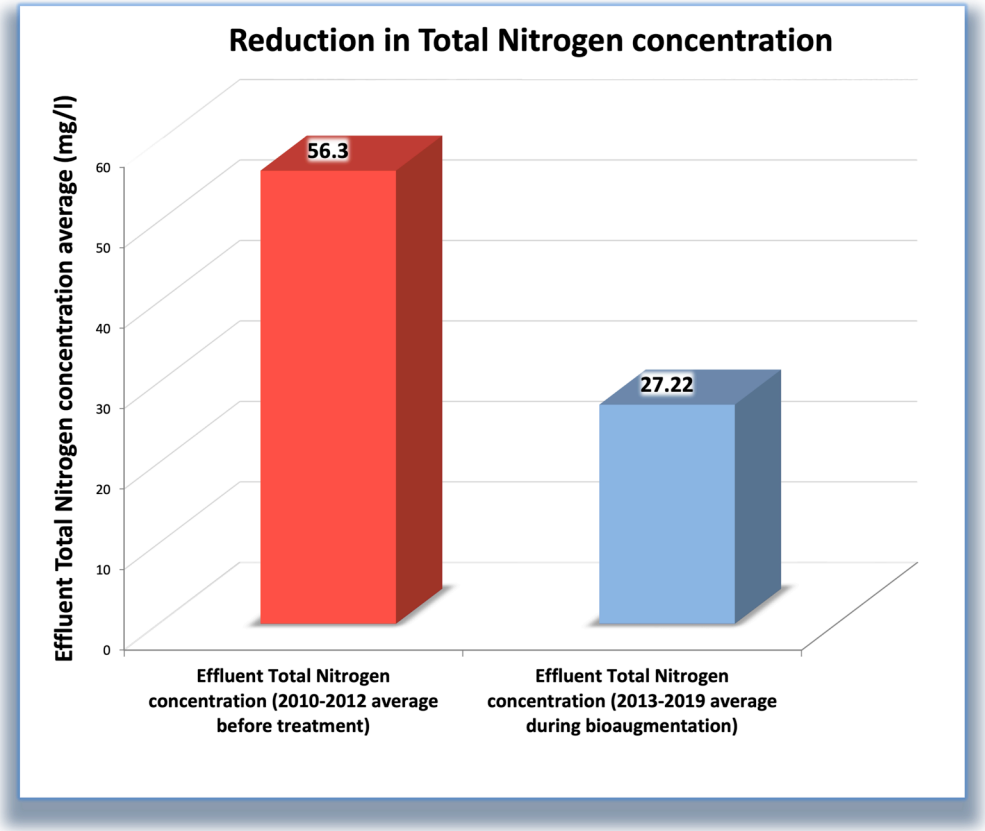
BioGuarde I was used (2 l/d) after each repair of mechanical, aeration-related failures for restoring the biology quickly, while Ammonia Guarde was added when nitrification needed a boost (1-2 l/d).

Results:

Effluent optimization:

As for Total Nitrogen we managed to keep the plant way below the 40 mg/l authority limit. In case of NH4-N the plant has a 5 mg/l limit for the effluent which it is able to keep between late March till mid-December. During winter nitrification still fluctuates with lower peaks, but the plant has received some fines until its total renovation in 2019.





Operating cost reduction - Energy consumption reduction, excess sludge reduction:

Bioclean TM bioaugmentation has a natural effect on DO utilization ability of the activated sludge. As the plant is equipped with DO control, the average operating frequency of the blowers dropped after the start of Bioclean TM dosage which resulted significant energy savings as shown below. Bioclean TM also has a mentionable impact on excess sludge production. **While reducing the yield of the activated sludge bacteria, operators of WWTP's naturally experience a drop in the monthly dewatered sludge production** which is another major factor of cost-savings for bioaugmentation with Bioclean TM.