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Case Study - Malatech Bioaugmentation

2 200 m3/d Pharmaceutical MBR Wastewater Treatment Plant

Goals of bioaugmentation:

The industry releases its treated effluent to a freshwater river, and did not meet with effluent COD, and NH4-N limits. The nature of the industrial processes were the main reasons of the underperformance, the factory released organic substances into the wastewater stream, which caused serious inhibition for the biology. COD breakdown, as well as nitrification has been hurt as a result of the toxic shocks. Operator aimed to eliminate payment of fines, increase the resistance, and tolerance of the biology towards inhibitory substances, and inoculate the effective biodegradation of these organic substances

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Author: Malatech Water Ltd.

Title: Pharmaceutical industrial wastewater treatment plant optimization

The client is an international company, among the world leaders in the pharmaceutical industry.

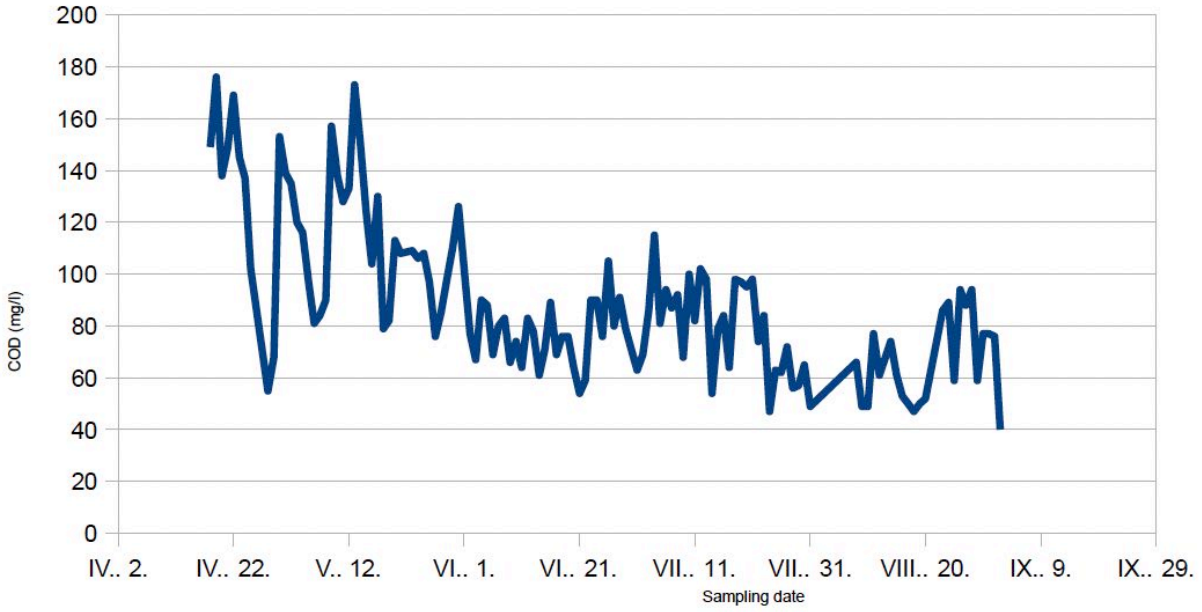
The plant is modern, well-equipped. After a physicochemical pre-treatment the raw wastewater enters the anoxic-aerobic MBR system. Activated sludge is kept between 11 000 - 14 000 mg/l concentration (MLSS). From the UF membrane tanks there is a recirculation line into the anoxic zone.

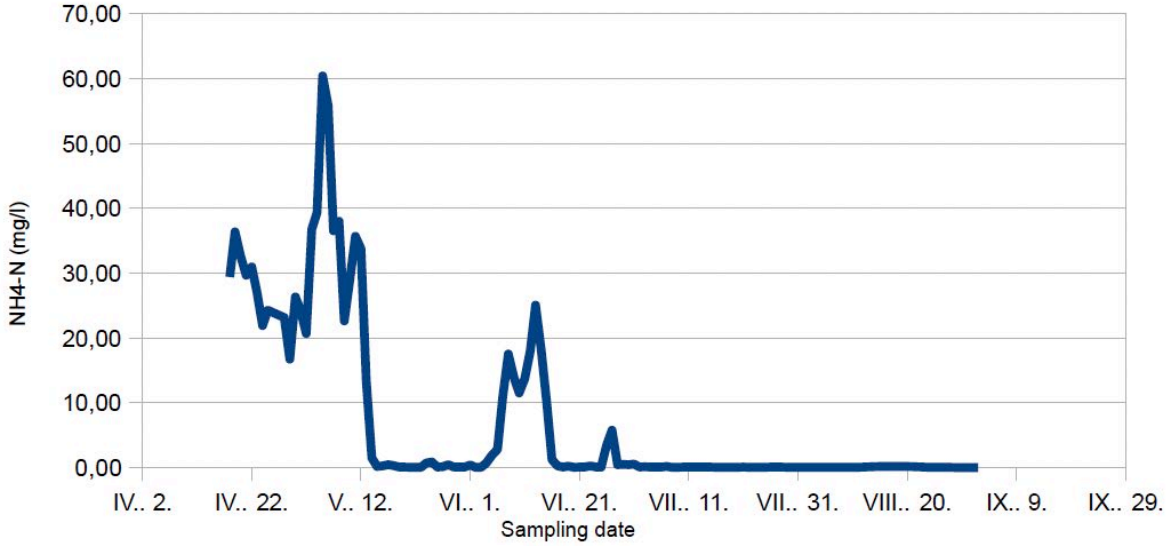
We have calculated with numerous inhibitory organic substances, which means the we have used **Bioclean TM, BioBooster NOC, and SOS5300** for bioaugmenting the activated sludge. Bioclean TM generally improves the operational window of the activated sludge bacteria for varoius parameters, and increases its resistance towards inhibition. SOS5300 contains specific bacteria which are highly tolerant against the inhibition of Phenol, BTEX and related organic substances, moreover they digest these substances. BioBooster NOC have been introduced for increasing the overall metabolic rate of the activated sludge.

Results:

Diagrams show COD, and NH4-N concentrations right from the start of bioaugmentation treatment. **COD fluctuated between 150-190 mg/l before treatment,** and stabilized between 40-80 mg/l after 3 months from the start of bioaugmentation. **Today, after 18 years of continuous bioaugmentation COD is 35-45 mg/l respectively.**

NH4-N fluctuated between 30-70 mg/l in the effluent before treatment. Nitrification has been restored in 2 months. Since then, the representative effluent NH4-N concentration is usually **less than 0.5 mg/l**. In the past 18 years nitrification fluctuates 2-3 times a year reaching 12 mg/l at maximum, which is quickly controlled by a temporary Ammonia Guarde dosage. **The plant has been using our technologies for 18 years with success.**




70,00
60,00
50,00
40,00
30,00
20,00
10,00
0,00
NH4-N (mg/l)
IV.. 2.
IV.. 22.
V.. 12.
VI.. 1.
VI.. 21.
VII.. 11.
VII.. 31.
VIII.. 20.
IX.. 9.
IX.. 29.
Sampling date