

Toxic Hit Recovery at a Mechanical Wastewater Treatment Plant

Wastewater treatment utilities receiving inputs from industrial and anthropogenic sources are highly susceptible to toxic waste. Toxic loads are often sporadic and can be extremely damaging to the biomass in treatment facilities.

A 0.06 MGD MWTP in Utah was struggling with weekly toxic hits that were killing off the biomass in its system. The facility served a large resort that received thousands of visitors annually, as well as a local distilling operation. Toxicity at the plant resulted from extremely high biological oxygen demand (BOD) and fats, oils, and grease from the resort. Additionally, chemicals and surfactants in the distillery influent were poisoning the biology. These toxic waste inputs prevented a stable biomass from becoming established in the system. Without functional biological treatment, the facility's effluent frequently had high BOD and NH₃ concentrations.

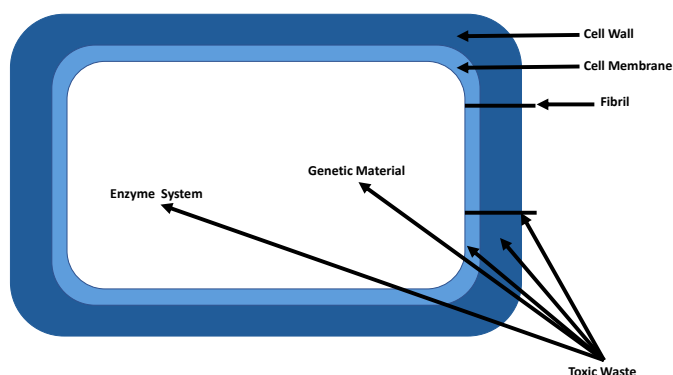


Figure 1. Toxic impacts on a bacterial cell. Toxicity inhibits cellular structure and activity. Fundamental cell structures inhibited by toxic waste include the cell wall, cell membrane, fibrils, and genetic material. Essential cellular activities that may be impaired include enzymatic activity and regulation of genetic material.

The book *Wastewater Bacteria* by Michael Gerardi explains that toxicity affects microbial cellular structure and activity (Figure 1).¹ The presence of toxicants in wastewater is known to inhibit biological treatment, specifically biological oxygen demand (BOD) removal and nitrification. To restore efficient wastewater processing, operators can augment their systems with a concentrated and diverse consortium of wastewater microorganisms. The following case study discusses the use of ProBiotic Scrubber® II (PBII) as a seed to restart a mechanical wastewater treatment plant (MWTP) after a series of toxic hits.

The operators added activated sludge from a neighboring plant to restart the system each time toxic waste killed off the biology. Hauling and applying activated sludge was becoming financially and operationally burdensome, so the facility manager sought alternative seeding options. After reviewing BioLynceus® case studies, management decided to treat the plant's toxicity with PBII.

To restore efficient wastewater processing after a toxic hit or influent overload, a daily dose of PBII was applied to the MWTP aeration basin for three to five days. The treatment increased the abundance of nitrifying and organotrophic bacteria, which helped improve effluent BOD and NH₃ levels. The system's recovery time after toxic hits was also reduced during bioaugmentation. After multiple successful treatments with PBII, the plant manager reported, "I am extremely pleased with the BioLynceus® product and have seen a huge change in effluent quality."

¹ Gerardi, M. (2006). *Wastewater Bacteria*. Hoboken, New Jersey: John Wiley & Sons, Inc. Pp. 173-203.

Treating toxic upsets with PBII quickly and cost-effectively established a healthy biomass at the MWTP.

BioLynceus® ProBiotic Scrubber® II provides the biology to treat wastewater plant toxicity.

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