

**Before****After****Case Study: Oak Tree**

Upon acquiring the Oak Tree Wastewater Treatment Facility, Oak Hill Utility Operating Company (UOC) identified several critical deficiencies that had severely compromised the facility's ability to operate effectively and maintain compliance with environmental regulations. Poor maintenance and operational practices had led to the failure of the sand beds, which are vital for the proper filtration of wastewater. The influent tank was burdened with an excess of sludge, necessitating immediate removal to prevent further loading of the compromised sand bed.

The facility also lacked basic infrastructure that ensured safety and operational continuity. The fencing around the site was incomplete, with missing boards creating a significant safety and liability risk. Furthermore, the aeration system was non-functional; no blowers were in place, and the existing diffusers had failed, leading to inadequate treatment processes. The facility had a troubling history of NPDES noncompliance, particularly with ammonia nitrogen violations and failing to meet minimum dissolved oxygen (DO) levels.

Recognizing the urgency of these issues, Oak Hill UOC embarked on a comprehensive improvement plan for the Oak Tree facility. The first steps involved stabilizing the site with the installation of a new, secure fence to address safety and liability concerns, and performing extensive electrical upgrades to ensure a reliable power supply.

To address the operational deficiencies, significant upgrades were made to the treatment process. Repairs were carried out on the air lines to the diffusers in the septic tanks, and a new blower system was installed to restore the aeration process. A Micro Moving Bed Biofilm Reactor (MBBR) system was installed within the existing tank, along with a new tertiary drum filter, to enhance biological treatment and solids removal. Additionally, the UV disinfection system was completely rebuilt with new units and housing, ensuring effective disinfection of the effluent. Modifications were made to the splitter valve to optimize the flow distribution, and yard piping was upgraded to support the improved treatment process. A new dosing pump was installed for feeding the MBBR, and new MBBR tankage and a tertiary filter were introduced to further enhance the facility's treatment capabilities.

These upgrades have led to a significant improvement in the facility's effluent quality, with ammonia levels reduced by 85% - from an average of 11 mg/L in 2019 to just 1.7 mg/L in the past year.

Through these targeted improvements, Oak Hill UOC has successfully restored the Oak Tree Wastewater Treatment Facility to full operational capacity, ensuring compliance with regulatory standards and providing reliable wastewater treatment services to the community.