

Integrated Urban Water Management (IUWM) Case Studies

Anoxic Bioremediation in Hauz Khaz Lake, New Delhi

Introduction/ Existing Scenario:

The Hauz Khas Lake in Delhi was getting polluted due to the treated and untreated sewage being discharged into it from a sewage treatment plant in Vasant Kunj. The lake used to receive treated sewage of approximately 3MLD daily. The situation deteriorated when untreated sewage also started being discharged into the lake sometimes. This caused a strong odor to emanate from the lake, posing a nuisance to the neighborhood.

How it is addressed:

The Hauz Khas Lake was revived by bioremediation technology, which took a few months to implement. The process involved the use of Persnickety® 713, a product developed by Syneco Systems, Inc., which reduced the pollution in the lake. This technology is effective in controlling foul odor and in reducing the amount of Total Suspended Solids (TSS), BOD and oil or grease accumulation in polluted waters.

About the Project:

The project involved natural in-situ treatment and Persnickety® 713's anoxic bioremediation technology (ABR), which uses selected anaerobic and facultative microbes. The technology involves manipulation of the environmental parameters to allow microbial growth and degradation to progress at a faster rate.

Process:

The treatment was carried out in two phases. Initially, high shock doses were given to stabilize the system for a few days, followed by low dosing once the bacterial strains entered the regeneration phase. Then, six to 24 hours prior to the dosing, the concentrate is mixed with an activator and diluted in chlorine-free water in the ratio of 1:40. Dosing is done at specific points that are generally closer to the inlet/ starting point of the sewage flow.

Implementation Agency:

Delhi Development Authority (DDA) and JM Enviro technologies Pvt. Ltd. Implementation status:

Implemented successfully and operational since 2007 Integration Across Sectors: Water, wastewater and stormwater Tools/ Technology Used: Anoxic Bioremediation Technology and Persnickety® 713 product.

Output/ Outcomes:

This technology of allowing microbial growth and degradation to proceed at a faster rate proved to be effective. As a result, the BOD and pH levels of the treated water fell within the first month of treatment. The BOD fell from 50 mg/l to 14 mg/l and from 70 mg/l to 21 mg/l at two different dosing points. The pH level also reduced from 9 to 8. In addition, the technology was effective in reducing the dissolved oxygen (DO) to satisfactory levels, leading to a cleaner lake environment and reviving the aquatic life in the lake.

Reasons for Success:

ABR, which is a low-cost and no-maintenance technology, proved favorable to the success of this project. Moreover, it virtually doesn't require any power since the process is based on the principle of using naturally occurring bacteria or fungi for degradation of contaminants into lesser toxic forms. Following the success of this project, it has been replicated at other sites, including at Kushak Drain in New Delhi.

Advantages:

This project provided eco-technology as an option for wastewater treatment in drains, lakes and STPs, among other sites. Another major advantage of this project is its low cost. It doesn't require additional infrastructure or new construction. It reduced the DO to satisfactory levels without using aerators that consume a large amount of power. The microbial consortia used in this process are capable of exhibiting growth at a wider temperature range too. The implementation of this project also led to reduced groundwater pollution. The treated water can be reused for irrigation or other purposes, since it matches the desirable standards of reuse, hence decreasing the load on freshwater sources.

