

Bio-Augmentation for Wastewater Treatment

Established Wastewater Treatment Plants

A major problem with many wastewater treatment plants is that they are simply overloaded. Wastewater research scientists have estimated that only 5-10% of the bacteria existing in a sewage treatment plant actively contribute to the sewage treatment process, while the remaining 90-95% of the bacteria compete for the available oxygen and nutrients.

EmTec specifically selected the bacteria in **EmTec-WP** in order to increase the percentage of these "worker bacteria" within the treatment plant, thereby increasing the overall results of the plant.

EmTec-WP is a live synergistic blend of natural, class 1 bacteria, specifically chosen for their ability to rapidly degrade solids, fats, lipids, protein, detergents, hydrocarbons, and other compounds. **EmTec-WP** is added at between two and twenty parts-per-million and is completely safe for humans, animals and plants. **EmTec-WP** is appropriate for all types of domestic treatment plants and has been shown to greatly reduce BOD and suspended solids.

The most striking results have been in the reduction of sludge and the rapid degradation of fats, oils, and greases in the wastewater treatment system. For example, a treatment plant in Ireland had a monthly average BOD of 380 milligrams-per-liter before treatment. This BOD was reduced to 24 milligrams-per-liter, which equals a reduction of 94%. An added benefit was that the amount of oxygen required to run the plant was reduced by 35%. These are exceptional results. In addition, **EmTec-WP** has had extremely good results in wastewater treatment plants that have been negatively affected by "shocking" from industrial areas.

EmTec-WP also helps to control odors in wastewater treatment plants. Odors are produced by the bacterial decomposition of organic material because indigenous bacteria do not completely degrade organic compounds, such as proteins, carbohydrates, and starches. Among the chemicals that cause these bad odors are hydrogen sulfide, organic sulfur compounds, organic acids and amines.

The micro-organisms in **EmTec-WP** utilize essentially all of the available organic material and oxidize it into carbon dioxide and water. Working on a competitive principle, selected micro-organisms are added at approximately one million times the concentration of indigenous bacteria, which are so outnumbered that they can not successfully compete for available organic material. This greatly restricts their growth and also gently diminishes the emission of organic compounds that produce the characteristic odor. The small amount of incompletely oxidized organic material that they may produce is quickly utilized by the micro-organisms in **EmTec-WP**, further reducing the odor.

EmTec Management Limited

Level 29 - The Offices at Centralworld
999/9 Rama I Road, Bangkok 10330, Thailand
Tel: +66 (0) 2207 2548 Fax: +66 (0) 2207 2550
Email: info@emtec.co.th



Alternative Wastewater Treatment Systems

In developing countries and rural areas, very simple systems can be designed to compliment the enhanced biological activity of **EmTec-WP**. With bio-augmentation and these very simple physical systems, the quality of the wastewater can be greatly enhanced without the overwhelming cost of new treatment plant construction. Additionally, previously contaminated rivers and streams can be quickly rejuvenated with **EmTec-WP**. In many cases these natural bodies of water can be converted into effective treatment facilities through continuous bio-augmentation with **EmTec-WP**.

Other examples of small wastewater treatment systems which can be greatly enhanced with **EmTec-WP** are: facultative lagoons, and aerobic or aerated lagoons.

Facultative Lagoons are systems that are low-cost and, with the use of **EmTec-WP**, can be a highly efficient alternative for wastewater treatment, especially in tropical and subtropical climates. When these lagoons are bio-augmented with **EmTec-WP**, a BOD reduction of 95% can be expected for raw screened or primary settled domestic wastewaters.

Aerobic or aerated lagoons can also be bio-augmented with **EmTec-WP**. These lagoons can be smaller in size or can accept higher loading. In the past, abnormal operation occurred when the lagoons were overloaded or when a toxic chemical was released into the lagoon. However, with the addition of **EmTec-WP**, these lagoons can be used as a post-treatment for facultative and anaerobic lagoons.

EmTec-WP can also be used for bio-augmentation during land application of sewage or sludge, and can be used for the removal of ammonia and phosphate from wastewater.

This information sheet was downloaded from:

<http://www.emtec.co.th/bio-augmentation-for-wastewater-treatment.html>

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