

IMPROVE AMMONIA REMOVAL WITH EBS PRODUCTS AND SERVICES

NITRIFICATION

Environmental Business Specialists, LLC (EBS) is a recognized leader in the area of industrial biological wastewater treatment troubleshooting, training, and optimization. Our staff of over thirty-five dedicated wastewater specialists, including engineers, microbiologists, and chemists, have worked with some of the world's largest industrial wastewater treatment systems and can assist you in all aspects of system assessment and optimization.

Nitrification, an area of particular specialty, is a critical step in many wastewater treatment systems and is becoming more important as regulations tighten regarding nutrients in industrial effluents. Nitrification is a two-step process where ammonia (NH_3) is converted to nitrite (NO_2) and then to nitrate (NO_3) and is carried out by a specific group of bacteria collectively referred to as nitrifying bacteria or nitrifiers. These bacteria are much more sensitive to environmental conditions than carbonaceous bacteria, the group of bacteria responsible for BOD removal. EBS offers a full menu of products and services specifically designed to alleviate the problems frequently found in the maintenance of nitrification levels in wastewater treatment plants (WWTPs).

NITRIFIRE™ 5X NITRIFYING BACTERIA FORMULATION

Sometimes, you simply need more nitrifiers faster than they can grow in the WWTP. To address this issue, EBS offers Nitrifire 5X, a high-activity and cost-effective nitrifier formulation used to establish a new nitrifier population or supplement the existing nitrifier population in a treatment system. Nitrifire 5X contains both *Nitrosomonas*, a genus of bacteria that converts NH_3 to NO_2 , and *Nitrobacter*, a genus of bacteria that converts NO_2 to NO_3 , making it a complete nitrification product. This separates Nitrifire 5X from other nitrifying bacteria products on the market, as the typical commercial nitrifier product contains little, if any, *Nitrobacter* strains.

NITRIFICATION TREATABILITY TESTING

Periodic loss of nitrification can be a puzzling and serious problem for operators of municipal and industrial wastewater systems. To help solve these problems, EBS has conducted numerous treatability studies across a wide variety of industries to determine the process control parameters limiting nitrification. Treatability testing assesses the nitrifying capacity of a biomass under various conditions, such as temperature or alkalinity, and can also be used to evaluate the potential toxic impact of streams or compounds on the nitrifier population. This information is invaluable for both determining the root cause for loss of nitrification and evaluating the potential benefits of adding supplemental nitrifiers.

A typical treatability study consists of a brief review of WWTP data, design of an appropriate treatability study to address the problem, and the actual implementation of the treatability study using respirometry. Treatability testing typically takes 1-3 days with results available within 7 days and generally costs between \$1,500 and \$5,000, depending on the complexity of the study.



Figures 1 and 2 show the results of a treatability study where the addition of Nitrifire 5X was evaluated to determine if adding supplemental nitrifiers could significantly increase the rate of nitrification for a WWTP. While the study results showed that Mixed Liquor Suspended Solids (MLSS) from the WWTP did contain a population of nitrifiers as evidenced by the respiration rate and some ammonia removal, the rate of nitrification was significantly increased when Nitrifire 5X was added to the MLSS to supplement the nitrifer population, thus indicating the addition of Nitrifire 5X could be used to increase the rate of nitrification for this WWTP.

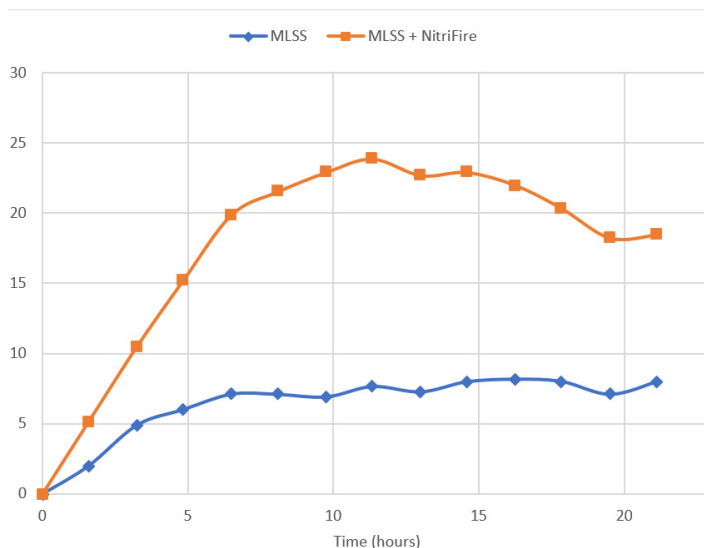


Figure 1 – Oxygen uptake rate of the MLSS with and without Nitrifire 5X with a starting $\text{NH}_3\text{-N}$ concentration of 57 mg/L

Ammonia percent removal (%)

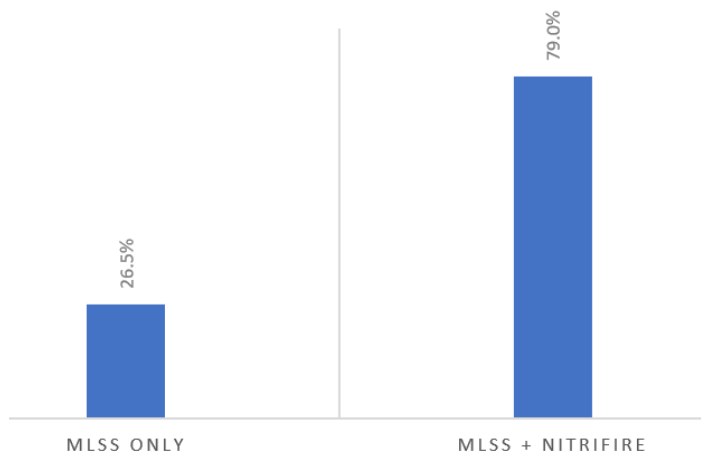
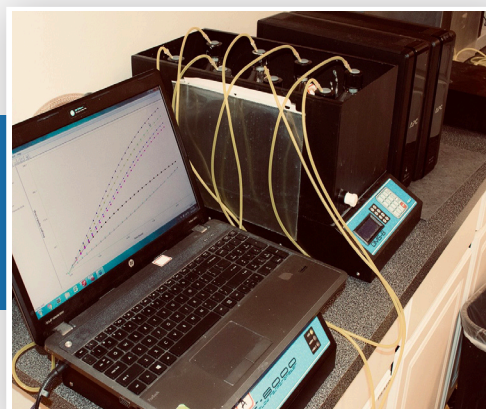
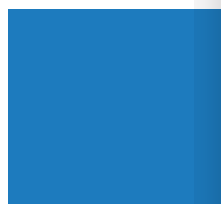
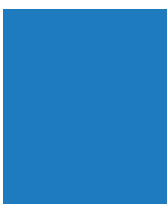
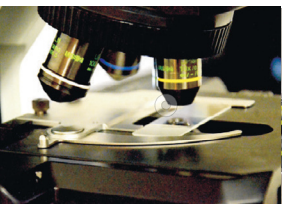


Figure 2 - The percentage of $\text{NH}_3\text{-N}$ removed after 22 hours test time



To learn more about Nitrifire 5X, please contact us at (985) 674-0660 or at info@ebsbiowizard.com today.

Environmental Business Specialists, LLC
1930 Surgi Drive, Mandeville, LA 70448
www.ebsbiowizard.com
info@ebsbiowizard.com • (985) 674-0660

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