

NITRABAR – demonstrating permeable reactive barrier technology for the removal of nitrate derived from agricultural practices

NITRABAR Partnership, incorporating the University of Oxford



Introduction

The application of nutrients to land in the form of chemical fertilisers and manures is an essential part of modern farming practice. Nitrogen is one of the key nutrients applied and is taken up by plants as nitrate to enhance growth.

Despite substantial efforts to optimise nutrient application to farmland, the levels of nitrate in many European groundwater bodies and rivers are still not meeting EC Directive targets. With the introduction of the Water Framework Directive, the issue of nitrate in the environment has become an even bigger challenge.

Permeable reactive barrier technology has been shown to have good potential for the removal of nitrate, and may have an application in strategically targeting high nitrate fluxes from agricultural land. There is a need to demonstrate the application of this technology within European climatic and agricultural settings.



NITRABAR approach

- NITRABAR is a passive system for the removal of nitrate present in shallow groundwater as a result of past and present agricultural practices.
- Essentially, the system is a narrow trench, installed between the field and a water body, which is filled with a mixture of natural materials. As groundwater passes through the system, denitrification occurs and the nitrate is to nitrogen gas.
- The system is expected to achieve an 85% reduction in the nitrate level in waters passing through it.

Project partners

- University of Oxford (Integrated Pollution Management Knowledge Transfer Network)
- Queen's University Belfast
- Environment Agency
- Ecomesh Ltd. (UK)
- PRGW (Poland)
- Greensan (Belgium)
- APCO Ltd. (Malta)
- CL:AIRE (UK)



The NITRABAR Project has been made possible due to the contributions of the partners involved and the contributions of the LIFE financial instrument of the European Community

Project objectives

- **To demonstrate the application of a reactive barrier to nitrate removal in an agricultural setting**
 - Site characterization
 - Design and installation of the system accounting for farming practices
 - Extensive monitoring programme
- **Enabling others to replicate the system throughout Europe**
 - This will be achieved by sharing information using literature, workshops and reports.

These objectives will be addressed over the 40 month project period, December 2005 to March 2009

Technology demonstration site

The NITRABAR demonstration system will be installed at the Ecos Millennium Environmental Centre, Ballymena, Northern Ireland



Installation of a monitoring borehole network at the ecos centre

Summerfield Ward: site of the demonstration system installation



Project Partners discussing the NITRABAR approach with farmers

Find out more...

www.nitrabar.eu

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