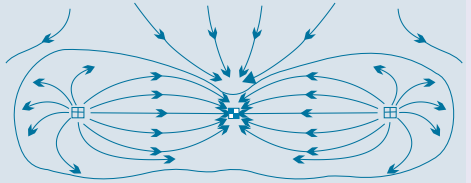
Highlights of the project

- Hydrological, micro-biological and geo-chemical characterisation of the aquifer.
- Treatment optimisation at lab scale before site implementation.

- Use of mathematical models to design the treatment system.

Example of treatment system hidro-dynamic model



- Monitoring pilot test for two years.
- Technical, economic and environmental assessment (Life Cycle Analysis) of the technology.

Key dates

July - December 2013	Initial tests and studies
January - June 2014	Pilot system design
June - December 2014	Treatment system construction
2015 and 2016	Operation and optimisation of the treatment system

Life+ InSiTrate

We work to restore the quality of our springs

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InSiTrate project

Project co-financed by:
LIFE12 ENV/ES/000651

Main stakeholders:

Ajuntament de Sant Andreu de Llavaneres

Agència Catalana de l'Aigua

Pictures provided by CTM, Amphos 21 and Catalana de Perforacions

InSiTrate

In-situ treatment technology for drinking water production from nitrate-polluted groundwater

ctm CENTRE TECNOLÒGIC

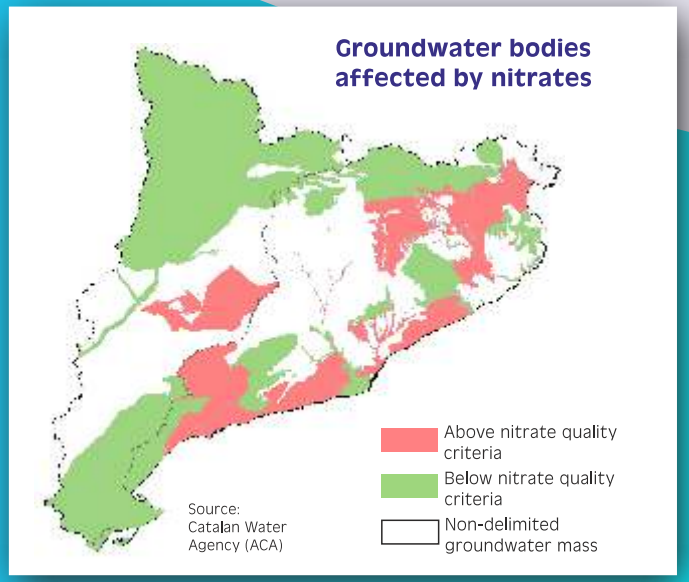
AMPHOS 21

catalanade PERFORACIONS

Environmental problem

Groundwater constitutes one of the main resources of freshwater on our planet. In Catalonia, groundwater provides 20% of all water used, and in relation to the inland basins this percentage increases to 43%.

An important problem associated with groundwater is the presence of nitrates due to the overuse of chemical fertilizers and manure. Excess nitrogen applied to the fields is lost by leaching through the soil and accumulates in groundwater bodies at levels not suitable for human consumption.



In Catalonia up to 30% of groundwater bodies suffer from nitrate pollution according to the Catalan Water Agency (ACA). On the other hand, more than 10% of the Catalan municipalities have drinking water supply problems and therefore, they must find alternatives.

The project

Life+ InSiTrate aims to demonstrate on a pilot scale the feasibility of in situ bio-remediation of nitrate-polluted groundwater for the production of drinking water.

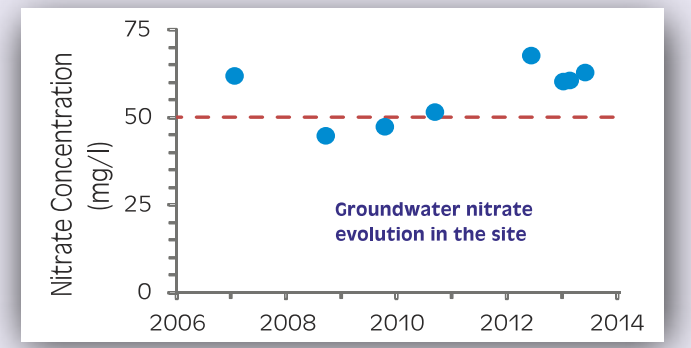
This is a project co-financed by the European Union within the framework of the Life+ Programme. The project is coordinated by the Fundació CTM Centre Tecnològic and includes the participation of Amphos 21 and Catalana de Perforacions.

The technology

Nitrate bioremediation is a technology based on accelerating the biological process of nitrate removal (i.e. denitrification), which takes place naturally in aquifers. This is achieved through the introduction of organic matter, totally innocuous, to the contaminated aquifer. In this way, indigenous aquifer micro-organisms can use the organic matter to remove nitrates from groundwater and produce water suitable for human consumption.

The pilot action

The pilot plant is located at Sant Andreu de Llavaneres (Catalonia). The aquifer of Sant Andreu de Llavaneres is a typical aquifer of the Catalan coastal area with average nitrate concentrations above the threshold limit of 50 mg/l.



The pilot plant consists of one nitrate-free water extraction well and several organic matter injection wells located at strategic places. It is fully automated with real time monitoring of the main parameters. During the monitoring period water will not be used.