

Project: Natural and Artificial Systems for Recharge and Infiltration (NASRI)

Induced by well abstraction, surface water infiltrates into Berlin aquifers and is used for drinking water production. The advantage of bank filtration is the capability of the subsurface to remove contaminants. Because a large proportion of the surface water in Berlin originates from treated effluents, the system is a semi-closed water cycle relying partly on indirect wastewater reuse.

Processes accompanying bank filtration and artificial recharge are currently studied in Berlin within a multidisciplinary project initiated by the KWB (Kompetenzzentrum Wasser Berlin) as a cooperation of the Berlin Water Works (BWB), the Technical and the Free University of Berlin, the German Environmental Protection Agency (UBA) and the Institute of Ecohydrology and Inland Fisheries (IGB) named Nasri (Natural and Artificial Systems for Recharge and Infiltration). It focuses on the behaviour and removal of, for example, pathogens, microsystems, organic pollutants as well as pharmaceutically active compounds during underground passage.

Within NASRI, the Free University evaluates the hydrogeology, hydraulics, geochemistry and hydrochemistry of the field sites. Wastewater indicators (e.g. Cl⁻, B, EDTA, Gd-EDPA), stable isotopes (¹⁸O, ²H) and Tritium/Helium age dating are used to calculate travel times to drinking water wells and proportions of bank filtrate in individual wells. The tracer results serve as a basis for the interpretation of the fate and behaviour of potential contaminants (e.g. drug residues or organic pollutants) analysed by project partners.

<http://www.kompetenzwasser.de/Natural-and-Artificial-Systems-for.23.0.html?&L=1>

Project: Evaluation of transport processes in the Oderbruch aquifer using the tritium/helium age dating method

Detailed groundwater monitoring was carried out within a previous research project in an anoxic, river recharged, pleistocene aquifer in the Oderbruch polder in Germany. First results from tritium/helium ($^3\text{H}/^3\text{He}$) age dating were promising and showed that the groundwater recharged by bank filtration gets progressively older with distance from the river. In the central polder region, the input of younger seepage water through the unsaturated zone could be demonstrated qualitatively. In a follow-up project transport processes within the aquifer are evaluated on a larger scale, using the tritium/helium age dating method. The emphasis is on the mapping of the nuclear tritium peak in order to quantify dispersion and flow velocities in the aquifer. An additional aim is to quantify the recharge through the unsaturated zone in the central polder areas. The outcome will be used to evaluate reaction rates and geochemical fluxes in the anoxic aquifer.


[HOME](#)
[RESEARCH](#)
[KWB](#)
[Research](#)
[Events](#)
[Press](#)
[Downloads](#)
[Newsletter](#)
[Database](#)
[Links](#)

Natural and Artificial Systems for Recharge and Infiltration (NASRI) project

Programme in Berlin to study the fate of pathogens and organics, geochemical processes and their interactions in bank filtration and artificial recharge systems at laboratory, semi-technical and field scale.

KWB, TUB, HU, FU, IGB, UBA

6.700.000 €

**Project
volume :**

Context

Bank filtration and artificial groundwater recharge have been used as a treatment process for a long time, and the mechanisms governing the removal of impurities and the chemical reactions of the water components have not been sufficiently understood. This was an obvious reason to initiate a larger cooperation project with the topic bank filtration and artificial groundwater recharge, with the major players in Berlin's water management.

Objectives

The interdisciplinary project will concentrate on microorganisms and trace organic substances present in surface waters. It will be focused for example on questions of the behaviour and removal of pharmaceutical residues during bank filtration. The fate and the elimination of other specific trace substances as well as of bacteria and viruses are other objectives of the research programme. The outcomes will be guidelines for designing and/or operating bank filtration schemes.

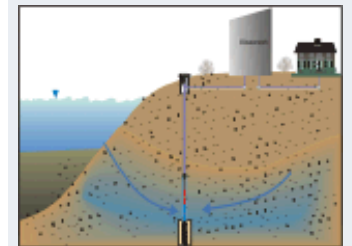
Research facilities

- Laboratory experiments (i.e. Column studies)
- Marienfelde semi-technical site
- Bank filtration Transects Tegel and Wannsee
- Artificial recharge ponds

The project is funded by the private industry partners namely Veolia Water (formerly Vivendi Water) and the Berliner Wasserbetriebe.

Contact:

- Berliner Wasserbetriebe: [Dr. Bernd Heinzmann](#),
Head Research & Development
- Veolia Water: [Laurent Phan](#),



Bank Filtration Process



Monthly water sampling at field sites

• Water and wastewater technologies

- TECHNEAU
- ENREM
- SCST
- ISM
- AMEDEUS
- EVA
- RKM
- BIOSENS
- PILOTOX
- KOCBIT
- ITZM
- Karolin
- Berlinbeach
- IMF
- Mobile Device
- TDSS

• Surface water management

- CYLIN
- OLIGO
- Erdre
- PPRP

• Groundwater management

- [NASRI](#)
 - Final Conference 2006
 - Congress 2006
 - Research groups
 - Workshop 2003
 - Further information
- IDB India
- CREAM

• Support R&D

• Teachings, Training and

Further Education



Head of Dept. Management of Resources, Networks and Systems

Project planning: Pre-phase (2001) and Programme (2002-2004).

- 2nd KWB Workshop on bank filtration (Project NASRI) took place on 3rd June 2004 at the dbb-Forum with approx. 130 participants from Germany and abroad
[Programm of the Workshop*](#)



Contact:

Dr. Birgit FRITZ (Veolia Water)
[birgit.fritz\(at\)kompetenz-wasser.de](mailto:birgit.fritz(at)kompetenz-wasser.de)



Artificial recharge pond in Tegel



Bank filtration abstraction well, lake Wannsee

Financial support:



Updated: Wednesday, 28
December 2005



Column studies