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BACKGROUND CRITERIA FOR THE IDENTIFICATION OF GROUNDWATER THRESHOLDS

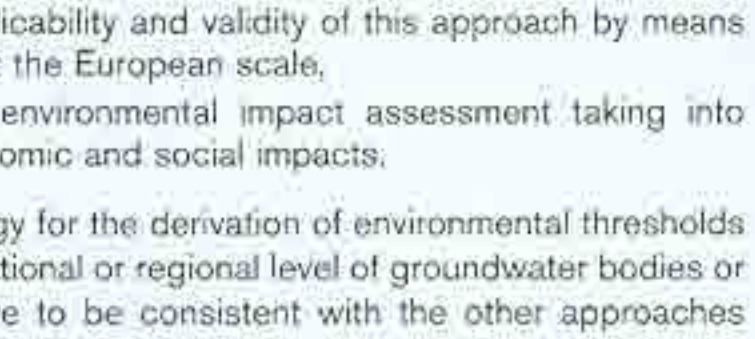
BRIDGE
BRIDGE

SIXTH FRAMEWORK PROGRAMME

01/2006 April-May

Project objectives

The BRIDGE project intends to develop a common methodology, intended for possible use by Member States, on "how to derive groundwater thresholds". The project is carried out at European level, involving a range of stakeholders and efficiently linking the scientific and policy-making communities. The different objectives of BRIDGE are:



- to evaluate and assemble scientific outputs to set out criteria for the assessment of the chemical status of groundwater. These criteria are data for characterisation of natural and anthropogenic pollutants, parameters indicative for pollution, data for characterisation of groundwater bodies as hydrologic and hydro-geological parameters.
- to derive a plausible general approach, how to structure relevant criteria appropriately with the aim to set representative groundwater threshold values scientifically sound and defined at national river basin district or groundwater body level,
- to check the applicability and validity of this approach by means of case studies at the European scale,
- to carry out an environmental impact assessment taking into account the economic and social impacts.

The final methodology for the derivation of environmental thresholds for pollutants at a national or regional level of groundwater bodies or river basins will have to be consistent with the other approaches under the WFD and other community legislation.

BRIDGE Project in CIRCA

http://www.wfd-bridge.net

Project policy context

Article 17 of the WFD stipulates that criteria for establishing the groundwater chemical status should be developed in a proposal made by the European Commission, i.e. a "Groundwater Daughter Directive" at EP and Council. The Commission proposal of Groundwater Directive COM (2003) 550 specifies that the "good chemical status" of Groundwater shall be based on compliance to existing Community quality standards (nitrates, plant protection products and biocides) and on threshold values (i.e. environmental quality standards) to be established by Member States at the most appropriate level (local, regional or national). These threshold values will have to be set up for all pollutants which have characterised groundwater bodies as being at risk, pursuant to the analysis of pressures and impacts carried out under the WFD (Article 5). The agenda of the Groundwater Daughter Directive proposal, as modified in the Council Common Position, implies that threshold values for relevant groundwater pollutants should be established on the basis of a common methodology before December 2008.

In this context, the BRIDGE project intends to develop a common methodology that could be used by Member States to establish such environmental thresholds in accordance with the requirements of the new Groundwater Directive. The project is carried out at European level, involving a range of stakeholders and efficiently linking the scientific and policy-making communities. The project entered into force on the 1st January 2005 and its duration is 24 months.

Working Group Packages. First year results (January 2005-January 2006)

WP1. Survey of representative groundwater pollutants and WP2. Study of groundwater characteristics

The main results of the BRIDGE project concerning the scientific knowledge to set up criteria for the establishment of the groundwater chemical status are:

- A Reference Database relevant to background concentrations in European Groundwater, European data sets for a Groundwater quality Database, and a preliminary draft reference report which presents a review on geochemical controls of substances (especially WFD pollutants and the 33 EU priority substances) and address monitoring and sampling practice, effects on eco-toxicological aspects and analytical aspects
- A report describing an inventory of all key hydro-geological parameters to be potentially taken into account within the development of the European approach to establish environmental groundwater thresholds. It includes surveys of hydro-geological properties, pollutant transfer and chemical processes, natural background level, interactions of groundwater with associated surface waters and dependant ecosystems, quantitative aspects and links to qualitative aspects

These Databases and reports contributed to the set up of the preliminary methodology and will serve as a basis and reference source for establishing threshold values.

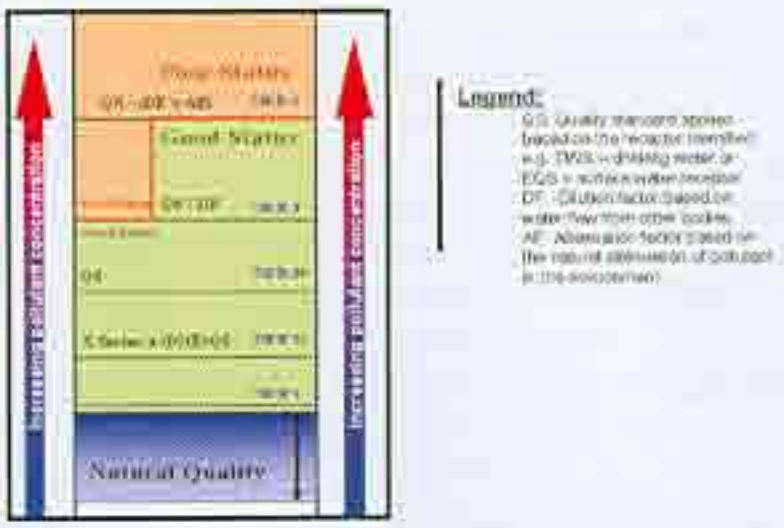
WP3. Criteria for environmental thresholds and methodology to define a good status

A concept note was included in the Description of Work at the start of the project and this has been the basis of discussions within this activity. As a main result of the first discussions it was agreed that an extended methodology should be developed using a tiered approach. This begins with a rapid and conservative practical procedure at the early Tiers progressing to more sophisticated but still robust procedures in the higher Tiers. Furthermore, during the course of the project it became clear that not only 'associated surface waters' and 'dependent terrestrial ecosystems' are of importance 'groundwater-itself' may often have to be addressed as a receptor. A draft report on a "Preliminary methodology to derive environmental threshold values" has been delivered. This report is based on the outcomes and draft reports of the 'upstream' work packages (characterisation of pollutants and characterisation of hydrogeological parameters) and on 6 reference papers on specific discussion topics that are:

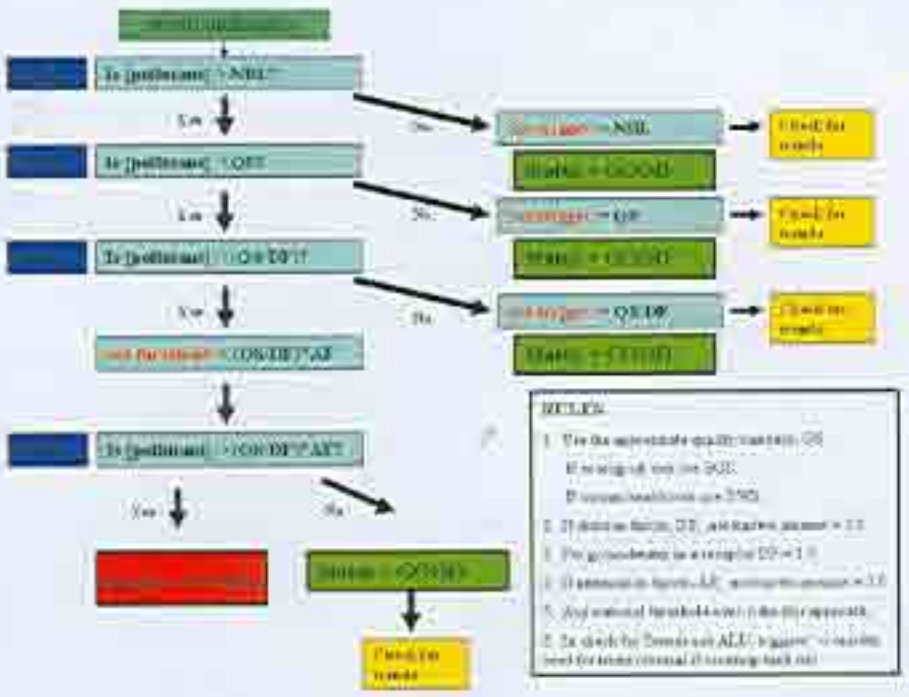
- a report on national methodologies for groundwater threshold values and a report on "network designs for groundwater bodies"
- two discussion papers 'associated surface waters' and 'groundwater-itself' and two approach papers on 'Natural background Levels' and 'Threshold values for the receptor groundwater itself' (papers to be partly or totally integrated in the final report on the methodology)

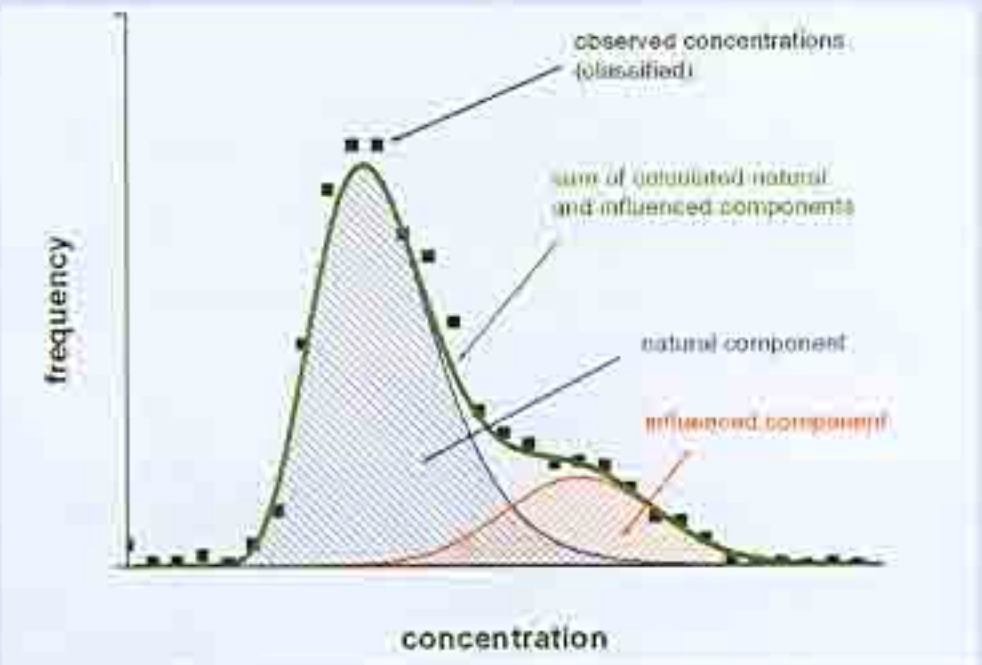
With regard to the overall objective is can be stated that the development of recommendations on a methodology and criteria for an European approach on how to establish environmental thresholds for groundwater bodies has been achieved. Further elaboration and refinement will be undertaken following outputs from the case studies and is planned to be finalised until November 2006.

Tier diagram for status determination



Tiered approach
Linking status and trend





WP4. Representative sites / water body studies and compliance testing

In order to carry out an application of the proposed methodology, a selection of sites has been made. The criteria of selection, the final selection of 14 study sites and a basic characterisation of these are reported in a report "Selection of representative studies". The 14 sites (see table below) cover a wide range of geological and climatological settings in Europe. Most sites have some interaction with dependent ecosystems, but a few sites are deep regional systems where the receptor could be groundwater itself or other human use. All sites show occurrences of one or several of the WFD pollutants or priority substances. The selected sites contain e.g. 4 European Pilot River Basins, 4 groundwater bodies studied in Baseline and 3 trans-boundary sites. The selected groundwater bodies are located in 12 of the 25 eco-regions for rivers and lakes, and the rivers in these discharges to 5 of 7 eco-regions for transitional and coastal waters, which both are defined in the Water Framework Directive.

The characterisation of all sites is well under way and will follow a common template in order to make the studies easy to compare. The details of the procedure on the evaluation of the threshold methodology are not yet defined.

Location of sites / groundwater bodies selected for BRIDGE WP4 case studies

WP5. Economic and social costs linked to the establishment of groundwater threshold values

A report describing the "general methodology framework for socio-economic decision-support for groundwater threshold setting" is to be finished. The assessment of the costs and benefits of feasible measures to achieve groundwater threshold values and their distribution across different interest groups in society will be achieved through the mean of five practical case studies:

- Upper Rhine, France
- Aveiro aquifer, Portugal
- Riga, Latvia (shallow groundwater)
- Scheldt river basin, Netherlands but crossing national boundaries
- Lahti aquifer, Finland

The preliminary description of the 5 case studies is completed and the socio-economic studies are going on. A review and analysis of existing groundwater valuation studies has been prepared which gives a systematic and structured overview of the economic values found associated with groundwater protection across Europe and North America.

WP6. Information and dissemination

The website of the project **www.wfd-bridge.net** is implemented on CIRCA.

The public reports delivered so far are available on the website or are going to be available as the website is continuously up-graded. Furthermore, the progress of the work within BRIDGE is systematically presented at the meetings of the WG C "Groundwater" (WFD Common Implementation Strategy).

The coming events are:

- A BRIDGE workshop on 21 June 2006; the aim of the workshop is to present the progress of the project to all partners and to stakeholders in order to facilitate discussions / interactions between science and policy worlds. This workshop is held the day before the International Conference on Groundwater in order to facilitate the attendance of stakeholders.
- The International Conference on Groundwater on 22-23 June 2006, Vienna, Austria. Contributions of BRIDGE are also scheduled to the International Conference.

Dissemination at National level:

- Information about BRIDGE Project and discussions within the Flemish Government with OVAM (= Flemish Waste Agency) and AMINAL (Flemish Administration for Environment, Nature Land and Water Management) (VITO)
- Preparation of information and presentation of information about BRIDGE project to Ministry of Environment and to Government of Republic of Lithuania in relation to the project "Impact assessment for the implementation of the directive of the EP and of the EC on the protection of groundwater against pollution (COM 550) (LGT)
- Information about BRIDGE project, Innovalis Aquitaine - Agence Régionale de Soutien à l'Innovation, Bureau Europe Rémi VIGNES Centre Condorcet (AETS)

Communication with scientific world:

- Common Forum on Contaminated Land – Vienna (Austria), May, 12-13, 2005 (UBA-A). BRIDGE project presentation
- Second European Conference on Natural Attenuation, Soil and Groundwater Risk Management - Frankfurt am Main (Germany), May, 18-20, 2005: Science-policy integration needs preparing common approaches to manage groundwater resources in Europe (poster) (UBA-A)
- VI Simposio del Agua en Andalucía - Sevilla (Spain), June, 1-3, 2005: Criterios para la identificación de valores límite de contaminantes en agua subterránea. Proyecto BRIDGE (IGME)
- EWRA 2005 (European Water Resources Association) – Menton (France), September, 7-10, 2005: Presentation of the BRIDGE Project - Background Criteria for the Identification of Groundwater Thresholds (BRGM and WP chairs)
- International Conference "Vulnerable Aquifer Preservation: Comparing European Experience" – Perugia (Italy), 8th September 2005 "BRIDGE – Background Criteria for the Identification of Groundwater Thresholds" (UBA- A)
- The Central European and European Union Standards on the Assessment of the Industrial and Mining Environmental Pollution – Warsaw (Poland), September, 21-24, 2005: Criteria for environmental pollution of industrial and mining areas assessment in Spain. The European BRIDGE Project (IGME)
- European Conference on Water Framework Directive, .the baseline. The Geological Society - London (United Kingdom), September, 22nd, 2005. Implementing the Water Framework Directive and characterising baseline groundwater conditions. Work progress in Spain and BRIDGE Project (IGME)
- CONSOIL 2005 – Bordeaux (France), October, 3-7, 2005 (Lecture Session A.1: Policy on Contaminated Land Management): Background Criteria for the Identification of Groundwater Thresholds. (UBA-A and BRGM)
- IAH-Conference (International Association of Hydrogeologists - Alicante (Spain), October, 4-8, 2005: Background Criteria for the Identification of Groundwater Thresholds. Presentation of the BRIDGE Project (IGME).
- Workshop on Groundwater Bodies in Europe and Adjacent Countries – Berlin (Germany) , October, 25-26, 2005; Natural background values and threshold values – the European BRIDGE Project (HLUG)
- Meeting of the Slovene section of the International association of Hydrogeologists (IAH) – Laibach (Slovenia), November, 22nd, 2005: Implementation of the EU Water Framework Directive (WFD) in Austria, Groundwater quality aspects – procedures applied and current state" (UBA-A)

Composition of the Consortium

Organisation name	Short name	Country
Bureau de Recherche Géologiques et Minières	BRGM	FR
Umweltbundesamt Gmbh	UBA-A	AT
Chancellor, Masters and Scholars of the University of Oxford	UOXF.AC	UK
Universiteit Gent	LAGH-UGENT	BE
Budapest University of Technology and Economics	BME	HU
Université de Liège, Aquapôle	ULG	BE
Flemish Institute for Technological Research	VITO	BE
Danish Environmental Protection Agency	DEPA	DK
Danmarks og Grønlands Geologiske Undersøgelse	GEUS	DK
ACTeon	Acteon	FR
Federal Environmental Agency-Germany	UBA-D	DE
Hessisches Landesamt fuer Umwelt und Geologie	HLUG	DE
Instituto Geológico y Minero de España	IGME	ES
Environment Agency	EA	UK
Suomen ympäristökeskus (Finish Environment Institute)	SYKE	FIN
National Agricultural Research Foundation	NAGREF	GR
Autorità di Bacino del Fiume Tevere	ABTEVERE	IT
Forschungszentrum Juelich GmbH	fz-juelich	DE
Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek TNO	TNO	NL
Universidade de Aveiro	UNI AVEIRO	PT
Geological Survey of Lithuania	LGT	LT
Vrije Universiteit Amsterdam	IVM	NL
Executive Environment Agency	EEA	BL
University of Tartu	UT	EE
Application Européenne de Technologies et de Services	AETS-Apave	FR
Akademia Górniczo-Hutnicza	DHWP/AGH	PL
Office International de l'Eau	OIEAU	FR

Provisional Calendar of BRIDGE Meetings for 2006

Dates	Type of event	Venue/Room
7 April	SC meeting	Brussels
21 June	BRIDGE Stakeholder's meeting	Vienna
26-27 June	WP5 meeting	Paris
29-30 September	SC + WP3/WP4	Lisbon
2 October	WG C + BRIDGE Contribution	Lisbon
15 December	Final Meeting	Paris

Project identification

6FP: Priority 8, Scientific Support to Policies
Contract N°: 006538 (SSPI)
Duration: 24 months
Start Date: 1st January 2005

Budget of the project:
Total budget ..... 2.963 M€
EC contribution ..... 1.877 M€

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March 2006 - NIPO: 657-06-009-6 D.L.: M-24621-2006 Design and Edition: IGME