EUROPEAN GROUNDWATER MEMORANDUM

to secure the quality and quantity of drinking water for future generations

- IAWR
- AWBR
- ARW
- RIWA-Rijn
- IAWD
- AWE
- AWWR
- RIWA-Maas
- RIWA-Scheldt


IAWR


IAWD


AWBR


AWE
Arbeitsgemeinschaft der Wasserversorger
im Einzugsgebiet der Elbe


ARW


AWWR
Aktiv für Ihr Wasser aus dem Ruhrtal


RIWA
RIWA-Maas


RIWA
RIWA-Rijn


RIWA
RIWA-Scheldt

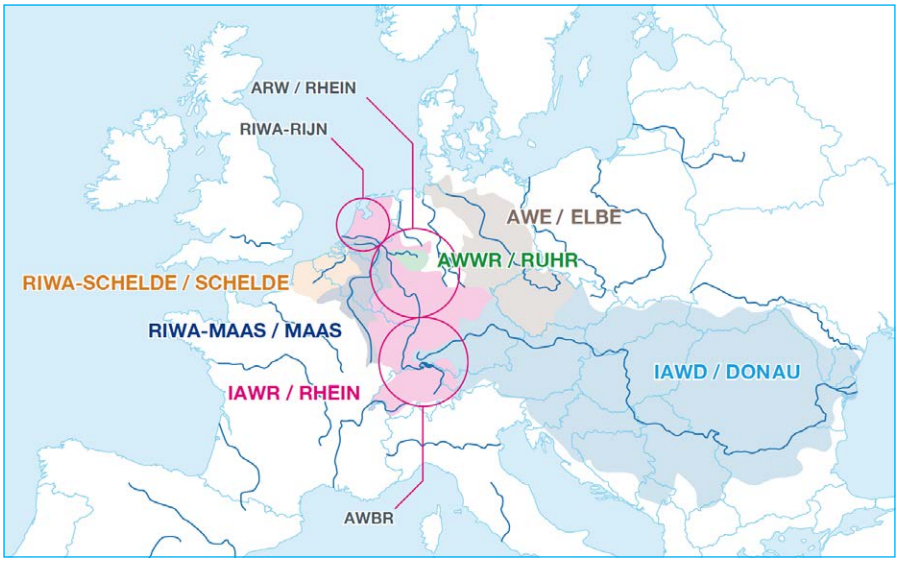
European Groundwater Memorandum to secure the quality and quantity of drinking water for future generations

Foreword

Water suppliers in the catchment areas of the major European rivers are convinced that a future-proof, climate-friendly, safe and affordable public drinking water supply for everyone requires generation-spanning preservation of the usability of the drinking water resources. Their common intention and aim is sustainable and precaution-driven protection of our drinking water resources. In their river basins, in addition to the indirect use of the surface water bodies (as riverbank filtrate or enriched groundwater), the abstraction of natural groundwater formed through precipitation is also of major water management importance.

The present Groundwater Memorandum formulates five key requirements for the protection of naturally formed groundwater resources and thus complements the European River Memorandum (ERM) aiming at the protection of the surface water bodies.

Around 170 water suppliers have joined forces in the organisations listed below. They represent the water protection and drinking water interests of 188 million people in the catchment areas of the rivers Rhine and Ruhr, Danube, Elbe, Meuse and Scheldt in 18 riparian states: Germany, Austria, Belgium, Bosnia-Herzegovina, France, Croatia, Liechtenstein, Luxembourg, the Netherlands, Montenegro, Romania, Serbia, Slovakia, Slovenia, Switzerland, Czech Republic, Bulgaria and Hungary.



Sketched overview of ERM Coalition river basins

- **IAWR**, International Association of Waterworks in the Rhine Basin, with its three member associations
  - **AWBR**, Association of Lake Constance and Rhine Waterworks
  - **ARW**, Association of Rhine Waterworks
  - **RIWA-Rijn**, Dutch Association of Rhine Waterworks
- **IAWD**, International Association of Water Service Companies in the Danube River Catchment Area
- **AWE**, Association of Water Companies in the Elbe Catchment Area
- **AWWR**, Association of Ruhr Waterworks
- **RIWA-Meuse**, Association of Meuse Waterworks
- **RIWA-Scheldt**, Association of Scheldt Waterworks

The five key requirements for sustainable groundwater protection:

1. Groundwater must be available naturally and in sufficient quantities

Groundwater is an indispensable component of nature and the natural water cycle. Groundwater is a highly important resource and crucial as drinking water resource for the supply of safe, wholesome and clean drinking water. Therefore, an anthropogenically unpolluted groundwater quality is to be strived for and preserved. The natural groundwater quality can vary depending on the hydro-geological situation in the groundwater bodies. The sustainable management of groundwater resources must be oriented towards the processes of natural groundwater formation, so that groundwater is available in sufficient quantities at best quality, now and for future generations. Groundwater can be used only to the degree to which it can be renewed. Overexploitation represents a threat not only to quantity but also to quality. Against the background of climate change and locally increasing population, this represents a particular challenge for the coming years and decades.

2. Groundwater is to be preserved as a precious common resource

Groundwater is not a commodity, but a heritage, a highly sensitive and precious good that must be protected and passed down through generations in an intact, natural state. Groundwater quality is affected by a variety of artificial interventions including input of substances from agriculture, residential areas, industrial plants and landfills. Therefore, groundwater and drinking water resources must be protected and preserved in order to prevent anthropogenic contamination. In agriculture, the principles of organic farming offer suitable starting points.

The water supply sector must be given the opportunity to obtain drinking water in sufficient quantities at any time and with simple, natural processes, i.e. without costly treatment. In society's discussion of values, the value of water and its preventive protection should be prioritized with drinking water use being the top priority.

Once groundwater has been polluted, deterioration usually lasts for long periods of time due to low flow velocities and slowed down natural purification processes. Anthropogenically contaminated groundwater can - if at all - only be remediated with disproportionate effort. Therefore, what must not happen tomorrow must be prevented today. Precautionary groundwater protection must safeguard drinking water resources quantitatively and qualitatively now and for future generations and effectively protect them against polluting soil and subsoil uses. Likewise, adverse influences on natural groundwater formation, e.g. due to sealing, must be minimised. In order to protect drinking water resources in particular from pollution, safeguard zones need to be designated.

3. Public drinking water supply has priority in use

Drinking water supply is a service of common interest and a core task of every state. Drinking water is of paramount importance to society as an essential basis of life. Access to sufficient clean drinking water is a UN human right. As such, priority has to be given to drinking water supply (water for human consumption) when competition with other activities such as agriculture, mining or industry exists. The priority for drinking water must be ensured in all use strategies and designations of use of groundwater bodies and guaranteed by appropriate regulatory measures i.e. in higher-ranking water rights. Water rights for public drinking water abstraction must have the highest possible legal certainty, and unused groundwater resources that are valuable regarding water management must be secured for future uses by drinking water supply by designating water priority areas in spatial planning.

4. „Zero pollution“ is the protection goal for groundwater

The goal is to protect water resources against adverse impacts and to exclude potential hazards and contamination. Essential principles to achieve this goal comprise application of the precautionary principle, polluter-pays-principle and prohibition of deterioration. Groundwater quality must not deteriorate but must be preserved for precautionary reasons and further improved if necessary. The prerequisite for enduring groundwater protection is the monitoring of groundwater with respect to qualitative aspects. The protection goal is „zero pollution“ and intervention values are required that trigger countermeasures.

4.1 Intervention values for action requirements

The objective of the intervention values is to assure a level of protection that addresses not only the immediate protection of health, but also the specific, intergenerational precautionary demand and general purity requirements for drinking water.

For substances originating from artificial interventions that affect the quality of naturally formed groundwater the following intervention values shall apply:

- Evaluated substances and degradation products with known effects on biological systems, per individual substance: 0.05 µg/L*
- Non-evaluated or only partially evaluated substances and degradation products, per individual substance: 0.05 µg/L
- Nutrients: half of the legally set limits for drinking water.

**except if toxicological findings require an even lower value, e.g. for genotoxic substances*

A higher intervention value of up to 0.5 µg/L for an anthropogenic substance can only be accepted for the exceptional case that the substance and its degradation products have been toxicologically fully evaluated, have accordingly no effects, and have additionally been shown not to form critical or non-evaluated transformation products during common drinking water treatment processes.

These values are minimum quality requirements to secure water supply in the future. The intervention values are half of the corresponding target values set in the European River Memorandum for surface water bodies. They include a safety factor due to the long time periods until long-term trends can be stopped.

4.2 Measures when intervention values are exceeded

Groundwater has a long memory and pollutants can accumulate. A trend reversal in contamination can only be achieved through long-term measures. Therefore, in order to protect drinking water supply and to ensure compliance with drinking water limit values, groundwater protection measures for trend reversal must be taken immediately, and automatically, as soon as intervention values are exceeded in groundwater.

If anthropogenic substances or nutrients above the intervention value are detected in groundwater, the primary sources of input must be subject to application restrictions and incentive levies. If these measures do not lead to the desired result, appropriate further steps (e.g. application bans) must be taken. The permanent non-violation of these intervention values is simultaneously the minimum requirement for remediation measures.

5. Polluters and policy-makers have to act

Precautionary groundwater protection and effective monitoring of groundwater quality will only succeed if producers and users of substances cooperate. Government, administration, legislators and the judiciary (state power) need to fulfil their obligation to ensure groundwater protection and apply the polluter-pays principle. Science, water suppliers and every individual in society are also called upon to do their part. Precautionary groundwater protection starts at the source of possible inputs.

5.1 Strict regulation for placing on the market and product responsibility

Non-natural substances that are persistent (P), mobile (M) or of concern to health or toxic (T) pose a particular risk to groundwater and a considerable threat to drinking water supply. Substances and their degradation and transformation products must be tested and assessed for PMT properties before approval and registration. Only substances that are not persistent (P), mobile (M) or toxic (T) including through their degradation or transformation products, may be approved. This must be established as an essential criterion for test requirements for substance approval and registration, in order to prevent the introduction of particularly critical substances into the water cycle.
In addition, product responsibility, groundwater monitoring and the periodic review of permits granted for substances must be ensured in such a way that they comply with the precautionary and polluter-pays principles and exclude future groundwater pollution.

5.2 Consistent data collection during production and application

Due to the large array of activities which pose a threat to groundwater quality, spatial planning is essential. Environmental information and knowledge of emission data from industry and land use, especially agriculture, in the catchment areas of groundwater extractions are crucial for safeguarding drinking water supplies. This data must be disclosed transparently and made available to the authorities and the drinking water suppliers at all times.

5.3 Consistent regulatory monitoring

A prerequisite for sustainable groundwater protection is the monitoring and control of groundwater in terms of quality and quantity. This applies in particular to the protection zones and catchment areas of the water supply. The scope of the analysis needs to cover all substances being relevant for drinking water. This requires a monitoring network that is adapted to regional conditions and that allows a comprehensive and risk-oriented assessment for the protection of drinking water supply. Model calculations can support the data from monitoring networks. By no means can these models replace them to ensure safely and reliably identifying polluted areas. When designing monitoring networks for groundwater monitoring, care must be taken to ensure sufficient warning time in advance for water abstraction so that defensive measures can be taken in good time and adverse trends can be effectively reversed. In addition to monitoring, consistent enforcement in accordance with the precautionary and polluter pays principles is a key task of the administration.

Fountain of the Marienberg Fortress, Wuerzburg, around 1200, depth 102 m

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