2020

EUROPEAN RIVER MEMORANDUM FOR QUALITY ASSURANCE OF DRINKING WATER PRODUCTION

IAWR

AWBR

ARW

RIWA-RIJN

IAWD

AWE

AWWR

RIWA-MEUSE

RIWA-SCHELDT

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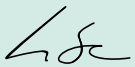

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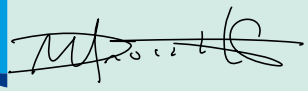
RIWA
RIWA-Meuse



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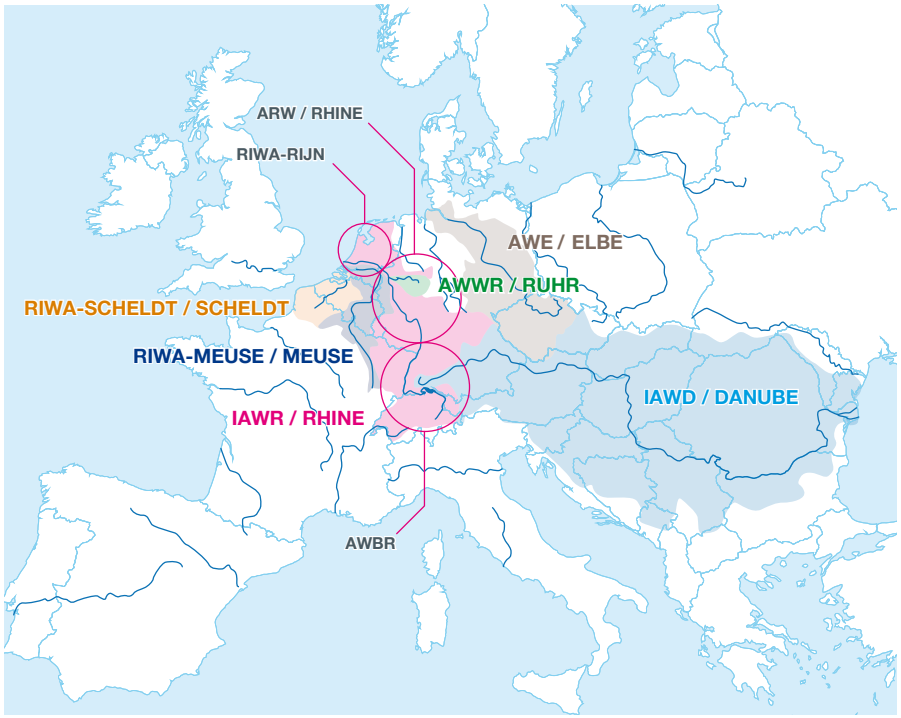
EUROPEAN RIVER MEMORANDUM FOR QUALITY ASSURANCE OF DRINKING WATER PRODUCTION

Water suppliers in the catchment areas of the major European rivers are convinced that a future-proof, climate-friendly, safe and affordable 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 drinking water resources. The resulting strategies and requirements for water protection are specified in this memorandum.

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.

- **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 Waterworks in the Danube 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

02/2020



Sketched overview of ERM Coalition river basins

PREAMBLE

Access to clean drinking water is a human right. Drinking water is essential, indispensable and an important basis for a sound economy. Together, we are responsible for using water considerately, returning it clean to the water cycle after use, and preserving it for the next generations. This requires everyone's contribution to sustainable management of water resources.

The European River Memorandum 2020 will help decision-makers in politics, authorities, industry and water management and serve as orientation for the still required improvement of the quality of water bodies used for drinking water. It will contribute to an open and transparent public discussion and show the necessity of precautionary protection of water bodies, in particular since climate change will make water resources scarcer and increase the relevance of the remaining water resources. A high-quality and sustainable drinking water supply without high technical and financial efforts must be secured for future generations.

Due to its predominant relevance, drinking water supply must take precedence over any other use of water bodies. In many regions, water suppliers depend substantially on surface water. These water bodies are potentially exposed to many emissions of contaminants. It is a clear aim to achieve a water quality in these water bodies that permits drinking water supply using natural treatment methods only.

The water quality as required in this memorandum is compliant with the strategy of the Water Framework Directive (WFD), which is based on the principles of precaution and sustainability. Natural treatment methods minimise the otherwise required technical impact on the water. They are based on the self-cleaning powers of nature and retain the natural character of water. Drinking water production with natural treatment methods saves energy and resources, which makes it climate and environmentally friendly.

THE WATERWORKS' STRATEGY OF PROTECTION OF WATER BODIES IS PRESENTED IN SEVERAL THESES

1. Priority of public water supply

Drinking water must take priority over competing usage claims due to its higher social relevance. The primary goal of protection measures for water bodies must be to enable water suppliers to produce impeccable drinking water at all times, with natural treatment methods, such as bank infiltration and sand filtration.

For this, the water bodies must meet quality demands that consider the general purity requirements of drinking water. Drinking-water-specific aspects, such as undesired pollution with unnatural substances and hygienic microbiological contaminations, must be considered and fixed in legislation by specifications on the quality of water bodies. The regulatory requirements for ecologically sound water bodies alone are insufficient to achieve this goal.

2. Precaution-driven protection of water bodies

Precaution is always better than fixing problems afterwards. Precaution-driven protection of water bodies must be in line with the requirements of long-term quality assurance of drinking water resources. We need to prevent today what must not happen tomorrow.

The essential starting point must be measures at the source of pollution. These measures must entail treatment or retention of pollutants at the place of origin, drive substitution of critical substances, and reduce risks by applying usage limitations.

3. Sustainable management of water resources

Water bodies in good ecological state are an important prerequisite for a secure drinking water supply. They secure the effectiveness of the natural self-cleaning processes in natural treatment methods that are essential for drinking water supply: bank infiltration, artificial ground water recharge and sand filtration.

Systems with biological diversity are robust systems. The ecological stress limits of the water bodies must not be exceeded to prevent harming natural self-cleaning processes. Therefore, tolerable maximum concentrations and temperatures must not be exceeded. The available water resources must not be overstressed. This specifically applies to periods of severe low water discharge.

The growing water demand requires that the amount of water used from existing water resources must not exceed the replenishment of these sources by precipitation or other processes, so drinking water supply can be guaranteed in the coming decades as well.

4. Prohibition of deterioration / requirement of minimisation

The water quality of water bodies that has been achieved in the last decades must not deteriorate but has to be improved for reasons of precaution. The demands and regulatory specifications concerning drinking water quality have increased in recent years and the numerous uses of water resources increasingly require an ecologically and hygienically improved condition.

Both discharges from point sources (through industrial and municipal sewage treatment plants) and diffuse pollution (by substances through run-off from the built environment and agricultural surfaces as well as rain overflows), must be reduced.

5. Monitoring of water bodies by authorities

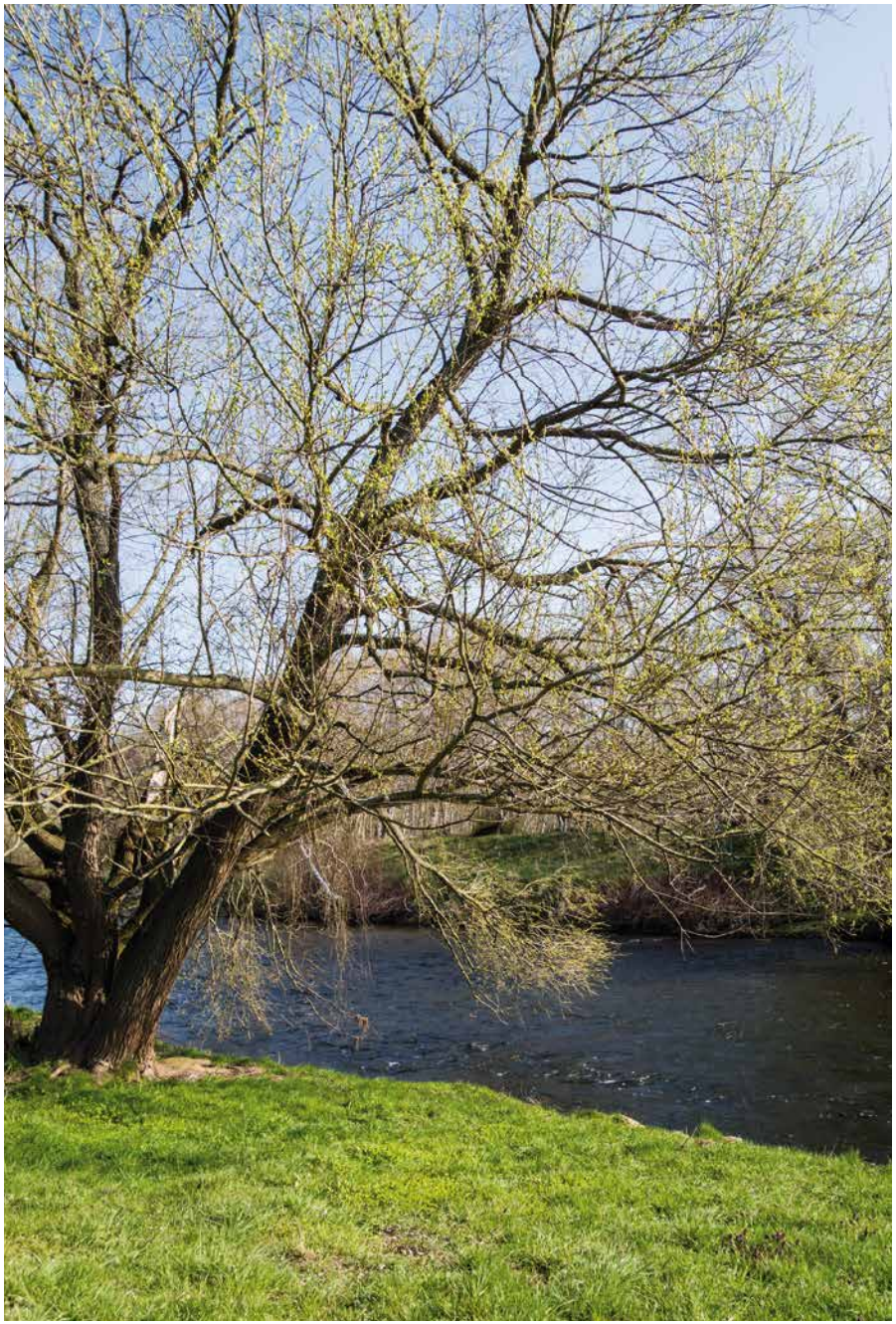
Monitoring of water bodies is a task of authorities that must be continually adjusted to new findings. Regular water quality analyses are indispensable for assessing the effects of wastewater discharge, point and diffuse pollution, high and low water periods and incidents. For reasons of precaution, authorities must also monitor water for new substances, microorganisms and other changes in water quality.

6. Taking responsibility for discharged substances

Most of the substances discharged into surface water bodies are not regulated by any water law. Their source materials as well as by- and/or transformation products are unknown in the vast majority of cases. Manufacturers and users must therefore take responsibility for the substances directly or indirectly emitted by them. Permitting authorities must provide transparency and inform about emitted substances and their loads in a publicly accessible manner. The existing statutory prohibition subject to authorisation needs to be enforced: ”What has not been permitted, shall be considered forbidden.”

7. Industrial plant safety and incident prevention

Operational incidents as well as incidents in industrial plants may cause considerable pollution of water bodies with hazardous substances and microorganisms. They pose a risk to the water cycle in general and to the drinking water supply in particular. They are usually due to improper handling of substances, incident-related events or lack of sufficient safety measures. The goal must therefore be further improvement of incident prevention.



8. Regulation of particularly critical substances

Unnatural substances that are persistent (P), mobile (M) or of concern to health (toxic/T) do not belong in water bodies. Such PMT substances put a strain on drinking water resources and pose considerable danger to them.

For precautionary protection of drinking water, all substances and their degradation and transformation products should be reviewed and assessed for their PMT properties before approval or registration. 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.

9. Application of stricter hygiene standards

The hygienic microbiological pollution of water bodies must be improved considerably. This applies in particular to pathogens, parasites, viruses, and antibiotic-resistant bacteria. Discharges of wastewater treatment plants, mixed water discharges, rainwater overflows and run-off from the built environment and agriculturally used surfaces are considerable sources of pollution of water bodies with hygienically relevant bacteria and germs that have received little consideration so far. In order to improve this dissatisfactory situation, specific treatment methods are required to effectively remove microorganisms.

10. Shared responsibility

Precaution-driven protection of water bodies requires everyone to contribute. Products or substances used and consumed by people may affect the environment. Manufacturers and authorities therefore have the task of informing the population about the consequences.

Application and disposal of potentially harmful substances and their effects on the environment must therefore be considered during product development. They need to be made transparent and communicated during marketing. This way, everyone can contribute and help lessen the strain on our water bodies and our drinking water.

TARGET VALUES FOR RIVERS AND WATERCOURSES

Water bodies that meet the target values of the following tables, permit sustainable production of drinking water with basic natural treatment methods. The target values refer solely to the quality of rivers and watercourses. They are maximum values and must be met even in extreme (discharge) situations. The values are minimum quality requirements to secure water supply in the future and are in agreement with the precautionary principal according to the WFD. The target values do not refer to geogenic background levels.

General parameters	Target value
Oxygen content	> 8 mg/L
Electrical conductivity	70 mS/m
pH value	7 - 9
Temperature	25 °C
Chloride	100 mg/L
Sulphate	100 mg/L
Nitrate	25 mg/L
Fluoride	1.0 mg/L
Ammonium	0.3 mg/L

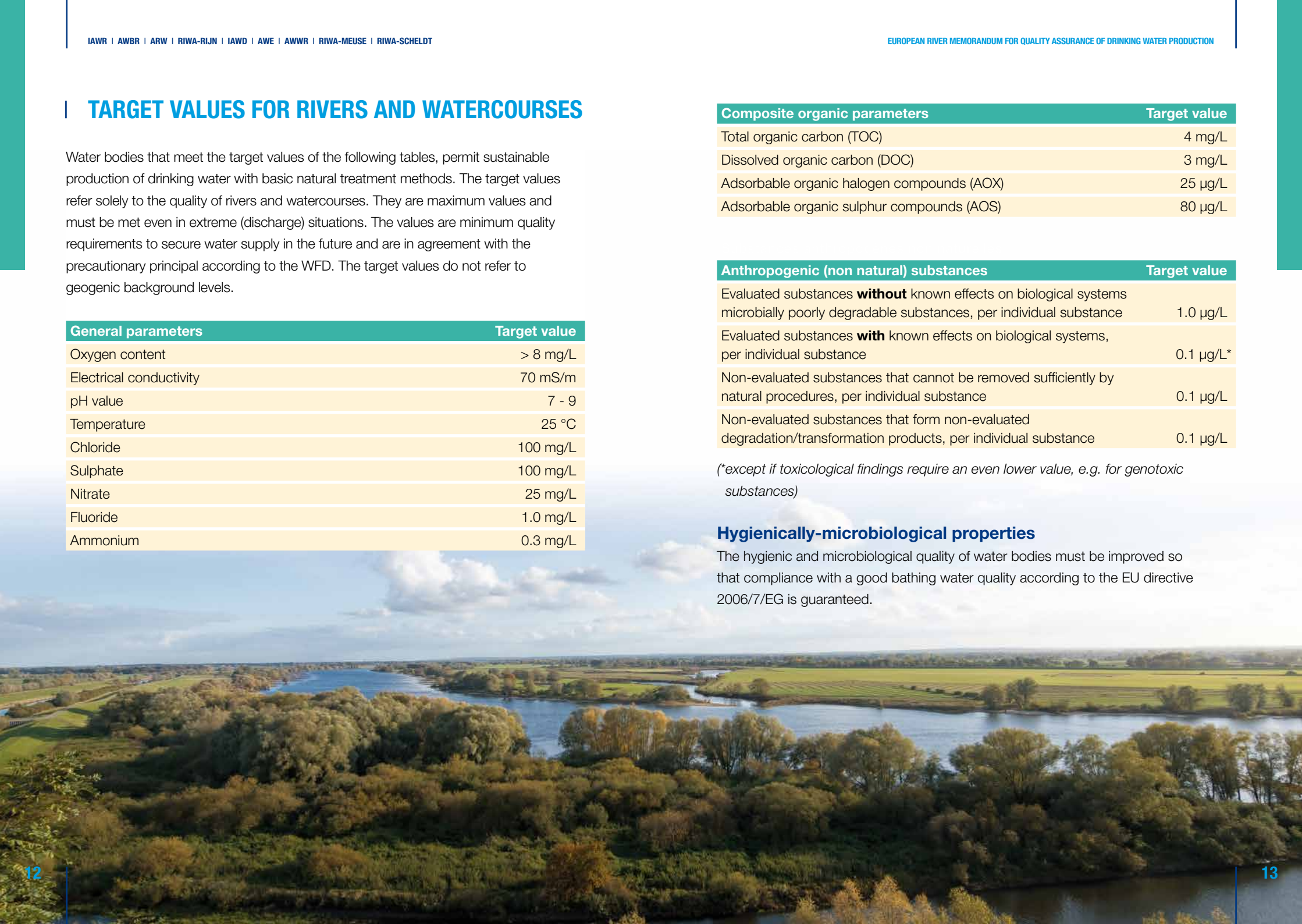
Composite organic parameters	Target value
Total organic carbon (TOC)	4 mg/L
Dissolved organic carbon (DOC)	3 mg/L
Adsorbable organic halogen compounds (AOX)	25 µg/L
Adsorbable organic sulphur compounds (AOS)	80 µg/L

Anthropogenic (non natural) substances	Target value
Evaluated substances **without** known effects on biological systems microbially poorly degradable substances, per individual substance	1.0 µg/L
Evaluated substances **with** known effects on biological systems, per individual substance	0.1 µg/L*
Non-evaluated substances that cannot be removed sufficiently by natural procedures, per individual substance	0.1 µg/L
Non-evaluated substances that form non-evaluated degradation/transformation products, per individual substance	0.1 µg/L

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

Hygienically-microbiological properties

The hygienic and microbiological quality of water bodies must be improved so that compliance with a good bathing water quality according to the EU directive 2006/7/EG is guaranteed.



CONSIDERATIONS REGARDING THE TARGET VALUES

The target values comply with legal requirements regarding drinking water quality and meet precautionary aspects and general purity requirements. They take the effectiveness of natural treatment methods into account.

The values were derived in accordance to the following criteria:

- Existing regulations for drinking water quality must be met in water bodies if natural treatment methods are unable to considerably reduce concentrations.
- Many non-natural organic substances have no thresholds specified under the drinking water regulation. In accordance with regulatory precaution targets for substances with effects on biological systems, an acceptance threshold of 0.1 µg/L is considered acceptable. This also applies to non-evaluated degradation products.
- For non-evaluated anthropogenic substances, a value of 0.1 µg/L is deemed justifiable for precautionary reasons as well, since effects on biological systems or toxic properties cannot be excluded.
- Toxicologically sufficiently assessed non-natural organic substances that were classified as harmless are subject to a limit of at most 1 µg/L.
- In individual cases, it is justified to apply stricter quality requirements to surface water than those applicable to drinking water. For example, exceptions are made if for treatment reasons for protection against microbiological-hygienic risks higher values must be accepted for drinking water (an example: when disinfection creates halogenated disinfectant by-products; this however does not justify any allowance for additional surface water pollution with these substances), or if it is required to protect technical facilities (an example: when the concentration of neutral salts, e.g. chloride and sulphate, or conductivity, should be lower than the drinking water limits in order to prevent corrosion).
- Sometimes the nitrate concentration of ground water requires mixing with surface water with concentrations below the drinking water threshold. A safety margin to the drinking water threshold for ammonium must be met, since nitrate can be converted into ammonium under anaerobic conditions.
- Composite organic parameters provide an integral description of the properties of water bodies. The target values for these parameters are based on their natural background levels.

Colophon

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