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Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)

Federal Ministry of Health (BMG)

Catalogue of precautionary services by water suppliers for the protection of water and public health

Preamble

The protection of water bodies and of human health are of very high significance in Germany both politically and in public perception. Government institutions are responsible for taking adequate precautions to ensure that protection standards are maintained. In doing so, they receive extensive support from water suppliers in Germany.

In fulfilling their mandate - namely to supply the general public with high-quality drinking water at all times, in adequate quantities and with sufficient water pressure - water suppliers also provide a range of services above and beyond this mandate, and these benefit environmental and health protection as a whole. Rather than simply treating and distributing the available water resources as drinking water, many of the water suppliers' activities are designed to actively protect these resources, in keeping with the precautionary principle. Examples include water body monitoring, for which purpose the water suppliers make their extensive data and monitoring networks available to the relevant government agencies and alert them to any new threats and trends. This also includes concrete measures for averting environmental pressures, such as advising and supporting farmers to reduce their emissions of nitrate, pesticides and microbiological pollutants into water bodies.

The main statutory provisions governing water supply are the respective European Directives, the Federal Water Act (WHG) and the Drinking Water Ordinance (TrinkwV 2001). These are supplemented by the generally accepted technical standards for drinking water

supply, such as DIN 2000[1] and the regulations published by e.g. the Deutscher Verein des Gas- und Wasserfaches e.V (DVGW German Technical and Scientific Association for Gas and Water).[2].

Ensuring the long-term quality and quantity of drinking water abstraction is vital, not only from an ecological and consumer perspective, but also for (environmental) economic reasons, since the preventive services provided by the water suppliers help to avoid pollution and related costs which would otherwise be borne by the general public or other agents.

As such, where water suppliers undertake preventive environmental and health measures or measures to ensure security of supply and plant safety which exceed the statutory requirements, such measures should be recognised and embraced, within the context of efficiency and cost analyses, provided that there is no striking discrepancy between costs and benefits.

The aim of the following catalogue of services is to achieve broad comprehensive recognition of such public welfare services and their reflection in water prices. .

Fundamental principles of preventive waterbody and health protection services

A number of requirements on resource conservation and ensuring the sustainable supply of drinking water explicitly aim at public water supply agents[3]. These include the following provisions under the Federal Water Act (WHG):

- Maintaining ecological equilibrium in drinking-water abstraction areas in accordance with the management principles outlined in Article 6 of the WHG;
- Providing a general public service in accordance with Article 50 of the WHG. This includes the requirement to ensure a water supply from local sources (together with the admissible exceptions to this requirement), promoting the careful use of drinking water resources, the planning, construction, operation and maintenance of water

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[1] DIN Deutsches Institut für Normung e. V. (publisher); DIN 2000, October 2000. Zentrale Trinkwasserversorgung - Leitsätze für Anforderungen an Trinkwasser, Planung, Bau, Betrieb und Instandhaltung der Versorgungsanlagen (Central Drinking Water Supply – Guidelines for Requirements on Drinking Water, Planning, Construction, Operation and Maintenance of Water Supply Equipment – in German language only).

[2] - DVGW technical standards – cf. http://www.dvgw.de/wasser/organisation-management/sicherheit-in-der-wasserversorgung/technische-regeln-trinkwv/ downloaded on 25.02.2014

3 The requirements governing resource conservation are outlined in the position paper "Wasserwirtschaftliche Grundsätze der Wasserversorgung und ihr Einfluss auf deren Kosten" (Principles of Water Resource Management of Water Supply and their Influence on Costs - dated 23/24 September 2010) by the German Working Group on water issues of the Federal States and the Federal Government represented by the Federal Environment Ministry (Bund/Länder – Arbeitsgemeinschaft Wasser, LAWA). The position paper (in German language only) can be found at http://www.lawa.de/documents/LAWA-Positionspapier_Wasserwirtschaftl_Grundsaetze_u_Einfluss_auf_Kosten_2010_cc0.pdf .

supply equipment which at least satisfies generally recognised technical standards, and ensuring the safety of all technical systems, as well as monitoring the extracted or extractable water in line with the statutory ordinances of the Federal Länder or decisions of the competent authorities;

- Protecting water resources from contamination with a range of area-wide waterbody protection measures and through measures resulting from the designation of water protection areas as set out in Article 51 of the WHG.

One of the key principles of the Drinking Water Ordinance (TrinkwV 2001) is that the lifelong consumption of drinking water must not pose any threat to human health, particularly as a result of pathogens. Achieving this requires observance of the microbiological and chemical limits defined in the Drinking Water Ordinance as well as observance of the principle of minimising exposure as far as reasonably possible. The Drinking Water Ordinance and DIN 2000 also stipulate counteracting potential health risks already in raw water. Article 17 of the TrinkwV 2001 furthermore requires the material and technical safety of all supply systems. To meet these requirements and targets, water suppliers provide an extensive range of preventive water body and health services in the context of providing public services. In keeping with the precautionary principle, these services complement the minimum statutory requirements and reflect the responsibility water suppliers take on for additional, voluntary services. Precautions to protect water and health are closely intertwined.

The precautionary principle implies that pressures on water bodies should be avoided from the outset, so as to minimise the associated risks to human health and the environment. The aim is to keep drinking water treatment efforts minimal and to use near-natural treatment techniques as far as possible. The catalogue of services below illustrates the fact that preventive measures often have wide-ranging effects far beyond the direct protection of drinking water resources - in other words, in performing their duties, the water suppliers also help to meet protection targets for water bodies and the environment.

The scope and format of such duties are adapted to suit the local conditions. Not every service must be provided by every water supplier at all times and in every location, but all services may be necessary in order to meet the statutory requirements. In individual cases, the location- or situation-specific character may necessitate additional precautions not listed in the following catalogue of services and which exceed the legally required minimum; onetheless these may be necessary in the interest of fulfilling the mission.

Catalogue of services

I Precautionary measures for specific waterbody protection

Precautionary measures to protect water bodies carried out by the water suppliers primarily in the vicinity of water abstraction installations and to maintain proper functioning of the entire water supply infrastructure, as outlined in the statutory requirements and technical regulations, help to prevent and minimise the risk of hazards and damage to occur. The water suppliers are either directly responsible for, or involved in, the identification, design, implementation and monitoring of such measures. They may also reflect their taking on responsibility, in keeping with the precautionary principle. In particular, such measures include the following:

1. Measures designed to prevent and minimise damage potentially arising during water abstraction, treatment, distribution and supply:

   - Measures associated with water abstraction applications and for ecological documentation purposes, particularly in landscape protection and Natura 2000 areas, such as environmental impact assessments, nature conservation, hydrological and hydrogeological inventories, for assessing and preventing any adverse environmental impacts associated with water abstraction and distinguishing them from the effects of other, competing uses;

   - Obtaining, evaluating and supplying geological site information (such as investigations, explorations).

   - Measures designed to balance water abstraction with the available water resources and to prevent ecological impairment in the abstraction areas, e.g. through artificial groundwater recharge to compensate for quantities extracted above and beyond natural recharge, sub-division into multiple abstraction points, or for reservoirs via the construction, operation and maintenance of connecting pipes and transfer pipes from other catchment areas;

   - Essential infrastructure-related measures to comply with generally accepted technical standards for meeting the water supply mandate (e.g. maintenance, inspections, replacements);

   - Ensuring reliability of supply systems and structures and functioning of working equipment as well as of company organisation and operating systems.

2. Precautionary, task-specific water body monitoring measures for the early detection of risks or pollutant emissions, i.e. planning, installation, operation and maintenance of monitoring networks in the catchment areas of water abstraction installations, and evaluation of the data obtained and administration of the corresponding database:

- Monitoring the available water volume by measuring groundwater levels and collating water level and effluent data from surface waters;
- Water quality monitoring, including laboratory analyses for quality measurement and assessment in the vicinity of water abstraction facilities;
- Soil analyses to monitor agricultural uses, e.g. by measuring residual nitrogen levels (Nmin analyses);
- Collation of hydrological and meteorological data and their analysis from a water resources management perspective, including drinking water reservoirs (as an element of integrated quantity and quality management);
- Preparing and operating flow and material transport models for catchment areas, including collating and logging the relevant data on
  - Quantity and quality of raw water
  - Meteorological and climate data
  - Information on soil conditions,

  for forecasting water quality and volume development as well as for system control.

3. Compulsory or voluntary measures designed to guard against potential damage caused by or emanating from other uses and operations, such as agriculture and forestry, human settlements and transport, industry and commerce, municipalities:
   - Services such as soil mapping, collation of hazard catalogues and drafting of hydro(geo)logical assessments and other documents to support the official designation and specification of water protection areas;
   - Compliance with statutory monitoring requirements and coordination of the competent authority's inspection of drinking-water protection areas, so as to identify and eliminate potential threats to the water and soil resources;
   - Participation in planning and licensing procedures within the catchment area (construction projects, applications under water legislation, Federal Immission Control Act (BImSchG) procedures etc.) which impact the drinking-water resource, i.e. the catchment of drinking-water abstraction installations (e.g. by submitting opinions on land use, regional planning and building plans, supporting authorities in monitoring compliance with licences and permits, supplying information to local government and political bodies);
   - Protective infiltration measures, i.e. artificial groundwater recharge in order to dilute problematic water constituents or create hydraulic barriers against contaminated

groundwater flows, and the permanent operation of defence wells in the inflow area to protect the water utility's own abstraction wells if contamination has been discovered (to avoid the need for drinking water treatment) and associated recommendations on water abstraction volumes;

- Measures to reduce substance loads from land by agriculture and forestry, e.g.
  - By purchasing plots of land within water protection areas for implementing and maintaining extensive cultivation;
  - By cooperating with other users in drinking water protection areas to adopt management practices in land use and operations which protect groundwater;
  - By promoting water protection measures within the framework of cooperation with farmers where water quality impairments have occurred or are likely (e.g. nitrate, pesticides), including offering advice and financial and/or organisational assistance, e.g. to compensate for farming restrictions and loss of earnings.

4. Beyond the aforementioned specific protection measures in water abstraction areas, water suppliers also provide a range of services that, as well as preventing hazards and damage, also help to improve general environmental conditions and the qualitative and quantitative status of water bodies as a whole. These include:
   - Ensuring minimum effluent levels or creating river continuity on dams, thereby improving the status of water body-dependent habitats of ecological merit;
   - The side-effects of artificial groundwater enrichment, such as buffering climatic variations in the groundwater balance and thereby helping to stabilise the ecological conditions in the catchment area;
   - Promoting the careful use of available water resources by ensuring that all distribution networks are well-maintained;
   - Research and development to improve water and environmental protection (e.g. in the areas of analytical methods and techniques, monitoring, risk management, energy efficiency);
   - Cooperating with associations and institutions that promote economic, political, technical and scientific water issues, with particular consideration of safety, hygiene and environmental protection;
   - Relieving the workload of government institutions by developing regulations and standards within the context of technical self-administration;

- Participating in special programmes to improve water protection;
- Within the framework of PR work, educating the general public on the responsible handling of drinking water and precautionary water protection.

II. Precautionary measures for specific health protection

Precautions to protect human health are intended to prevent potential adverse effects of contamination of water for human consumption, and ensure that drinking water is wholesome. The purpose of such measures is to minimise risks and prevent harm. The health objectives required by law and specified in technical regulations, are met by keeping the entire infrastructure in good working order, by using hygienically safe materials, as well as by preventively conserving resources. The water suppliers are either solely responsible for, or involved in, the design, implementation and monitoring of such measures. Such measures may also reflect their responsibility, in keeping with the precautionary principle. In particular, they may include the following:

- Measures for the monitoring and control of drinking water quality throughout the water supplier's entire value-added chain, from catchment to customer;
- Measures to minimise the risk of potentially health-impairing influences on drinking water quality within the water supplier's sphere of responsibility, such as the development of risk-based, process-oriented management systems (in accordance with DVGW regulation W 1001 and the WHO Water Safety Plan concept) and implementation of the multi-barrier principle;
- Measures to avoid or minimise drinking water stagnation in transportation and distribution networks, to prevent hygiene-related problems;
- Measures to ensure that high-quality materials are used in pipelines and equipment, above and beyond the minimum requirements defined in the technical regulations and standards, to ensure that drinking water has retained its natural quality when it reaches the consumer;
- Research and development measures addressing public health protection in public drinking water supply systems, e.g. specific research programmes such as the research focus on the “performance and efficacy of treatment stages” which investigates newly identified health hazards, and the cross-organisational "Raw water database: water supply" as the basis for cooperation between water suppliers and the agro-chemical industry, which aims to minimise and prevent discharges of pesticides into drinking water resources;

- The development of risk prevention strategies with conceptual elements such as measures to physically protect public drinking water supply facilities;
- Additional drinking-water treatment steps, where raw water quality and compliance with the minimisation principle so require;
- Participating in special programmes to improve health protection, including in-depth investigations into newly emerging or recognised substances for which monitoring is not compulsory but which could potentially influence drinking water (such as perfluorinated chemicals, e.g. PFT);
- Maintaining reliable supply systems and structures, functioning equipment, and reliable operating structures.

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