

Deliverable 11.6 Legislative Framework

Introduction

The legislative framework is often the key driving force for managing contaminated megasites. At the same time, this framework often contains several different acts, laws and policies for both land and water on EU, federal and even local level. As a result, the legislative framework can be complicated or inconsistent on some points. In this case stakeholders have to formulate objectives that match as far as possible with the legislative framework.

An overview of the most important legislation for megasite management in Europe is provided below:

- EU water framework directive (WFD), click further to the [summary](#).
- EU groundwater directive (GWD) which is currently in preparation, click further to the [summary](#).
- EU- standards regarding groundwater and water systems [summary](#).
- Legislative framework of EU countries , click further to the [summary](#)

The WFD and the GWD mainly provide general objectives, such as the “non-deterioration principle and good chemical status”, rather than exact criteria. These have to be defined at member state-level. The GWD is currently under construction, while discussions are still going on about the objectives for industrial areas that have a strong impact on the groundwater quality (the so-called Risk Management Zones, RMZ). Within the Welcome project it appears that the RMZ concept fits very well with the megasite approach, since it strongly relies on a risk-based approach rather than an approach to clean-up to uniform and inappropriate legislative standards. Therefore it has been decided to adopt the RMZ concept and use it as a basis for defining the management objectives.

Also for this RMZ concept, criteria have to be defined at megasite level, including:

- Local standards (as defined in federal legislation)
- Allowable impact on receptors (to what level do the receptors have to be protected?)
- Required reduction of contaminant mass flux (how much must the mass flux be reduced to obtain an acceptable situation for the stakeholders?)
- Available time and space for risk reduction (to what extent and for how long do we allow the contaminants to increase?)

The legislation in many EU countries is still rather stringent and unfit to support the RMZ concept. Authorities have to be convinced that the risk-based approach is the only way to manage contaminated megasites. The consequence can be that a new strategy or policy will be introduced which does not comply fully with the federal legislation, but which is supported by all stakeholders. Perhaps this might be a starting point for revising the legislation in such a way that it will support the RMZ concept as proposed in the EU GWD.

Summary EU water framework directive (to be updated)

With publication of the WFD on 22 December 2000 the EU introduces a legal instrument that is primarily focussed on an integrated approach for water quality management. The general objective of the guideline is to prevent further deterioration of the water quality (and quantity). Whole river systems are taken into account, including bodies of groundwater and surface water as one unit. The most important concept in the WFD is the organisation on river system level. All participating countries need to make a management plan for each river system, in which exact objectives, guidelines and measures are being defined. The WFD only gives general definitions and guidelines.

The main objective is to reach a good ecological and chemical status for all water systems in 2015. On the one hand the quality of water systems is being guaranteed, and on the other hand measures are being taken to improve the quality of deteriorated water systems. No exact criteria are formulated for reaching the objective, and exemptions and derogations exists for the following situations:

- costs are disproportionate to the long term benefits
- adverse natural conditions
- unfeasible due to technical limitations

Besides this, some (parts of) water systems are not taken into consideration or need other standards. This is the case for water that is strongly influenced by human activities. For groundwater there are currently no criteria defined in the WFD for “good chemical status” and the “non-deterioration objective”. This will be formulated separately in Article 17 and added to the WFD before December 2002 (see: GWD). Only those zones where a significant groundwater flow or where significant amounts of water are being withdrawn, are considered as groundwater in the WFD. Herewith the possibility is created to take only measures in groundwater zones that are important for the ecosystems at the surface and for the use of recourses. The obligation to further prevent contamination as much as possible counts for all groundwater systems. With the introduction of the WFD, including groundwater as a component, the status of the existing groundwater directive (80/68/EEC) is uncertain. It remains unclear according to which legislation contaminated groundwater is assessed. Officially the existing groundwater directive will expire in 2013. The criteria within this guideline are very stringent (no emissions are allowed, all the groundwater has to be restored to drinking-water standards) and partly in contradiction with the WFD.

In the Netherlands, four river basins are distinguished: the Rhine, the Meuse, the Schelde and the Eems. For each river basin an international river basin management plan will be developed, and will form part of the water management amendment. The exact boundaries of the river basins are not yet defined. For the Dutch river Delta around Rotterdam it remains uncertain if it belongs to the Rhine of Meuse system. In reality both rivers come together in this area.

→download the full WFD document as pdf-file [here](#)

Summary EU groundwater directive (to be updated)

With the introduction of the WFD a framework was established for community action in the field of water policy. The WFD forms the basic legislation for the protection of the European aquatic environment. It appeared that this directive provided an insufficient basis for the various problems of groundwater protection. Consequently, the WFD included a provision, in Article 17, stipulating that specific measures should be adopted to prevent and control groundwater pollution. These measures should be designed to achieve the objective of good groundwater chemical status in accordance with Article 4(1)(b) of the WFD, acting on the proposal of a new directive: the groundwater directive (GWD).

This directive sets out criteria for the assessment of the chemical status of groundwater, which responds to the requirement of Article 17(2)(a) of the WFD. In this respect, the option to set out a list of quality standards that would be uniformly applied to all groundwater bodies throughout Europe in relation to the definition of good chemical status was withdrawn, owing to the natural variability of groundwater chemical composition and the lack of present monitoring data and knowledge. Besides existing standards (nitrates, pesticides), drinking water quality standards would not be appropriate for the evaluation of groundwater quality since the purification treatment is filling part of the standard, i.e. establishing groundwater quality standards to this level would mean that there would be no safety margin at all. In addition, drinking water quality standards are aimed to protect human health but they are not necessarily appropriate as environmental standards.

By the time of preparing this paper the GWD was still under construction. Two draft versions of the directive were available. Both having a different vision and approach on the management of contaminated groundwater. The megasite approach that is developed within the WELCOME project matches with the first version of the GWD, because the concept of Risk Management Zones (RMZ) have been introduced. Therefore the principles of this version will be followed and further developed, rather than the more recent 2.0 version. Below both draft versions of the GWD are summarized.

GWD draft version 1.0

An alternative to uniform quality standards has been proposed, consisting in the establishment of a list EU Groundwater common (screening) indicators. This approach takes into account various groundwater typologies and relates them to ranges of concentration of selected indicators corresponding to baseline values. The concentration ranges of these indicators should be established by member states within two years after the entry into force of this directive. If appropriate, quality standards should be derived from this list, on the basis of the monitoring data collected throughout Europe, in order to strengthen the compliance regime related to the definition of good chemical status of groundwater bodies.

In addition, a combined approach for preventing and limiting diffuse and point sources of pollution is proposed, taking into account new requirements regarding the management of historical pollution sources, referred to as Risk Management Zones (RMZ). According to the definition, RMZ are a group (or groups) of historical point sources of pollution, which together yield a significant flux of a substance that affect groundwater quality in a specific area or may affect receptors such as groundwater uses and aquatic or terrestrial ecosystems, which require specific management requirements.

The following requirements have been defined for RMZ:

- Historical point sources of pollution have to be identified and recorded, and inventories have to be build up at member state level
- Groundwater contamination in relation to relevant impacts on existing or identified future receptors has to be monitored
- Groundwater quality has to be assessed
- Providing that measures are technically feasible and not disproportionately expensive, appropriate measures should be taken to reduce the mass flux of pollutants and limit the extension of contaminated plume(s) beyond the designated RMZ
- If necessary, Member states may establish local standards for a RMZ to assess the quality of groundwater for specific pollutants.

GWD draft version 2.0

Also in the second draft version of the GWD an alternative to uniform quality standards has been proposed, consisting in the establishment of groundwater (screening) indicators. This approach takes into account various groundwater typologies and relates them to ranges of concentrations of selected indicators corresponding to background values. Member States should establish the concentration ranges of these indicators within eighteen months after the entry into force of the GWD. If appropriate, the Commission will identify common indicators and/or quality standards that will be derived from this list on the basis of monitoring data collected throughout Europe, in order to strengthen the compliance regime related to the definition of good chemical status of groundwater bodies.

The GWD sets criteria for the identification and reversal of significant and sustained upward trends of anthropogenic origin. In addition, measures for preventing or limiting pollution are proposed, taking into account new requirements regarding the management of point pollution sources (risk management zones) that should be considered with immediate effect after the date of entry into force of the Directive. The proposed measures ensure a continuation/revision of the protection regime of the Directive 80/60/EEC, repealing its “prevent or limit” articles at the date of entry into effect of the Directive and its authorisation regime by the end of 2013 as stipulated by the WFD.

Point sources of pollution require that specific management requirements are established, taking into account aquifer characteristics, the behaviour of pollutants specific to the polluted sites, and the level of risks. The specific requirements for RMZ comprise:

- Member States shall identify and record point sources of pollution, to be designated as RMZ, and build up inventories at the level of river basin districts
- Member States shall undertake the assessment of groundwater chemical status within a RMZ or a group of risk management zones, and take the necessary measures to monitor groundwater pollution
- Providing that measures are technically feasible and not disproportionately expensive, Member States shall:
 - (a) Take measures to reduce the mass flux of pollutants; and
 - (b) Limit the extension of contaminated plumes beyond the designated RMZ
- Member States shall take measures to restrict the use of polluted sites and of the groundwater to avoid the degradation of the water resources.

Monitoring requirements are fully covered by the Water Framework Directive and are not repeated in this Directive. Additional specifications concern the evaluation of the groundwater background

chemical composition and the way indicators should be used in the context of monitoring. New specifications also concern the control and monitoring of risk management zones. → download the draft version 1.0 or 2.0 of the GWD as pdf-file [here](#)

EU- standards regarding groundwater and water systems (state I/2003)

For the subject-matter water an number of legislations, orders, contracts and decisions on the level EU and on national level could be considered.

http://www.e-lex.de/service/frameset/index_03.htm

http://europa.eu.int/pol/env/index_de.htm

There are a number of EU guidelines and regulations available at the present time. :

Part A

- 2000/60/ EC: water framework
- 80/68/ EC: groundwater guideline
- (GWD-draft: groundwater daughter direction (currently a draft))
- 79/923/ EC: quality guideline for mussel water bodies
- 78/659/ EC: fresh water protection guideline
- 76/464/ EC: surface water protection guideline
- 76/160/ EC: bathing surface water guideline

- 90/656/ EC: cross over- measures (prevailing in Germany) referring defined EU- instructions for environment

Part B

- 75/440/ EC: quality requirements to surface water for water supply in member states
- 79/869/ EC measuring techniques/ frequency of sampling and analyzing of surface water for water supply
- 80/778/ EC: drinking water guideline
- 98/83/ EC: the new drinking water guideline
- 96/61/ EC: IVU (IPPC) – guideline
- 91/692/ EC: report guideline

Part C

- 84/156/ EC: threshold values and quality standards for effluent of mercury other than alkaline electrolysis industry
- 84/491/ EC: threshold values and quality standards for effluent of mercury at alkaline electrolysis industry
- 91/271/ EC: communal waste water
- 86/278/ EC: clarification sludge guideline

Part D

- 91/676/ EC: nitrate guideline
- 86/280/ EC: threshold values and quality standards for defined hazardous compounds
- 84/491/ EC: threshold values and quality standards for effluent of hexachlorocyclohexane

1.1 decisions

- 2455/2001/ EC decision by European parliament and by council for definition the list of priority compounds at water policy and for change of guideline 2000/6
- 97/464/ EC decision for methods for attestation of conformity of

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- 92/446/ EC: construction products according to guideline 89/106/EWG questionnaire for water guidelines

1.2 other publications

- report of commission: execution of guideline of council 91/271/ EC of May, 21st 1991 (treatment of communal waste water, changed by guideline 98/15/ EC...)

Legislative framework of EU countries

An extensive overview of legislative standards of EU countries has been made for WELCOME Deliverable 11.6. For more info about policy background and legislation in EU countries please consult the following page <http://www.clarinet.at>

Austria

Belgium

Germany

Great Britain

Denmark

The Netherlands

Poland

USA

Austria

In Austria, the regional authority is responsible for the identification of contaminated sites. It will notify the Federal Environment Agency of suspected contaminated sites within its state in order to be able to use public funding for the site management. The Federal Environmental Agency carries out investigations and risk assessment of the suspected contaminated sites and is responsible for the regulation of the public funding contribution. The following acts are dealing with the problems:

Water Act (1959): This federal act provides legislation to protect the quality of water, which includes both groundwater and surface water. The competent authority is responsible for the prevention of water contamination. It is authorized to order remediation measures in order to protect waters.

Act for the Clean-up of Contaminated Sites (ALSAG, 2000): This federal act provides legislation for the identification of contaminated sites, risk assessment and financing of remediation measures.

Trading Regulations (1994): This federal act aims to prevent hazards to people and the environment caused by working industrial plants. The competent authority is authorized to approve industrial activities, to order safety measures and to shut down industrial plants.

Federal Waste Management Act (2000): This federal act rules on avoidance, reduction, recycling and disposal of waste. It also rules on monitoring, remediation and the closure of dump sites.

Belgium

The responsibility for contaminated sites policy in Belgium falls separately on its three regions: the Flemish region, the Walloon region and the Brussels-Capital region.

Flemish region

Flanders passed a decree on 22 February 1995 specifically dealing with soil remediation. This came into force on 29 October 1995. Practical implementation is regulated by the Flemish Regulations on Soil Remediation (VLAREBO), which came fully into force in October 1996. The responsible authority in the Flemish region for soil contamination and remediation, and also for waste management, is OVAM (Public Waste Agency of Flanders).

The Decree on Soil Remediation contains some key ideas that address new ways of handling the issue of contaminated sites :

- A register of polluted soils and the opportunity to request a soil certificate, including an extract from the register;
- The difference between historic and new soil pollution;
- The difference between obligation and liability for remediation.

It is important to note that under the Decree, soil includes both the solid phase and groundwater.

According to this Decree strict soil investigation and remediation procedures are mandated, starting with a preliminary soil investigation and followed, when appropriate, by a full (quantitative) soil investigation, a soil remediation plan and the remedial works themselves

Walloon and Brussels region

At the time of writing there is no specific legislation for soil remediation in the Walloon region. A system for the classification of waste dumps on the basis of risks to water, human health and ecosystems is being developed. The ranking is carried out on the basis of a checklist that considers the source of pollution (location characteristics), the vectors (pathways) and the receptors (risk groups). The model is partly approved, and is now being validated.

Contaminated soils are considered as waste under the Walloon regulation on waste. A piece of contaminated land should be ranked as a waste deposit. In order to remediate such sites, the owner or person responsible for the pollution has to submit a rehabilitation project plan to the administration. This plan must be approved by the Minister of Environment and, after remediation, the administration follows up to ensure that the work has been properly carried out. A specific guidance regulation on soil is under development.

In the Brussels-Capital region at the time of writing there is no specific legislation relating to contaminated soil investigation and remediation.

Extensive information about [“Environmental quality standards for Belgium”](#) you will find in the Table 1

Germany

The general legislative framework in Germany for the problem of contaminated sites and groundwater assessment is determined by both the German Soil Protection Act (BBodSchG, 1996) and the German Water Act (WHG, 1996). These acts give general definitions and targets for soil and water as protectable receptors. Special requirements for contaminated sites are stipulated by a regulation of the Soil Protection Act (BBodSchV, 1999) as well as general technical guidelines, worked out in cooperation with the German states (‘Länder’), for water (LAWA guideline, 1993) and waste (LAGA guideline, 1993).

The responsibility for policy on contaminated sites in Germany falls on the different states, which caused the development of different methods of hazard ranking and risk assessment. The German states have their own register for contaminated sites and their own state-specific laws, which concern the problem of contaminated sites including water bodies.

A review about all relevant acts regarding groundwater and surface water assessment of the German states is given below:

1. Soil limit values for the protection of groundwater (because of the migration pathway soil-groundwater) from German Soil Protection Act 1999
2. Soil limit values for neighboured agriculture (because of the migration pathway soil-groundwater) from German Soil Protection Act 1999
3. Groundwater limit values at the interface saturated- unsaturated layer from German Soil Protection Act 1999
4. Groundwater values of insignificance (of pollutions) from 1998 LAWA (Germany)
5. German Drinking Water Law from 1990
6. German Guideline for surface water from 1998
7. Surface Water Law Saxony-Anhalt from 2001
8. German Effluent standards for sewage from 2001
9. European list of priority substances in (surface) water from 2001.

More extensive information about different environmental quality standards in Germany you can find in the following [link](#).

Great Britain

The existence of contamination threatens sustainable development:
 it impedes social progress, depriving local people of a clean and healthy environment;
 it threatens wider harm to the environment and to wildlife;
 it inhibits the prudent use of land and soil resources, particularly by obstructing the recycling of previously-developed land and increasing development pressures on greenfield areas; and
 the cost of remediation represents a high burden on individual companies, home- and other land-owners, and the economy as a whole.

In this context, the Government's objectives with respect to contaminated land are:

- (a) to identify and remove unacceptable risks to human health and the environment;
- (b) to seek to bring harmed land back into beneficial use; and
- (c) to seek to ensure that the cost burdens faced by individuals, companies and society as a whole are proportionate, manageable and economically sustainable.

These three objectives determine the "suitable for use" approach to the remediation of contaminated land, which the British Government considers as the most appropriate approach to achieving sustainable development in this field.

The following laws and guidelines are relevant for groundwater contamination:

The Contaminated Land (England) Regulations 2000 (SI 2000/227) are a new statutory regime for the identification and remediation of contaminated sites.

DETR Circular 02/2000 (2000): This is a guideline for local authorities on the implementation of Part IIA of the Environmental Protection Act (1990) in England. Under the new legislation, each council has a statutory obligation to inspect land for contamination within its district. The regime provides an improved system for the identification and remediation of contaminated land. This applies only to land causing unacceptable risks to human health or the wider environment, assessed in the context of the current use and circumstances of the land.

The Environmental Protection Act (1990, updated 1995), introduces what is known as integrated pollution control for all media into British legislation. Under this act, local authorities have “statutory nuisance” powers to require treatment of contaminated sites which are considered to represent a threat to public health or the environment, and are entitled to take action themselves, recovering their costs from the responsible person at their discretion.

The Water Resources Act (1991) empowers the Environmental Agency to take action to prevent or remedy the pollution of controlled waters, including circumstances where the pollution arises from contamination in the land, and recover the costs from the polluter.

The Town & Country Planning Act (1971): Guidelines on this act demand that land is put to optimum use and that, where appropriate, the restoration of permanent usability is ensured in the case of specific uses as a result of land contamination.

The statutory guidance (DETR, 2000) states: "The local authority has the sole responsibility for determining whether any land appears to be contaminated land."

The local authorities have a significant responsibility, which reflects existing local authority duties under the statutory nuisance regime and Town & Country Planning, Development Control. The role in broad terms includes:

To cause the area to be inspected to identify potentially contaminated sites

To determine whether any particular site is contaminated (by definition)

To determine whether any such land should be designated a ‘special site’

To act as enforcing authority for contaminated land not designated as a ‘special site’

The Environment Agency also has four main roles:

To assist local authorities in identifying contaminated land (particularly where water pollution is involved)

To provide site specific guidance to local authorities on contaminated land where requested

To act as enforcing authority for contaminated land designated a ‘special site’

To publish periodic reports on contaminated land.

Denmark

In Denmark a stringent “polluter pays” principle is applied. The government will only pay in cases where the landowner is innocent or where no landowner exists. The regional authorities are responsible for the identification, assessment and remediation of contaminated sites. The Environment Protection Agency of Denmark (EPA) gives support by setting guidelines and giving advice in technical and procedural affairs. The EPA will also act as the regulatory authority for large contaminated sites of national importance.

The **Contaminated Soil Act (1999)** contains the following objectives:

- Protection of drinking water resources,
- Prevention of health problems due to the use of contaminated areas,
- Provision of the basis for a co-ordinated and directed public effort to avoid detrimental effects as a result of soil contamination,
- Prevention of the further pollution of the environment through the use and disposal of soil, and
- Uphold the polluter as the primary party who must adopt the required measures to combat the impact of soil contamination and restore the original state of the environment.

The **Environment Protection Act (1998)**: The main objective of this Act is to prevent pollution of air, water and soil by active companies.

The **Watercourse Act** (1982): rules the use and maintenance of water courses. The supervision is the responsibility of the local authorities (small water courses) and the regional authorities (large watercourses).

The **Loss of Value Act** (1993): Innocent landowners can initiate a publicly financed remediation by paying a contribution fee to prevent the decrease of property value.

The Netherlands

Soil Protection Act

(after: Vegter, 1999)

Prevention of soil pollution in the Netherlands is based on the Soil Protection Act, which came into force in 1987. In 1994, the Soil Cleanup Act was incorporated in the Soil Protection Act. Prevention of soil pollution and cleanup of polluted sites have the same legal base, permitting an integrated soil protection policy for the soil, including groundwater and sediments.

Central to the Dutch soil protection policy is the principle of soil multi-functionality. According to this principle, the number of functions that a soil can have, should not be reduced by human activities in order to keep all options open for actual and future landuse. Soil has to be preserved and protected as a valuable resource for the future. Because restoration of contaminated land is considered as part of soil protection, the multi-functionality principle applies to soil cleanup as well. However, in view of the technical difficulties and financial problems caused by a large number of contaminated sites, this principle no longer applies to historical contamination (contamination resulting from activities dating from before 1987). Cleanup objectives for those situations depend on the actual or intended use of the land. They will also involve groundwater cleanup by cost effective means (including bioremediation and natural biodegradation).

Legislative framework water

(after: Fourth national policy document on water management, government decision, undated)

Effective water management is essential to the habitability of the Netherlands and therefore a basic precondition for the continuing economic health of the country. It is important that public confidence in our flood defences should be fostered and maintained, even in the face of the apparent threat associated with climate change.

Apart from averting the direct threat to public safety posed by major floods, it is also extremely important to regulate water levels in order to prevent minor flooding and water damage. Such incidents disrupt not only the private and working lives of individuals but also agricultural and building activities. Effective control of groundwater is essential to innumerable parts of the country's economy and ecology. Agriculture, for example, is heavily dependent on efficient water management, regarding both the ability of farmers to till the soil (for which groundwater levels should not be too high) and regarding the productivity of the land (groundwater levels must be neither too high nor too low, and salinity must not be excessive).

Extensive information about [“Environmental quality standards for Netherlands”](#) you will find in the Table 3.

Poland

At the beginning of 2002 the legislative conditions for groundwater and surface water quality assessment are undergoing changes, mostly due to the European accession process taking place in Poland. Two important acts concerning water resources were put into force last year:

- Water Law (2001)
- Environmental Protection Law (2001).

For this legislation a transitional period of its implementation is set up

The legislative conditions for groundwater and surface water quality assessment are defined mostly in the Environmental Protection Law. This act defines responsibility of surface and groundwater quality monitoring systems. The Water Law constitutes the water management system for catchment areas as well as groundwater resources. A special administration body is established for management of the water quality: Water Management Board. This body is a part of national administration and is obliged to protect water resources. For that purpose appropriate legal instruments - quality requirements are or will be provided. The role of this administration is restricted to execution of relevant regulations.

Water quality analysis for policy purposes is carried out within a separate scheme of surface and groundwater quality monitoring. The general provision of environmental monitoring system is included in the law establishing a special governmental agency - the Inspectorate of Environmental Protection. The Inspectorate governs the country environmental monitoring system. The monitoring of water resources on the country level is a subject of a special strategy set up by the Ministry. Apart from this, regional and local monitoring schemes, managed by other institutions, including industrial enterprises can be established separately.

The legal framework for remedial actions in Poland is not fully developed yet. The basics of the framework are established by the Environmental Protection Law. The Act has the following features:

- Consideration of contaminated sites and land
- Focus is on soil as environmental target
- Responsibility of the county administration for management of contaminated land and remediation,
- Responsibility of legal entities is established - polluter pays principle,
- Provision of a general scheme for management of historical pollution cases.

The remediation in Poland, now is conducted, rather on a case by case basis as a result of administration activity, initiated in severe pollution cases. The responsibility of local, regional and state administration and its role in the management is connected with the primary ownership structure of industrial enterprises in Poland, which were, up to 1989, mostly government owned.

Extensive information about [“Environmental quality standards for Poland”](#) you will find in the Table 5.

Glossary

The Environmental Protection Agency (EPA) defines **brownfields** as "abandoned, idled, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination."

Annex 2 Belgium

Table 3 Environmental quality standards for Belgium

Annex 1 Germany

Analysis and evaluation of the table “threshold values groundwater / surface water”

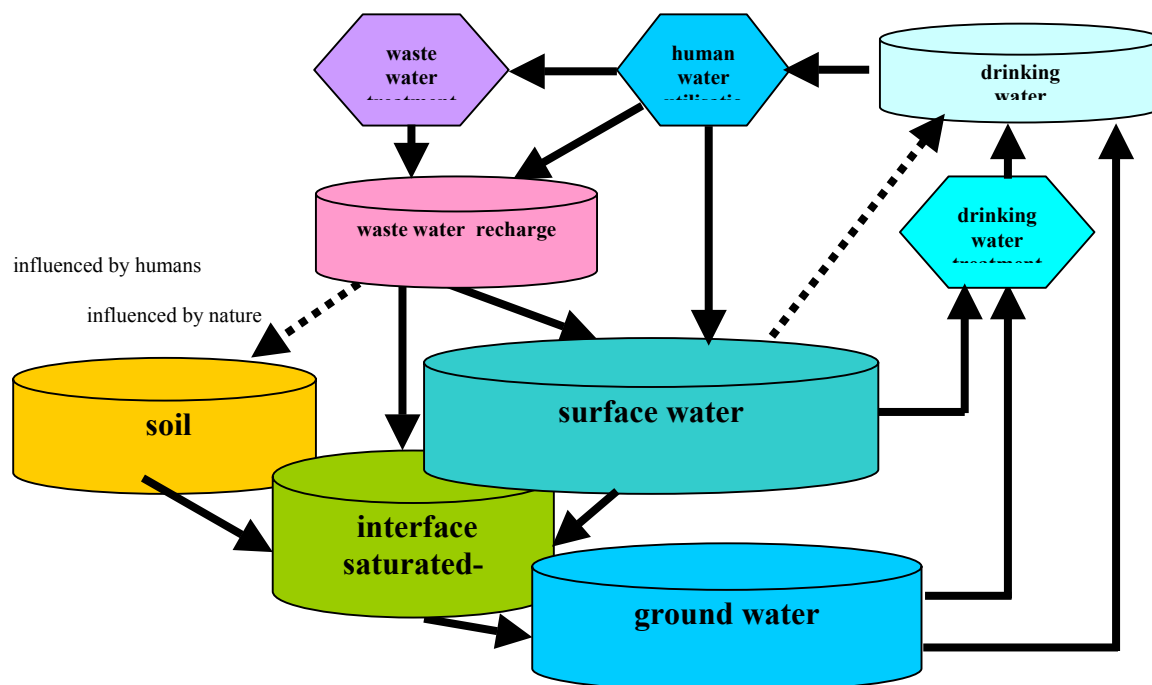
The different values for water quality in Germany and in Saxony-Anhalt in some cases don't correspond.

Following directives of the German legislation are taken into consideration in the Table 1 Threshold values groundwater / surface water:

10. Soil limit values for the protection of groundwater (because of the migration pathway soil-groundwater) from German Soil Protection Act 1999
11. Soil limit values for neighboured agriculture (because of the migration pathway soil-groundwater) from German Soil Protection Act 1999
12. Groundwater limit values at the interface saturated- unsaturated layer from German Soil Protection Act 1999
13. Groundwater values of insignificance (of pollutions) from 1998 LAWA (Germany)
14. German Drinking Water Law from 1990
15. German Guideline for surface water from 1998
16. Surface Water Law Saxony-Anhalt from 2001
17. German Effluent standards for sewage from 2001
18. European list of priority substances in (surface) water from 2001.

The pure comparison of threshold values for risk assessment can be used only for a first preliminary step of an tiered approach, due to the consideration of only a few limit values is a very schematic validation of a site situation. In further steps the values should be used related to the site conditions.

Figure 1 gives a schematic overview of the connections of the “water bodies”, which are to taken into account :



Following the connections in figure 1 it is to see, which quality of which water body influences the next. These dependences should be reflected also in the legal boundary conditions fixed by the given threshold values. Due to that, it is to assume that groundwater standards could never be more restrictive than drinking water standards for example.

Looking at these dependencies the table “threshold values groundwater / surface water” was evaluated.

The concluded contradictions and uncertainties of the German legal framework are shown in table 1

N° of criteria of uncertainty	threshold values	line in table “threshold values groundwater / surface water”
1	no conformity saturated- unsaturated layer and groundwater	1, 63, 76,119,122, 123, 173, 175, 240
2	missing values in the either or the other comparable see colour marks fraction at: a) saturated- unsaturated layer and groundwater b) waste water at receiving water location and surface water c) drinking water and groundwater d) surface water Saxony-Anhalt and surface water Germany	
3	higher values at drinking water than at surface water Germany	62, 82, 122, 176, 199, 205, 240
4	higher drinking water standards than Effluent standards for sewage	199
5	higher values at waste water than at surface water Germany	62, 131-133, 140, 169, 177, 179
6	higher values at surface water Saxony- Anhalt than at surface water Germany	87, 92, 101, 103, 144, 149
7	higher values at drinking water than at ground water	63, 12, 162, 175
8	no consideration of priority substances from EU law	marked green

In conclusion of the value discussion of German water standards it is to notice that the different Laws and Guidelines are not harmonized in their requirements (fixed by limit or threshold values), which causes uncertainties regarding risk assessment and decision making processes. Therefore these values should only be used in the context of the specific site conditions.

Therefore laws, which influence environmental regulations, should

1. be harmonized and prevent uncertainties
2. allow expert decisions for special cases (i.e. mega sites)

The laws shouldn't hinder strategic problem solutions but allow efficient management systems at contaminated sites.

Table 3 Threshold values groundwater / surface water

Annex 3 Netherlands

Table 4 Environmental quality standards for Belgium

Annex 4 Poland

Table 5 Environmental quality standards for Belgium