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CHAPTER 7 CASE STUDY GERMANY

Rur Catchment in the Meuse River Basin District in North Rhine-Westphalia, Germany

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7.1 Introduction

River Basin District Meuse and Catchment Characteristics

The Rur catchment is a tributary to the Meuse River Basin, which includes several countries: France, Belgium (Wallonia, Flanders), the Netherlands and Germany. The tributaries of the Niers, (Eifel-) Rur and Schwalm are mostly in Germany, but flow into the Maas (Meuse) in the Netherlands. Germany, with approximately 3,700 km², has the smallest surface area of the Meuse river basin. However, the German part is not unimportant: of the 7.7 million inhabitants in the Maas Basin area, 23% of them (1.8 million) live in Germany. In comparison, the Netherlands has 39%, the Belgian provinces 31%, and France 7%.

The Rur (*Roer* in French or Dutch) originates in Belgium, though 90% of the river is located within the state of North Rhine-Westphalia in Germany. The river flows into the Meuse in the Netherlands at Roermond. The total basin area is 2,340 km² and the length of the river is 163 km. The upstream area in Germany is in the Eifel area, which is an area with hills, woods and large water reservoirs. The downstream area is more populated, with both agricultural land and industry. The land use is divided into farmland (34.7%), woodland (26.9%), grassland (16.1%), built-up area (17.9%) and a remainder of 4.4% (www.flussgebiete.nrw.de).

River Basin Management and Coordination

North Rhine-Westphalia (NRW) is responsible for parts of four river basin districts, the Rhine, Weser, Ems and the Meuse. Except for the Weser, the rest of the river basin districts are international. NRW further divides these districts into twelve sub-basins called *Teileinzugsgebiete*, one of which is the Rur.

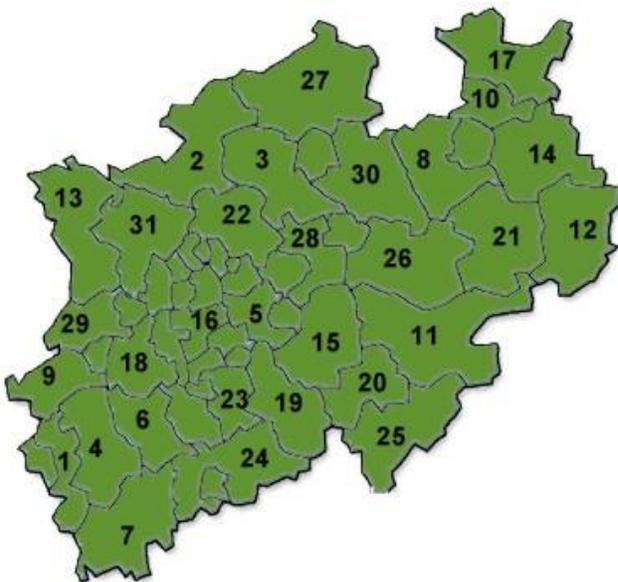


Map 1: 12 sub-basins in North Rhine-Westphalia
Source: <http://www.rur.nrw.de/>



Map 2: Rur river and the main cities

The state of NRW consists of five administrative regions (*Regierungsbezirke, districts*). The capital of NRW is Düsseldorf, and the largest city is Cologne. The Rur river is situated within the Cologne region of NRW. The Cologne region is further divided into eight *Kreise* (counties) and four *kreisfreie Städte* (county-free towns).



Map 3: NRW and its counties

The Rur is in both the Düsseldorf and Cologne region. The most relevant counties (*Flächenkreise*) are:

- 1 Aachen
- 4 Düren
- 7 Euskirchen
- 9 Heinsberg

The counties contain in total 42 municipalities (*Gemeinden*). The Cologne regional government (*Bezirksregierung*) has an office in Aachen, which is responsible for the Rur and the southern tributaries of the Meuse (*Die Geschäftsstelle Rur und südliche sonstige Maaszuflüsse*). The town of Aachen is a county-free town.

Relevant is also the water board (*Wasserverband*) Eifel–Rur in Düren. The *Wasserverbände* play a special role in the institutional landscape of Germany, where municipalities cooperate in the associations to ensure an efficient organisation of water supply and sewerage in their working area (Winnege and Maurer 2002). Many municipalities delegate part of their tasks such as sewage treatment to these water boards (Leussen, Slobbe et al. 2007). The technical, economic and ecological aspects of water management are tackled by the association, which is based on the principle of user participation and local autonomy (Winnege and Maurer 2002). The river basin approach is most prominently applied in North Rhine-Westphalia (Mostert 1998a), where nine statutory river basin associations (*sondergesetzliche Wasserverbände*) form the operational organisation (Winnege and Maurer 2002). It is only in NRW that the water boards cover the entire river basin areas. In other states of Germany, there are only a few and often smaller water boards.

As noted in Chapter 2, the competent authority of the Meuse RBD in Germany is the Ministry for Environment, Nature Protection, Agriculture and Consumer Protection (MUNLV) of North Rhine-Westphalia. The MUNLV is the *oberste Wasserbehörde*, the *Bezirksregierung* is the *obere Wasserbehörde* and the *Kreise* and *Gemeinden* are *untere Wasserbehörde*. Both *obere* and *untere Wasserbehörde* give contracts to the *Wasserverbände* to do the operational work regarding measures in water management.⁴⁹

The MUNLV of North Rhine-Westphalia has achieved a significant improvement in the chemical status of the watercourses, mainly by improving wastewater treatment and reducing industrial pollutants. At the same time, however, the morphological structure of the watercourses has deficits (Sewilam, Bartussek and Nacken 2007).

7.2 Goal Setting Process

Designation of Water Bodies

⁴⁹ See Figure 2 (Chapter 2) for a comprehensive overview of all authorities and their relationships.

Legal Establishment

According to Article 36b (3) WHG, the designation of water bodies as artificial or heavily modified should take place in the RBMPs. Consequently, the *oberste Wasserbehörde* (Ministry MUNLV) formally designates water bodies, since it is responsible for determining the RBMPs (see chapter 2). The RBMPs should also state the reasons for designating water bodies as artificial or heavily modified (Article 36b (3) WHG). Article 25b (2) WHG lays down the criteria for a water body to be designated as artificial or heavily modified. Those are the same as the ones mentioned in Article 4 (3) WFD. The LWG does not provide any rules concerning the designation of water bodies (Czychowski and Reinhardt, 2007).

Designation in Practice

How to characterise watercourses?

The characterisation process of watercourses is considered to be the first important step in the actual implementation of the WFD. The German working group of the Federal States (LAWA) has specified a quality classification system with fourteen different hydromorphological indicators. A stretch of water (100 m segment) can be assessed in seven categories for each of these indicators, ranging from natural to completely changed (Sewilam, Bartussek and Nacken 2007, p. 2039). On the basis of such a system, however, about 120,000 watercourse segments would have to be investigated in order to evaluate them and discuss rehabilitation measures, which is almost impossible due to the small number of experts in the field (*idem* p. 2040). This is one of the reasons why a decision support system (DSS) was designed to model specific effects of specific measures, in so-called 'if-then rules', which are based on different scenario's (Sewilam, Bartussek and Nacken 2007). The DSS was, however, not used to draft the programme of measures, but will, according to the Ministry, be used as a tool to take measures in the future for more specific planning. We will return to the programme of measures in Section 2.4.

Designation of water bodies in NRW

Because of new information and changing political preferences, the designation of water bodies has seen major changes in the implementation process of the WFD in North Rhine-Westphalia in recent years. First, a designation took place in 2004-2005 for NRW, with around 23 % Heavily Modified Water Bodies (HMWB), 4 % Artificial Water Bodies (AWB) and the rest (63 %) being 'natural' (other) Water Bodies (NWB) (Borchardt et al. 2005 see Figure 13).

This original designation had a higher number of Natural water bodies in comparison to the neighbouring areas of the Netherlands and Lower Saxony. After the election of 2005, in which the political regime changed its colours from Red/Green to Black/Blue (from

Christian Democratic to Liberal), this designation was redone and altered. At the beginning of 2008, it became clear that the new designation resulted in a larger number of HMWBs. According to one of the interviewees, there was a reduction of almost 50% in the number of water bodies that were originally designated as Natural, and a 50% increase in HMWBs. In a new overview, NRW water bodies were listed as about 60% HMWBs and AWBs, and 40% NWBs.

According to the Ministry, the new designation of HMWB was mainly carried out in order to be consistent with the methodology used in the rest of Germany and other European countries, and in order to comply with CIS guidance document No. 4 (Identification and designation of heavily modified and artificial water bodies).

Designation was partly based on new information on modifications of water bodies (for example, had a water body been modified in the past?). In addition, other assessment methods for structural degradation were taken up. Not unimportantly, a questionnaire for farmers (*Fragebogen*) was set up by the agricultural representatives as a basis for new information. Agricultural stakeholders, important to the process, were of the opinion that in the first designation process, water bodies were wrongly designated as 'natural'.

Of course, questions were raised. The nature conservation organisations were very surprised and even disillusioned by this change of course. According to one of the interviewees, these were in fact political decisions. It could be interpreted as a way of creating more policy discretion and flexibility, and weakening the ambition for water bodies to reach a good status. In general, it can be said that a good 'ecological potential' (for HMWBs and AWBs) was defined on the basis of the feasibility of goals and measures, and was thus more pragmatically defined as compared to good ecological status (for natural water bodies), which is based on a reference condition and is more 'environmental-science-based'. A second argument, stressed by another interviewee, was that NRW was adjusting to its neighbours, mainly to the designations in the Netherlands, but also to those in Lower Saxony, where both had designated higher numbers of HMWBs overall. This was most apparent in border areas.

One of the problems with the reference conditions for water bodies is that watercourses can have several different 'natural references' during their course (e.g. from rapid streams to slow rivers). In the Rur area, some water bodies change from natural to heavily modified when going from upstream to downstream. Therefore, designation also depends on how specifically the water bodies are categorised.

Setting Formal Standards

General Environmental Goal of good Status

The WHG contains the general goal of good status (§ 25a, § 25b, § 32c and § 33a WHG). It does not contain a deadline by which to reach these goals; that has to be set by the states (§ 25c WHG). According to the WHG, the states are responsible for determining the relevant measures. Also, the laws of the states must make it obligatory for RBMPs (*Bewirtschaftungsplan*, § 36b WHG) to be drafted and programmes of measures (*Maßnahmenprogramm*, § 36 WHG) to be set.

In North Rhine-Westphalia, the LWG contains the general goal of good status. This goal should be reached by 22 December 2015 (§ 2c LWG).

The GewBEÜV transposes Annexes II, III and V of the WFD and contains the reference conditions.

Specific Environmental Goals

The WHG and LWG do not contain the specific quality standards. These will probably be determined in the RBMPs. The GewBEÜV does contain specific quality standards for priority substances and for substances being part of the ecological status. Eventually, all goals and measures per water body are summed up in the so-called *Wasserkörpersteckbriefe* (Interview).

Type of Obligations

The formulation of the general goals in the WHG can be perceived as an obligation of result (*'Gewässer sind so zu bewirtschaften, dass ein guter Zustand/gutes Potenzial erhalten oder erreicht wird'*, which can be translated as 'water bodies should be so managed that a good status/potential shall be obtained or achieved'). This is also the opinion of the ministerial interviewees (Interview). The formulation of the obligations in the LWG also resembles that of an obligation of result (a good status/potential is to be achieved, *ist zu erreichen*). As far as the specific goals are concerned, the good chemical status shall be defined by intervention values. Substances that are part of the good ecological status are formulated as intervention values as well (GewBEÜV). It is still a point of discussion at the level of the LAWA whether or not other substances shall be formulated as intervention values (Interview).

7.3 The Planning Process

The *Obere Wasserbehörde* at the level of the *Bezirkregierung* (districts)⁵⁰ is a key policy actor in the implementation of the WFD. Every sub river basin has a specific administrative

⁵⁰ In the Netherlands, no such administrative layer exists.

agency or 'bureau' (*Geschäftsstellen*) at this level, which is not bound to the administrative borders of *Bezirke*, but to the sub river basin itself. At this level, the content of RBMPs (*Bewirtschaftungsplan*) is discussed, and goals are proposed for the sub river basin. The goals and draft measures for specific areas (sub-sub river basins) are discussed in so-called *Runde Tische* (round tables). Municipalities, *Wasserverbände* and NGOs can attend these round table meetings.

Setting objectives/goals in steps

NRW is using the LAWA method in setting the objectives for natural water bodies (good ecological status) and the Prague method⁵¹ for the HMWBs (good ecological potential). The standard way of setting GEP, following the Prague method is starting with an estimation of maximum potential, which can be derived from reference conditions (e.g. resembling natural water bodies). After this, all possible measures are collected (initially without looking at the costs). Next, the feasibility of these measures is considered, to determine what is possible and what is impossible (without extreme economic, ecological or societal costs). Finally, feasible and efficient measures are chosen to reach a good ecological potential. For the regional waters, goals and measures are usually set by the level of the district agency, the *Geschäftsstelle* for sub river basins. The Ministry coordinates and supervises this process. In this coordination process, the Ministry can ask questions about different solutions in comparable cases (sub river basins or water bodies). Ultimately, the Ministry is responsible for the RBMP and decides on the selection of goals and measures.

7.4 Programme of Measures

A summary of the programme of measures must be laid down in the river basin management plans. The programme of measures is formally the responsibility of the national government of the *Länder*, in our case the MUNLV. The actual implementation is carried out by the districts (*Bezirksregierungen*), the *Kreise / kreisfreie Städte* and the *Landwirtschaftskammer* on the one hand, and by the municipalities, the water boards (*Wasserverbände*), the state (both federal and *Länder*) and individual farmers as *Massnahmenträger* - who are implementing measures - on the other (Interview).

⁵¹ See also the Introduction of this report. There are different methods possible to reach GEP and GES. The Royal Method starts from the 'end state' reference conditions and then determines the High Ecological Status (for Natural Water Bodies) and Maximum Ecological Potential (for HMWBs and AWBs), which are then used to derive the objectives that are reflecting good ecological status and good ecological potential. The Prague Method begins with the current (modified or artificial) status of water bodies and derives objectives that are possible and feasible to reach improvements. At the end, it is also directed towards reaching good ecological potential.

Programme of Measures in practice

The process of designing and deciding upon programmes of measures, which is especially crucial for reaching good ecological potential in HMWBs and AWBs, is showing an ambiguous picture in NRW. For some of the river basins, the MUNLV is using a Decision Support System (see Section 2.1 Characterisation of water bodies) as a tool to support decision-making for future measures in order to allocate resources and develop programmes of measures in NRW. The Decision Support System was implemented for seven rivers (Steuer, Berkel, Sieg, Niers, Issel, Wienbach and Ottersgraben). The Berkel case was elaborated in more detail (Sewilam, Bartusseck and Nacken 2007). For example, to go from Class 6 to an improved morphology of Class 3, the development time can be set at eighteen years with minimum costs; by that time Class 3 can be reached in 75% of the river segments (Sewilam, Bartusseck and Nacken 2007, p. 2046).

But the options for ecological targets and programmes of measures are also intensively discussed in the district offices of the *Bezirksregierung* and the round table discussions. So, although there are general decision-making tools for programmes of measures, the process of deciding upon measures in NRW is not clear. There are problems in deciding upon the actual sets of measures to realise a GEP. One of the interviewees said that it was yet unclear what was meant by a good ecological potential. 'Until that is clear, one has to do all that is possible.' He added that measures were proposed as general targets per water body. This interviewee, who was involved in many working groups and *Runde Tische*, said that in the process of round tables the participants at first defined the measures that would have a positive effect on the status of the surface water bodies. Unfortunately, it was not possible to appraise the costs of all the fixed measures, because of the lack of nationwide terms of reference. Therefore, there was no general view of how much money was needed. In addition, it was not clear who had to pay the costs and during what time period. These questions have to be answered before a prioritisation (with timelines) of measures is possible. This interviewee pointed out that cost-benefit analyses are done by the Ministry, but that no information was available from them to enable stakeholders to have good discussions on efficiency of measures or to use when deciding upon actual measures. This was frustrating for some of the deeply involved stakeholders.

The Ministry made clear that the concept of the planning of measures often did not allow the calculation of costs on the scale of water bodies. A top-down approach was applied, meaning that certain fields of measures for a group of water bodies were identified first. These programmatic measures were agreed during the Round Table discussions. The planning was often not detailed enough to calculate costs anyhow, so this will be done in the coming years as the further steps towards a detailed planning will be taken (bottom-up process). If any costs- data on the scale of water bodies were available, these were also given to all stakeholders. In the end most participants of the

Round Table agreed with the concept of planning 'top-down', allowing for flexibility in the future to realise these measures

Reflecting on this discussion, it actually reveals a more general problem with the goal-setting process in the WFD. To be able to decide on ecological (and chemical) conditions, ecological targets, probability and feasibility of all sorts of measures and societal and economic costs of these measures, there must be enough information to be able to decide what measures have to be realised in what time period. The involved stakeholders must be provided with all information available and must be able to balance very different interests. This is asking for full rationality from all the people involved, when they in fact suffer from bounded rationality due to insufficient information, scientific uncertainties, and their own interests being at stake, which they are expected to defend.

7.5 Resources

There is some information available on estimated costs of measures on the sub-sub river basin level, in schemes and schedules of goals and measures. At the time of our research, however, we did not have an overview of total costs for the Rur area, or an overall costs/benefits analysis for WFD in North Rhine-Westphalia as a whole⁵². There was also no reference found to a costs/benefits analysis of the implementation in NRW that could be compared to other countries (e.g. the Netherlands). Very recently, with the publication of the draft RBMP, the Minister revealed information on costs (Uhlenberg 2008, see www.flussgebiete.nrw.de). The Ministry announced a plan to add 10 million euros to the water management budget in 2009, and in total, 50 million euros for 2010 and thereafter in connection with the WFD. With these additional financial resources, there will be a total of 40 million euros available in 2009 and 80 million euros for 2010 and thereafter.

In close cooperation with the central agricultural organisation (*Landwirtschaftskammer*), a part of these financial resources is destined for agriculture, in the form of consultation and advice for farmers concerning nutrient management. This consultation will be supported with 1.5 million euros for the first year, and with 3 million euros every year from 2010 (Uhlenberg 2008).

7.6 No Deterioration Principle

Legal Establishment

The principle of no deterioration (called *nachteilige Veränderung vermieden* or *Verschlechterungsverbot*) is laid down in the WHG (§ 25a, § 25b, § 32c and § 33a WHG) and already existed in German law before the introduction of the WFD. The principle is not laid down in the LWG. The principle which is laid down in the WHG is formulated

⁵² This is part of the draft RBMP that was published at the end of 2008.

in general terms only. According to the WHG, it should be further elaborated in the RBMPs.

The principle encompasses every influence that is neither positive or neutral with regard to the water status in an ecological or chemical respect. Some authors are of the opinion that a deterioration within status classes is allowed, while others, like Reinhardt (2007, p. 1028) say that German law does not permit this, and that even minor changes are not allowed. This view was also confirmed in an interview. Still others say that deterioration within status classes is allowed as long as it is not significant (Interview). Legislation is shaped in such a way that plans or permits in principle must be denied if deterioration (in whatever way it might finally be defined) were to take place.

The current principle applies since the day the WFD entered into force. Its wording is expressly not exactly the same as in the WFD ('further deterioration') and omits the word 'further', because that would not fit within the German water protection legislation (Reinhardt 2007, p. 1026).

No Deterioration in Practice

The environmental objectives, the environmental quality standards and the no-deterioration principle are applied to all waters (not only designated water bodies). At the same time, a more pragmatic approach is chosen when it comes to the question of when one could speak of 'deterioration'. The meaning of the principle of no deterioration is perceived quite differently in practice. According to some interviewees and the EU-guidance documents, deterioration *is* allowed within status classes and only forbidden *between* classes. Not all interviewees were in agreement on this, however. The interviewees also gave different opinions concerning the starting date of the principle. Some confirmed the starting point as the year 2000 (when the WFD entered into force), others were of the opinion that the principle applied, and only could be applied, from the moment the monitoring data became available (*i.e.* 2003). The monitoring is done by the *Landesamt für Natur, Umwelt und Verbraucherschutz*.

7.7 Use of Exemptions

Legal Establishment

The WHG lays down the exemptions in § 25c and § 25d. The deadline mentioned in the laws of the states can be extended if no further deterioration occurs, if technical or natural reasons do not allow for the goals to be reached in time, and if the costs of reaching the goals within the determined time frame would be disproportionate. The states are allowed to set less strict goals if human activities (which cannot be avoided) or natural circumstances do not allow for the goals to be reached or only with disproportionate costs, if further deterioration is avoided, and if they reach the best possible ecological and chemical status.

Exemptions in Practice

As in other countries, it will be difficult in Germany to reach the goals of the WFD in the given time frame. For Germany as a whole, it was estimated in 2004 that 14% of the surface water bodies were likely to meet the objectives, 24% was estimated as 'possibly at risk' and 60% was described as 'at risk of failing the objectives' (Borchardt e.a. 2005). It is hard to give an estimation of the percentage that will be postponed to 2021 or 2027. For wastewater management, the targets are set at 2015. According to a draft document on the goals for the Rur river basin, most of the goals are to be reached 'later than 2015' (Interview). We could not rely on an overview of exemptions to 2021 or 2027, but the impression was that the majority of the area-specific programmes were not set at 2015, but were anticipating exemptions in time. In the interviews, mainly the costs of hydromorphological measures and the difficulties of buying out agricultural land (property rights) were mentioned. About 33% of the river length in the Rur catchment area will reach good ecological status, and about 71% of the river length will reach good chemical status.

As far as the use of less stringent goals is concerned (usually referred to as *Ausnahme*; in effect the lowering of targets in a specific case, and also part of exemptions), some problematic substances are discussed, e.g. the problem of copper and zinc because of runoff due to the former mining of metal ores (*Alter Erzbergbau*). NRW will use an exemption before 2015 for brown coal mining (*Braunkolhetagebau*). This is explained in Textbox 7.1. The problem is the enormous impact on the groundwater levels in the area and the ecosystem in general. Through a long-term Brown Coal Plan, NRW wants to compensate these implications for the hydrological situation. Brown coal mining is also affecting cross-border groundwater systems on which the Netherlands depends. For pollution by nitrates, NRW foresees a longer period being necessary to reach the WFD goals. It is already clear that the goals for nitrates cannot be reached in 2027, but the exemption of lowering the targets will not be used.

Sometimes there are obvious physical reasons for not reaching the targets, such as with large reservoirs in the river basin. The large reservoirs in this area are the Rurtalsperre, Urftalsperre and Oleftalsperre, and this concerns specific problems with heavy metals from deep underground. These problems cannot be solved in the short term and will affect the future water quality (First International Scientific Symposium on the River Meuse 2002, p.21). Although, according to the recently published results of the 2006 to 2008 monitoring phase, the 'effluents' of the above-mentioned reservoirs (Urftalsperre, Oleftalsperre and Rurtalsperre) do not show any violation of the environmental quality goals for metals, there are sources of metals in the upper courses, e. g. the Schwarzbach in the upper Rur area because of the weak acid pH-value of the swamp water (Interview). There are also metal sources in the catchment area of the Urftalsperre and Oleftalsperre which are caused by geological conditions.

Textbox 7.1

Brown coal mining and the Water Framework Directive: Garzweiler II

Brown coal mining is on the whole a massive interference in the natural balance of the ecosystem. Since the extraction of brown coal is carried out in dry mines, extensive lowering of the water table and sumping measures are necessary. In Garzweiler II the water table has fallen more than 200m; 80-150 million m³/a groundwater has been extracted during a period of up to 40 years.

To compensate for the effects of the brown coal mining in Garzweiler II, an extensive and ambitious catalogue of objectives has been drawn up (Brown Coal Plan). According to this, the water table in groundwater-dependent wetlands must, for instance, remain in the same state as before the impact of brown coal mining, and their biodiversity must be retained.

In order to meet these objectives, measures are being taken with a planning horizon of about 100 years. These include the infiltration of water into an aquifer, discharging water into the surface water (approx. 40 - 89 million m³/a), water treatment and, from 2030, the transition of Rhine water to refill the remaining pit (...)

If one compares the WFD objectives for the quantitative condition with the status in the individual groundwater bodies in the catchment areas, Niers and Schwalm, it is clear that the good quantitative condition is jeopardised by the lowering of the groundwater. (...) the possibilities of dealing with this conflict of objectives in line with the WFD are as follows:

- Extension of time in accordance with Art 4 (4) WFD.
- Formulation of less strict ecological objectives in accordance with Art. 4 (5) WFD.
- Feasible provisions to minimise the negative effects in accordance with Art. 4 (7) WFD.

based upon Meiners, H.G., 2002, p.34

The brown coal mining (Garzweiler II) is an example of willingly lowering the standards for 2015 because the standards cannot be met for groundwater bodies.

7.8 *Integration*

General

Within the competences of the water authorities, lower authorities are bound by the instructions of higher authorities. The RBMPs Ministry supervises the *Bezirksregierungen* and the *Bezirkregierungen* supervise the lower water authorities. The higher administrative body has a general power to annul decisions of a lower body.

As far as other than water authorities are concerned, the situation is as follows. The RBMPs are legally binding on all authorities. However, there is no general legal instrument to oblige other authorities to take them into account. Although there is no general legal instrument with which the Ministry could influence decisions of other ministries or lower authorities, there are diverse legal instruments that ascertain policy integration, at least to a certain extent. When considering the *legal* instruments for policy integration and binding rules, one has to take the content of the RBMPs into account. As

far as the RBMPs contain conservation measures that protect existing situations, these factual situations are often legally protected by planning law or nature conservation law. If, for example, a river and its banks and meadows are of great natural importance, they are in most cases already designated as a special protection area or a different kind of nature protection area. Furthermore, the spatial planning system assures that areas with special functions for certain purposes, such as, e.g., areas adjacent to rivers which serve as a retention area (*Überschwemmungsgebiete*), have been assigned as such in higher spatial planning (*Raumordnung*) or local spatial planning (*Flächennutzungsplan*). Most parts of the RBMPs, however, contain planned actions, things to be done. A legal instrument for the external integration of those measures does not make much sense. That seems to be the reason why, as far as we could examine, there is no substantial discussion about the existence of or the need for legal instruments for the external integration of RBMPs.

On the organisational and institutional level, a few characteristics of the implementation in NRW are important. First of all the Competent Authority, the Ministry for Environment, Nature protection, Agriculture and Consumer Protection of North Rhine-Westphalia (MUNLV), is in itself a combination of very different policy fields and socio-economic interests. Integration can be, and has to be somehow, accomplished within the Ministry itself. Secondly, there are organizational and procedural institutions that function as platforms to attain integration, such as the steering group (*Lenkungsgruppe*) that exists at the ministerial (*Länder*) level where groups of different interests meet as well (governmental authorities, water boards, fish boards, nature boards, agricultural organizations, etc.) This steering group gives advice and influences the groups at the different round tables in the region. In these round tables (*Runde Tische*) in all thirteen sub-river basins (*Teileinzugsgebiete*) and sub-sub-river basins (planning entities; *Planungseinheiten*, 83 in total) the different policy interests are determined 'around the table'. These round tables are an important platform for integration and influence; at the level of the districts, the *Bezirksregierung* is trying to balance these different stakeholders' interests.

Nature and Water

Legal Establishment and Integration in Practice

To start with, it has to be noted that conflicts between nature conservation measures and water management requirements do not occur very often. On the contrary, usually nature conservation measures are an important tool in supporting the realization of RBMPs. This is especially true if areas adjacent to surface waters have been designated under one of the manifold regimes of area protection which the *Bundesnaturschutzgesetz* (BNatSchG) and the nature conservation acts of the *Länder* provide. If, for instance, an area has been designated as a nature protection area (§ 23 BNatSchG), everything which

could result in a deterioration or substantial disturbance of such an area is forbidden. Usually that protection serves the protection of the included or adjacent waters, too.

§ 31 BNatSchG requires that the *Länder* make sure that (all) surface waters, including their banks and adjacent belts, are protected as habitats for local animal and plant species and that they are developed in such a way that they can fulfil their function as part of a coherent ecological network. This provision is (no more than) a programmatic requirement for the *Länder*, which leaves a great deal of discretion as to how this goal will be reached. It is questionable whether this provision, which aims to integrate water management and nature conservation, has any concrete legal effect.

In practice, an important and special provision is the 'general interference clause' (*allgemeine Eingriffsregelung*) laid down in § 18 ff BNatSchG and the respective nature conservation acts of the *Länder*. § 18 BNatSchG requires that any action that could influence nature and the landscape whenever this has a negative effect on the functioning of the ecosystem or the overall appearance of the landscape (*Landschaftsbild*) should meet the criteria laid down in § 19 BNatSchG. These criteria mainly exist of three requirements. Firstly, every negative influence that can be avoided is forbidden. Secondly, the interests of nature and landscape protection have to be weighed against all other interests. Thirdly, the adverse effects of any action negatively influencing nature and the landscape have to be compensated. Those requirements are applied everywhere, even in places which do not fall under any special protection regime. If compensation of the natural functions of an area is not possible at the place or nearby where the negative effect occurs, financial compensation, which has to be spent for nature conservation purposes, is sufficient. In practice, financial compensation is often applied. The money gained by applying § 19 BNatSchG, respectively the corresponding paragraphs in the nature conservation legislation of the *Länder*, is a very important source for financing nature development projects, which often also serve the goals or actions of an RBMP.

Thus, it can be concluded that, although there is no legal requirement in nature conservation or water law that forces nature conservation authorities to realise an RBMP, nature conservation law and measures usually support the goals of an RBMP. That is especially true for the general interference clause, which makes it possible to generate fairly substantial financial resources that can be used for nature conservation and water management purposes. Where RBMP's mainly contain activities that have to be realised, an instrument that generates some money for these activities is in the end possibly much more effective than a legal provision which declares a RBMP "binding" for nature conservation law and - measures.

Agriculture and Water

Legal establishment

As far as the integration of RBMPs into the agricultural policy and law is concerned, one has to realise that the influence of agricultural activities on the water bodies is mostly due to diffuse sources. Diffuse sources are not easily regulated by individual permits or similar instruments. On the one hand, these diffuse sources are regulated by general rules. German law contains quite a few general regulations, mainly in order to fulfil the requirements under the Nitrates Directive, which regulate the use of manure or pesticides on river banks or near waters. The most important rule in this respect seems to be § 3 VI of the Federal Manure Regulation (*Düngeverordnung*), which forbids the use of manure within certain distances (between 1 and 10 meters) of surface waters. Furthermore, especially § 90a LWG (NRW) has to be mentioned here. Some years ago, this provision, which introduces general *Gewässerrandstreifen* ('bank-belts') was added to the LWG NRW, mainly to fulfil the requirements of the WFD. Although the WFD does not explicitly require such a rule, the legislator thought that this was necessary (Filser 2005). Art. 90a LWG NRW determines that there are *Gewässerrandstreifen* adjacent to all surface waters. These belts are five or ten metres wide. Within these belts the use of pesticides is forbidden. However, under certain circumstances exceptions are possible. The use of manure is not generally forbidden (Zilkens, 2007) but can be forbidden by the *untere Wasserbehörde*, if that is necessary to realise an RBMP (§ 90a VI sub. 3 LWG NRW).

Besides these general rules, more far-reaching restrictions on agricultural activities are, as in other countries, usually determined by voluntary agreements. Additionally, changes of land use for agricultural purposes are governed by planning law (as described later) and nature conservation law (as described previously).

Theoretically, the WHG and the water acts of the *Länder* require a permit, whenever an agricultural activity has any effect on the quality of surface waters. In such a case, the farmer makes 'use of' the surface water and has to obtain a permit for doing so (§ 2 I WHG). That also covers diffuse agricultural activities (Zilkens 2007). When deciding on such a permit, the *untere Wasserbehörde* is bound by the RBMPs. Thus, theoretically, the integration of water management into agricultural regulations is not that necessary, because these activities are governed by water law itself. However, this is in theory. In practice, diffuse sources of pollution are usually not regulated by individual permits. § 2 I WHG and the respective norms in the water laws of the *Länder* are not applied to normal agricultural activities.

Integration in Practice

Besides the existing regulations concerning agricultural sources and pollution described above, and the additional measures that were already taken to anticipate the WFD, it is still necessary to implement new measures specifically for agriculture. NRW is following

a cooperative mode of implementing by signing a voluntary agreement (*convenant*) with the central agricultural representative organisation, the *Landwirtschaftskammer*, and others such as other *Landwirtschaft* organisations, the organisation of *Wasser- und Bodenverbände* and the *Arbeitskreis für Hochwasserschutz und Gewässer NRW* as signatories. It is well known that agriculture is a strong interest in NRW and has regained influence since the last election in 2005. Feasibility of measures in the WFD usually means not having a major negative impact on agriculture. The Ministry is seeking legitimacy and support for reaching substantial goals, but does this by balancing economic and ecological interests and avoiding additional negative impacts on agriculture.

Because of the dependency of the Ministry on the cooperation of agriculture, it is seeking ways to avoid a deadlock in which agriculture is forced to implement measures against its will. On the other hand, agriculture in NRW can be held accountable through the good agricultural practice (*Gute Fachlichen Praxis*) and on the basis of already summarised existing environmental obligations, such as the manure legislation.

Stepping-stones approach

For the competent authority, a cost-efficient way to reach a good status of waters is the stepping-stones approach (the so-called *Trittsteine*) (*Deutscher Rat für Landespflege* 2007; Uhlenberg 2008, p. 7). It was adopted because many experts stated that for the ecological functioning of a water system, a certain number of sections with good hydromorphological conditions is sufficient, and thus presents a cost-efficient way of reaching good status/potential. The concept needs stepping stones, which are relatively small, but it also requires sections, which work as bases for the species. These sections are quite long (around 1 km) and have quite high demands concerning hydromorphological conditions, thus also needing a significant amount of area.

In this approach, the agricultural organisations can search for specific areas of agricultural land that can be reserved for adjustments to fit in WFD-related measures. This is a way to combine ecological and agricultural activities and goals, but with very limited implications for land use and agricultural land use. Lack of budget to pay for measures for water quality improvements leads to a strong focus on the creation of these stepping stones to meet the demands of the WFD (*Landtagsbericht WRRL* 2007, pp. 3, 5). The stepping-stone concept is not an invention of the agricultural organisation, but is a pragmatic instrument to handle the problem that morphological changes cannot be removed completely, due to immense costs. According to the Ministry, there are good reasons to believe that this approach is a way of reaching good status with rather small negative effects on the surrounding uses, thus guaranteeing cost-efficient measures.

The agricultural organisations, especially the *Landwirtschaftskammer*, follow their own course in trying to gain legitimacy and cooperation among their agricultural members. In general, they do not seek cooperation with nature conservation organisations

(Interview), although there are exceptions. Regarding the possible deadlock situation, one of the interviewees made a comparison with a dog biting its tail. 'Lets stop the dog running around biting its tail and do something.' The stepping-stone (*Trittsteine*) concept is seen as a possibility to 'do something' and start with actual measures to reach targets. From the perspective of agricultural representatives, to get commitment you have to ask farmers for their cooperation, and ask them almost individually for agricultural land use that can change its function and change the ecological conditions. Although it potentially is an integrating concept, the stepping-stone approach is not always implemented in close cooperation with nature conservation organisations, because 'farmers are afraid of the nature conservation organisations' (Interview). This attitude varies from region to region. There are several examples (MUNLV 2008) where agriculture and nature conservation organisations work together in a cooperative way on the restoration of rivers.

One of the possible options that is being considered is to try to connect the possibility of compensating nature and landscape for changes in land use (e.g. when agricultural land is changed into built-up areas, such as housing; see Section 3.2 regarding *allgemeine Eingriffsregelung*) to this concept of stepping stones. The obligatory compensation of damage to nature or landscape could then be provided by creating WFD stepping stones.

The agriculture organisation is willing to invest in advisors that go to farmers to make reservations for land use and to convince them of the necessity of the WFD cooperation (Interview), and to advise them on issues such as nutrient management. Recently, the Ministry confirmed this approach of voluntary cooperation and consultations for farmers (Uhlenberg 2008, p. 7; see Section 2.5 Resources).

Spatial Planning and Water

Legal Establishment and practical implications

Water management and spatial planning are, just as in the Netherlands, two very different policy fields, where spatial planning has a more detached, multi-disciplinary, coordinating approach and role and water management a more technical-specific, sector-based approach (Greiving, 2001, Moss, 2003). Water policy aspects have to be taken into account in all spatial plans. Before explaining how RBMPs may influence the general spatial planning, one has to take into account a few characteristics of the German spatial planning law system. The general (higher) spatial plans (*Raumordnungspläne*) are to a fairly high degree binding on the local spatial plans (*Bauleitplanung*). They may contain concrete designations (*Ziele*)⁵³ for a certain area which have to be adopted by

⁵³ This is a confusing term. *Ziel* (goal) does suggest a general goal which can be reached by several different means. The *Raumordnungsziele*, however, may be much more concrete and are to a great extent comparable with the former *concrete beleidsbeslissing* in Dutch law. However, there is one difference. The lower plans have to be adjusted (actively) to new *Ziele*, whilst there was no such obligation in Dutch planning law with regard to the concrete *beleidsbeslissingen*.

lower plans, especially by the local plans. At the local level, there are two kinds of plans. The *Flächennutzungspläne*⁵⁴ (local land-use plans) provide a framework for differentiation in spatial functions for the whole territory of a municipality. The only plan which is directly binding on citizens is the *Bebauungsplan* (building plan)⁵⁵. *Bebauungspläne* only cover the built-up area of a municipality, not the open areas. For the open areas of a municipality, the statutory law itself provides for the legal regime for buildings. § 35 Baugesetzbuch (BauGB) generally forbids the construction or renovation of buildings and determines certain 'privileged uses' for which exemptions may be provided. This provision explicitly contains a legal link to the RBMPs, which will be elaborated hereafter.

There is no provision that directly binds the higher spatial planning (*Raumordnungsplanung*) and obliges higher spatial plans to be used so as to realise the RBMPs. That is quite logical. It is the task of higher spatial planning to weigh all interests, including the task and interest of realising water plans. However, water quantity and quality are explicitly mentioned amongst other basic principles of higher spatial planning (*Grundsätze der Raumordnung*) in § 2 II No. 3 and No. 8 *Raumordnungsgesetz*. As said before, this can result in the determination of a certain area that primarily serves water interests. If such a *Ziel der Raumordnung* is determined in a higher spatial plan, then this is strictly binding on all public authorities whatever decision they take (§ 4 I *Raumordnungsgesetz*). More specifically, the higher plans may determine a so-called 'preference area' (*Vorranggebiet*, § 7 IV nr. 1 *Raumordnungsgesetz*). This is an area or location which primarily serves a certain purpose or some purposes, in this case water management goals, possibly in combination with other preferred goals. Local spatial plans bind citizens and have to be adjusted so as to meet such determinations (§ 1 IV BauGB). However, it has to be noted that the determination of a *Ziel der Raumordnung* in a higher spatial plan in order to realise an RBMP will be quite exceptional. Usually, an RBMP will not require the determination of a certain location primarily or exclusively for the purposes of water management.

Of much more practical importance is the question whether RBMPs have effects as far as local planning decisions are concerned. As far as the local plans (local land use plans and building plans) are concerned, § 1 VI sub. 6 g BauGB requires the municipalities to take an RBMP explicitly into account. As the task of the spatial planning is to weigh all the interests against each other, making the spatial planning more strictly tied up with the aims or requirements of an RBMP would not fit within the legal system. A stricter tie is only possible if the interests of water management have been weighed against other interests on a higher planning level and have led to the determination of a *Ziel der Raumordnung*.

⁵⁴ § 1 *Baugesetzbuch* (BauGB) uses the term *vorbereitender Bauleitplan*, too.

⁵⁵ § 1 BauGB also uses the term *verbindlicher Bauleitplan*.

Furthermore, the already mentioned § 35 BauGB is of practical importance for the integration of RBMPs in the planning law. Most requirements of RBMPs will not concern the built-up areas of cities and villages, but the open spaces. § 35 BauGB governs all building activities and functional renovations. § 35 differentiates between privileged and non-privileged uses. Privileged uses may be realised if 'public interests' are not opposed. Non-privileged uses may be realised in exceptional cases only and if public interests are not negatively influenced. § 35 III sub. 2 BauGB explicitly mentions that public interests are negatively influenced if projects conflict with water management plans. This provision especially refers to RBMPs (Ernst, Zinkahn, Bielenberg & Krautzberger, §35). Thus, the planning law contains a legal link to the RBMPs. As a consequence, non-privileged uses are forbidden if they conflict with an RBMP. As far as privileged uses are concerned, an RBMP may not be opposed.

7.9 Conclusions

The Competent Authority of the Meuse River Basin District in Germany is the Ministry for Environment, Nature protection, Agriculture and Consumer Protection of North Rhine-Westphalia (MUNLV). The overall definition of the goals is set at this (central) level. The *Obere Wasserbehörde* at the level of the *Bezirkregierung* (districts)⁵⁶ is a key policy actor in the implementation of the WFD; every sub-river basin has a specific administrative agency or 'bureau' (*Geschäftsstellen*) at this level, although it is not tied to the administrative borders of *Bezirke*, but to the sub-river basin itself. At this level the content of RBMPs (*Bewirtschaftungsplan*) is discussed, and goals are proposed for the sub-river basin. The goals and draft measures for specific areas (sub-sub-river basins) are discussed in so-called *Runde Tische* (round tables). Municipalities, *Wasserverbände* and NGOs can attend these round-table meetings. The responsibility for the actual implementation lies with the districts and with the municipalities and *Kreise*, which can contract the *Wasserverbände* to implement measures.

The process of designing and deciding upon programmes of measures depicts an ambiguous picture in NRW. On the one hand, it seems that the Ministry takes the lead, on the other hand, the options for ecological targets and programmes of measures are also intensively discussed at the district offices of the *Bezirksregierung* and in the round-table discussions.

There is a great deal of discussion in NRW on the way in which to deal with some of the concepts and prescriptions of the WFD. It was not always clear what was meant by a good ecological potential and there was a lack of information at the round tables to seriously discuss packages of measures, e.g. concerning the costs of certain measures, who should pay for the measures and in what time period. As was stated earlier, this reveals a more general problem with the goal-setting process in the WFD. To be able to

⁵⁶ In the Netherlands, no such administrative layer exists.

decide on ecological (and chemical) conditions, ecological targets, the probability and feasibility of all sorts of measures and the social and economic costs of these measures, the stakeholders involved must be provided with all the information that is available and must be able to balance very different interests. This requires a high level of rationality by all those involved when, in fact, they suffer from bounded rationality because of a lack of information, scientific uncertainties, and their own interests which they are expected to defend.

Agriculture is a strong interest in NRW. The authorities are looking for feasible measures which mean not having too negative an impact on agriculture, although stringent regulations have already been adopted for agricultural pollution. While in some countries, like Denmark, the focus is explicitly on the impact by diffuse pollution from agriculture, this is also very relevant in NRW, but the approach is different. In NRW there is a strong focus on collaboration with agriculture, through voluntary agreements, consultation and measures that can be 'fitted into' existing agricultural activities. The agricultural representatives are very enthusiastic about the stepping-stones (*Trittsteine*) approach, while the environmental and nature conservation organizations are very reluctant and even sceptical about this option for the WFD. However, there are other nature conservation organizations which are less sceptical and see this approach as a first step to get things going (Interview).

One of the striking results of this case study is the change in designation in NRW; the first and preliminary designation was very different from the second. NRW was first predominantly 'coloured green' (natural water bodies) and is now predominantly 'coloured red' (heavily modified water bodies), so to speak. Needless to say, nature conservation and environmental groups prefer the old situation of the designation of natural water bodies, because natural conditions take the lead and the whole process is then more ambitious. It looks as if NRW started off with a scientific and problem-based analysis. There is much detail in all kinds of scientific studies on characterization and hydro-morphology etc. But the implementation process is now entering the phase of decision making and a more pragmatic approach is chosen where efficiency and legitimacy take over. Moreover, in the designation process, NRW has adjusted to the (border areas of) the Netherlands and Lower Saxony. In many ways NRW and the Netherlands resemble each other.

We must remind ourselves that the Rur area is not the most problematic area in NRW. In some catchment areas, such as the (strongly modified and problematic) Emscher or the Wupper, the implementation of the WFD is much more prominent and strongly backed by participatory measures and pilot or research projects. The leadership and responsibility of large and influential water boards strongly support this process in these catchment areas (Kastens and Becker 2008). The Rur is, though, an area with both non-

problematic areas and natural water bodies and some very problematic issues, such as brown coal mining, which makes it a good case for the NRW as a whole.

References

Borchardt, D. et al. (2005), Water Framework Directive - Summary of River Basin District Analysis 2004 in Germany. Environmental Policy. S. Richter and V. Mohaupt, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Czychowski, M. and M. Reinhardt (2007), Wasserhaushaltsgesetz unter Berücksichtigung der Landeswassergesetze, Verlag C.H. Beck, München

Deutscher Rat für Landespflege 2007, Kompensation von Strukturdefiziten in Fließgewässern durch Strahlwirkung,
http://www.flussgebiete.nrw.de/berichte/DRL_SR81_final.pdf

Ernst, Zinkahn, Bielenberg & Krautzberger (Eds.) (2008), Baugesetzbuch, Kommentar, München, 89th ed.

Filser (2005), Die Umsetzung der Wasserrahmenrichtlinien durch das novellierte Landeswassergesetz, NWVBl. p. 422 e.v. (p. 423).

Greiving, S. (2001), Afstemming en integratie tussen ruimtelijke ordening en water huishoudelijke planning in Duitsland, In: De Roo, G. en M. Schwartz, Omgevingsplanning, een innovatief proces, Den Haag: SDU Uitgevers, p. 217-230

Kastens, Britta and Gert Becker (2008), Consequences of European governance structures and institutions for the regional scale – the example of adaptive water management in the Lower Rhine region– Abstract of Report (Status 02-06-2008)

Kastens, B. and J. Newig (2007), The Water Framework Directive and Agricultural Nitrate Pollution: Will Great Expectations in Brussels be Dashed in Lower Saxony? European Environment 17: 231-246

Leussen, W. v., E. v. Slobbe, et al. (2007), Transboundary Governance and the Problem of Scale for the Implementation of the European Water Framework Directive at the Dutch-German Border. International Conference on Adaptive and Integrated Water Management. Basel, Switzerland

Meiners, H.G. (2002), Monitoring Garzweiler II based on the Water Frame Directive – Quantitative Condition of the Groundwater in the Partial Catchment Area of the Niers.

In: First International Scientific Symposium on the River Meuse, PROCEEDINGS
November 27-28, 2002 Maastricht, Netherlands

Moss T. (2004), The governance of land use in river basins: prospects for overcoming problems of institutional interplay with the EU Water Framework Directive, Land Use Policy 21, 85-94

Mostert, E. (1998a), River Basin Management in the European Union. European Water Management 1(3): 26-35

MUNLV 2008, Ökologische Gewässerprojekte der Kommunen (Broschüre, www.flussgebiete.nrw.de)

Sewilam, H, S. Bartussek and H. Nacken (2007), Rule-based Decision Support System for the Morphological Rehabilitation of Water Courses, Water Resources Management 21: 2037-2047

Schlichter, O., R. Stich, H.J. Driehaus, S. Paetow (Eds.) (2002, updated 9/2007), Berliner Kommentar zum Baugesetzbuch, Berlin 3rd ed.

Stemplewski J., D. Krull, P. Wermter, I. I. Nafo, N. Palm & C. Lange (2008), Integrative socio-economic planning of measures in the context of the water framework directive, Water and Environment journal 2008/ CIWEM

Uhlenberg, Eckhard (2008), Impulse für lebendige Gewässer in Nordrhein- Westfalen (speech Minister MUNLV) 22-12-2008 Staatskanzlei; www.flussgebiete.nrw.de/Aktuelles/Pressemitteilungen/index.jsp

Winnegge, R. and T. Maurer (2002), Water Resources Management: Country Profile Germany. Global Water Information Network (GLOBWINET). F. I. o. H. Global Runoff Data Centre

Zilkens (2007), F. Zilkens, Ein frischer Blick auf die Wasserrahmenrichtlinie, Agrar- und Umweltrecht 2007, p. 33 e.v.

Interviewees

Klaus Gütling, Referent Abteilung IV, Abfallwirtschaft, Bodenschutz und Wasserwirtschaft, Ministerium für Umwelt und Naturschutz, Landwirtschaft und Verbraucherschutz des Landes Nordrhein-Westfalen (Oberste Wasserbehörde), 25 August 2008, Düsseldorf

Thomas Menzel, Referent Abteilung IV, Abfallwirtschaft, Bodenschutz und Wasserwirtschaft, Ministerium für Umwelt und Naturschutz, Landwirtschaft und Verbraucherschutz des Landes Nordrhein-Westfalen (Oberste Wasserbehörde), 25 August 2008, Düsseldorf

Rudolf Wergen, Coordination of WFD implementation, Geschäftsstelle Rur und südliche sonstige Maaszuflüsse, Bezirksregierung Nordrhein-Westfalen, Außenstelle Aachen, (Obere Wasserbehörde), 14 August 2008, Aachen

Frank Jörrens, WFD & water quality monitoring, Wasserverband Eifel-Rur, 14 August 2008, Düren

Arno Hoppmann, River basin management leader, WFD implementation process supervision, Wasserverband Eifel-Rur, 14 August 2008, Düren

Christoph Aschemeier, Wassernetz NRW, 4 November 2008, Düsseldorf

Bruno Schöler, Landwirtschaftskammer Nordrhein-Westfalen, Ressourcenschutz, Wasser und Boden, 14 November 2008, Bonn