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Member State : Netherlands

Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

on the Implementation of the Water Framework Directive (2000/60/EC)

River Basin Management Plans

{COM(2012) 670 final}

1. GENERAL INFORMATION

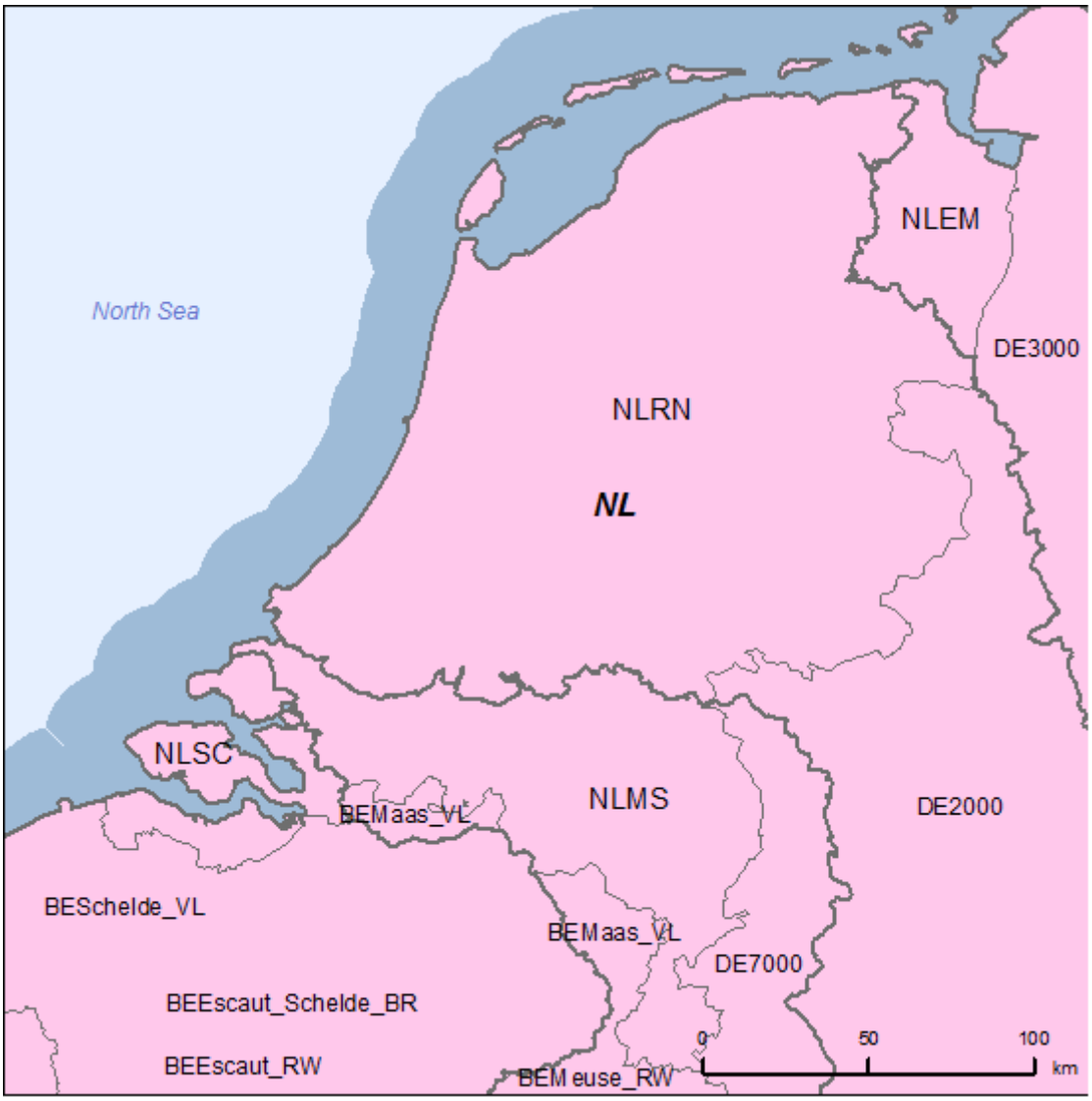

Figure 1.1: *Map of River Basin District*

International River Basin Districts (within EU)
International River Basin Districts (outside EU)
National River Basin Districts (within EU)
Countries (outside EU)
Coastal Waters

Source*: WISE*

The Netherlands cover a total area of 41.526 km² and has 16, 4 million inhabitants.

It has four river basin districts. These are all parts of international river basin districts. The sharing countries are EU member states, as well as Switzerland, and Liechtenstein. The table below gives the specifications of the river basin districts.

RBD	Name	Size (km²)	Percentage of NL territory	Percentage of international RBD	Countries sharing RBD
NLRN	Rhine	28917	69	17.1	AT, BE, CH, DE, FR, IT, LI, LU
NLSC	Scheldt	3263	8	5.5	BE, FR
NLMS	Meuse	7474	18	21.8	BE, DE, FR, LU
NLEM	Ems	2478	6	13	DE

Table 1.1: *Overview of the Netherlands' River Basin Districts*
Source*: River Basin Management Plans reported to WISE[1]: http://cdr.eionet.europa.eu/nl/eu/wfdart13*

Name international river basin	National RBD	Countries sharing RBD	Co-ordination category	
			1	
			km²	%
Rhine	Rhine	AT, BE, CH, DE, FR, IT, LI, LU	33800	17.0
Scheldt	Scheldt	BE, FR	2008	5.5
Meuse-Maas	Meuse	BE, DE, FR, LU	7500	21.8
Ems	Ems	DE	2312	13.0

Table 1.2: *Transboundary river basins by category (see CSWD section 8.1) and % share in the Netherlands[2]*
Category 1: Co-operation agreement, co-operation body, RBMP in place.
Category 2: Co-operation agreement, co-operation body in place.
Category 3: Co-operation agreement in place.
Category 4: No co-operation formalised.
Source*: EC Comparative study of pressures and measures in the major river basin management plans in the EU.*

[1] This MS Annex reflects the information reported by the MS to WISE which may have been updated since the adoption of the RBMPs. For this reason there may be some discrepancies between the information reported in the RBMPs and WISE.

[2] Categorisation determined under the EC Comparative study of pressures and measures in the major river basin management plans in the EU (Task 1b: International co-ordination mechanisms).

2. STATUS OF RIVER BASIN MANAGEMENT PLAN REPORTING AND COMPLIANCE

In the Netherlands, the WFD River Basin Management Plans (RBMPs) were adopted by the government on the 27 November 2009 and can be found at http://www.helpdeskwater.nl/onderwerpen/wetgeving-beleid/kaderrichtlijn-water/sgbp/@28241/item_28241/

It consists of RBMPs for 4 national parts of 4 international River Basin Districts (RBDs), i.e. the districts of Rhine, Meuse, Ems and Scheldt.

Here below, is a summary of the main strengths and weaknesses of the Dutch RBMPs:

2.1 Main Strengths:

- Water management is clearly tackled in depth in the Netherlands. There was already a significant effort undertaken for implementation of WFD principles prior to the adoption of the RBMPs in 2009. The rationale of the WFD objectives is well underpinned in most of water management issues in the Netherlands.
- All Dutch RBMPs are similar, with a clear structure and are very illustrative (graphs, flow charts, etc. to support the information in the plans). This facilitates the reading and comprehension, as well as the finding of specific information. The plans are very well fitted for public consultation in this way, as they are accessible and easy for the general public to understand.
- Public participation has been carried out very extensively, and stakeholder involvement seems to be of great importance through the entire RBM development process.
- The surveillance monitoring networks cover all biological, physico-chemical and hydromorphological quality elements relevant for the specific types, as well as all the priority substances. Therefore, it is assumed that all relevant pressures are being detected.
- The assessment methods for ecological status are, in general, well developed and consolidated. They are considered to detect all relevant pressures.
- The Netherlands applies a solid approach for the definition of good ecological potential, generally based on the mitigation measures approach for heavily modified water bodies, and on the reference based approach for artificial water bodies.
- The Programmes of Measures are well structured and easily understandable. There is a clear link between the significant pressures and the measures defined. Some of the measures have been coordinated with other Member States as part of the International RBMPs.

2.2 Main weaknesses:

- Although Dutch RBMPs are clear and easy to understand, the background documents are not always easy to find, the number of background documents is very high and the

information may well be spread across a number of different plans (national and regional plans).

- There are a large number of plans and strategies at different levels (national, regional, local), which results in a complex matrix of plans and competences across the different authorities and the coordination of all these plans is not always clear.
- Although the detailed background documents (studies, guidelines) and different plans are one of the main strengths of the implementation of the WFD in the Netherlands (nearly all issues are discussed and documented), the different institutional levels of implementation may cause regional differentiation. This is the case in particular in relation to HMWB/AWB designation, water body delineation and characterization, etc. For some of these processes, only very general information is given in the RBMP, which has then been developed in the different plans of the Provinces, the Waterschappen and Rijkswateren.
- The RBMPs do not seem to contain all the relevant information, in particular as the programmes of measures are concerned, as this would be included in the sub-basin plans. Measures included in the Programmes of Measures of the RBMP are not presented in sufficient detail to understand if the necessary financial commitment is provided for. Furthermore, there is not much information included on measures in relation to climate change adaptation, although this is a very relevant topic in the Netherlands.

3. GOVERNANCE

3.1 Timeline of implementation

For the four river basins of the Netherlands, the following documents were delivered to the CDR database in March 2010: the RBMP, maps, annexes, the international RBMP and a Dutch summary of the four RBMPs (for Meuse 16 March, for Rhine, Ems and Scheldt 19 March). On 1 June 2010 all of these documents were resubmitted for every river basin, and now also include an English version of the summary of the four RBMPs[3].

In the WISE summary reports of the four RBMPs the publication dates of following documents are given:

- Timetable, work programme and the statement on consultation measures: 7 July 2006.
- Draft RBMPs: 22 December 2008.
- RBMPs: 22 December 2009.

3.2 Administrative arrangements – river basin districts and competent authorities

The arrangement of the national authorities responsible for WFD implementation is provided in the graph below[4]:

[3] Source: Central Data Repository (EEA)

[4] EC Comparative study of pressures and measures in the major river basin management plans in the EU (Task 1: Governance and legal aspects).

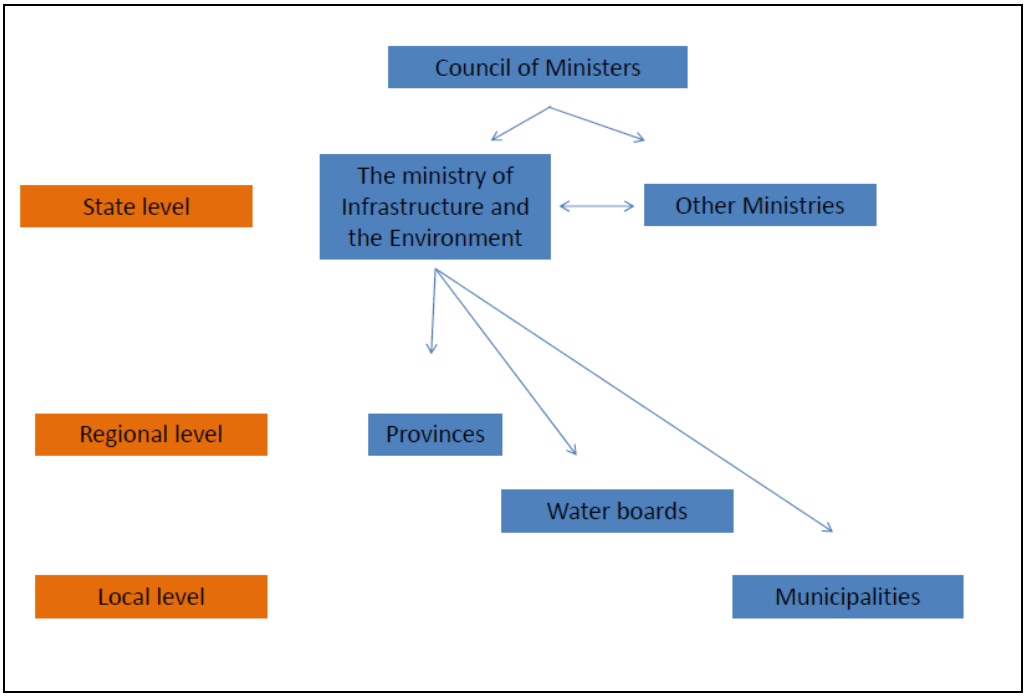

Figure 3.1: *Organogram of the national authorities responsible for the implementation of the WFD.*
Source*: 'Pressures and Measures study'*[5]

At the state level the 'Ministry of Infrastructure and the Environment' is the responsible authority for implementing the WFD. Other responsible authorities for WFD implementation include: Provinces (regional level), Water boards ('Waterschappen' sub-basin level) and Municipalities (local level). Only the state and the Water boards are indicated to have direct water management authorities. Provinces and municipalities have other authorities that are linked to water management and hence contribute in WFD implementation. The competences of different authorities are explained in the introduction of the RBMPs. These competences, together with the coordination between the different authorities, are laid down in the 'National Water Act'.

Following the publication of the RBMPs, the Ministry of Infrastructure and the Environment was created on 14 October 2010, taking over all competences from two former Ministries, including the Ministry of Transport, Public Works and Water Management. Since the RBMPs were published before this date, the plans name the former Ministry of Transport, Public Works and Water Management as the main competent authority for WFD implementation.

3.3 RBMP – Structure, completeness, legal status

The RBMPs include a description of several water management plans at different levels: national, provincial, regional. The regional plans (waterschapsplannen) cover the sub-basins while the other plans (based on administrative boundaries) may overlap between the river

[5] EC DG ENV study 'Comparative Study of Pressures and Measures in the major river basin management plans in the EU'

basins. The issue of water management is clearly tackled in depth in the Netherlands. However, there existence of a number of plans and strategies at different levels results in a complex matrix of plans and competences across the different authorities.

The RBMPs are very clearly structured and the different topics of the WFD implementation can be easily found in the setup of the plans.

A national approach has been followed in the implementation of the WFD. All RBMPs have the same structure. The 'Ministry of Infrastructure and the Environment' is the ultimate body responsible for the drafting of the RBMPs, and has a role of overall coordination.

The RBMPs are adopted by the National Parliament. As regards the legal status, the RBMPs are planning documents and form part of the National Water Plan. In the hierarchy of legal acts, on the one hand, it falls under laws and regulations (decrees). It cannot contradict laws and regulations, and has no binding legal nature as such. However, as a national planning document, it is self-binding to the national government, and where needed, local governments are expected to implement it and transpose its provisions in their local planning documents. In cases where the plan seeks to have a legally binding impact, it indicates which legal instruments should be used. However, there is no requirement to review existing individual decisions and planning documents in line with the RBMP. The RBMPs have a legal effect on individual decisions through general policy. The relationship between the RBMP and individual decisions is not set in specific legal provisions. It rather stems from the general system of permitting and the links between different decisions and plans. The environmental objectives are incorporated in the Decree on the quality requirements and monitoring of water, which stipulates that, in adopting the water management plan and the provincial water or spatial plan, the water management authorities and the provinces, respectively, take the environmental quality requirements of the WFD into account. With regards to the environmental quality standards that need to be considered for the permit, the legislation refers to the National Waterplan (of which the RBMPs are a part).

3.4 Consultation of the public, engagement of interested parties

The National Water Consultation (nationaal wateroverleg), falling under the State Secretary of the Ministry of Infrastructure and Environment, plays an important role in implementing the WFD. Representatives of the other competent authorities (provinces, water boards, communities, other relevant ministries, etc.) take part in the consultation process. A national framework was set up for the consultation of the drafting of the four RBMPs and also for the establishment of the monitoring programmes.

Consultation with the public was done through various ways (through media, via the internet, printed material, sending information to all relevant stakeholder groups…). A description is included in annex to the RBMPs concerning the main changes that the consultation process has brought about (adjustments and clarifications).

3.5 International cooperation and coordination

In the RBMPs a short description is given of the International RBDs and on the cooperation with the neighbouring countries for drafting the International RBMPs. All four of the Dutch river basins are part of an International River Basin District.

As stated above, all Dutch RBDs are International RBDs. International coordination committees responsible for drafting the international RBMPs has been established for Rhine

and Ems river basins, for Scheldt and Meuse the already existing International River Commission acted as coordinating bodies. Each of the IRBDs and an International RBMP has been adopted for each of these IRBDs. Information on how these International RBMPs have been translated into the national RBMPs may be found in all Dutch RBMPs. Furthermore, for some issues (e.g. in relation to standards and monitoring of priority substances and specific pollutants) there seems to have been an overall approach followed by each member state part of the International RBDs. Further on, coordination in relation to monitoring has been carried out at different levels within the International RBDs.

4. CHARACTERISATION OF RIVER BASIN DISTRICTS

4.1 Water categories in the RBD

Rivers, lakes, transitional and coastal waters are present in all RBDs in the Netherlands. Nearly all Dutch river water bodies have been delineated as heavily modified water bodies.

4.2 Typology of surface waters

The methodology for development of a typology for the Dutch surface waters is given in *'Definitiestudie KaderRichtlijn Water (KRW). Typologie Nederlandse Oppervlaktewateren. Alterra-rapport*'[6] and the '*Referenties en maatlatten voor natuurlijke watertypen voor de kaderrichtlijn water* '[7]

Based on a set of descriptors, for each of the categories (rivers, lakes, transitional and coastal waters), a type can be assigned for a certain water body.

There is no information in the RBMP on the validation of the typology with biological data. However, the background documents contain information on this validation in two ways, first by comparison with existing, validated typologies, and second in the background documents mentioned before. As a result some types were grouped when the metrics were defined.

Type specific reference conditions have been established for each of the surface water types. In the background documents detailing the classification tools developed for each of the biological quality elements, it can be seen that type-specific reference conditions have been established. Methods for classification are fully developed for all Biological Quality Elements (BQEs) and a list of the BQEs that are not developed for certain categories or types are provided together with an explanation of the reasons for such shortcomings.

The number of surface water types that have been defined in the different water categories is summarised in the table below:

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6 Elbersen, J.W.H., P.F.M. Verdonschot, B. Roels & J.G. Hartholt (2003) ISSN 1566-7197

7 (Stowa, 2007)

RBD	Rivers	Lakes	Transitional	Coastal
NLEM	8	16	2	4
NLMS	114	57	2	4
NLRN	6	17	1	4
NLSC	2	56	2	8

Table 4. 1: *Surface water body types at RBD level*
Source*: WISE*

The number of types of natural surface water bodies is limited by the types described in '*Referenties en maatlatten voor natuurlijke watertypen voor de kaderrichtlijn water*'. Not all river basin districts have used all types, so numbers may be lower. For heavily modified water bodies (HMWBs) in most cases the most comparable type has been used, although good ecological potential values for one or more quality elements may be reduced. The high numbers in the table probably represent HMWBs bodies, although these are not considered as a separate type in the Netherlands. For artificial water bodies (AWBs), some additional types have been defined (about 5 depending on RBD).

4.3 Delineation of surface water bodies

The Netherlands does not have a specific methodology for small water body delineation and therefore the water bodies for which the drainage basin is less than 10 km^2 long for rivers or 50 ha for lakes have not been included.

However, the Netherlands have recently confirmed that the water bodies included in the RBMPs represent all surface and groundwater bodies in the Netherlands. Artificial polders have sometimes not been delineated explicitly as neighbouring polders have the same characteristics. Enlarging the polders that are delineated as AWBs will have no effect on objectives, monitoring sites and measures. The same is true when river water bodies (now represented in kilometre length) are enlarged with tiny streams in the upper catchment.

The table below presents an overview of the number and average size of the water bodies in the whole of the Netherlands and per river basin.

RBD	Surface Water								Groundwater	
	Rivers		Lakes		Transitional		Coastal			
	Number	*Average Length (km)*	*Number*	*Average Area (sq km)*	*Number*	*Average Area (sq km)*	*Number*	*Average Area (sq km)*	*Number*	*Average Area (sq km)*
NLEM	5	55	14	2	1	176	2	342	2	1157
NLMS	103	21	49	2	1	46	2	248	5	2024
NLRN	145	16	338	8	2	67	6	1447	11	2138
NLSC	1	16	49	5	1	328	5	405	5	796
Total	*254*	*19*	*450*	*7*	*5*	*137*	*15*	*793*	*23*	*1736*

Table 4.2: *Surface water bodies, groundwater bodies and their dimensions*
Source*: WISE*

4.4 Identification of significant pressures and impacts

The RBMPs provide information on the different pressure types and the categories for reporting (WFD reporting sheets) were used. There are no numerical values provided in the WISE reporting per category, but only an overall percentage of water bodies subject to point sources pollution for all categories of water except for coastal water bodies.

The Article 5 reporting submitted at an earlier stage has been confirmed by the values in the RBMPs. The following main management issues, considered as pressures and impacts in the relevant chapter of the RBMP, have been highlighted:

1. the unnatural condition of most waters (most of these are part of a delta and partly to be restored);
2. the deteriorated ecological condition caused by pollution load (from traffic, infrastructure and agriculture)
3. the bad chemical condition because of the load of priority substances;
4. load from upstream areas (from third countries).

For all RBDs, **diffuse sources** have the largest impact on water bodies, including pollution from agriculture, atmospheric deposition, traffic and infrastructure, and run-off.

For **point sources**, effluents from urban waste water plants and sewage outlets are considered to have a significant impact on the surface water bodies.

For nearly all threshold **exceeding substances**, the load from third countries is deemed an important source.

For **groundwater**, the main pressures are due to nutrients, pesticides and heavy metals (related to the land use). Nitrates seem to be less an issue for the Rhine RBD, in contrast to the Meuse RBD where nitrates is a major issue. For phosphate, the Netherlands has confirmed that problems in the coastal regions are due to background values. For point source pollution to groundwater, this is mostly related to soil pollution in the proximity of abstractions.

The methodology of determining significant point and diffuse source pollution is based on data on emissions, and the significance level is determined based on the fact that a certain substance would be attributing more than 10% standard exceedance for a certain water body. The relative importance of a certain point source or diffuse source overall is based on the number of surface water bodies assessed as being significantly impacted.

The main **hydromorphological pressures** for all RBDs are similar and include: canalisation, loss of riparian zones and flooding areas, sluices/weirs, dredging, barriers for fish passages, lack of water retention, etc.

The decision on what the significant pressures are in terms of '**water abstractions**', '**water flow regulation**' and '**morphological alterations**' and 'other human activities' on water bodies are taken by the water managers. The methodology is based on considering that a pressure is significant if this pressure, alone or in combination with other pressures, will lead to failing to achieve good chemical status or a good ecological status or potential by 2015. The relative importance is based on the number of surface water bodies for which the pressure is determined as being significant.

For the Rhine Delta, the Ems and the Scheldt RBDs, the effluents of urban waste water treatment have an important impact (exceeding threshold of toxic substances), specifically for

the larger rivers (e.g. large treatment plants mainly discharging in the Rhine itself) but also for the regional waters (as is the case for the Scheldt RBD). For the Meuse RBD, the sewage outlets cause a problem, because of their peak and sudden frequency. This may cause important negative consequences for the functioning of the ecosystem. In addition to this, the pesticides and other organic micro-pollutants have a significant impact in the receiving waters.

RBD	No pressures		Point source		Diffuse source		Water abstraction		Water flow regulations and morphological alterations		River management		Transitional and coastal water management		Other morphological alterations		Other pressures	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
NLEM	0	0	9	40.91	22	100	0	0	4	18.18	14	63.64	1	4.55	14	63.64	5	22.73
NLMS	2	1.29	59	38.06	142	91.61	25	16.13	91	58.71	109	70.32	4	2.58	115	74.19	136	87.74
NLRN	6	1.22	137	27.9	441	89.82	92	18.74	272	55.4	364	74.13	13	2.64	322	65.58	424	86.35
NLSC	0	0	15	26.79	50	89.29	3	5.36	51	91.07	42	75	5	8.93	50	89.29	18	32.14
Total	*8*	*1.1*	*220*	*30.39*	*655*	*90.47*	*120*	*16.57*	*418*	*57.73*	*529*	*73.07*	*23*	*3.18*	*501*	*69.2*	*583*	*80.52*

Table 4.3: *Number and percentage of surface water bodies affected by significant pressures*
Source*: WISE*

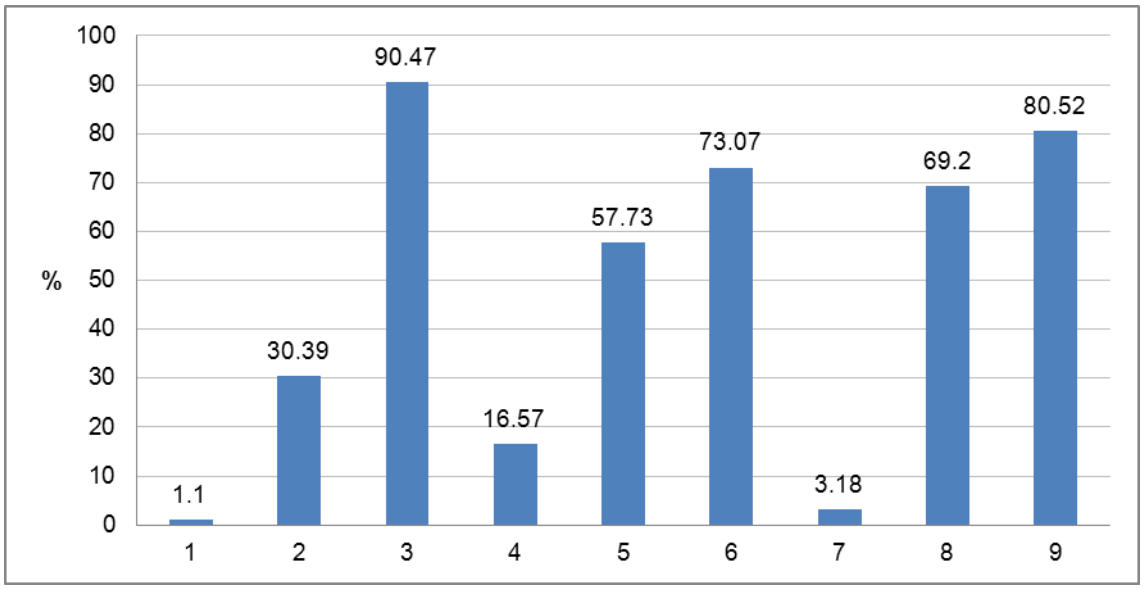

Figure 4. 1: *Graph of percentage of surface water bodies affected by significant pressures*
1 = No pressures
2 = Point source
3 = Diffuse source
4 = Water abstraction
5 = Water flow regulations and morphological alterations
6 = River management
7 = Transitional and coastal water management
8 = Other morphological alterations
9 = Other pressures
Source*: WISE*

4.5 Protected areas

A table presenting the number of protected areas of all types in each RBD and for the whole country, for surface and groundwater is given below:

RBD	Number of PAs										
	Article 7 Abstraction for drinking water	Bathing	Birds	European Other	Fish	Habitats	Local	National	Nitrates	Shellfish	UWWT
NLEM	2	48	3			6				1	
NLMS	9	136	17			43				1	
NLRN	18	392	59			95				3	
NLSC	2	68	11			15				4	
Total	*31*	*644*	*90*			*159*				*9*	

Table 4.4: *Number of protected areas of all types in each RBD and for the whole country, for surface and groundwater*[8]
Source*: WISE*

[8] This information corresponds to the reporting of protected areas under the WFD. More/other information may have been reported under the obligations of other Directives.

5. MONITORING

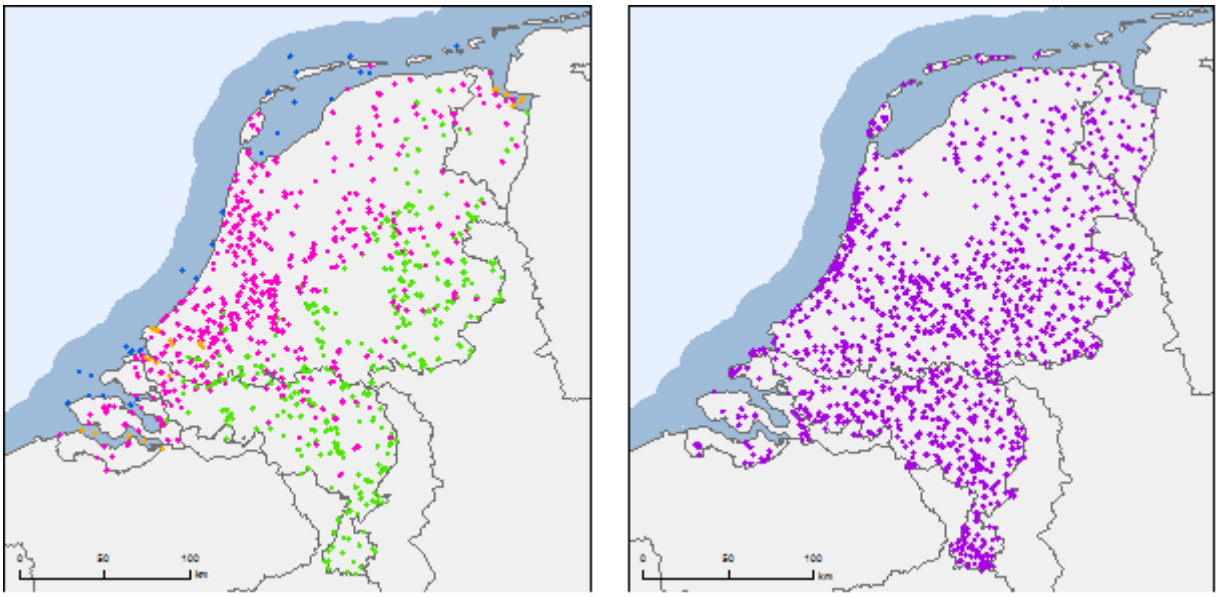

Figure 5.1: *Maps of surface water (left) and groundwater (right) monitoring stations*

- *River monitoring stations*
- *Lake monitoring stations*
- *Transitional water monitoring stations*
- *Coastal water monitoring stations*
- *Unclassified surface water monitoring stations*
- *Groundwater monitoring stations*
- *River Basin Districts*
- *Countries outside EU*

Source*: WISE, Eurostat (country borders)*

Background documents relevant for Monitoring are the following: Guidelines on WFD monitoring of Surface Water and Assessment Protocol (*Richtlijn KRW Monitoring Oppervlaktewater en Protocol Toetsen & Beoordelen*) as laid down by the *Directeuren Wateroverleg* (DW) on 10 February 2011 and Instruction guidelines on monitoring surface water – European Water Framework Directive and Testing and Assessment **Protocol (*Instructie Richtlijn monitoring oppervlaktwater Europese Kaderrichtlijn*[9]).**

[9] All relevant documents have been made legally binding by referring them in the juridical decision number BJZ2010006069.

RBD	Transitional											Coastal										
	QE1.1 Phytoplankton	QE1.2 Other aquatic flora	QE1.2.1 Microalgae	QE1.2.2 Angiosperms	QE1.3 Benthic invertebrates	QE1.4 Fish	QE1.5 Other species	QE2 Hydromorphological QEs	QE3.1 General Parameters	QE3.3 Non priority specific pollutants	QE3.4 Other national pollutants	QE1.1 Phytoplankton	QE1.2 Other aquatic flora	QE1.2.1 Microalgae	QE1.2.2 Angiosperms	QE1.3 Benthic invertebrates	QE1.4 Fish	QE1.5 Other species	QE2 Hydromorphological QEs	QE3.1 General Parameters	QE3.3 Non priority specific pollutants	QE3.4 Other national pollutants
NLEM																						
NLMS																						
NLRN																						
NLSC																						

Table 5.1: *Quality elements monitored*

	QE Monitored
	QE Not monitored
-	*Not Relevant*

Source*: WISE*

RBD	Rivers		Lakes		Transitional		Coastal		Groundwater		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
NLEM	2	5	5	14	4	4	2	1	60	3	33
NLMS	48	140	11	51	3	5	4	2	410	172	208
NLRN	31	193	67	359	3	7	13	10	658	36	774
NLSC	0	1	12	30	4	4	7	5	36	2	30
Total by type of site	*81*	*339*	*95*	*454*	*14*	*20*	*26*	*18*	*1.164*	*213*	*1.045*
Total number of monitoring sites[10]	*342*		*462*		*23*		*27*		*2185*		

Table 5.2: *Number of monitoring sites by water category.*
Surv = Surveillance, Op = Operational, Quant = Quantitative
Source*: WISE*

5.1 Monitoring of surface waters

For **surveillance monitoring**, all biological, physico-chemical and hydromorphological quality elements relevant for the type are monitored. Within the priority substances group, for surveillance monitoring all priority substances are measured, for other specific substances, a specific model is applied for the selection of substances that are relevant to monitor. This model is based on a 'black list' of substances to monitor, including the basin specific pollutants. Those substances that are not relevant and that are below the thresholds for at least three years, are withdrawn from the list.

The procedure to be followed for the **selection of the biological quality elements** (BQEs) for operational monitoring in a water body is described in the guidelines. The general rule is that the most sensitive quality elements are selected for the relevant pressure. It is recommended to select those quality elements that react fastest to the measures. Furthermore the sensitivity of the quality element needs to be detectable in the assessment. After some time, another quality element with a longer response time may be selected, which will provide a better certainty on the overall ecological quality of the water body. Finally, it is recommended (when there is equal suitability) to select the most cost-efficient method. In practice when screening the RBMPs, no direct link of the operational monitoring to the pressures seems to exist, but because of the very dense monitoring, it is assumed that all relevant pressures are detected.

The RBMPs explain that the selection of **priority substances** and **specific pollutants** is based on what substances are most probably the cause of poor chemical status, what substances are present (load), and for what substances measures may be applied.

The **grouping of water bodies** for the monitoring purposes is described in the Instruction Guidelines on Monitoring Surface water – European Water Framework Directive and Testing

[10] The total number of monitoring sites may differ from the sum of monitoring sites by type because some sites are used for more than one purpose.

and Assessment Protocol ('*Instructie Richtlijn monitoring oppervlaktewater Europese Kaderrichtlijn Water en Protocol Toetsen en Beoordelen*') of **January 2010** and a different approach is applied for surveillance and operational monitoring.

Coordination in terms of the development of overall monitoring programmes in the different RBDs has been carried out. In sections 4.1 and 4.5 of the RBMPs, the coordination arrangement for the monitoring of specific substances is explained. The monitoring coordination is done with Germany, Switzerland and France for the Rhine, and with Belgium and France for the Meuse and the Scheldt. These are the so-called catchment-relevant, and in the next RBMPs this will also involve joint monitoring programmes.

However, there is no clear information in the RBMPs on whether a specific **trans-boundary monitoring network** has been set up, in addition to the national monitoring programmes (which are also described in the International RBMPs).

5.2 Monitoring of groundwater

A **quantitative** groundwater monitoring programme has been established for all RBDs.

On the selection of sites and the frequency of groundwater quality monitoring, it is decided that based on a **risk assessment** that follows from surveillance monitoring, sites at risk are included for operational monitoring for the substance for which the threshold has been exceeded.

A **trend assessment** has been done for groundwater used for abstraction of drinking water.

The RBMPs indicate that in the Dutch situation, groundwater pollution is addressed via the emergency system laid down in the Soil Protection Act (Wet Bodembescherming, 2005). Based on this Soil Protection Act, a risk-based approach is applied. In case there is a decision in favour of rehabilitation, the decision also has implications for the monitoring and is designed to follow the trend in pollutants, and focuses on the purpose of rehabilitation. This refers in particular to substances which are present in quantities exceeding the intervention value.

All RBDs are part of an international river basin and approaches on the coordination of monitoring programmes for groundwater are different for each of the RBD. For the Ems RBD, no trans-boundary 'tuning' is necessary as there is only very local groundwater movement on the Dutch-German border. In the International Meuse Commission an inventory and comparison of monitoring networks and standards has been done. This will also be the case in the future for the trans-boundary water body *'diepe zandlagen'*, for which there are significant abstractions from the Flanders site (discussions are going on during this first planning period).

5.3 Monitoring of protected areas

A monitoring network is in place for drinking water protected areas in and around the protected area for the groundwater. This monitoring is done by the water companies.

For all other types of protected areas, the surveillance and operational monitoring networks are considered to cover the requirements for the purpose of assessing the status of protected water bodies, and therefore no additional monitoring has been implemented.

RBD	Surface waters									Ground-water drinking water
	Surface drinking water abstraction	Quality of drinking water	Bathing water	Birds sites	Fish	Habitats sites	Nitrates	Shellfish	UWWT	
NLEM	0	0	0	10	0	8	0	0	0	8
NLMS	5	0	0	24	0	39	0	4	0	63
NLRN	7	0	0	70	0	57	0	6	0	147
NLSC	0	0	0	23	0	15	0	13	0	5
Total	*12*	*0*	*0*	*127*	*0*	*119*	*0*	*23*	*0*	*223*

Table 5.3: *Number of monitoring stations in protected areas*[11].
Source*: WISE*

6. OVERVIEW OF STATUS (ECOLOGICAL, CHEMICAL, GROUNDWATER)

The following tables provide an overview of the status of groundwater and surface water bodies in the Dutch RBDs when the RMBPs were adopted (2009), and the status that is expected in 2015.

RBD	Total	High		Good		Moderate		Poor		Bad		Unknown	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
NLEM	2	0	0	0	0	1	50.0	0	0	0	0	1	50.0
NLMW	8	0	0	0	0	7	87.5	0	0	0	0	1	12.5
NLRN	6	0	0	0	0	3	50.0	1	16.7	0	0	2	33.3
NLSC	2	0	0	0	0	1	50.0	0	0	0	0	1	50.0
Total	*18*	*0*	*0*	*0*	*0*	*12*	*66.7*	*1*	*5.6*	*0*	*0*	*5*	*27.8*

Table 6.1*: Ecological status of natural surface water bodies.*
Source*: WISE*

[11] Number of sites calculated from data reported at site level. If no data reported at site level, then table supplemented with data reported at programme level.

RBD	Total	High		Good		Moderate		Poor		Bad		Unknown	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
NLEM	20	0	0	0	0	11	55.0	8	40.0	1	5.0	0	0
NLMW	147	0	0	0	0	41	27.9	68	46.3	35	23.8	3	2.0
NLRN	485	0	0	3	0.6	174	35.9	205	42.3	103	21.2	0	0
NLSC	54	0	0	0	0	11	20.4	33	61.1	10	18.5	0	0
Total	*706*	*0*	*0*	*3*	*0.4*	*237*	*33.6*	*314*	*44.5*	*149*	*21.1*	*3*	*0.4*

Table 6.2: *Ecological potential of artificial and heavily modified water bodies.*
Source*: WISE*

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
NLEM	2	1	50.0	1	50.0	0	0
NLMS	8	3	37.5	4	50.0	1	12.5
NLRN	6	1	16.7	5	83.3	0	0
NLSC	2	0	0	2	100	0	0
Total	*18*	*5*	*27.8*	*12*	*66.7*	*1*	*5.6*

Table 6.3: *Chemical status of natural surface water bodies.*
Source*: WISE*

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
NLEM	20	13	65.0	7	35.0	0	0
NLMS	147	39	26.5	75	51.0	33	22.4
NLRN	485	403	83.1	80	16.5	2	0.4
NLSC	54	46	85.2	5	9.3	3	506
Total	*706*	*501*	*71.0*	*165*	*23.4*	*38*	*5.4*

Table 6.4: *Chemical status of artificial and heavily modified water bodies*
Source*: WISE*

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
NLEM	2	1	50	1	50	0	0
NLMS	5	2	40	3	60	0	0
NLRN	11	8	72.7	3	27.3	0	0
NLSC	5	3	60	2	40	0	0
Total	*23*	*14*	*60.9*	*9*	*39.1*	*0*	*0*

Table 6.5: *Chemical status of groundwater bodies.*
Source*: WISE*

RBD	Total	Good		Poor		Unknown	
		No.	%	No.	%	No.	%
NLEM	2	2	100	0	0	0	0
NLMS	5	5	100	0	0	0	0
NLRN	11	11	100	0	0	0	0
NLSC	5	5	100	0	0	0	0
Total	*23*	*23*	*100*	*0*	*0*	*0*	*0*

Table 6.6: *Quantitative status of groundwater bodies.*
Source*: WISE*

RBD	Total	Global status (ecological and chemical)					Good ecological status 2021		Good chemical status 2021		Good ecological status 2027		Good chemical status 2027		Global exemptions 2009 (% of all SWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 - 2015									Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	No.	%	No.	%	%	%	%	%
NLEM	22	0	0.0	1	4.5	4.5									91	0	0	0
NLMS	155	0	0.0	5	3.2	3.2									96	0	0	0
NLRN	491	3	0.6	60	12.2	11.6									87	0	0	0
NLSC	56	0	0.0	3	5.4	5.4									95	0	0	0
Total	*724*	*3*	*0.4*	*69*	*9.5*	*9.1*									*90*	*0*	*0*	*0*

Table 6.7: *Surface water bodies: overview of status in 2009 and expected status in 2015, 2021 and 2027*[12]
Waterbodies with good status in 2009 fall into the following category:
1. Ecological status is high or good and the chemical status is good, exemptions are not considered
Waterbodies expected to achieve good status in 2015 fall into the following categories:
1. Ecological status is high or good and the chemical status is good, exemptions are not considered
2. Chemical status is good, and the ecological status is moderate or below but no ecological exemptions
3. Ecological status is high or good, and the chemical status is failing to achieve good but there are no chemical exemptions
4. Ecological status is moderate or below, and chemical status is failing to achieve good but there are no ecological nor chemical exemptions
Note*: Waterbodies with unknown/unclassified/Not applicable in either ecological or chemical status are not considered*
Source*: WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)*

[12] Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

RBD	Total	Ecological status					Good ecological status 2021		Good ecological status 2027		Ecological exemptions (% of all SWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
NLEM	2	0	0	1	50.0	50.0					0	0	0	0
NLMS	8	0	0	3	37.5	37.5					50.0	0	0	0
NLRN	6	0	0	1	16.7	16.7					50.0	0	0	0
NLSC	2	0	0	0	0	0					50.0	0	0	0
Total	*18*	*0*	*0*	*5*	*27.8*	*27.8*					*44.4*	*0*	*0*	*0*

Table 6.8: *Natural surface water bodies: ecological status in 2009 and expected status in 2015, 2021 and 2027*[13]
Source*: WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)*

RBD	Total	Chemical status					Good chemical status 2021		Good chemical status 2027		Chemical exemptions (% of all SWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
NLEM	2	1	50.0	50.0	1	0					50.0	0	0	0
NLMS	8	3	37.5	37.5	3	0					50.0	0	0	0
NLRN	6	1	16.7	16.7	1	0					83.3	0	0	0
NLSC	2	0	0	0	0	0					100	0	0	0
Total	*18*	*5*	*27.8*	*27.8*	*5*	*0*					*66.7*	*0*	*0*	*0*

Table 6.9: *Natural surface water bodies: chemical status in 2009 and expected status in 2015, 2021 and 2027*[14]
Source*: WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)*

[13] Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.
[14] Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

RBD	Total	GW chemical status					Good chemical status 2021		Good chemical status 2027		GW chemical exemptions (% of all GWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
NLEM	2	1	50.0	1	50.0	0					50	0	0	0
NLMS	5	2	40.0	3	60.0	20.0					40	0	0	0
NLRN	11	8	72.7	8	72.7	0					27	0	0	0
NLSC	5	3	60.0	3	60.0	0					40	0	0	0
Total	*23*	*14*	*60.9*	*15*	*65.2*	*4.3*					*35*	*0*	*0*	*0*

Table 6.10: *Groundwater bodies: chemical status in 2009 and expected status in 2015, 2021 and 2027*[15]
Source*: WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)*

RBD	Total	Groundwater quantitative status					Good quantitative status 2021		Good quantitative status 2027		GW quantitative exemptions (% of all GWBs)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
NLEM	2	2	100	2	100	0					0	0	0	0
NLMS	5	5	100	5	100	0					0	0	0	0
NLRN	11	11	100	11	100	0					0	0	0	0
NLSC	5	5	100	5	100	0					0	0	0	0
Total	*23*	*23*	*100*	*23*	*100*	*0*					*0*	*0*	*0*	*0*

Table 6.11: *Groundwater bodies: quantitative status in 2009 and expected status in 2015, 2021 and 2027*[16]
Source*: WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)*

[15] Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.
[16] Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

RBD	Total HMWB and AWB	Ecological potential					Good ecological potential 2021		Good ecological potential 2027		Ecological exemptions (% of all HMWB/AWB)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
NLEM	20	0	0	2	10.0	10.0					90.0	0	0	0
NLMS	147	0	0	13	8.8	8.8					89.1	0	0	0
NLRN	485	3	0.6	67	13.8	13.2					86.2	0	0	0
NLSC	54	0	0	7	13.0	13.0					87.0	0	0	0
Total	*706*	*3*	*0.4*	*89*	*12.6*	*12.2*					*87.0*	*0*	*0*	*0*

Table 6.12: *Heavily modified and artificial water bodies: ecological potential in 2009 and expected ecological potential in 2015, 2021 and 2027*[17]
Source*: WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027)*

RBD	Total HMWB and AWB	Chemical status					Good chemical status 2021		Good chemical status 2027		Chemical exemptions (% of all HMWB/AWB)			
		Good or better 2009		Good or better 2015		Increase 2009 -2015					Art 4.4	Art 4.5	Art 4.6	Art 4.7
		No.	%	No.	%	%	No.	%	No.	%	%	%	%	%
NLEM	20	13	65.0	13	65.0	0					35.0	0	0	0
NLMS	147	39	26.5	39	26.5	0					51.0	0	0	0
NLRN	485	403	83.1	403	83.1	0					16.5	0	0	0
NLSC	54	46	85.2	46	85.2	0					9.3	0	0	0
Total	*706*	*501*	*71.0*	*501*	*71.0*	*0*					*23.7*	*0*	*0*	*0*

Table 6.13: *Heavily modified and artificial water bodies: chemical status in 2009 and expected status in 2015, 2021 and 2027*[18]
Source*: WISE (for data on status in 2009, 2015 and exemptions) and RBMPs (for data on status in 2021 and 2027*

[17] Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.
[18] Data for 2009 and 2015 extracted from WISE. Data for 2021 and 2027 established during the compliance assessment of the RBMPs.

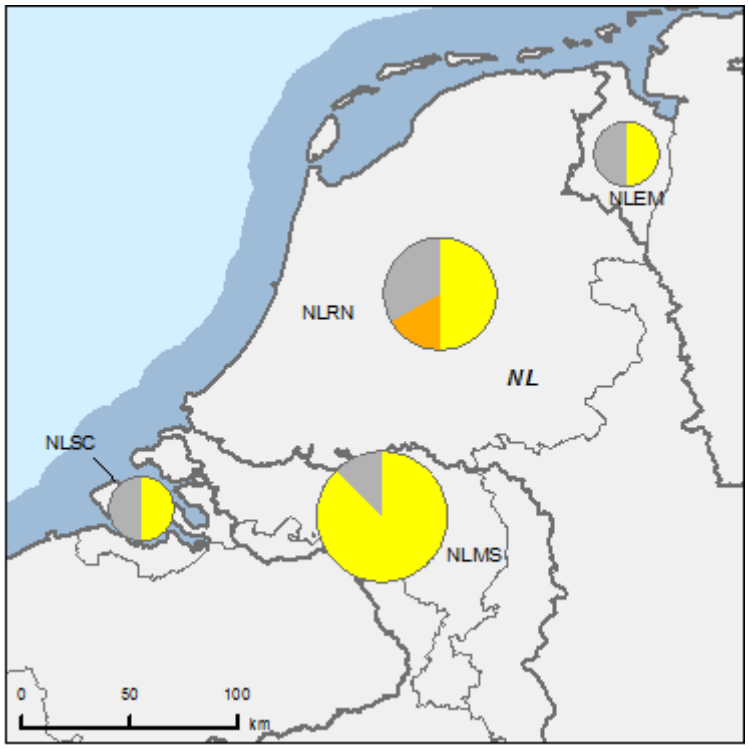

Figure 6.1: *Map of ecological status of natural surface water bodies 2009*

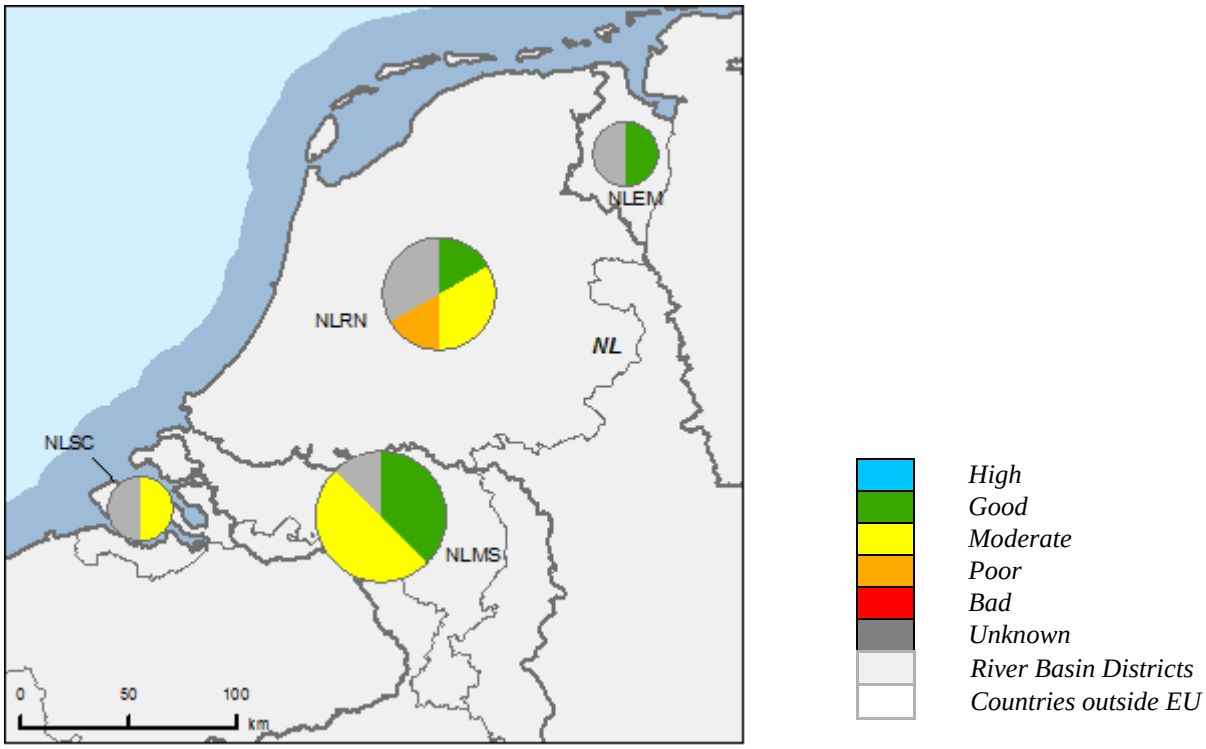

Figure 6.2: *Map of ecological status of natural surface water bodies 2015*
Note*: Standard colours based on WFD Annex V, Article 1.4.2(i).*
Source*: WISE, Eurostat (country borders)*

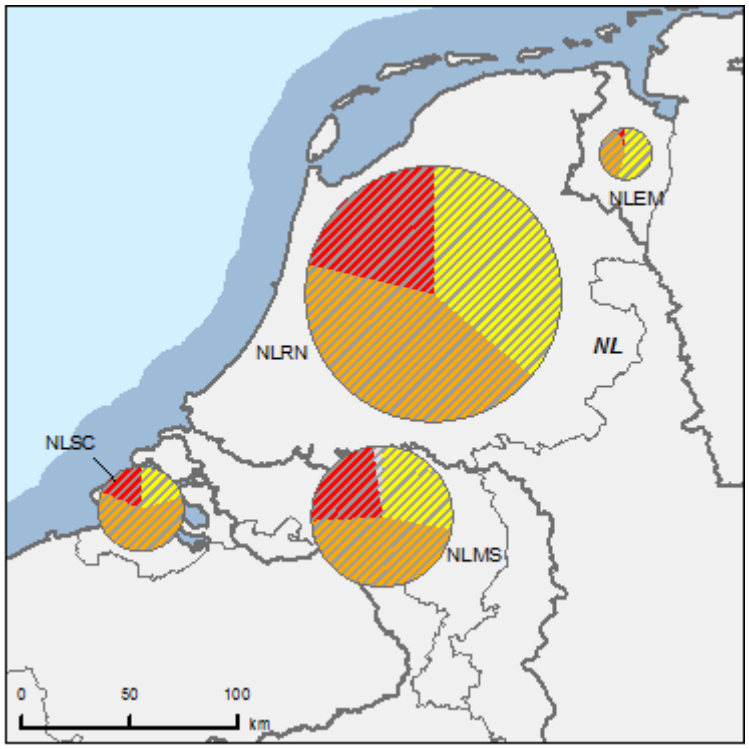

Figure 6.3: *Map of ecological potential of artificial and heavily modified water bodies 2009*

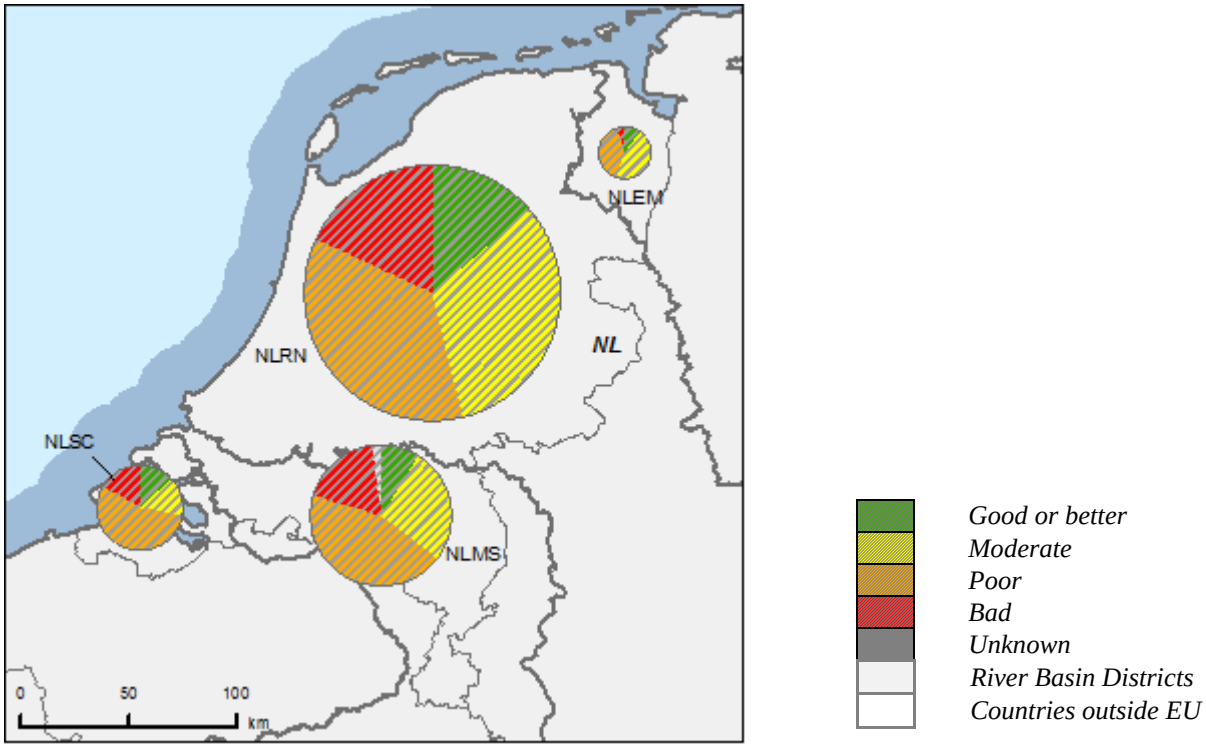

Figure 6.4: *Map of ecological potential of artificial and heavily modified water bodies 2015*
Note*: Standard colours based on WFD Annex V, Article 1.4.2(ii).*
Source*: WISE, Eurostat (country borders)*

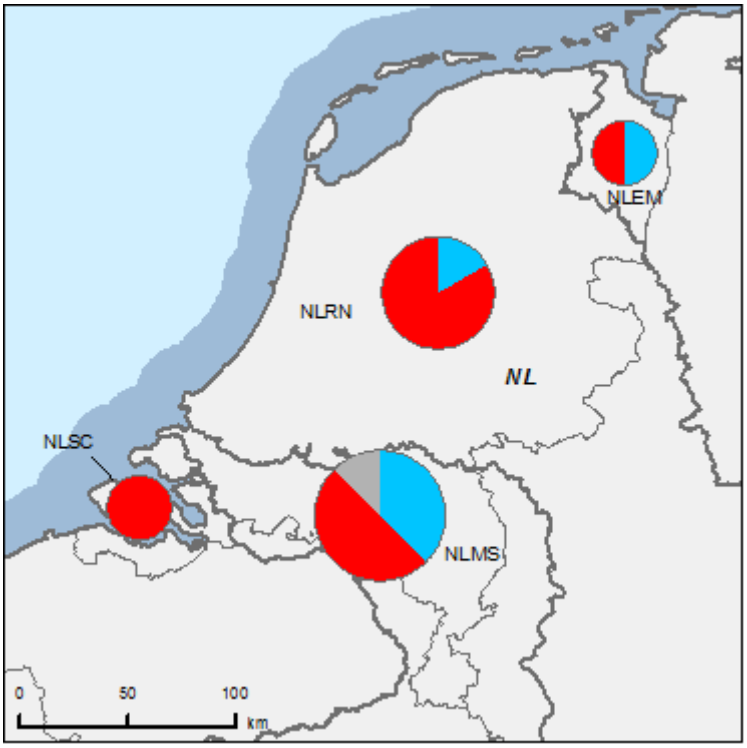

Figure 6.5: *Map of chemical status of natural surface water bodies 2009*

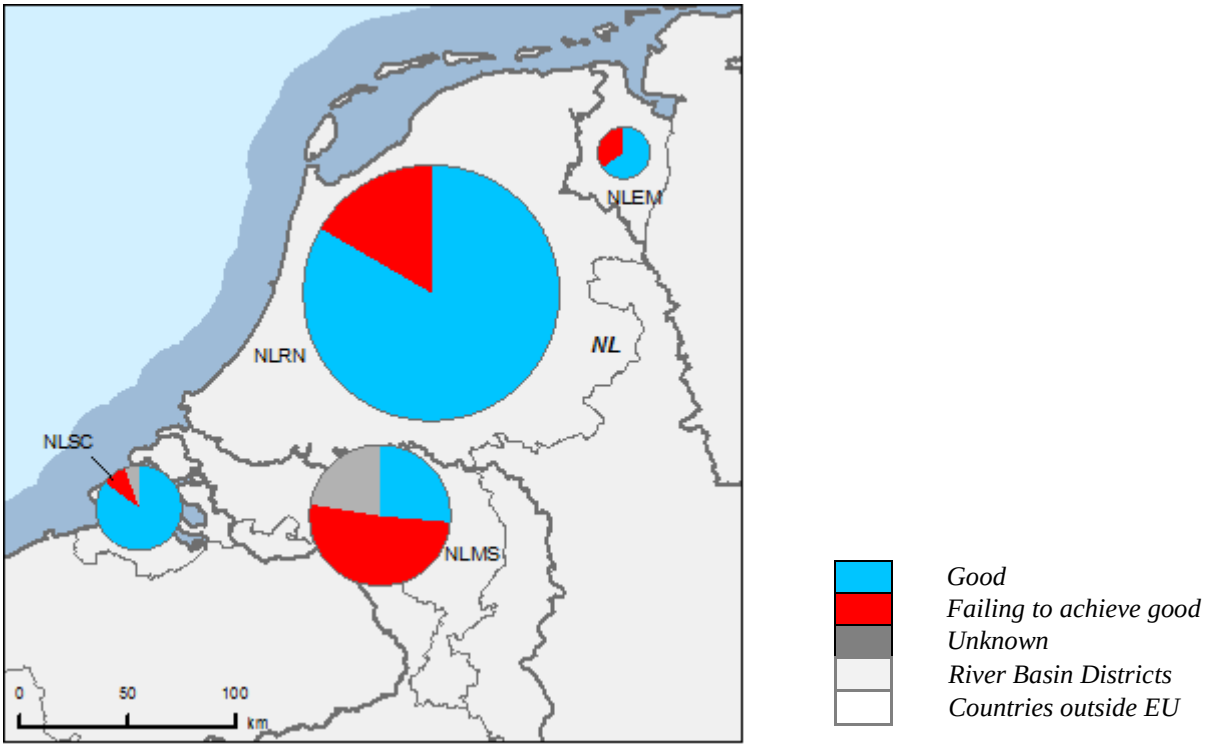

Figure 6.6: *Map of chemical status of natural surface water bodies 2015*
Note*: Standard colours based on WFD Annex V, Article 1.4.3.*
Source*: WISE, Eurostat (country borders)*

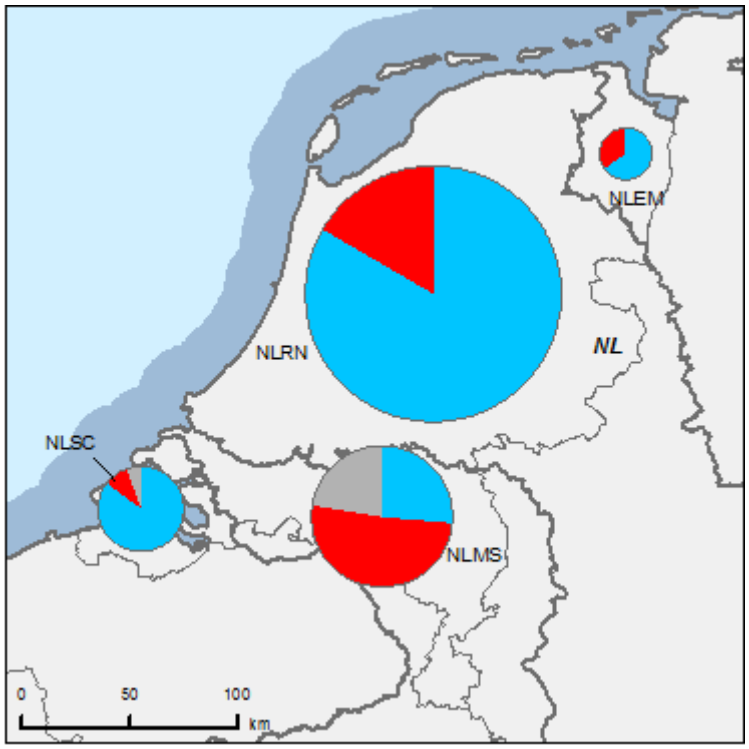

Figure 6.7: *Map of chemical status of artificial and heavily modified water bodies 2009*

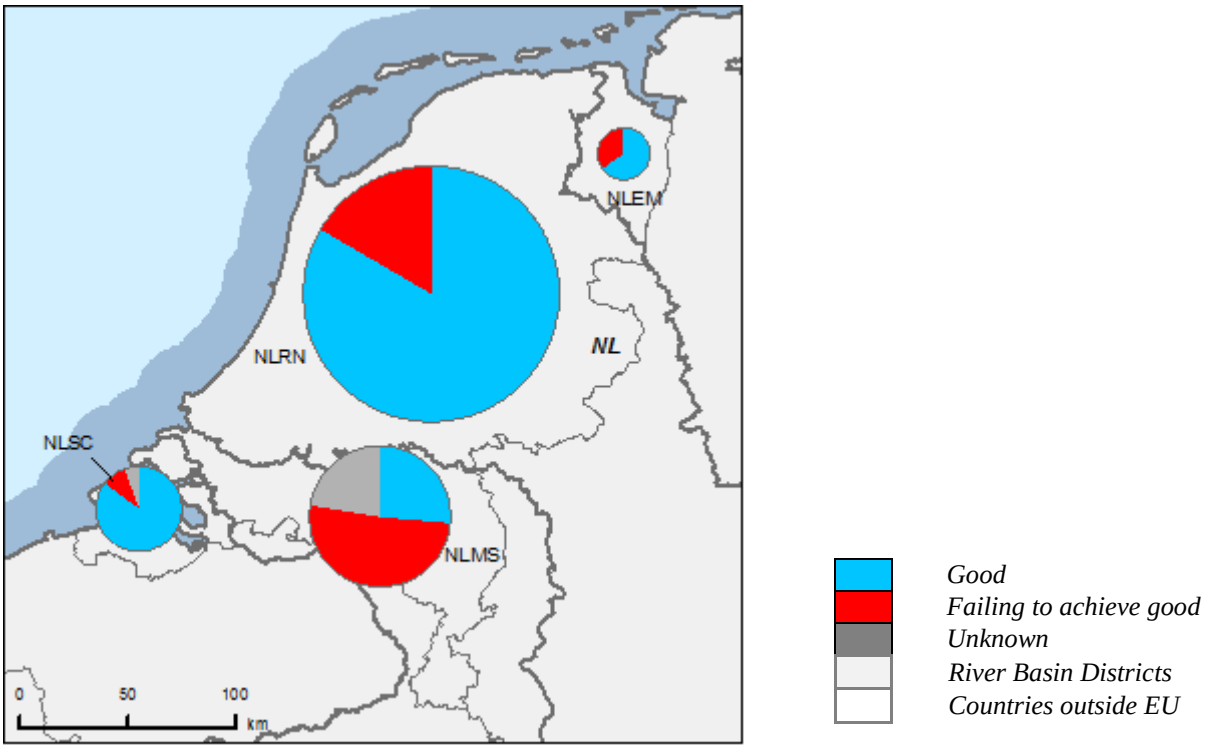

Figure 6.8: *Map of chemical status of artificial and heavily modified water bodies 2015*
Note*: Standard colours based on WFD Annex V, Article 1.4.3.*
Source*: WISE, Eurostat (country borders)*

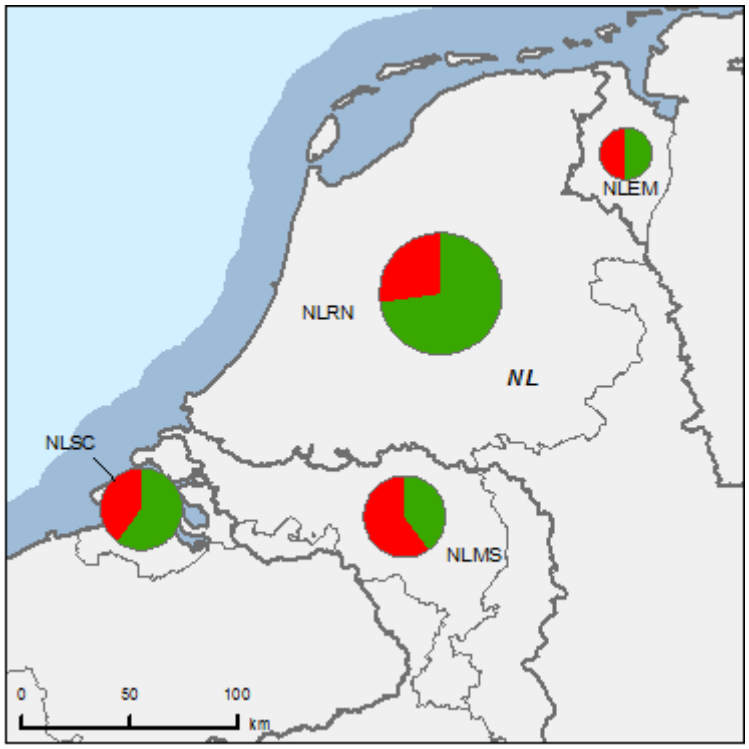

Figure 6.9: *Map of chemical status of groundwater bodies 2009*

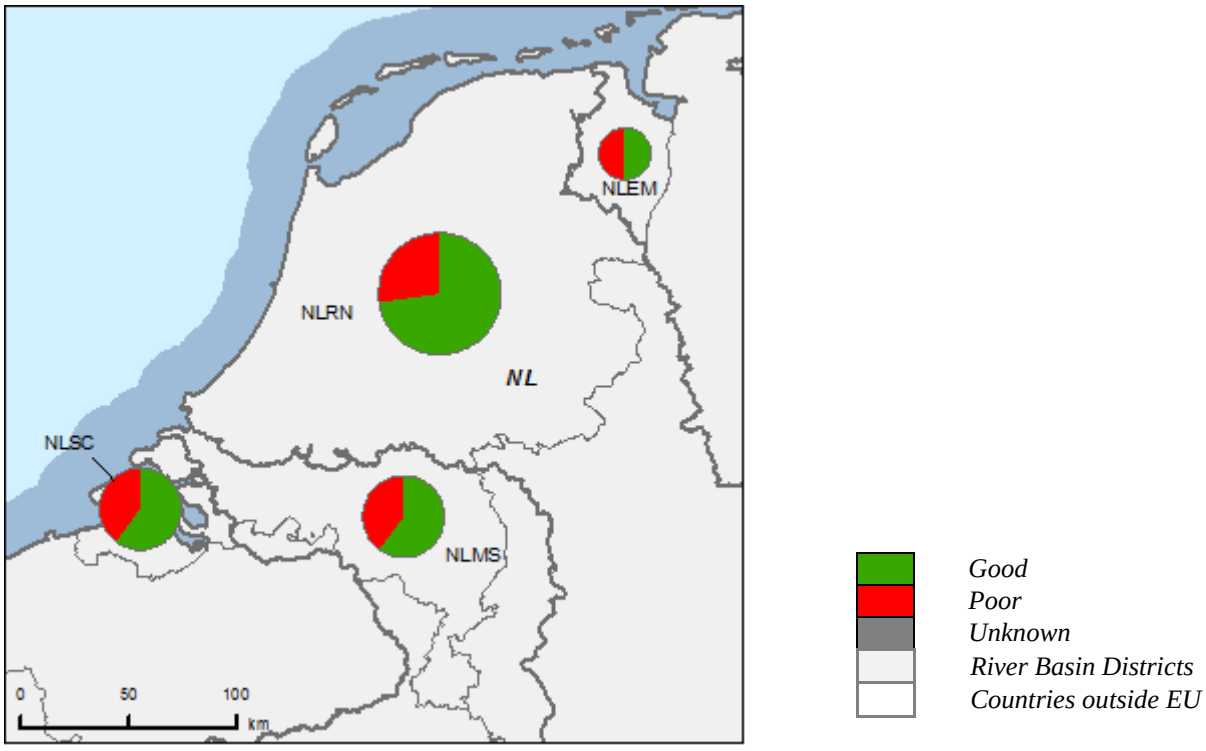

Figure 6.10: *Map of chemical status of groundwater bodies 2015*
Note*: Standard colours based on WFD Annex V, Article 2.4.5.*
Source*: WISE, Eurostat (country borders)*

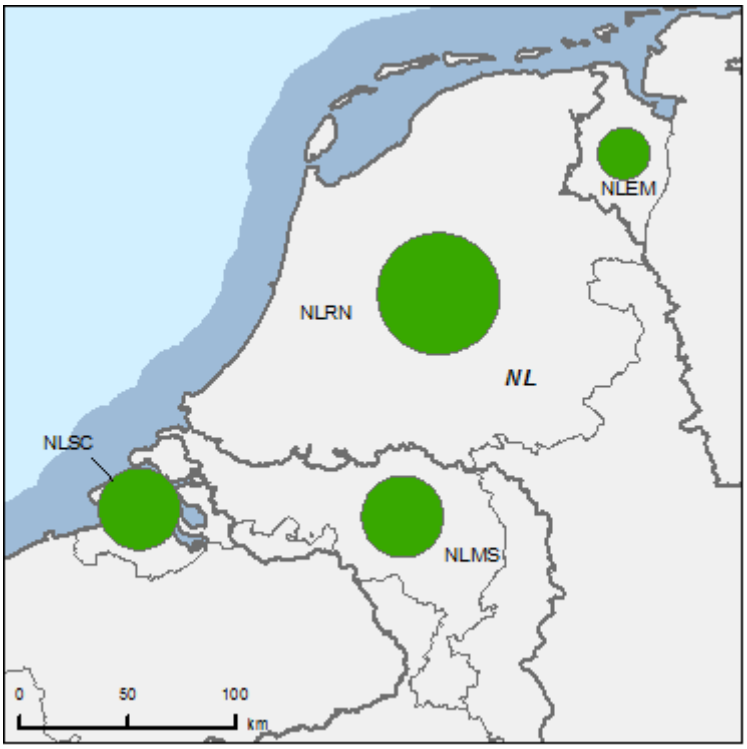

Figure 6.11: *Map of quantitative status of groundwater bodies 2009*

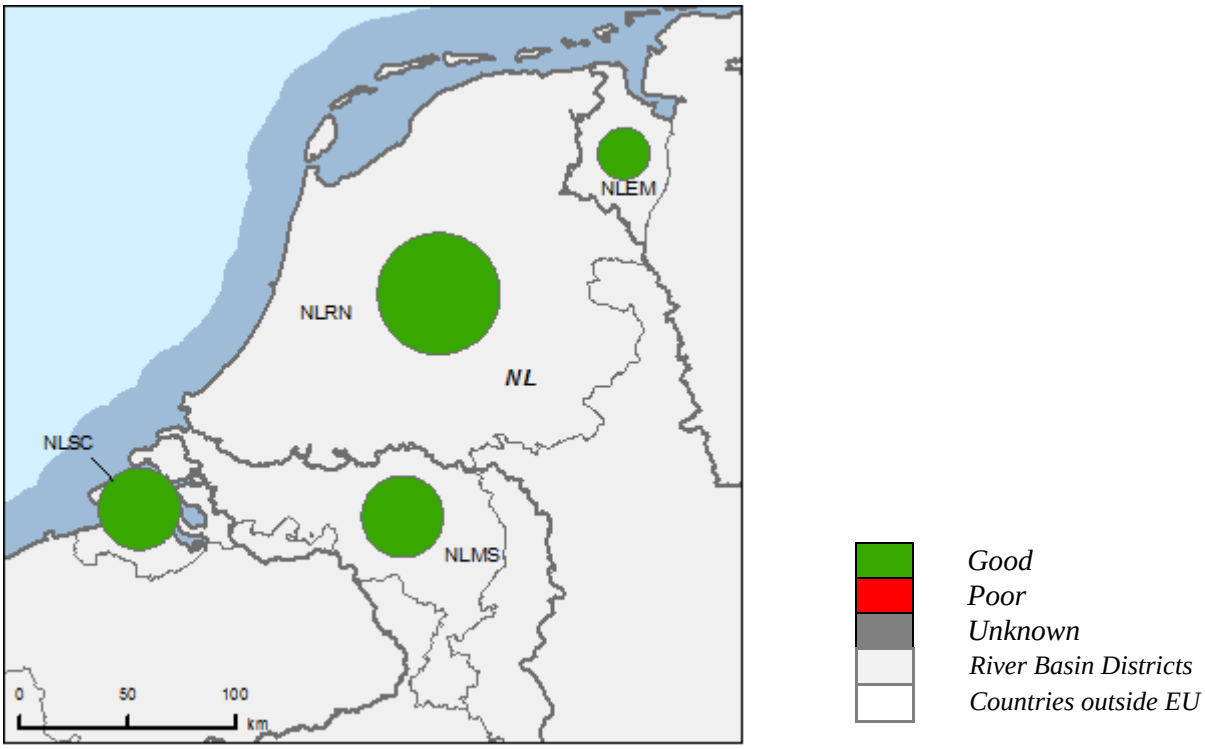

Figure 6.12: *Map of quantitative status of groundwater bodies 2015*
Note*: Standard colours based on WFD Annex V, Article 2.2.4.*
Source*: WISE, Eurostat (country borders)*

7. ASSESSMENT OF ECOLOGICAL STATUS OF SURFACE WATERS

The authorities responsible for assessing the status, setting of objectives and determining measures are the following:

- The national water managers determine in the RBMP the main objectives, the methodologies (e.g. for setting the objectives for HMWB and AW waterbodies) and measures in broad terms.
- The water managers (regional (water boards, provinces and municipalities) and *Rijkswaterstaat*) implement the measures to reach these objectives. These measures are included in the regional water management plans (see section 12 on the Programmes of Measures).
- The provinces, and for the public water bodies, the Secretary of State, decide on the status and type of the water body, and the objectives themselves for those bodies. This is part of the provincial responsibility for Public water management plans.

7.1 Ecological status assessment methods

Methods for classification of ecological status are fully developed for all Biological Quality Elements (BQEs), except for some categories or types for which certain BQEs classification systems have not been developed. More in detail, this concerns classification tools for phytoplankton for small brackish to salt waters, although for natural brackish waters a classification system has been developed.

The BQEs together are considered to detect all relevant pressures, and the relationship between BQEs and pressures is provided and explained in detail in the background documents referred to in the RBMPs (available for each of the BQEs):

- Eutrophication: Phytoplankton, phytobenthos/macrophytes.
- Acidification: macrophytes, benthic invertebrates, fish.
- Morphology: macrophytes, benthic invertebrates.
- Hydrology: macrophytes, benthic invertebrates.
- Continuity: fish.

For **natural waters**, standards for the hydromorphological quality elements (QEs) have been derived for all water types to be reported, and, as explained in the background document, the class boundaries for hydromorphology are linked where possible to the biological elements. The objectives for the general physico-chemical parameters are determined based on the biological descriptions. Good ecological status and good ecological potential values for nutrients are mainly based on the observed relation between concentrations of Nitrogen/Phosphorus and the biological condition. For the other general physico-chemical parameters in natural waters, the good ecological status values have been determined by water type.

The **one-out all-out principle** has been applied for ecological status assessment.

An extensive methodology for **confidence** and **precision assessment** is given in the Guidelines on WFD Monitoring of Surface Water and Testing and Assessment Protocol

(Richlijn KRW Monitoring Oppervlaktewater en Protocol Toetsen & Beoordelen) as laid down by the Directeuren Wateroverleg (DWO) on 10 February 2011.

All Good/Moderate boundaries seem to been brought into line with the '**Commission Decision on Intercalibration** of 30 October 2008' as is reported by the Member State. When changes to good/moderate boundaries were needed as a consequence of intercalibration, comparable changes were made for all types. In only one case, type R8 (tidal fresh water rivers), this was not possible for all BQEs. In some other cases (e.g. macroinvertebrates and phytobenthos) a different assessment method has been applied. In both cases, the Netherlands is working on improving the assessment methods and linking the results with the large intercalibration group, if applicable.

RBD	Rivers							Lakes							Transitional							Coastal					
	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Physico-Chemical	Hydromorphological	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Physico-Chemical	Hydromorphological	Phytoplankton	Macroalgae	Angiosperms	Benthic invertebrates	Fish	Physico-Chemical	Hydromorphological	Phytoplankton	Macroalgae	Angiosperms	Benthic invertebrates	Physico-Chemical	Hydromorphological
NLEM																											
NLMS																											
NLRN																											
NLSC																											

Table 7.1: *Availability of biological assessment methods*

Assessment methods fully developed for all BQEs

Assessment methods partially developed or under development for all or some BQEs

Assessment methods not developed for BQEs, no information provided on the assessment methods, unclear information provided

\- *Water category not relevant*

Source*: RBMPs, amended with information received from the Netherlands*

7.2 Application of methods and ecological status results

For each water body, all quality elements (QEs) are used to determine the ecological status, although grouping has been applied in some cases, and measures in a single water body are sometimes deemed representative of several bodies of water with similar characteristics.

The BQEs are considered to detect all relevant pressures, and the relationship between BQEs and pressures is explained in the background documents. However, the plans do not provide any information on how the selection of sensitive BQEs has been applied in practice and if the relationship between those BQEs and the pressure is used for defining the BQEs to be monitored and assessed for status assessment.

The methodology of **uncertainty analysis** is included in the Guidelines on WFD Monitoring of Surface Water and Testing and Assessment Protocol, but no further information is provided on how these uncertainty results have been taken into consideration for the status assessment.

7.3 River basin specific pollutants

For the **river basin specific pollutants** that have not been selected by the International River Basin Committee, the Netherlands has set a standard. The European methodology[19] has been used for setting the standards for priority substances. However, standards have not been defined for all relevant substances. For some substances, standards have been taken up from the 2004 Decision[20]. No distinction is made for the set objectives per water category. Standards for specific pollutants are given in annexes to the RBMPs.

[19] Annex V 1.2.6.

[20] Council Decision concerning the conclusion, on behalf of the European Community, of the Stockholm Convention on Persistent Organic Pollutants was adopted on 14 October 2004.

RBD	CAS Number	Substance	Percentage Water Bodies Failing Status (%)
NLEM		Cupper	51-75
NLEM		Zinc	26-50
NLMS		4-tertiar-octylfenol	<1
NLMS		Ammonium	21-50
NLMS		Benzo(a)antraceen	11-25
NLMS		Cobalt	6-10
NLMS		Cupper	51-75
NLMS		Dimethoaat	11-25
NLMS		Linuron	2-5
NLMS		Malathion	6-10
NLMS		Metolachloor	6-10
NLMS		Pirimicarb	11-25
NLMS		sum PCB's	6-10
NLMS		Tertabutyltin	<1
NLMS		Thallium	6-10
NLMS		Triazofos	2-5
NLMS		Zink	51-75
NLRN		Ammonium	25-50
NLRN		Cobalt	2-5
NLRN		Cupper	51-75
NLRN		Dimethoaat	<1
NLRN		Dimethoaat	<1
NLRN		Ethylazinfos	<1
NLRN		Imidacloprid	1-2
NLRN		Linuron	<1
NLRN		Methylazinfos	1-2
NLRN		Metolachloor	2-5
NLRN		sum PCB's	2-5
NLRN		Tetrabutylin	2-5
NLRN		Thallium	2-5
NLRN		Vanadium	1-2
NLRN		Zink	25-50
NLSC		Ammonium	2-5
NLSC		Benzo(a)antraceen	6-10
NLSC		Boron	2-5
NLSC		Cobalt	2-5
NLSC		Cupper	26-50
NLSC		Molybdenum	2-5
NLSC		Sum PCB's	2-5
NLSC		Tetrabutyltin	6-10
NLSC		Thalium	2-5
NLSC		Uranium	2-5
NLSC		Vanadium	2-5
NLSC		Zinc	26-50

Table 7.2: *River basin specific pollutants causing failure of status*
Source*: RBMPs*

8. DESIGNATION OF HEAVILY MODIFIED WATER BODIES (HMWB) AND ASSESSMENT OF GOOD ECOLOGICAL POTENTIAL

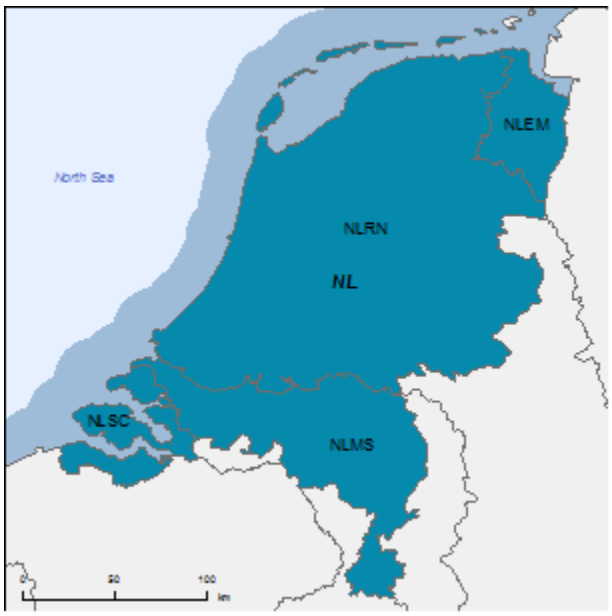

Figure 8.1: *Map of percentage Heavily Modified and Artificial water bodies by River Basin District*

0 – 5 %
5 – 20 %
20 – 40 %
40 – 60%
60 – 100 %
No data reported
River Basin Districts
Countries outside EU

Source: *WISE, Eurostat (country borders)*

According to the data included in the Commission Staff Working Document of the first implementation report (2007) (see figure 8.1), the Netherlands has the highest percentage of HMWB and AWBs on a total of surface water bodies in the European Union.

For HMWBs, the Netherlands is the third country in percentage of the total surface water bodies, just above 40%, only after Slovakia and the Czech Republic. For artificial water bodies (AWBs), the figure is definitely much higher than any other EU country, above 50% of the total surface water bodies.

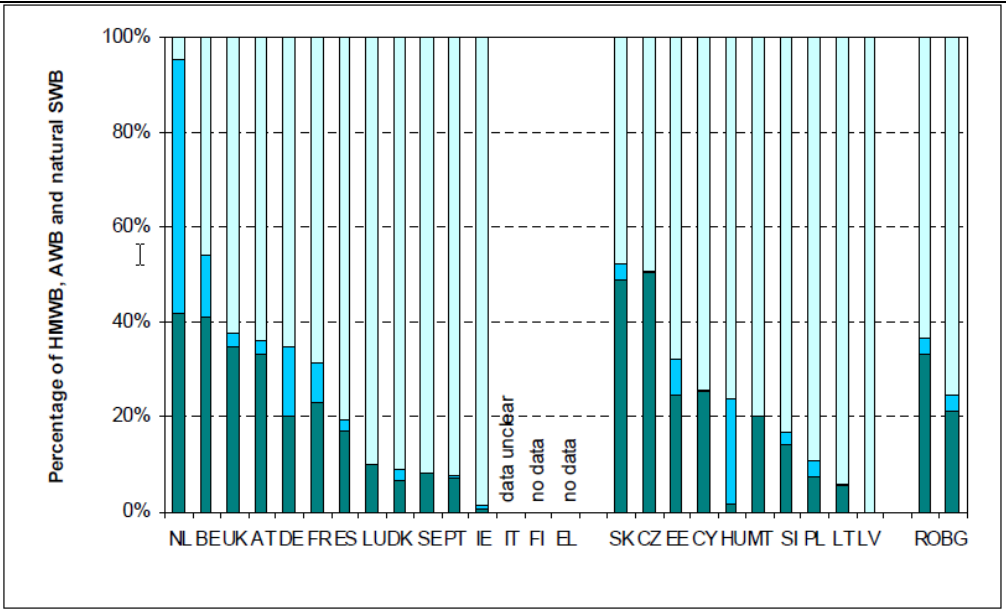

Figure 5: Percentages of provisionally identified Heavily Modified Water Bodies (■ = HMWB), Artificial Water Bodies (■ = AWB) and Natural Surface Water Bodies (■ = Natural SWB) per Member State (based on data reported by Member States).

Notes for Figure 5:
1) Finland and Greece: percentage of HMWB, AWB and natural SWB not reported.
2) Italy reported unclear data.

***Figure 8.2**: provisionally identified HMWBs (fist implementation report[21])*

8.1 Designation of HMWBs

The HMWB and AWB designation process in the Netherlands lead to a large number of HMWBs and AWBs designated. This is not surprising as most of the Netherlands surface waters are regulated and impacted by human activities in some way (see chapter on RBD characterization/significant pressures).

% Total surface water bodies	NLEM	NLMS	NLRN	NLSC
Natural	8%	5%	1%	4%
HMWB+AWB	92%	95%	99%	96%

***Table 8.1:** Percentage of natural and HMWBs in the Dutch RBDs*
***Source**: RBMPs*

Significant negative effects are determined on the basis of the main uses. For example, in areas with high biodiversity most hydromorphological measures will not lead to a significant

[21] http://ec.europa.eu/environment/water/water-framework/implrep2007/pdf/sec_2007_0362_en.pdf

effect (e.g. halting drainage) while in contrast hydromorphological measures areas within intensive agriculture and urban areas will lead to significant effects (e.g. remeandering in an urban area). However, there are no criteria to determine significance defined per water use, but rather dependent on the area (urban/intensive agriculture versus nature). The Netherlands has however confirmed that criteria to determine whether there are significant adverse effects are site-specific and sometimes water-use specific, and are therefore listed in the plans of water managers.

Large **physical modifications** related to the uses as per Article 4(3) WFD have been considered. In the RBMPs, it is discussed what can be considered as a sustainable activity and also whether both repetitive and isolated events should be considered.

A **stepwise approach** for determining whether a waterbody should be designated as HMWB/AWB is applied. The CIS approach has been followed. The national Guidelines on maximum ecological potential (MEP) and good ecological potential (GEP) state the following: a modification is significant if the good ecological status can no longer be achieved. It is important here to delimit the concept modifications in the physical layout. This includes dykes and weirs, but not the diffuse pressures from nutrients and sewer overflows.

The **uncertainty** is mainly present in the definition of MEP and GEP as proposed in the procedure in the HMWB guidance. The designation step is less uncertain because it is based on the present situation and on estimations and/or decisions related to uses served, alternatives, and economic consequences. The uncertainty is further reduced by expressing GEP values at the most comparable 'natural' water body type. The translation of irreversible hydromorphological changes into ecological effects is the main step that introduces uncertainty.

The Netherlands has confirmed that the Netherlands will review the designation and the reasons for it in the next RBMP cycle, for each water body.

8.2 Methodology for setting good ecological potential (GEP)

Good Ecological Potential has been defined in the Dutch RBMPs. In the MEP/GEP guide, the **standard methodology** is explained (Guidelines on the General Approach in MEP/GEP and Standards and MEP for locks and canals).

The **reference based approach** has been generally applied for **artificial water bodies** (e.g. ditches, locks & canals), due to the availability of sufficient data on waters in optimum status. The **mitigation measures** approach is often applied for **heavily modified water bodies**. This is because the uncertainty in the description of the natural water type benchmark was considered to be significant. Sometimes a combination of the two methods has been used. Information on the applied approach is included in the different plans (regional, provincial, *rijkswateren*).

The approach that has been most commonly applied has been the 4 G approach: (1) G1: use GES-values of natural waters; (2) G2: use default values determined for ditches and canals (based on reference-based approach); (3) G3: use using expert knowledge from the water manager, either: GEP =MEP (GEP = MEP minus measures that do not have a significant impact on the objective to be reached or GEP = MEP minus fixed percentage of MEP or Because in the original condition, the water body is already in good condition, the objective has been set equal to the current state; (4) G4: quality element not relevant. All provincial plans include GEP values in the 'fact sheets' for all relevant parameters.

Improvements due to mitigation measures that are considered/selected are mainly (1) improvement of fish migration (e.g. construction of fish ladders); (2) improvement and larger habitat for macroinvertebrates, other flora and fish by creating more room and reconstruction of beds or natural shoreline development; (3) general measure, reducing nutrient concentrations gradually by both reducing pressure from agriculture and WWTPs. (4) other measures.

8.3 Results of ecological potential assessment in HMWB and AWB

Only 3 HMWBs/AWBs in the Netherlands are assessed as being at good potential. These water bodies are part of the Rhine RBD but represent only a very small fraction of the total number of water bodies.

% Surface water bodies	NLEM	NLMS	NLRN	NLSC
% of all surface water bodies at good ecological status/potential or better now	0%	0%	(3/491*100)%	0%
% of HMWB/AWB surface water bodies at good ecological potential or better now	0%	0%	0.6% (3 WBs)	0%

Table 8.2: *Percentage of water bodies at good or high status in the Dutch RBDs*
Source*: RBMPs*

9. ASSESSMENT OF CHEMICAL STATUS OF SURFACE WATERS

9.1 Methodological approach to the assessment

All priority substances (those included in Annex I of the EQS Directive[22]) are included in the assessment of the chemical status of the water bodies. For these first RBMPs, the assessment of the 33 + 8 substances was based on the standards included in the Annex I of the EQS Directive. No standards have been derived for biota and sediment.

In Annexes to the RBMPs (Bijlage E), it is stated that a monitoring programme may be applied after assessing the results, in order to correct the standards taking into account a) the natural background concentrations for metals and their derivatives when these prohibit reaching the environmental standard and b) the pH, hardness and other water quality parameters that determine the biological availability of metals. If it appears from the first line testing that the limit has been exceeded for a metal, the second line testing first corrects for the background concentration. The background concentration is first retrieved from the test value before being tested against the standard. For a number of metals, a formula has been derived with DOC to correct for bioavailability. This refers to copper, nickel and zinc. The pH and hardness may not be too high or too low. There is an 'Instruction Sheet' as a background document on the bioavailability of metals, and the following background documents are available: Knoben R.A.E. & Snijders, J.M. (2010). Instructie voor het omgaan om normoverschrijdingen van metalen en andere microverontreinigingen in oppervlaktewater, RWS Waterdienst report.

9.2 Other issues

In the Netherlands, a mixing zone approach has been used. A revision framework has been drawn up for national waters. The mixing zone approach is developed in the 'Immission Testing Manual' (*Handboek Immissietoets*, 28 October 2011), which was designated as BBT document under the Environmental Law Regulation (*Regulering Omgevingsrecht*) and it is based on the EU Guidance on Mixing Zones (2011). This testing method includes the assessment of effects of discharges on surface waters. When granting a permit for the discharge of wastewater, this document must be taken into account. To reduce the extent of mixing zones in the future, current efforts are focused on regular review of permits granted for the discharge of wastewater.

10. ASSESSMENT OF GROUNDWATER STATUS

Good chemical conditions and good quantitative status are the objectives for groundwater bodies. Next to the good chemical status requirements, it should be evident from the trend analysis that there is no significant increase. Further on, preventive measures should be taken to avoid intrusions of pollutants in relation to drinking water abstraction.

[22] Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council. *OJ L 348, 24.12.2008, p. 84–97*.

The groundwater status assessment is based on the Groundwater Directive[23]. Whenever the standards set are exceeded, this does not result in the classification of non-compliant, but leads to further analysis. There were thresholds defined for 6 substances for each groundwater body. However, this is not the case for all substances included in Annex II of the Groundwater Directive for several reasons. The choice of the substances considered has been justified in the RBMPs.

In total there are 9 different groundwater bodies which are at risk of failing to reach a good chemical status in 2015.

Groundwater body	Risk
NLGW0006	Nitrates
NLGW0007	Arsenic, Annex II pollutant
NLGW0008	Arsenic, Annex II pollutant, Pesticides
NLGW0010	Chloride
NLGW0013	Annex II pollutant
NLGW0015	Chloride
NLGW0019	Nitrates
NLGWSC0002	Pesticides
NLGWSC0005	Arsenic

Table 10.1: *Groundwater bodies at risk of failing to reach good chemical status in 2012.*
Source*: RBMPs*

10.1 Groundwater quantitative status

It is reported in WISE 3.2.1 that the Dutch assessment method for determining the quantitative quality has been developed in accordance with the EU Guidance Document nº18[24]. It includes the assessment of four elements: water balance, salt water and other intrusions, surface water (aquatic ecosystems), and groundwater dependent terrestrial ecosystems.

The balance between recharge and abstraction of groundwater is assessed with a comparison of annual average groundwater abstractions against 'available groundwater resource' in the groundwater body. This has been reported to be calculated for a subset of all groundwater bodies. It is however not clear if this is done for all measuring sites.

The methodology reported (WISE 3.2.1) determines the changes in water levels for all 'chosen' measuring sites, with a reference level of the year 2000. The average water level in a groundwater body should not further diminish following anthropogenic influences. Then there is an assessment on whether the groundwater recharge is larger than the groundwater abstraction, the net drainage via the surface water and other possible losses. If this is the case, the water balance is considered to be appropriate (which means that the groundwater body is in good quantitative status).

[23] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration. *OJ L 372, 27.12.2006, p. 19–31.*

[24] http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents/guidance_n18pdf/_EN_1.0_&a=d

10.2 Groundwater chemical status

In general, there is no reference in the plans to groundwater dependent terrestrial ecosystems, but only to effects of groundwater bodies on 'surface water bodies'. However, nutrients are considered as an important pressure for groundwater dependent terrestrial ecosystems.

In general, it is considered in the assessment per substance that it is not at good quality when the number of measuring sites for which the standard is exceeded represents more than 20% of the number of measuring sites per groundwater body. This level of 20% has been taken from the EU guidance. During the implementation of this first cycle (up to 2015), an assessment is being carried out, together with discussions with other Member States, in order to evaluate whether this percentage needs to be amended.

A methodology to assess trends and trend reversal has been developed (reported in WISE 3.2.2.2). There is no significant increase allowed for trends. The starting point of trend reversal is at 75% of the threshold value. This means that if the concentration is expected to increase up to 75% of the threshold value, measures should be taken for trend reversal. For the assessment of trends a Dutch guidance document has been prepared (KRW en *Grondwaterrichtlijn: Handreiking trend en trendomkering*, 2008).

10.3 Protected areas

Water bodies with abstraction for human consumption are designated as drinking water protected areas in the Netherlands.

RBD	Good	Failing to achieve good	Unknown
NLEM	1		
NLMS	4		
NLRN	9		
NLSC	2		
Total	*16*	*0*	*0*

Table 10.2: *Status of groundwater drinking water protected areas*
Source*: WISE*

11. ENVIRONMENTAL OBJECTIVES AND EXEMPTIONS

11.1 Additional objectives in protected areas

For **drinking water from surface water**, standards have been defined in the RBMPs. For drinking water from groundwater, the RBMPs establish a target value in order to reduce the need for purification.

Additional objectives for **shellfish waters** have not been defined for this first cycle of RBMPs. This is partly due to an on-going research study to determine whether the level of protection of shellfish waters is guaranteed for bacteriological parameters (faecal coli-bacteria) that are included in the Shellfish Directive.

Additional objectives related to human health have been established according to the **Bathing Water Directive**. Algae blooms (phaeocystis) are included in the classification system for lakes and coastal water bodies.

In case of existence of a **Natura2000 area** the necessary assessment is carried out to verify whether the biological Natura2000 objectives would lead to more stringent environmental objectives for the whole water body. These objectives will be set when the management plans and the conservation goals will be defined, and will therefore be done for the next cycle of RBMPs.

11.2 Exemptions according to Article 4(4) and 4(5)

Around **86%** of water bodies in the Netherlands are subject to an exemption under **Article 4(4)**. The justification of this important delay in the achievement of the WFD objectives is provided in the Government position of December 2006 Policy Paper that states that 'The Government has decided to take more time to improve water quality than the final date originally aimed for in the WFD of 2015 and for phasing this until 2027'. This Policy Paper was in turn based on some background documents, such as the Audit WB21 (Water Management 21st Century) and the strategic social cost-benefit analysis for the WFD.

Natural circumstances can be included as a reason if the measures will only have an effect after a long period. Technical reasons can be the reason for asking for a delay in reaching the objectives as for these water systems, advice seeking and concept development is needed to determine the most cost-efficient measures for agriculture (planning time) or if additional research needs to be done to determine main pressures. Economic reasons can also be given in case by including all necessary measures this would lead to a drastic increase of taxes or if there is no room (area, spatial context) available (too expensive). From the surveillance assessment it is obvious that for most of the surface water bodies it will not be possible to reach good ecological status or potential by 2015.

The main pressures causing the need of exemptions under Article 4(5) include navigation or recreation, water balance, protection against flooding and drainage.

Fully achieving the WFD objectives by 2015 is deemed to not be possible in practice and would also not be pragmatic, feasible or affordable. The phasing of the objectives will allow spreading the costs over a larger number of years.

The national approach is mainly focused on **hydromorphology** and less on emission reduction. The plans suggest that focusing on hydromorphological aspects will allow for

more benefits to be achieved with fewer resources than for reducing emissions. However, this may be a problematic approach, given that both hydromorphology and emissions reduction should be addressed in order to achieve the good status objective

There seems to be no specific method for the discussion on whether the costs are disproportionate but the costs and benefits have been weighed up for in the justification, and this has been described in the RBMPs.

According to the Government's analysis, the full achievement of all chemical and ecological objectives with the necessary measures would not be possible. Furthermore, the objectives would have to be lowered in some cases. Given the high level of uncertainty, it was decided to avoid the lowering of objectives in this first cycle, and to implement instead a step-wise approach up to 2027 and to decide in 2021 for which parameters a lowered objective needs to be made concrete.

Technical feasibility is the main reason for the justification of the application of the exemptions (in particular in the Rhine RBD), followed by the **disproportionate costs** that the necessary measures would entail. **Natural conditions** (historic pollution), and the long time needed for recovery are also given as reasons to justify the application of the exemption under Article 4(4) (see Table 11.1).

RBD	Global[25]					
	Technical feasibility		Disproportionate costs		Natural conditions	
	Article 4(4)	Article 4(5)	Article 4(4)	Article 4(5)	Article 4(4)	Article 4(5)
NLEM	18	0	12	0	11	-
NLMS	146	0	111	0	29	-
NLRN	340	0	234	0	158	-
NLSC	51	0	43	0	3	-
Total	*555*	*0*	*400*	*0*	*201*	-

Table 11.1: *Numbers of Article 4(4) and 4(5) exemptions*
Source*: WISE*

[25] Exemptions are combined for ecological and chemical status.

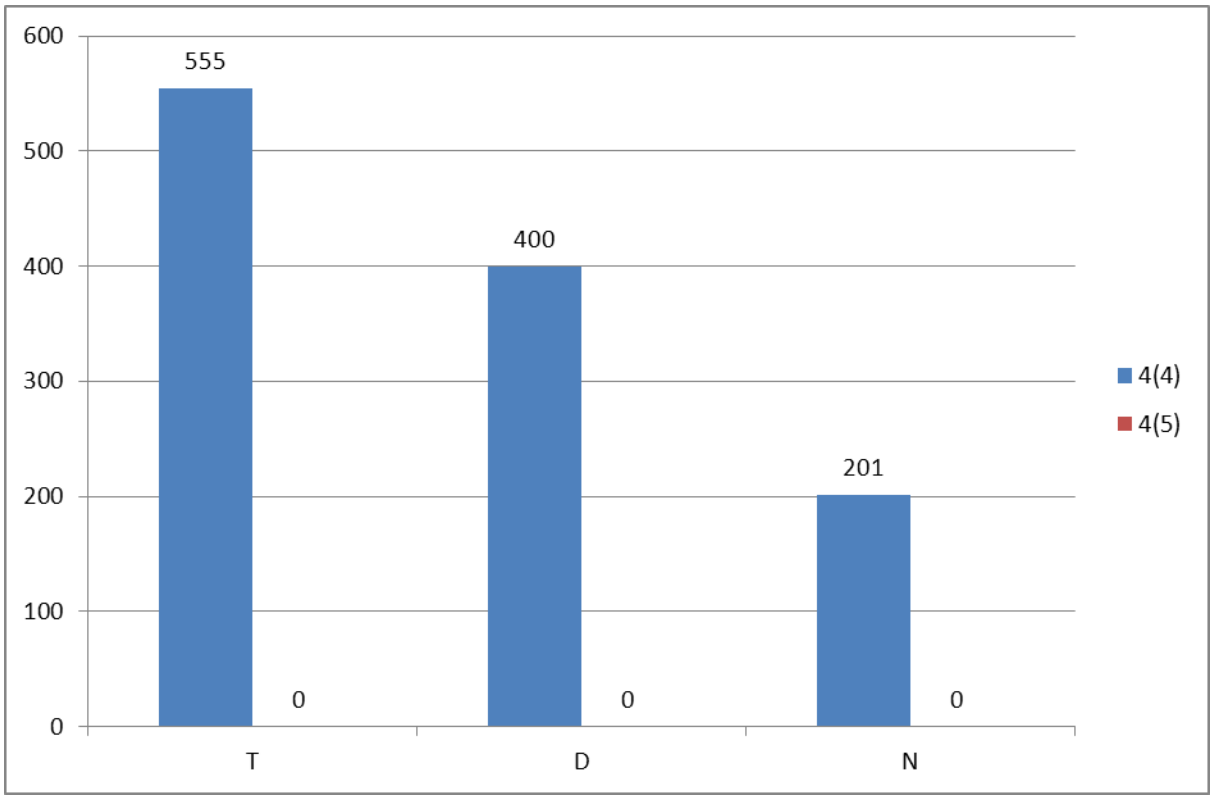

Figure 11.1: Numbers of Article 4(4) and 4(5) exemptions
T = Technical feasibility
D = Disproportionate costs
N = Natural conditions
Blue = Article 4(4) exemptions
Red = Article 4(5) exemptions
***Source**: WISE*

11.3 Exemptions according to Article 4(6)

No exemptions for Article 4(6) have been applied in the Dutch RBMPs. However, some indications are provided on what will be considered for the 2nd RBMPs. The categories of what may be included under Article 4(6) are listed, but no further details are provided.

11.4 Exemptions according to Article 4(7)

No exemptions for plans and programmes have been applied (Article 4(7) WFD).Only a few examples are given about what type of projects would fall under Article 4(7), such as flood protection, navigation, ports/marinas.

In the **Meuse RBD**, the following plans and programmes are mentioned: sluis Ternaaien (Bovenmaas), Integrale verkenning Maas (Benedenmaas); Zandwinning/zomerbedverdieping ten behoeve van uitvoering Overdiep (Bergsche Maas); Integrale verkenning Maas (opvangen toekomstige hogere afvoeren in de Maas: Bovenmaas, Grensmaas, Zandmaas, Bedijkte Maas). However, the exemption under Article 4(7) has not been applied for any of these plans in this first RBMP. Article 4(7) is discussed, and it will be applied in the future, but it has not yet been applied. The measures applied are deemed to be appropriate for the moment,

i.e. strategic EIA, water tests. The projects have been screened, resulting in a lack of need of application of Article 4(7), with the exception of one project. In any case, the projects are considered to be at an early planning stage, and therefore it is not sure whether the application of Article 4(7) will be necessary.

In the **Rhine RBD**, eight projects have been mentioned in chapter 3.6.5 (including deepening of the river, constructing a bypass, licensing salt extraction, gas exploitation). For these plans, the possible application of Article 4(7) will be assessed at a later stage.

In the **Scheldt RBD**, Article 4(7) has not been applied

11.5 Exemptions to Groundwater Directive

The RBMPs state that the inventory of exemptions from measures for the Groundwater Directive need to be submitted to the Commission. However, there is no requirement to include this in the RBMP.

The RBMPs provide the number of exemptions, as allowed by the Article 6 of the Groundwater Directive. For these exemptions, it is acknowledged that an inventory will need to be made and notified to the European Commission.

12. PROGRAMMES OF MEASURES

According to Annex VII of the WFD, the RBMPs should contain a summary of the programmes of measures (PoM), including the ways in which Member States expect to achieve the objectives of Article 4 WFD. The programmes should have been established by 2009, but are required to become operational only by December 2012. The assessment in this section is based on the PoM as summarised by the Member State in its RBMP, and the compliance of this with the requirements of Article 11 and Annex VII of the WFD.

It therefore does not include a comprehensive assessment of compliance with the requirements of Article 11(3)[26] on basic measures. It focuses in particular on key sets of measures. Member States will report to the Commission by December 2012 on the full implementation of their PoMs, including on the progress on the implementation of basic measures as required by Article 11(3). The Commission will assess what Member States report and will publish its assessment in accordance with Article 18 WFD.

12.1 Programme of measures (PoM) – general

According to Annex VII of the WFD, the RBMPs should contain a summary of the programmes of measures (PoM), including the ways in which Member States expect to achieve the objectives of Article 4 WFD. The programmes should have been established by 2009, but are required to become fully operational only by December 2012. The assessment in this section is based on the PoM as proposed by the Member States in their RBMPs, and the completeness and compliance of such programmes with the requirements of Article 11 of the WFD.

[26] These are the minimum requirements to be complied with and include the measures required under other Community legislation as well as measures to achieve the requirements of other WFD Articles and to ensure appropriate controls on different activities affecting water management

Member States will report to the Commission by December 2012 on the full implementation of their PoMs, including on the progress on the implementation of basic measures as required by Article 11(3). The Commission will carefully assess what Member States will report by then and will decide thereafter on the most appropriate follow-up of the implementation of the measures.

All the Dutch RBMPs follow the same **structure** for describing the PoM. The way the PoM is presented is comprehensible and easy to compare between different river basins. The PoMs describe both the basic measures (applied nationwide via national legislation) and the supplementary measures. No specific information is given on additional measures.

The RBMPs provide a table (table 6.1) with the **link** of the pressures with the measures, and describes the approach to define the necessary measures. The status of the water bodies has been taken into account for the definition of the additional measures, including hydromorphological measures.

There is a general description of the **significant pressures** that have led to the definition of specific measures. For the supplementary measures, a table in the RBMPs shows the specific analysis at water body level.

The PoMs have been **coordinated** with other Member States as part of **International RBMPs**. The details on this coordination are provided in several occasions in the RBMPs, concerning the harmonisation of objectives, and the necessary measures to be taken, international coordination of the measures, and international agreements.

The **basic measures** are applied at national level via national legislation. The **supplementary measures** are formulated on a regional level (sub basins). Detailed information on application is provided per sub basin and per water authority responsible for the implementation of the measures (annex P of the RBMPs), as for example, the number of fish passes that will be installed. But no information is provided up to the water body level.

The **total costs of the supplementary measures** are identified in the RBMPs (in millions of euros for the period 2009-2015: Scheldt 73.3; Meuse 503; Ems 149.4, Rhine 1502) and also a breakdown of the costs per pressure is provided. An estimation of the cost for general environmental measures made by the most important sectors that are somewhat related to water quality are given for the whole of the Netherlands.

In the RBMPs, it is mentioned that the **financing of costs for water management** is based on the principles 'the user pays' and the polluter pays'. There is a general description of how the cost recovery is applied to the different water services, i.e. through levies, tariffs, etc.), but there is no further detail on how this has been applied (value of the tariffs and levies). The cost recovery percentage for most water services reaches 100% and the sectors that use these water services (and pay for them) are clearly mentioned in the plans. However, there is no clear information on the total budget or the share of the contributions from the different sectors.

No **timeline** is provided in the RBMPs on when the measures will become operational. The basic measures are already implemented via national legislation. For the supplementary measures, no timing for implementation is provided.

As already stated, the RMBPs mention several other water management plans available in the Netherlands (national, regional, etc.). These plans may well contain more detail on scope, costs, timeline, etc., in particular the plans for the sub-basins (*'Waterschapsplannen'*).

12.2 Measures related to agriculture

Agriculture has been defined as an **important driver** leading to **significant pressure** in all the Dutch RBDs. Several pollutants from diffuse agricultural sources form a significant pressure on water quality. Water abstractions for agriculture are not indicated as provoking significant pressure on water quantity. Morphological alterations are indicated as important pressures in all RBDs, but there is a big diversity of reasons for such modifications (agriculture, housing, shipping, flood defence, etc.).

The RMBPs describe the overall approach of stakeholder involvement on national and regional level. Discussion groups with several stakeholders (including representatives of the agricultural sector) have been organised and information campaigns, for instance through websites, have been launched.

The following table provides an overview on the type of the measures that have been adopted in the RBMPs of the different river basins to address the pressures resulting from agriculture.

Measures	NLEM	NLMS	NLRN	NLSC
Technical measures				
Reduction/modification of fertiliser application	✓	✓	✓	✓
Reduction/modification of pesticide application	✓	✓	✓	✓
Change to low-input farming	✓	✓	✓	
Hydromorphological measures	✓	✓	✓	
Measures against soil erosion				
Multi-objective measures	✓	✓	✓	✓
Water saving measures				
Economic instruments				
Compensation for land cover				
Co-operative agreements				
Water pricing	✓	✓	✓	✓
Nutrient trading				
Fertiliser taxation				
Non-technical measures				
Implementation and enforcement of existing EU legislation				
Controls				
Institutional changes				
Codes of agricultural practice				
Advice and training				
Awareness raising		✓	✓	
Measures to increase knowledge for improved decision-making	✓	✓	✓	
Certification schemes				
Zoning				
Specific action plans/programmes	✓	✓	✓	
Land use planning				
Technical standards				
Specific projects related to agriculture				
Environmental permitting and licensing				

Table 12.1: *Types of WFD measures addressing agricultural pressures, as described in the PoM*
Source*: RBMPs*

Some information is provided on the **scope of application** of the measures. The basic measures are applied at national level. The supplementary measures related to agriculture are expressed in units (number, ha, km, etc.).

No **timeline** is provided in the RBMPs on when the agricultural measures will be implemented. The basic measures are already implemented via national legislation. For the other measures no timing is given for implementation.

In the RBMP it is mentioned that the **payment of costs** for water management is based on the principles 'the user pays' and 'the polluter pays'. For the different water services the cost

recovery applied is explained in the RBMPs (e.g. via levies, tariffs). However, there is no detailed explanation on how this is applied (e.g. how the value of levies is set). Moreover the PoM does not include any information regarding the support from the Rural Development Programme.

12.3 Measures related to hydromorphology

The additional measures related to hydromorphology that are described in the RBMPs are in general **linked to a specific pressure**. However, there is no clear link between the pressure and the use.

The hydromorphological measures are taken mainly for the following hydromorphological pressures: channelisation/normalisation of the watercourses, loss of riparian zones and floodable areas, bank reinforcement, culverts, breakwaters and covered water bodies and barriers (see table below).

Measures	NLEM	NLMS	NLRN	NLSC
Fish ladders	✓	✓	✓	✓
Bypass channels		✓	✓	
Habitat restoration, building spawning and breeding areas	✓	✓	✓	✓
Sediment/debris management				
Removal of structures: weirs, barriers, bank reinforcement	✓	✓	✓	✓
Reconnection of meander bends or side arms				
Lowering of river banks				
Restoration of bank structure	✓	✓	✓	✓
Setting minimum ecological flow requirements				
Operational modifications for hydropeaking				
Inundation of flood plains				
Construction of retention basins				
Reduction or modification of dredging				
Restoration of degraded bed structure				
Remeandering of formerly straightened water courses	✓	✓	✓	✓

Table 12.2: *Types of WFD measures addressing hydromorphological pressures, as described in the PoM*
Source*: RBMPs*

A **cost effectiveness analyses** has been undertaken in the PoM, which concludes that the proposed measures on hydromorphology will contribute significantly to achieving the ecological targets. It is also stated that the present policy already contributes to the realisation of the goals. An estimation of the effects of the total programme of measures on the ecological status was made by the water managers. This is only represented for the main ecological groups and for parameters relevant for eutrophication (% achievement of goal vs. % of non-achievement of goal). No specific effects per measure have been described.

It is not clear whether hydromorphological measures have been envisaged in **HMWBs** in the different RBDs. The measures are described in general (e.g. 64 km of water bodies will be widened or remeandered). The exact locations of where these measures will be implemented

have not been provided. Although it is unclear whether the hydromorphological measures will be implemented for HMWBs, it is likely that the sub-basin plans provide more details on this issue.

The **'ecologically based flow regime' is** mentioned in the *'Referenties voor maatlatten' (Stowa 2007)*. It is stated that the parameters on water depth and velocity are a part of the hydrological parameters and that they play a (minimal) role in the ecological status assessment.

Furthermore, the possible negative effects of water abstraction are considered to be limited to periods of **extreme drought**. The possible effects on ecological functioning are therefore only temporary, and hence considered as non-significant. Only general measures on water abstraction are proposed (for example licence system) but no specific measures on 'ecologically based flow regime' have been included in the PoM.

12.4 Measures related to groundwater

Groundwater **over-exploitation** is not considered a problematic issue in the Netherlands. There had been some problems related to over-abstraction in the past, but basic measures have been already in place for a long time to diminish this pressure. Now groundwater abstractions are at a sustainable level and are not deemed to represent a significant pressure. **Artificial recharge** however is mentioned as an important pressure on groundwater bodies.

Both basic and supplementary measures have been established to tackle groundwater over-exploitation. The **basic measures** include licensing of larger abstractions, taxes on ground water abstractions and licensing of direct infiltration. The **supplementary measures** are only applied in those Nature 2000 areas which encounter drought problems. These measures are described in the plans (Annex P of the RBMPs).

Several measures have been implemented to improve the **chemical status** of the groundwater bodies. Most of these measures are basic measures in compliance with the relevant community legislation for this topic (IPPC directive, Seveso directive, etc.). The following measures have been implemented via **national legislation**: obligation for permits for discharge of water in groundwater, sanitation of soil and groundwater pollution, obligation of a permit for infiltration in the soil, obligation of permits for mining. However it is unclear for most measures whether they only limit inputs or actually prevent inputs.

Tables are provided showing that **quality standards are exceeded** at several monitoring points in the four RBDs. However the measures described are not geographically indicated so it is not clear whether the measures are taken specifically in those parts of the groundwater bodies were quality standards have been exceeded.

For all of the RBDs, an **International RBMP** has been drafted in coordination with the neighbouring countries. For Scheldt, Rhine and Meuse the International RBMPs specifically mention some measures related to groundwater, but these are not described in detail.

12.5 Measures related to chemical pollution

The RBMPs do not present an exhaustive **inventory of the sources of chemical pollution**, but rather include information on chemical pollution in several different tables. There is information on the amount of some pollutants entering the surface waters annually via the

effluent from wastewater treatment installations, industry and diffuse sources. However, it is unclear whether this information is complete and it is quite difficult to get a clear overview.

Most of the measures described in the PoMs are **basic measures** that are applied at national level. Most of these measures are indeed implementing other relevant Community legislation (UWWT directive, IPPC directive, etc.), and national measures such as regulation on point discharges (prohibition, need of permissions, etc.). **Supplementary measures** have only been described for households (see table below).

Groundwater measures	NLEM	NLMS	NLRN	NLSC
Improving and adapting the purification of waste water treatment plants	x	x	x	x
Deal with sewerage overflows	x	x	x	
Removal of non-purified discharges.		x	x	
Removal of non purified outlets of waste water	x	x	x	x
Modification of leak sewage pipes	x	x	x	x

Table 12.3: *Overview of the measures on groundwater implemented in the Dutch river basins*
Source*: RBMPs*

Only **basic substance specific measures** are described in the RBMPs. These measures are described very generally (e.g. stricter norms of use of nitrates). There is however no information on **supplementary measures** for specific chemical substances.

12.6 Measures related to Article 9 (water pricing policies)

The Dutch RBMPs have a chapter describing the economic analysis of water use. This contains a sub chapter on cost recovery of water services.

The Netherlands have distinguished five water services and cost recovery rates are calculated for all of them. These water services are production and supply of water including self-service (100% cost recovery), collecting and discharging of rain and wastewater (95% cost recovery), wastewater treatment (100% cost recovery), groundwater management (95% cost recovery), and regional water management (dike management, water quantity management, water quality management) (100% cost recovery). It can be assumed that these 5 water services cover the water services definition of WFD.

Water uses are not defined for the Article 9 purposes. In the definition of water services the water uses are suggested. These water uses include for example households, industry and agriculture. No information is given on contribution of water uses to cost recovery of water services.

In the cost recovery calculations the following costs have been included: financial costs, including investment, operating and maintenance costs, costs for research and implementation of groundwater measures (e.g. measures to counter dry-up).

Subsidies and cross-subsidies have been included into the cost recovery calculations. How they are handled is different per water service:

- For production and supply of water there are no significant cross-subsidies.

- For collecting and discharging of rain- and wastewater cross-subsidies are decreased since almost all communities have adopted a discharge levy. The reorganisation of the sewage system is often combined with the redevelopment of streets and urban renovation, most of the time this budget is not separated. Constructing new buildings implies construction costs of sewers that are paid by the home-owner.
- Wastewater Treatment has no significant cross-subsidies (less than 2%).
- For groundwater management part of the costs are appliance costs, funded with general assets, so this implies a limited subsidy.
- Regional water management has no significant cross-subsidies (district water boards receive less than 2% subsidies to do traditional tasks).

Environmental and resource costs have also been considered in calculating the cost recovery levels. The Netherlands have chosen a pragmatic approach, the costs of current mitigation measures are a measure of current environmental costs. It is assumed that these measures compensate the negative effects on the environment and help reach a good status.

The RMBPs do not describe precisely, by type of water use, the way water-pricing policy provides adequate incentives for users to make efficient use of water resources. However it is mentioned that financing of water management in the Netherlands is based on the "the polluter pays principle" and "the user pays principle", and price incentives are used to stimulate efficient water use. The following instruments through which costs are recovered are mentioned (in general): volumetric charging, polluting levy, discharging levy, groundwater levy, groundwater taxation and other. The above mentioned instruments prove that incentive pricing policy is addressed in the Netherlands.

There has been a national coordination in the application of Article 9 for all Dutch river basins (defining the five water services, cost recovery, adequate contributions, and adequate incentives for efficient water use).

The topic of the application of Article 9 has been discussed internationally for the different basins but it is unclear how this international cooperation was executed (which topics have been covered, etc.).

12.7 Additional measures in protected areas

The Dutch RBMPs do not clearly identify the protected areas needing additional measures and no information is provided on the type and magnitude of the additional measures. The protected areas are indicated on maps. Only basic measures for protected areas according to community legislation and national legislation are described.

Only in the case of Natura 2000 areas, is there an indication of those areas that suffer droughts, and where additional measures will be taken in the RBMPs. The measures are detailed in the plans (Annex P of the RBMPs).

Groundwater protection zones have been established nationally in order to protect **drinking water abstraction areas**. In addition to these areas, other measures have been adopted specifically to safeguard the drinking water, such as diminishing nutrient emissions from agriculture. These measures are described very generally in the RBMPs and no details on their implementation have been provided.

13. CLIMATE CHANGE ADAPTATION, WATER SCARCITY AND DROUGHTS AND FLOOD RISK MANAGEMENT

13.1 Water Scarcity and Droughts

Water scarcity and drought are not relevant in all of the four Dutch river basins. They are not mentioned as significant pressures. The RMBPs mention that in times of exceptional droughts a shortage of water may arise. Measures have been defined to handle that if it happens (list of priority sectors that can still use water in periods of droughts, others can use less or no water at all or a ban on use of groundwater in dry periods). No other reasons are mentioned. Over exploitation is not mentioned as a source of pressure (water abstractions are not judged as important pressures). In some groundwater bodies the desiccation caused by over abstraction in the past is tackled by artificial infiltration.

The RMBPs give an overview of the amount of water abstracted currently per groundwater body. The current abstractions are far less than the supply.

Information on water demand and water availability trend scenarios for the future is provided in the framework of the Delta Programme.

The following measures are defined in the PoMs that relate to water scarcity and droughts: reduction / management of groundwater abstraction (e.g. by controls, registers), adoption of binding performance criteria for new buildings and for public and private networks, measures to enhance water metering, modification of the water pricing system to foster a more efficient use of water, training, education and capacity-building in water saving, studies, research and pilot projects to solve water scarcity problems and improve the response to droughts, application of water saving measures in industry as a prerequisite to get a licence, and drawing up of a priority list for the division of water in times of drought.

In all the IRBMPs some international coordination is described on this topic (what to do in long periods of droughts, sustainable management, water abstraction and damming in general). But none of the IRBMPs describe specific measures to tackle problems of water scarcity and drought. This is understandable since the low relevance of these problems in this part of Europe.

13.2 Flood Risk Management

Floods are an important issue in a low lying country like the Netherlands. Floods and flood risk management are not discussed in the RBMPs as a separate topic or in a separate chapter. It does however appear in several of the topics covered by the RBMP.

Flood protection is indicated as one of the uses for which water bodies are being designated as HMWBs. Protection measures against floods are mentioned to be a pressure on water quality (the level of significance depends on the basin, important to moderate).

Extreme floods are mentioned to be a cause of temporary deterioration of the status of water bodies (Article 4(6) justification). Flood protection measures are also indicated to be a reason for not reaching good ecological status or potential (Article 4(7) justification).

Some measures that are included in the PoM also have a positive effect on flood mitigation or reduce the flood risk but are not defined for this purpose (e.g. water retention measures on small water bodies, widening of water bodies, reconnection with the natural floodplains, etc.) No specific flood protection measures are mentioned.

In the RBMPs it is mentioned that the next RBMPs (2015-2021) will have to be attuned to the Flood Risk Management Plans (FRMPs) that have to be drafted in the framework of the flood risk directive. In the FRMPs all aspects of flood risk management have to be considered, but taking into account the environmental objectives of the WFD. No information is provided on what form this future coordination will take.

13.3 Adaptation to Climate Change

The RBMPs contain a separate chapter on climate change. In this chapter climate change scenarios focusing on change in temperature and precipitation are discussed, the impacts on water status due to climate change, and the impact on other pressures. It is emphasised that, although there are a lot of uncertainties, it is possible to take 'no regret measures' that will have a positive effect anyway. It is specifically mentioned that salinisation is expected to get worse due to climate change. The Netherlands, as a low delta-country is considered to be extra sensitive to this.

For the second RBMPs cycle, the effects of climate change will be further developed. This applies for instance to the focus of the monitoring program on climate change, updating the climate scenarios and the visualisation of knowledge gaps.

A climate check has been carried out for the Dutch PoMs. The methodology is not described in the RBMPs. A reference is made to a background document where this is described more in detail (*Check op klimaatrobuustheid van de maatregelen van de Stroomgebiedbeheerplannen* (2009-2015)). Only general conclusions from this climate check are mentioned. It is not mentioned if this has influenced other points in the assessment for drafting the PoMs.

The RMBPs do not mention specific climate change adaptation measures. It is only mentioned that most measures stay efficient when screened in the climate check and that some measures also create a win - win situation, meaning that not only they help reach the target for which they have been defined but that they also help reduce the negative effects of climate change.

14. RECOMMENDATIONS

Following the steps of river basin planning as set out in the WFD should ensure that water management is based on a better understanding of the main risks and pressures in a river basin and as a result, interventions are cost effective and ensure the long term sustainable supply of water for people, business and nature.

To deliver successful water management requires linking these different steps. Information on **pressures** and risks should feed into the development of **monitoring programmes**, information from the monitoring programmes and the **economic analysis** should lead to the identification of **cost effective programmes of measures** and justifications for exemptions. **Transparency** on this whole process within a clear governance structure will encourage **public participation** in both the development and delivery of necessary measures to deliver sustainable water management.

- To complete the 1st river basin management cycle, and in preparing for the second cycle of the WFD, the following recommendations can be made:

- The division of competences between the different authorities results in a complex system with different levels involved in the implementation of the WFD. Furthermore, the background documents with many important details are not easily accessible, and the relevant information, including on pressures, methodologies and measures, may be spread in several plans (national, regional, local). Improved transparency and communication of the coordination mechanisms between competent authorities would be advisable. In addition, easy access to all relevant documents will encourage public participation in both the development and delivery of necessary measures to ensure sustainable water management.
- The Netherlands has made significant effort in the development of assessment methods for hydromorphological quality elements, as well as to develop methods for the establishment of good ecological potential in HMWBs. However, very little improvement of the water status is expected by 2015 and the objectives for subsequent plans are not clear. Objectives should be clearly indicated in order to be able to reach good status of waters in a reasonable timeframe.
- The designation of HMWBs should comply with all the requirements of Article 4(3). The assessment of 'significant adverse effects' on their use or the environment and the lack of 'significantly better environmental options' should be specifically mentioned in the RBMPs.
- A large number of exemptions have been applied in this first cycle of RBMPs. While the WFD does provide for exemptions, specific criteria must be fulfilled for their use to be justified. The application of exemptions needs to be more transparent and the reasons for the exemptions should be clearly justified in the plans, in particular for those based on technical infeasibility and disproportionate costs.
- The high number of exemptions applied in these first RBMPs is a cause for concern. The Netherlands should take all necessary measures to bring down the number of exemptions for the next cycle, including the needed improvements in the characterisation process, monitoring networks and status assessment methods, as well as reducing significantly the degree of uncertainty.
- It is unclear whether there are other new physical modifications planned besides those reported in the RBMPs. If this is the case, the use of exemptions under Article 4(7) should be based on a thorough assessment of all the steps as requested by the WFD, in particular an assessment on whether the project is of overriding public interest and whether the benefits to society outweigh the environmental degradation, and the absence of alternatives that would be a better environmental option. Furthermore, these projects may only be carried out when all possible measures are taken to mitigate the adverse impact on the status of the water. All conditions for the application of Article 4(7) in individual projects must be included and justified in the RBMPs as early in the project planning as possible.
- The identification of river basin specific pollutants needs to be more transparent, with clear information on how pollutants were selected, how and where they were monitored, where there are exceedances and how such exceedances have been taken into account in the assessment of ecological status. It is important that there is an ambitious approach to combatting chemical pollution and that adequate measures are put in place.

- The Netherlands should develop the necessary monitoring for priority substances in a non-water matrix (such as biota or sediments). In particular, mercury, hexachlorobenzene and hexachlorobutadiene should be monitored in biota for comparison with the biota standards in the EQSD, unless water EQS providing an equivalent level of protection are derived. It should be clear from the plans which priority substances are preventing the attainment of good chemical status. The requirement for trend monitoring of priority substances in sediment or biota as specified for several substances in EQSD Article 3(3) will need to be reflected in the next RBMPs.
- The PoM should contain all the relevant measures to be applied in the RBD. Many of these measures are only described in the sub-basin plans, which results in a quite general PoM in the RBMPs and in a lack of specificity concerning the measures to be implemented. The RBMPs will benefit from more detail on how the implementation of the PoM will lead to the achievement of objectives under Article 4. This will require more information on scope of measures, financing, timescales, etc. In addition, budgetary cuts decided after the adoption of the plan have cast serious doubts on the implementation of the planned measures. Adequate financing for the PoM should be provided to make it possible to achieve the objectives of the adopted RBMPs.
- Agriculture is indicated as exerting a significant pressure on the water resource in the Netherlands. This should be translated into a clear strategy that defines the basic and mandatory measures that all farmers should adhere to and the additional supplementary measures that can be financed. This should be developed with the farmers' community to ensure technical feasibility and acceptance. The baseline for water protection in the agriculture sector needs to be very clear so that all farmers know the rules, and the authorities in charge of the CAP funds can adequately set up Rural Development programmes and cross compliance water requirements.
- The cost-recovery should address a broad range of water services, including impoundments, abstraction, storage, treatment and distribution of surface waters, and collection, treatment and discharge of waste water, also when they are 'self-services', for instance self-abstraction for agriculture. The cost recovery should be transparently presented for all relevant user sectors, and environment and resource costs shall be included in the costs recovered. Information should also be provided on the incentive function of water pricing for all water services, with the aim of ensuring the efficient use of water. Information on how the polluter pays principle has been taken into account should be provided in the RBMPs.
- The issue of adaptation to climate change is very relevant in the Netherlands. It will be advisable that the next Dutch RBMPs integrate the dimension of climate change into the development and implementation of the measures, including in meter allocation systems.