ANNEX 2

Information on the Monitoring Programmes of the Member States

PRELIMINARY REMARKS

This Annex provides a summary of the information provided by each Member State on the establishment of monitoring programmes for surface waters and groundwater in accordance with Article 8 and Annex V WFD. These Member State Annexes follow the same outline. The information below explains the approach taken.

GENERAL COMMENTS

Throughout the Annex, a dash '-' in a table means 'not applicable' or 'not relevant'.

The following acronyms have been used in the tables:

Surv: surveillance monitoring

Op: operational monitoring

Quant: quantitative monitoring

INFORMATION SUPPLIED

This section gives information on the kind of report provided by the Member State (electronic or paper report), if it was provided in the agreed format, and whether any additional information (reports, links to reports or general web pages) were given. In case reports were uploaded in the Central Data Repository (CDR) or direct links to documents were provided, these were taken into account in the assessment, but in case only general web pages, e.g. on the implementation of the WFD were given, these were not searched exhaustively.

FACTS AND FIGURES

This section presents 1) a list of the river basin districts and the number of water bodies, 2) the number of surveillance and operational monitoring stations, as well as the number for quantitative monitoring of groundwater, 3) the number of monitoring stations in protected areas reported under the WFD, and 4) maps showing the locations of surface water and groundwater monitoring stations.

The numbers of the *water bodies* were initially taken from the 2005 reports on Article 5 WFD and were then consulted with the Member States in January 2009. The updated number of water bodies was integrated in the calculation of the indicators that are presented in this report.

The numbers of *monitoring stations* reported under Article 8 WFD were also consulted with the Member States and some of them reported changes. Therefore, the numbers of monitoring stations given in the table in the Annex may not correspond with the information reported in WISE which is the one used for the calculation of indicators. Therefore, there may be some (minor) differences in the numbers provided in tables and figures of the main report and those in the Annex.

The numbers of monitoring stations in *protected areas* shown in the Annex are only those that were reported under the Water Framework Directive. The reporting of monitoring of protected areas under the Water Framework Directive was requested only if the information was not reported under other directives. The Bathing Directive 76/160/EEC and the Nitrates Directive 91/676/EEC both require reporting on monitoring stations. In addition, Directive 91/692/EEC on Standardised Reporting includes the reporting of monitoring stations for the Shellfish Directive (79/923/EEC codified by 2006/113/EC) and Fish Directive (78/659/EEC codified by 2006/44/EC).

The Habitats Directive 92/43/EEC and the Birds Directive 79/409/EEC do not include obligations concerning the reporting of monitoring stations in water. Similarly, the Drinking Water Directive 98/83/EC only requires monitoring at the tap, but no monitoring of surface water or groundwater.

If a Member State has established and applies action programmes in the whole of its territory, then, in accordance to Article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones. If a Member State applies more stringent waste water treatment in the whole of its territory, then, in accordance to Article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas. In those cases it is not relevant to talk about monitoring in protected areas as there is no obligation to designate specific zones.

For these reasons the numbers on monitoring stations of protected areas given in the Annex may not be identical with those reported under other Directives. In the respective table, a dash ("–") means "not applicable". No information (empty cell) means "no information has been reported under the WFD".

SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

The analysis has relied on the information reported into WISE and any other report provided as referenced in the "Information supplied" section. General statements about the criteria used for the design of the monitoring programmes have not been thoroughly checked, in part because the lack of supporting information that would be necessary to make an in-depth analysis. In particular, the WFD Article 5 pressure and impact analysis was carried out in 2004 and reported to the Commission in 2005. This analysis is one of the main elements that drive the design of the monitoring programmes. Many Member States have, since 2005, updated the analysis and this information will be reported to the Commission in March 2010 together with the river basin management plans. In 2010 also the status information will be reported, which is the main result the monitoring programmes have to deliver. It is only then that the Commission will have the whole picture and will be able to make a more in-depth analysis (see **Figure 3** 'General approach to compliance checking' in the main report).

Development of Biological Assessment Methods

The assessment presented here is based on the information reported under Article 8 WFD. This may not reflect the actual status of development of the methods in case the Member States have not reported complete information. In order to complement the information presented in this section, a note has been added to the table in those cases where the methods are not yet fully developed or where the information was incomplete, i.e. the cells are not green. The note provides a short overview of the results of the intercalibration exercise for the relevant country (Commission Decision 2008/915/EC). The cases in which the national

assessment systems for particular quality elements have been intercalibrated but they appear "under development" or "not developed" in the table may likely be due to an incomplete reporting.

A number of charts are provided presenting the number of stations in which the various quality elements are monitored. These charts are based on all types of stations (i.e. surveillance and operational). The legend of the charts is the following:

Phyto-p:	phytoplankton
Macro-p and phyto-b:	Macrophytes and phytobenthos
Benthic inv:	Benthic invertebrates
River cont:	river continuity
Morph conds:	morphological conditions
Gen para:	general physico-chemical conditions
Priority Subs:	priority substances
Non-priority poll:	non-priority pollutants
Other poll:	other pollutants
Macro-a and angio:	Macroalgae and angisperms
Hydromorph:	Hydromorphological parameters in general

GROUNDWATER MONITORING PROGRAMMES

The same comments apply as for the surface water assessment. Statements about the criteria used in the design of the network have not been thoroughly checked.

FURTHER INFORMATION

The weblinks provided in WISE to further information are given in this section.

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

A brief summary of strengths and weaknesses found is given in this section.

TABLE OF CONTENTS

Member State	Page
Austria	
Belgium	
Bulgaria	
Cyprus	
Czech Republic	
Denmark	
Estonia	
Finland	
France	
Germany	
Greece	
Hungary	
Ireland	
Italy	Error! Bookmark not defined.
Latvia	Error! Bookmark not defined.
Lithuania	Error! Bookmark not defined.
Luxembourg	Error! Bookmark not defined.
Malta	Error! Bookmark not defined.
Netherlands	Error! Bookmark not defined.
Poland	Error! Bookmark not defined.
Portugal	Error! Bookmark not defined.
Romania	Error! Bookmark not defined.
Slovakia	Error! Bookmark not defined.
Slovenia	Error! Bookmark not defined.
Spain	Error! Bookmark not defined.
Sweden	Error! Bookmark not defined.
United Kingdom	Error! Bookmark not defined.

Member State: AUSTRIA

INFORMATION SUPPLIED

Austria timely provided information in WISE in the agreed format on monitoring programmes and stations for three Austrian river basin districts (Danube, Rhine and Elbe) and weblinks for additional information.

FACTS AND FIGURES

Austria has a population of 8.3 million (Eurostat, 2007) and an area of $83,851 \text{ km}^2$.

Austria is situated in three international river basins: Danube, Rhine and Elbe.

Austria has no transitional or coastal waters.



River basin districts and number of water bodies

River Basin District	Surface (km ²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Danube	80565	96	863	55	-	-	128
Rhine	2365	3	57	5	-	-	7
Elbe	921	1	20	2	-	-	1
Austria	83851	100	940	62	-	-	136

Note: the number of river water bodies shown in the table covers only those with catchments larger than 100 km². According to the communication from the Austrian authorities, there are ca. 5000 water bodies with catchments smaller than 100 km² that will be reported in the river basin management plans.

River Basin	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		ers
District	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Danube	69	451	32	1	-	-	-	-	1926	247	3050
Rhine	7	32	1	0	-	-	-	-	72	0	302
Elbe	0	14	0	0	-	-	-	-	14	0	7
Total	76	497	33	1	-	-	-	-	2012	247	3359
Total number of monitoring stations	5	50	3	33				-	20	12	3359

Number of surveillance, operational and quantitative monitoring stations

Notes:

the river monitoring stations shown in the table are located in water bodies with catchments larger than 100 km². According
to the communication from the Austrian authorities, monitoring of smaller water bodies will add around 1500 additional
operational monitoring stations (to be reported in the river basin management plans).

- total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

Pivor Basin		Surface water											
District	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water					
Danube	32	100	44	127	-	-	-						
Rhine	1	3	5	22	-	-	-						
Elbe		2			-	-	-						
Total	33	105	49	149	-	-	-						

Number of monitoring stations in protected areas reported under the WFD

Notes:

the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. 268 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written. Austria has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5

of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones. A total of 312 surface water monitoring stations for nitrates have been reported by Austria under the nitrates Directive in 2008 (reference period 2004-2007).

- Austria applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

Location of surface water and groundwater monitoring stations



SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Austria has established surveillance, operational and investigative monitoring programmes. There are specific sub-programmes designed for the surveillance and operational monitoring of rivers and lakes.

Surveillance monitoring is carried out in the first year of the 6-year monitoring cycle. Except for the reference sites, the surveillance monitoring is repeated during the following 5 years for a selection of quality elements (e.g. priority substances are not monitored in all stations in rivers and macrophytes and fish are not monitored in lakes). The surveillance monitoring stations cover more than 90% of the country water resources. Monitoring stations in rivers are selected on the following criteria: water bodies with catchment areas larger than 1000 km², transboundary water bodies, water bodies representative of typical uses in the river basin districts and reference sites. In the case of lakes, significant water bodies larger than 1 km² are

selected which are representative of the various types present in the river basin district and of the typical range of uses. In addition, reference lakes are also monitored.

Operational monitoring covers rivers with catchments larger than 100 km^2 . Monitoring of river water bodies with catchments smaller than 100 km^2 is foreseen to start only in December 2010 and has not been reported (the description of this monitoring will be included in the river basin management plans). The Austrian authorities estimate that the operational monitoring of small river water bodies will consist of an additional 1500 stations. As regards lakes, operational monitoring covers one lake in the Danube river basin district. The selection of monitoring stations is driven by the 2004 pressure and impact analysis.

For *investigative monitoring* Austria is participating in pollution detection systems under biand multilateral water conventions. Warning and information systems for cross regional incidents have been installed which would allow following any incident.

In Austria drinking water is abstracted only from groundwater. Therefore no special monitoring for surface *drinking water protected areas* is required according to the report.

Austria is situated in three international river basins: Danube (96% of Austrian territory), Rhine (3%) and Elbe (1%). The *international coordination* of the programmes for the river basins is carried out by bi-lateral commissions and the international river commissions ICPDR (Danube), ICPR (Rhine) and ICPER (Elbe).

Austria has coordinated the monitoring programmes for the Danube with the following neighbouring countries: Germany, Czech Republic, Slovakia, Hungary and Slovenia.

Development of Biological Assessment Methods

The reports provide complete information on the methods for the assessment of biological quality elements except for phytoplankton in rivers and macroinvertebrates in lakes. The report¹ justifies the lack of method for phytoplankton in rivers on the grounds that very little autochthonous phytoplankton is produced in Austrian rivers. For large rivers (Danube, March, Thaya) the development of a method is under discussion. As regards lakes, the report states that the assessment of macroinvertebrates does not add any useful information to that collected through other quality elements.

Qualitative information is provided on the expected level of confidence.

¹ "Leitfaden zur Erhebung der biologischen Qualitätselemente – Einleitung" page 15 (http://wasser.lebensministerium.at/article/articleview/52972/1/5659/)



Summary of available biological assessment methods

Note: In the context of the WFD intercalibration exercise, Austria has intercalibrated national methods for a range of biological quality elements (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <u>http://eur-lex.europa.eu/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF).</u>

Selection of Quality Elements and Frequency of Monitoring

All quality elements are monitored in surveillance monitoring in rivers except phytoplankton. As regards lakes, all quality elements except macroinvertebrates are monitored. Priority substances are not monitored in lakes as they are not discharged.

The monitoring *frequency* of the surveillance monitoring of rivers and lakes is higher than the minimum required by the Water Framework Directive. For operational monitoring, frequencies are higher than the minimum included in the Water Framework Directive in the case of physico-chemical parameters in rivers and phytoplankton in lakes.



Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters

GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

There are programmes identified for quantitative, surveillance and operational monitoring in Austria.

The report refers to 3 sub-programmes (manual monitoring; automated monitoring and automated monitoring of springs) for *quantitative assessment* in Austria. For each programme, the report lists some general criteria for the selection of sites for quantitative assessment of groundwater such as geology, hydrogeology, the groundwater/surface water interactions, climate, land uses, etc.

The report refers to 2 sub-programmes for *surveillance monitoring* in Austria; one is an initial surveillance monitoring which will take place in 2007 and another repetitive surveillance monitoring which will be in operation between 2008 and 2012. According to the description of the methodology in the report the results from the 2004 pressure and impact analysis were taken into account in the selection of surveillance monitoring sites.

The repetitive surveillance sub-programme for groundwater is reported to addresses long term anthropogenic trends and potential increase of contaminants.

There are *operational monitoring* programmes for groundwater bodies identified at risk by the 2004 analysis, the report describes the methodology for selecting sites for the operational network. There is no site selected for operational monitoring in the Rhine and the Elbe river basin districts for the moment.

The repetitive monitoring of the surveillance monitoring and the operational monitoring start at 22/12/2007 following the results of the initial surveillance monitoring.

The report mentions that the groundwater abstraction wells are monitored according the EU drinking water Directive. The report does not provide information on the monitoring stations that are associated with *protected area for drinking water*.

The report does not explicitly mention that cross-border water bodies are included in the network, but it mentions that international coordination has taken place in the design of the monitoring network.

Selection of Quality Elements and Frequency of Monitoring

The report lists all core *parameters*: groundwater level and temperature, groundwater yield, oxygen content, pH value, conductivity, nitrate, ammonium. Other pollutants are also mentioned.

As regards *frequency* of groundwater monitoring, it is reported to be carried out every year for the first cycle with a monthly frequency for manual stations or daily in stations with automatic logger.

The initial surveillance monitoring is carried out for one year, 4 times for core parameters and twice for other pollutants. The repetitive surveillance monitoring is carried out twice every year for core parameters and once every year for other pollutants.

For operational monitoring of the Elbe and the Rhine, the monitoring frequency is not reported, because there is no operational monitoring foreseen at the moment. For the Danube the operational monitoring will be carried out every year for the first cycle.

FURTHER INFORMATION

http://wisa.lebensministerium.at/article/archive/18247 http://wasser.lebensministerium.at/article/articleview/52972/1/5659

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Clear concept for developing the monitoring programmes following WFD requirements
- + The report is clear and of very good quality
- + International coordination
- Monitoring of water bodies with catchment areas smaller than 100 km² starts only in 2010

Member State: BELGIUM

INFORMATION SUPPLIED

Belgium has reported through WISE for its four river basin districts. Information was supplied separately for the seven regional parts of the river basin districts plus an additional report on coastal waters for the Scheldt river basin district.

In Belgium, the three regions (Brussels, Flanders, and Wallonia) have responsibility for managing the surface waters and the groundwater on their territory. In addition, the Federal Government has responsibility for coastal waters (located only in the Scheldt river basin district). The Scheldt river basin district is shared between the 3 regions and the Federal Government, with Brussels covering only a very small part (only 3 water bodies). The Meuse river basin district is shared by the Flemish and the Walloon Region. The Rhine and the Seine river basin districts only cover territory in the Walloon Region. The CCIM (Coordination Committee International Environmental Policy) is the consultative body that is in charge of the necessary coordination of the implementation of the WFD between the different competent authorities in Belgium. In addition, the regions coordinate the implementation of the WFD in the context of the international conventions for the Meuse and the Scheldt rivers. The following report was submitted which also explains in more detail the administrative arrangements in Belgium:

• Monitoring Programmes for the Belgian Coastal Waters (undated)

FACTS AND FIGURES

Belgium has a population of 10.6 million (Eurostat, 2007) and an area of 30,735 km². Belgium is situated in four international river basins: Scheldt, Meuse, Rhine and Seine.



River District	Basin	Surface (km ²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitiona I water bodies	Number of coastal water bodies	Number of groundwater bodies
Scheldt								
o Flemish re	egion	11991	39	156	14	11	-	32
o Walloon re	egion	3745	12	79	-	-	-	10
o Brussels r	region	162	0.5	3	-	-	-	5
o Coastal w	aters	137	0.5	-	-	-	1	-
Meuse								
o Walloon re	egion	12255	40	257	-	-	-	21
o Flemish re	egion	1596	5	17	3	-	-	10
Rhine		769	2.5	16	-	-	-	2
Seine		80	0.3	2	-	-	-	0
Belgium		30735	100	530	17	11	1	80

River basin districts and number of water bodies

Number of surveillance, operational and quantitative monitoring stations

River Basin District	Riv	ers	La	kes	Trans wat	itional ers	Coasta	waters	Gr	oundwat	ers
	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Scheldt											
o Flemish region	58	364	8	28	14	28	-	-	32	32	32
o Walloon region	14	86	-	-	-	-	-	-	146	39	83
o Brussels region	9	5	-	-	-	-	-	-	12	10	46
o Coastal waters	-	-	-	-	-	-	4	5	-	-	-
Meuse											
o Walloon region	36	172	-	-	-	-	-	-	241	47	114
o Flemish region	6	38	2	8	-	-	-	-	10	10	10
Rhine	3	7	-	-	-	-	-	-	13	2	3
Seine	1	1	-	-	-	-	-	-	-	-	-
Total	127	673	10	36	14	28	4	5	454	140	288
Total number of monitoring stations	6	91	3	16	2	8	;	5	46	34	288

Note: total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes.

			:	Surface wate	r			Ground water
River Basin District	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Scheldt								
o Flemish region			4				-	
 Walloon region 		22		2		89	-	82
o Brussels region							-	
o coastal waters		3					-	
Meuse								
 Walloon region 		131		62		58	-	130
o Flemish region							-	
Rhine		6		2			-	9
Seine		2		1			-	
Total		161	4	67		147	-	221

Number of monitoring stations in protected areas reported under the WFD

Notes:

The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 116 and 1402 surface water monitoring stations for bathing water and nitrates respectively have been reported by Belgium under the bathing water and nitrates Directives in 2008 (figures are preliminary, quality checking on-going at the time this report is written).

- Belgium applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

Location of surface water and groundwater monitoring stations



SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

There are some differences in the reporting and in the approaches taken by the 4 regional competent authorities.

Each region has established separate sub-programmes for *surveillance* and for *operational monitoring* for their relevant water categories: the Brussels and Walloon regions each have 2 sub-programmes for rivers; the Flemish region has 2 sub-programmes for each of the three

relevant water categories - rivers, lakes and transitional waters. Sub-programmes for coastal waters have been set up at the federal level. All reports refer to the design criteria in Annex V of the WFD.

At the time of reporting, none of the regions was planning an *investigative monitoring* programme. Wallonia provided general information on the strategy for developing investigative monitoring.

Monitoring of protected areas is incorporated in sub-programmes in Wallonia and for coastal waters. In Brussels, none of the three monitoring stations are located in protected areas. Flanders did not provide any information on the Meuse river basin district, but for the Scheldt four stations were reported to be located in a drinking water protection area.

Monitoring under *other EU Directives or voluntary agreements* is only incorporated in monitoring sub-programmes in Wallonia, specifically for the Birds, the Habitats, the Nitrates, the Urban Wastewater and the Fish Water Directives. For coastal waters monitoring is linked with the monitoring programmes under OSPAR. Wallonia and Flanders reported to have included monitoring stations of EIONET-Water.

International co-ordination is reported to be taking place in all river basin districts, although the information is insufficient for the Flemish region. For coastal waters in the Scheldt river basin district international coordination takes place through the International Scheldt Commission and in the framework of the OSPAR Convention.

Development of Biological Assessment Methods

For the Walloon region, the WISE reporting does not include information on the sampling and analytical methods for any of the quality elements and the direct hyperlinks to the monitoring report do not work. A report was found in the WFD web page of the Walloon Region, though (see the section "Further information" below). In that report the methods for biological assessment are referenced. For Brussels, the report makes reference to methods developed by the Free University of Brussels but no information is provided. For the Flemish region, the methods were reported for almost all biological quality elements with the exception of the method for macroalgae in transitional waters. For the coastal waters, all biological methods are available with the exception of the methods for macroalgae and angiosperms.

The information given on *confidence and precision* is very limited.

BELGIUM

Summary of available biological assessment methods



Note: In the context of the WFD intercalibration exercise, Belgium has intercalibrated national methods for a range of biological quality elements (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at http://eurlex.europa.eu/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF).

Selection of Quality Elements and Frequency of Monitoring

The *selection of biological quality elements* used for surveillance monitoring in rivers is the same across the three regions. The selection is fairly comprehensive and covers most of the quality elements recommended in the Directive with the exception of phytoplankton, which is not monitored in the Walloon Region.

For lakes (which are only present in the Flemish part of the Scheldt river basin district), all quality elements are monitored except priority substances and other specific pollutants.

For transitional waters (which are only present in the Flemish part of the Scheldt river basin district) all quality elements are monitored, except macroalgae.

For coastal waters (which are only present in the Scheldt river basin district) the biological elements macroalgae and angiosperms are missing.

For operational monitoring, all reports indicate that there is a targeted approach in selecting the various quality elements depending on the pressures to which the water body is subject.

The *frequency* of surveillance monitoring for biological quality elements varies across the three regions. In the Flemish part the surveillance monitoring programmes will be carried out once every 6 years which is equivalent to the minimum frequency specified in the WFD. In the Walloon region and in Brussels, the monitoring frequency for biological quality elements is reported to be carried out every three years.

The frequency of operational monitoring for biological elements is the same for the Flemish and Brussels region and will be monitored every three years. In the Walloon region monitoring will be carried out the first year and the frequency will be decided subsequently depending on the results. For coastal waters, operational monitoring will be carried out once every year for the first river basin management cycle for benthic invertebrates and 12 times per year for phytoplankton.



Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters

poll

GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

In the Walloon region, there is no specific groundwater monitoring programme for the Seine river basin district due to its small size; instead, the groundwater monitoring programme is integrated in the Meuse monitoring programme. There are differences in the reporting and in the approaches taken by the relevant responsible authorities.

All 3 regions have established programmes for the *quantitative, surveillance and the operational monitoring of groundwater*. The reports are clearly focussed on operational monitoring of groundwater bodies at risk, but are less clear if they are designed to assess upward pollution trends.

Information on *additional monitoring in protected areas* for drinking water abstraction is available in Wallonia and Flanders. Wallonia also supplied the number of protected drinking water abstraction areas. There are no drinking water protection areas in Brussels.

Information on other monitoring networks linked to *other EU Directives or international obligations* is only given in the Walloon report for monitoring of transboundary groundwater bodies. In the Flemish and in the Brussels report only general comments are given.

Selection of Quality Elements and Frequency of Monitoring

For surveillance monitoring, all reports across the 3 regions indicate that the monitoring programmes are comprehensive and that *all parameters* are covered. For operational monitoring, all reports across the 3 regions indicate that although there are no specific sub-programmes addressing specific pressures, there is a targeted approach in selecting the various quality elements depending on the pressures to which the water body is subject.

The indicated *frequency* of monitoring for quantitative monitoring is once per year except in Flanders, which is not yet decided. The indicated frequency for chemical surveillance monitoring varies across the regions: once per year for the Brussels region, every three years for Wallonia and not yet decided for the Flemish region. The indicated frequency for operational monitoring is once per year in Brussels and Flemish regions and every three years in Wallonia.

FURTHER INFORMATION

- <u>http://environnement.wallonie.be/directive_eau/homepage.cfm?Menu=1</u>
 "Mise en oeuvre de l'article 8 de la directive 2000/60/CE. Monitoring des eaux de surface. Mars 2007", available at http://environnement.wallonie.be/directive_eau/homepage.cfm?Menu=1
- Federale Overheidsdienst, Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu, Directoraat-generaal Leefmilieu, Mariene milieu (undated): Monitoring Programmes for the Belgian Coastal Waters, Reporting according to Art. 8 of the Water Framework Directive (2000/60/EC) – <u>www.health.fgov.be</u>, available at <u>http://cdr.eionet.europa.eu/be/eu/wfdart8/envrjr8bw/WFDart8_BEFED.pdf</u>

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Overall good availability of methods to assess ecological status, in particular in Flanders
- Reporting is not consolidated at river basin district level but separate reports for the three regions and the Federal Administration are provided
- In Flanders the frequency of monitoring of biological quality elements is the minimum in the WFD

Member State: BULGARIA

INFORMATION SUPPLIED

Bulgaria has reported through WISE in the agreed format for its four river basin districts. Additional information has been obtained by the following sources:

- National report for the implementation of the requirements of WFD Article 8.
- Excel tables with descriptions of quality elements, sampling and analysis methodologies and standards reported in WISE.

FACTS AND FIGURES

Bulgaria has a population of 7.7 million (Eurostat, 2007) and an area of 111,071 km². Three of the four Bulgarian river basin districts are international (Danube, East Aegean and West Aegean).

Bulgaria has not designated transitional waters.



River Basin District	Surface (km²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Danube	42836	39	120	41	-	-	48
East Aegean	35230	32	245	61	-	-	48
Black Sea	21040	19	118	33	-	12	43
West Aegean	11965	11	116	16	-	-	39
Bulgaria	111071	100	599	151	-	12	178

River basin districts and number of water bodies

Number of surveillance, operational and quantitative monitoring stations

River Basin	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
District	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Danube	92	58	41	0	-	-	-	-	48	21	86
East Aegean	43	80	16	12	-	-	-	-	38	12	41
Black Sea	26	32	12	16	-	-	7	6	66	37	63
West Aegean	27	58	5	4	-	-	-	-	33	0	34
Total	188	228	74	32	-	-	7	6	185	70	224
Total number of monitoring stations	3:	52	10	03		-	1.	3	20	1	224

Note: Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

Pivor Basin	Surface waters										
District	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water			
Danube		41	3		-		147	45			
East Aegean		87	4		-		118	38			
Black Sea		73		53	3		93	68			
West Aegean		60			-	23	23	19			
Total		261	7	53	3	23	381	170			

Number of monitoring stations in protected areas reported under the WFD

Note: the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 115 surface water monitoring stations for nitrates have been reported by Bulgaria under the nitrates Directive in 2008 (reference period 2004-2007). 93 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.



Location of surface water and groundwater monitoring stations

SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

The approach for *surveillance and operational monitoring* is the same for the four river basin districts. Both surveillance and operational monitoring are divided into water category specific sub-programmes.

In general, the design the surveillance monitoring network follows the requirements of WFD Annex V section 1.3.1 – Criteria for surveillance monitoring.

Operational monitoring is based on the results from the risk assessment (performed in 2004). There is no operational monitoring for Lakes in the Danube RBD but all lakes are included in surveillance monitoring due to their categorisation as "possibly at risk" because of the complete lack of information as for the biological quality indicators.

Operational monitoring of some quality elements has been delayed until 2009. This delay is reported to be due to administrative problems in upgrading monitoring.

Investigative monitoring is reported for all the river basin districts except for the Black Sea. Information on the strategy has been provided including information on the number of occasions and sites to date.

A few surface water stations are reported to be located in *drinking water protected areas*.

In general the reports provide information whether the monitoring networks cover protected areas and monitoring under additional *legislative or voluntary agreements*. In addition, sites included in WISE-SoE network are indicated and some sites are part of the TransNational Monitoring Network under the Danube River protection convention.

Development of Biological Assessment Methods

The information on the biological assessment methods was not delivered in the WISE submission in the agreed format but in an excel sheet and in a national report on monitoring programmes provided separately. Most of the biological assessment methods for rivers and lakes are not in place yet, except the method for benthic invertebrate in rivers and the chlorophyll in lakes. The Report states that methods should be available in 2009. In coastal waters, reference is made to methods derived in the context of the Black Sea Commission without further explanation. Although assessment methods are not developed, sampling is carried out for most of the quality elements.



Summary of available biological assessment methods

<u>Note</u>: In the context of the WFD intercalibration exercise, Bulgaria has intercalibrated with Romania some metrics for phytoplankton and macroinvertebrates in coastal waters, but not fully developed national assessment systems (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at http://eur-lex.europa.eu/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF).

Selection of Quality Elements and Frequency of Monitoring

Surveillance monitoring covers all quality elements except priority substances and other specific pollutants in the Black Sea in lakes.

The selection of quality elements for the *operational monitoring* depends on the pressures to which the water body is subject.

The Report indicates that for the moment the surveillance monitoring for biological quality elements will be carried out during the first year. Further monitoring will be decided later. In general the indicated cycle of the operational monitoring for biological quality elements is once every year for the first 6 years river basin management plan cycle.

Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



GROUNDWATER

Design of Monitoring Programmes

In each of the river basin districts there are specific monitoring programmes for *chemical* surveillance monitoring, operational monitoring and quantitative monitoring. In the West

Aegean river basin district there is no operational monitoring programme because there are no groundwater bodies at risk.

In the National Report is mentioned that monitoring will start later than December 2006, in July 2007, due to some administrative delays in adapting the monitoring programme.

Information is provided on monitoring stations located in *drinking water protected areas*. The report states that the results of 2004 analysis under Article 5 of the WFD have been taken into account when designing the quantitative programme.

The National Report states that in 2 river basin districts delineation of transboundary groundwaters have been coordinated with the neighbouring country. With respect to international commitments, WISE-SoE network is mentioned.

Selection of Quality Elements and Frequency of Monitoring

All core parameters and *parameters* indicative of identified pressures have been taken into consideration for surveillance and operational monitoring (except in West Aegean river basin district, where there are no groundwater bodies at risk).

The *frequency* for the groundwater level monitoring is once per year for the first 6 years of the cycle.

The Report indicates that for the moment the surveillance monitoring is carried out the first year only.

The frequency for operational monitoring is once per year for the first 6 years of the cycle.

FURTHER INFORMATION

No hyperlinks to additional information were reported.

Information on the analytical and sampling methods is available in excel sheet format at http://cdr.eionet.europa.eu/bg/eu/wfdart8/envr9ayg

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Clear concept for establishing the monitoring programmes following WFD requirements
- The methods for the assessment of ecological status are not available or under development

Member State: CYPRUS

INFORMATION SUPPLIED

Cyprus reported through WISE in the agreed format. In addition, a summary report which contains additional information has been also uploaded in WISE.

FACTS AND FIGURES

Cyprus has a population of 0.78 million (Eurostat, 2007) and an area of 11,015 km². Cyprus comprises one River Basin District. There are no transitional waters in Cyprus.



River basin districts and number of water bodies

River Basin District	Surface (km²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Cyprus	11015	100	217	18	-	25	19
Cyprus	11015	100	217	18	-	25	19

Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Cyprus	19	12	10	1	-	-	7	1	84	69	84
Total	19	12	10	1	-	-	7	1	84	69	84
Total number of monitoring stations	31		11		-		8		153		84

Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water									
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water		
Cyprus	4	13	17	8		6		110		
Total	4	13	17	8		6		110		

Note: the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 28 surface water monitoring stations for nitrates have been reported by Cyprus under the nitrates Directive in 2008 (reference period 2004-2007). 114 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.



Location of surface water and groundwater monitoring stations

SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Cyprus has put *surveillance* and *operational monitoring* programmes in place.

The design of monitoring programmes is strongly influenced by the specific hydrological characteristics of Cyprus. According to the report, nearly 90% of river length presents non-continuous flow. For the purpose of selection of monitoring stations, water bodies with continuous flow for at least 3 months per year were chosen.

The *surveillance monitoring* network is focused on water bodies not at risk and on those needing further assessment. It includes intercalibration and reference sites, stations included in the Information Exchange Decision and in the monitoring under the Nitrates Directive. There are no natural freshwater lakes in Cyprus, only reservoirs. Surveillance monitoring covers 59% of all lake water bodies. In coastal waters, the surveillance network (7 sites in 7 water bodies) is focused on significant water bodies in size and on water bodies needing further assessment (either probably at risk or probably not at risk).

Operational monitoring is carried out in 20% of the river water bodies at risk (9 out of 46) and in the only lake and the only coastal water body identified as being at risk. According to the report, the location of monitoring points is related to significant point source and diffuse pollution sources from agriculture.

An *investigative monitoring* programme has been put in place, but is focussed on the applicability of some biological quality elements to the ecological conditions in Cyprus, rather than the purposes of investigative monitoring as laid down in the Directive (see section on development of biological assessment methods below).

The report provides some information on the monitoring of *protected areas*. The reports indicate where Water Framework Directive monitoring sites overlap with monitoring sites for other commitments.

Development of Biological Assessment Methods

The report discusses the applicability of the biological quality elements in Cyprus.

A method for macroinvertebrates has been intercalibrated but according to the report still needs further development. A research project is on-going to assess the use of macrophytes and phytobenthos in rivers in Cyprus.

The report states that the use of fish in rivers and lakes is not useful as an indicator of ecological status as there is only one native species in Cyprus. This statement is not further substantiated.

In lakes, the assessment of ecological status will be based on phytoplankton. Macrophytes do not develop in reservoirs due to the typical strong seasonal variation in water level. The report states that the usefulness of macroinvertebrates as indicators in lakes is considered low in Europe.

No information has been reported on assessment methods for coastal waters. However, according to the results of the intercalibration exercise², Cyprus has intercalibrated national methods for macroinvertebrates, phytoplankton (chlorophyll-a only) and macroalgae.



Summary of available biological assessment methods

Note: In the context of the WFD intercalibration exercise, Cyprus has intercalibrated the national assessment methods for macroinvertebrates in rivers and macroinvertebrates and macroalgae in coastal waters. In addition, Cyprus has intercalibrated parameters indicative of biomass and taxonomic composition and abundance of phytoplankton in lakes (reservoirs only) and a parameter indicative of biomass of phytoplankton in coastal waters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitorina system classifications as а result of the intercalibration exercise. available at http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L 2008:332:0020:0044:EN:PDE)

Selection of Quality Elements and Frequency of Monitoring

Surveillance monitoring in rivers covers neither aquatic flora nor fish. In lakes, the only biological quality element monitored is phytoplankton and other specific pollutants apart from priority substances are not monitored. In coastal waters all quality elements are monitored.

² See Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise (available at <u>http://eur-</u>lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF)



Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters

Biological quality elements are reported to be monitored twice a year, hydromorphological quality elements once a year in rivers and coastal waters and twelve times a year in lakes. Physicochemical quality elements are monitored four times a year in all categories, with *priority substances* twelve times a year in lakes and six times a year in coastal waters.

GROUNDWATER

Design of Monitoring Programmes

Cyprus has put in place *quantitative* and *surveillance monitoring* programmes for groundwater. Surveillance monitoring stations may also be used as *operational monitoring* sites.

The quantitative monitoring programme together with other ongoing programmes is reported to be sufficient to ensure proper assessment of impacts due to abstractions and discharges on groundwater level. Surveillance monitoring programme has taken into account the validation of 2004 pressure and impact tanalysis and the assessment of long-term trends. Ground water bodies at risk are included in the network.

Drinking water *protected areas* are monitored under the surveillance and quantitative programmes.

The report provides information on monitoring of drinking water protected areas and mentions that the networks have been designed to ensure potential integration of multipurpose monitoring, e.g. combining requirements for Nitrates Directive monitoring etc. The reference report mentions that the networks have been designed to ensure compliance with protected area objectives.

Selection of Quality Elements and Frequency of Monitoring

Core and other pollutants (listed as As, Cd, Pb, Hg, Cl, SO4, Tricloroethylene, Tetracloroethylene) are reported to be selected on basis of potential risk to groundwater under the *surveillance monitoring*.

Groundwater level monitoring will be performed 4 times a year. For surveillance monitoring, general parameters will be monitored once a year and other pollutants twice a year. For operational monitoring general parameters will be monitored twice a year.

FURTHER INFORMATION

EU-summary report Article 8. Ministry of Agriculture Natural Resources and Environment of the Republic of Cyprus. Nicosia, March 2007 <u>http://www.moa.gov.cy/moa/wdd/wdd.nsf/All/23B6C4F913B17601C22571760031DEDD?O</u> <u>penDocument</u> Also available at <u>http://cdr.eionet.europa.eu/cy/eu/wfdart8/cy001/EU-summary_Monitoring_Cyprus_v22.pdf</u>

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Clear report
- Low density of monitoring stations in coastal waters (8 stations)
- Most of the methods for the assessment of ecological status are not available or under development

Member State: CZECH REPUBLIC

INFORMATION SUPPLIED

Czech Republic submitted Article 8 reports timely through WISE in the required format for its three international river basin districts: Danube, Elbe and Oder. A weblink for additional information is also provided.

FACTS AND FIGURES

The Czech Republic has a population of 10.3 million (Eurostat, 2007) and an area of 78,867 km².

The Czech Republic is situated in three international river basins: Elbe, Danube and Oder.

The Czech Republic has no transitional or coastal waters.



River basin districts and number of water bodies

River Basin District	Surface (km²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Elbe	49933	63	600	50	-	-	97
Danube	21688	28	301	17	-	-	40
Odra	7246	9	127	8	-	-	24
Czech Republic	78867	100	1028	75	-	-	161

Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Elbe	67	528	16	41	-	-	-	-	333	333	451
Danube	32	137	6	22	-	-	-	-	104	104	156
Odra	12	170	5	13	-	-	-	-	25	25	63
Total	111	835	27	76	-	-	-	-	462	462	670
Total number of monitoring stations	885		76		-		-		462		670

Note: Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes. For groundwater all stations for chemical monitoring were reported as both surveillance and operational.

CZECH REPUBLIC

River	Surface water										
Basin District	Bathing water	Habitats / Birds	Drinking water Fish		Shellfish	Nitrates	Urban waste water	Drinking water			
Elbe					-						
Danube					-						
Odra					-						
Total					-						

Number of WFD monitoring stations in protected areas reported under WFD

Note: the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 949 surface water monitoring stations for nitrates have been reported by the Czech Republic under the nitrates Directive in 2008 (reference period 2004-2007). 188 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.



Location of surface water and groundwater monitoring stations

SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

The same design approach, methodologies and standards have been applied in all three river basin districts.

Specific monitoring programmes for operational, surveillance and investigative monitoring have been set up. These monitoring programmes are based on the WFD objectives as well as on those of the national Water Law.

Surveillance monitoring: There are two specific sub-programmes for surveillance monitoring – one for rivers and one for lakes. The summary of the monitoring programmes describes the criteria applied in the Danube, Labe and Odra river basin districts, which correspond to the WFD guidance document on monitoring. The validation of the results of the 2004 pressure and impact analysis, the assessment of long-term changes in natural conditions and the long-term changes resulting from widespread anthropogenic activity are included as objectives in the design of the surveillance monitoring network. The surveillance monitoring networks

include no reference sites. The design of the surveillance monitoring network includes those sites meeting at least one of the criteria for selection of monitoring sites required by WFD. Priority in site selection is given to sites of the existing monitoring networks.

Operational monitoring: There are two specific sub-programmes for operational monitoring – one for rivers and one for lakes. Operational monitoring is a multipurpose programme addressing the requirements of WFD, those of the Czech national Water Law and also the international commitments of the Czech Republic towards the International Commissions for the Protection of the Danube River, of the Elbe River and of the Odra River. Operational monitoring is based on the existing programmes, which have been upgraded to meet the above mentioned aims. Priority in site selection is given to sites of the existing monitoring networks.

Investigative monitoring: The framework monitoring programme in the Czech Republic includes investigative monitoring programmes. Reasons for establishing investigative monitoring are outlined as well as the goals of such monitoring, the principles of selection of monitoring sites and the list of monitoring variables (quality elements, frequencies). Investigative monitoring programmes are specific for a water body or a group of water bodies. They include assessment of impacts of accident pollution. Information on specific incidents is not included in the report. No investigative monitoring activity is in operation at present.

The report states that *protected areas* intended for drinking water abstraction are monitored, but it does not provide information on the stations used for that purpose. There is no information on monitoring of other protected areas.

International co-ordination is carried out in the context of both transboundary commissions and co-operation of the expert groups under the international protection convention for the river basin districts. The report gives information on the number of sites belonging to EIONET-water monitoring network and refers to the international river basin conventions (ICPDR, ICPE, ICPO).

Development of Biological Assessment Methods

The report contains a thorough description of methods and standards in use for the biological quality elements. There is no specific information on levels of confidence that will be expected from the methods used.

CZECH REPUBLIC

Summary of available biological assessment methods



Note: In the context of the WFD intercalibration exercise, the Czech Republic has not intercalibrated any national assessment methods or parameters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at http://eurlex.europa.eu/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF).

Selection of Quality Elements and Frequency of Monitoring

The coverage of quality elements in surveillance monitoring is comprehensive for both rivers and lakes, also including monitoring of non-mandatory quality elements (zooplankton in lakes).

Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



The *frequency* of monitoring of biological quality elements is once every 3 years both in surveillance and in operational monitoring. The number of samples per year varies from 1 to 7 depending on the quality element. Physico-chemical parameters are measured once every three years in surveillance and every year in operational monitoring. Priority substances and other specific pollutants are monitored every year.

GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Groundwater monitoring networks are undergoing an important reconstruction that will be operational only in 2008. The report submitted is based on the existing network. Specific monitoring programmes for operational, surveillance and quantitative monitoring of groundwaters have been reported. However, for chemical monitoring all stations are reported to be both surveillance and operational.

Monitoring of groundwater quantity in Czech Republic is based on an existing network.

The design of the network for *monitoring of chemical status* of groundwater takes into account the impacts of point and diffuse sources of pollution. Monitoring network covers the area of infiltration into, flow within and discharge from a groundwater body. Information on pressures, the conceptual model and the fate and behaviour of relevant pollutants were used to determine the most appropriate locations for monitoring points. Higher density of monitoring sites is set in areas with potential contamination of groundwater. Each groundwater body has to be monitored by at least one monitoring site.

The report does not provide information on monitoring stations located in *protected areas*, but explains that this is at the moment part of a separate dedicated monitoring network. The current update of the monitoring networks for groundwater will also integrate the monitoring of protected areas.

Information is provided on monitoring activities under *international conventions* (Elbe, Danube and Odra) and WISE-SoE (former EIONET-Water). There is no information related to monitoring under other EU Directives. Czech Republic has however no transboundary groundwater bodies delineated in the Czech part of the Danube, Odra and Elbe river basin districts.

Selection of Quality Elements and Frequency of Monitoring

The chemical monitoring includes all core *parameters* and other parameters indicative of identified pressures.

Groundwater level monitoring will be carried out every year, operational monitoring programmes will be carried out every second year and the surveillance monitoring programmes will be carried out every third year.

FURTHER INFORMATION

http://www.ochranavod.cz

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Clear concept for developing the monitoring programmes following WFD requirements
- + Overall the report is clear and of good quality
- + Methods for assessment of ecological status available
- Frequency of monitoring for surface waters is hardly beyond the minimum required in the WFD
- Additional monitoring of protected areas is not clear

Member State: DENMARK

INFORMATION SUPPLIED

Denmark reported through WISE for its four river basin districts in the agreed format. However, a large proportion of the text fields in the WISE report contain only a link to the following report:

- Report "NOVANA. National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environment" (2005)

FACTS AND FIGURES

Denmark has a population of 5.5 million (Eurostat, 2007) and an area of 43,321 km².

Denmark shares one river basin district with Germany.

Denmark has not designated transitional waters.



River basin districts and number of water bodies

River Basin District	Surface (km²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Jutland and Funen	32263	74	24451	1888	-	101	267
Zealand	9362	22	8043	517	-	39	103
International	1101	3	1874	36	-	-	7
Bornholm	595	1	379	18	-	1	6
Denmark	43321	100	34692	2459	-	141	383

Note: Denmark is undertaking a re-delineation of river water bodies intended to reduce the total number to ca. 5000. At the time of writing this report the process has not concluded and therefore the numbers shown in the table for rivers are the ones reported in 2005 in the context of the Article 5 report.

Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		ers
	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Jutland and Funen	547	561	163	164	-	-	22	34	544	544	87
Zealand	149	154	96	97	-	-	11	16	275	275	31
International	20	21	4	4	-	-	-	-	23	23	3
Bornholm	12	12	0	0	-	-	1	1	16	16	2
Total	728	748	263	265	-	-	34	51	858	858	123
Total number of monitoring stations	748		265		-		51		858		123

Note: Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes. In the case of Denmark almost all stations were identified as both surveillance and operational.
Number of monitoring stations in protected areas reported under the WFD

River Basin				Surface wate	r			Ground water
District	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Jutland and Funen						-	-	35
Zealand						-	-	32
International						-	-	1
Bornholm						-	-	2
Total						-	-	70

Note:

- The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. At the time of writing this report, Denmark has not submitted yet the reports due in 2008 under the bathing water and nitrates Directives.
- Denmark has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.
- Denmark applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

Location of surface water and groundwater monitoring stations



SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Monitoring programmes for all 4 river basin districts are designed in a uniform and transparent manner, although they have a highly complex structure with very many different sub-programmes dealing with different water categories, purposes and quality elements, as well as different monitoring frequencies.

The Danish monitoring programmes for lakes, rivers and coastal waters are designed to meet the requirements of both *surveillance and operational monitoring*. DEVANO 2008 is a programme under NOVANA that explicitly relates to operational monitoring in order to the establishment of status for the water bodies identified as being at risk according to the article 5 analyses. The description of the NOVANA national monitoring programme (pdf-files given as link in the Article 8 report), states that NOVANA incorporates Denmark's obligations under the Water Framework Directive regarding surveillance monitoring of groundwater and surface waters.

The programme encompasses a mix of extensive and intensive sub-programmes, the former including a less frequent monitoring in a large amount of stations and the latter a more frequent monitoring in a reduced number of stations. The intensive monitoring is designed to describe trends. It encompasses reference stations, but it is not clear from the reports how many sites are reference sites in each of the sub-programmes.

The report for Zealand river basin district describes trend stations (e.g. intensively monitored sites) are included with the aim to provide detection of trends of 1-2% per year after 15 years for rivers and after 30 years for lakes and coastal waters.

There is a strategy for *investigative monitoring* in place.

There is no surface water monitoring of *drinking water protected water*, since only groundwater is used for drinking water supply.

NOVANA is requirement-driven and includes meeting Denmark's international obligations. No information is given, however, on which stations are used for other directives/conventions than the WFD.

Development of Biological Assessment Methods

Many technical documents are available describing Danish monitoring (NOVANA). Detailed information is provided on sampling, analyses, and frequency, for all quality elements, except for phytoplankton and phytobenthos in rivers (although a method for macrophytes is available).

No information is available on the levels of confidence.

Summary of methods available



Note: In the context of the WFD intercalibration exercise, Denmark has intercalibrated the national assessment methods for macroinvertebrates in rivers and coastal waters. In addition, Denmark has intercalibrated a parameter indicative of biomass of phytoplankton in lakes and in coastal waters (chlorophyll-a) and a parameter indicative of abundance of angiosperms in coastal waters (depth limit, in the Baltic Sea) (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications result intercalibration available as а of the exercise. at http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:l 2008:332:0020:0044:EN:PDF).

Selection of Quality Elements and Frequency of Monitoring

Monitoring covers all quality elements in all water categories except phytoplankton in rivers. However, the fact that all NOVANA programmes are marked as both surveillance and operational monitoring, together with the lack of reporting of quality elements at station level, has complicated the analysis of the information and has made it difficult to know which quality elements are monitored in which type of monitoring.

Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters

Note: It is not possible to display this information due to the inconsistency of the information reported³.

Macroinvertebrates and fish are used in operational monitoring of rivers (DEVANO programmes). Also aquatic flora is monitored in the "intensive" NOVANA sub-programmes. In lakes and coastal waters, a range of quality elements are used for operational monitoring and are included in the intensive sub-programmes.

Monitoring frequency of quality elements varies but is generally every 3 or 6 years in the NOVANA extensive monitoring and every 1 or 2 years in the DEVANO or the NOVANA intensive programmes.

GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

In the reported separate documents, it is acknowledged that the monitoring is covering obligations under the WFD regarding surveillance monitoring and to meet in part the requirements for operational monitoring of ground waters. The actual article 8 reports only provide very limited information and refer to the separate linked documents for additional information. The main report was published in 2005. In the report it is recognised that further modifications are needed to fully comply with the requirements of the Water Framework and the Habitat Directives, and that this was programmed for 1 January 2007. However in the art 8 reports submitted there is no clear indication of what and if these adjustments have been made and implemented.

There are 5 sub-programmes for surveillance monitoring, subdivided into intensive and extensive monitoring for both hazardous substances and main chemicals as well as redox.

The art 8 report mentions that there will be a one off operational sub-programme carried out for 1 year for a prioritised selection of ground water bodies at risk according to the article 5 analysis.

The monitoring programme is reported to have been designed to fulfil Denmark obligations under international agreements including the directives and international conventions including on the Nitrates Directives as well as the OECD/Eurostat Joint Questionnaire. The reports do not provide specific information on additional monitoring requirements for protected areas and transboundary ground water bodies. It is not clear how the information in the report refers to monitoring of drinking water abstraction areas.

³ The data submitted for the International river basin district DK4 appears to be wrong (monitoring programmes information is taken from Zealand river basin district). In addition, the information in the stations file does not match the one in the monitoring programmes file.

Selection of Quality Elements and Frequency of Monitoring

Relevant core parameters are reported to be monitored in all river basin districts and for operational monitoring additional risk-based parameters are also reported to be monitored. One sub-programme for quantitative monitoring is reported, with monitoring to be carried out once every year in the first cycle.

Chemical surveillance and operational monitoring is reported to be carried out at least once every year for the first cycle. There are however some differences between sub-programmes and quality elements. In general for intensive surveillance programmes, pesticides are monitored once every year. Other organic pollutants are monitored only every six years and metals are monitored every three years. For extensive surveillance programme, main chemicals will be monitored every 6 years and for hazardous substances every 3 years. These can be increased depending on the concentrations measured in the period 1989 - 2005. In the extensive main chemical monitoring, if the nitrate concentration is higher than 3 mg/l, monitoring is increased from once every six years to every three years.

FURTHER INFORMATION

NOVANA, National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environment. Programme Description – Part 1. NERI Technical Report, No. 532. *Available at* <u>http://www.dmu.dk/NR/rdonlyres/0DDB35D3-31DC-42F4-BA13-</u> 2956723158CA/0/FR532_www.pdf

NOVANA, National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environments Programme Description – Part 2, NERI Technical Report, No. 537. *Available at* : <u>http://www.dmu.dk/NR/rdonlyres/5EC5E735-724E-4769-A560-</u> D53613C89536/0/FR537_www_S_H.pdf

Sampling methodology and analysis methodology ; :

NOVANA, Technical instructionson marine monitoring, Part 1-7. Peter Henriksen, Afdeling for Marin Økologi. Hanne Kaas, DHI – Institut for vand og miljø, Miljøministeriet. Danmarks Miljøundersøgelser. Link to overview : <u>http://www2.dmu.dk/1_om_dmu/2_tvaer-funk/3_fdc_mar/programgrundlag/TekAnv2004_2009/TA04_oversigt.pdf</u>

NOVANA, Monitoring in lakes, technical instructions from DMU, no. 22, 2005.

Editors: Torben L. Lauridsen, Martin Søndergaard, Jens Peder Jensen, Erik Jeppesen. Danmarks Miljøundersøgelser, Miljøministeriet. Link :

http://www2.dmu.dk/1_viden/2_Publikationer/3_tekanvisning/rapporter/TA22.pdf In addition to the documents listed below, links are provided for a large number of additional documents relating to surface and ground waters: http://www.dmu.dk/Overvaagning/NOVANA/Programbeskrivelse+del+3/baggrund http://www.dmu.dk/Overvaagning/NOVANA/Programbeskrivelse+del+3/Forpligtelser

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Most methods for assessment of ecological status available
- Additional monitoring of protected areas is not clear
- WISE reporting is incomplete, referring largely to separate documents, and provides inconsistent information

Member State: ESTONIA

INFORMATION SUPPLIED

Estonia has reported through WISE in the agreed format for its three river basin districts. The following supportive documents in Estonian were provided through WISE for each of the three river basin districts:

- Lääne-Eesti vesikond (ÜLEVAATESEIRE, JÕED)
- Ida-Eesti vesikond (ÜLEVAATESEIRE, JÕED)
- Koiva vesikond (ÜLEVAATESEIRE, JÕED)

The documents make reference to additional information for the sampling and analytical methodology as well as some information on the design of monitoring networks.

FACTS AND FIGURES

Estonia has a population of 1.3 million (Eurostat, 2007) and an area of 43,860 km².

Estonia includes two international river basins: East Estonia and Gauja.

Estonia has no transitional waters.



River basin districts and number of water bodies

River Basin District	Surface (km²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
West Estonia	23478	64	669	35	-	14	10
East Estonia	19047	34	372	37	-	2	14
Gauja	1335	2	58	7	-	-	2
Estonia	43860	100	1099	79	-	16	26

Number of surveillance, operational and quantitative monitoring stations

River Basin	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
District	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
West Estonia	108	4	35	0	-	-	47	0	189	0	118
East Estonia	108	13	54	24	-	-	8	0	191	44	137
Gauja	10	0	7	0	-	-	-	-	3	0	2
Total	226	17	96	24	-	-	55	0	383	44	257
Total number of monitoring stations	22	26	9	6	-		5	5	42	7	257

Note: Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

Number of monitoring stations in protected areas reported under WFD

River Basin				Surface water	r			Ground water
District	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
West Estonia			3				-	
East Estonia			4				-	
Gauja							-	
Total			7				-	

Note:

- The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 10 surface water monitoring stations for nitrates have been reported by Estonia under the nitrates Directive in 2008 (reference period 2004-2007). 56 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.
- Estonia applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.



Location of surface water and groundwater monitoring stations

SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Monitoring programmes are primarily structured according to water category (rivers, small lakes and coastal waters) with two separate programmes for rivers based on different quality components (hydrochemistry and biology). Almost all sub-programmes cover *both operational and surveillance monitoring* except for coastal water, for which there is no operational monitoring. The number of surveillance monitoring stations is substantially higher than the operational stations. The report is very brief and there is no information on the overall design considerations, hence it is not possible to know what the reasons are for that.

Monitoring in rivers relies largely on a yearly monitoring of physico-chemical parameters. The biological monitoring is carried out every 5 years only. Operational monitoring in rivers is carried out in a limited number of stations and it does not include biological quality

elements. In lakes there is annual monitoring of biological quality elements together with physico-chemical parameters.

No information is reported on *investigative monitoring*.

The assessment of long term changes in natural conditions and changes due to widespread anthropogenic pressures have been incorporated into the design.

No information is provided *on level of confidence and precision* expected to be achieved by the monitoring programmes.

A few monitoring sites located in *drinking water protected* areas are indicated. No further information is provided on monitoring of *protected areas*. There is neither information on monitoring sites associated with other *international commitments*, except for general references with the HELCOM Baltic Sea monitoring programme in the coastal waters section of the written report. No information on other international co-ordination was provided in the reports.

Development of Biological Assessment Methods

Information on sampling, analysis and frequency methodology is described in the additional textual reports. For most of the methods the information is very brief and it is not clear whether a national assessment method has been developed or it is just a sampling method which is available. In general, there is more detail for lakes (except for fish) and there are references to publications. For coastal waters there is a reference to the HELCOM Combine manual.

There is incomplete information *on levels of confidence and precision* with only generic statements.



Summary of available biological assessment methods

Note: In the context of the WFD intercalibration exercise, Estonia has intercalibrated the national assessment methods for phytobenthos in rivers and macrophytes in lakes. In addition, Estonia has intercalibrated a parameter indicative of biomass of phytoplankton in lakes and in coastal waters (chlorophyll-a) (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at http://eurlex.europa.eu/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF).

Selection of Quality Elements and Frequency of Monitoring

Except those for coastal waters, all sub-programmes are marked as surveillance and operational and therefore it is not possible to distinguish which quality elements are monitored under which type of monitoring.

Surveillance monitoring in rivers does not include phytoplankton. In lakes, it does not include fish, priority substances and other specific pollutants. Macroinvertebrates, priority substances and other specific pollutants are not monitored in coastal waters.

As regards monitoring frequency, in lakes phytoplankton is monitored every year and macroinvertebrates every 5 years; the monitoring frequency of other aquatic flora is not clear. In rivers biological quality elements are monitored every 5 years only.

Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

The same methodology was used in each of the three river basin districts across Estonia. There are specific monitoring programmes for two groundwater networks: a) 'hydrochemistry' covering *both surveillance and operational* monitoring and b) groundwater level monitoring. The factors taken into account in the design of the monitoring programmes are the hydro-geological conditions, pressures and impacts (such as abstraction), availability of long-term data, nitrates sensitive areas, and trans-boundary groundwater bodies. It is unclear, how the results of the 2005 analysis have been taken into account.

There is only one ground water body identified being at risk in Estonia, in the East Estonia river basin district, which is covered by *operational monitoring* programme. The operational network will be updated following the results of the surveillance monitoring.

Information on *protected areas* is limited to the number of *drinking water abstraction* areas. Nitrate sensitive areas were taken into account when designing monitoring network.

Transboundary groundwater bodies are included in the national monitoring network but no international monitoring requirements are mentioned.

Selection of Quality Elements and Frequency of Monitoring

Chemical monitoring, covering *both surveillance and operational monitoring*, mentions only general parameters (other specific parameters and other pollutants are not included).

Frequency of groundwater level is monitored monthly, every year of the 6 year cycle. General chemical parameters are measured once every year.

FURTHER INFORMATION

No further information was provided.

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + All lake water bodies are included in surveillance monitoring with annual monitoring for a number of quality elements
- The report is very brief and there is no explanation of the design considerations of the monitoring programmes. The number of surveillance monitoring stations in rivers is much higher than the operational without clear explanation.
- It is not clear if operational monitoring in rivers covers biological quality elements
- No information on monitoring of protected areas

Member State: FINLAND

INFORMATION SUPPLIED

Information was timely provided in WISE in the agreed format. The report covers Finland's eight river basin districts (7 mainland including 2 international and 1 island).

There were additional weblink and reports provided supplementing the general information included in the electronic report:

- Vesienhoitoalueen seuranta. Seurannan periaatet ja esimerkkejä seurantaohjelman laatimisen. (River basin's monitoring. Principles of monitoring and samples to design the monitoring programme.) Ympäristöministeriön Raportteja. 20/2006. (Ministry of Environment).
- *Ympäristön suranta Suomessa 2006-2008. Jorma Niemi (toim)* (Environmental monitoring in Finland 2006-2008. Jorma Niemi (editor)).
- Suomen Ympäristö 24/2006. Suomen Ympäristökeskus. (Finnish Environment Center publication).

FACTS AND FIGURES

Finland has a population of 5.3 million (Eurostat, 2007) and an area of $370,807 \text{ km}^2$ (including coastal waterbodies).

Finland has identified no transitional waters.



River basin districts and number of water bodies

River Basin District	Surface (km²) ¹⁾	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Kokemäenjoki- Archipelago Sea- Bothnian Sea	83357	22	243	273	-	124	1006
Oulujoki-lijoki	68084	18	96	122	-	16	551
Vuoksi	58158	16	145	472	-	-	692
Kemijoki	54850	15	58	42	-	5	314
Kymijoki-Gulf of Finland	57074	15	237	612	-	46	908
Teno-, Näätämö- and Paatsjoki (Finnish part)	25566	7	18	29	-	-	24
Tornionjoki (Finnish part)	14587	4	32	22	-	3	108
Aland islands	9131	2	-	2	-	61	5
Finland	370807	100	829	112	-	255	3608

Notes:

1. Surface area includes the coastal water bodies.

2. According to the Finnish authorities, the number of water bodies is preliminary and will be reviewed by March 2010.

River Basin District	Riv	ers	Lakes		Transi wat	itional ers	Coasta	waters	Gr	oundwate	ers
District	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Kokemäenjoki- Archipelago Sea-Bothnian Sea	17	18	11	6	-	-	27	21	23	37	29
Oulujoki-lijoki	21	10	11	2	-	-	2	3	50	5	48
Vuoksi	12	1	38	3	-	-	-	-	23	10	24
Kemijoki	5	2	2	2	-	-	1	2	20	0	16
Kymijoki-Gulf of Finland	10	9	28	2	-	-	15	15	43	32	50
Teno-, Näätämö- and Paatsjoki (Finnish part)	6	0	1	0	-	-	-	-	8	0	3
Tornionjoki (Finnish part)	2	0	1	0	-	-	0	1	13	0	10
Åland islands	-	-	0	0	-	-	11	40	0	0	1
Total	73	40	92	15	-	-	62	88	180	84	181
Total number of monitoring stations	8	9	10	04		-	1	18	25	5	181

Numbers of surveillance, operational and quantitative monitoring stations

Notes:

1. Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

2. The numbers of coastal waters monitoring stations in Aland river basin district presented in this table differ substantially from the ones reported under article 8 by Finland, which are the ones used in the indicators and tables in the rest of this report (6 surveillance stations and 6 operational). The numbers in the table above have been provided as a response to a consultation in January 2009.

Pivor Basin			:	Surface water	r			Ground water
District	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Kokemäenjoki- Archipelago Sea-Bothnian Sea	11	23	18	10		-	-	39
Oulujoki-lijoki	10	15	2	4		-	-	35
Vuoksi	10	24	4	9		-	-	15
Kemijoki		5		2		-	-	17
Kymijoki-Gulf of Finland	3	34	2	7		-	-	42
Teno-, Näätämö- and Paatsjoki (Finnish part)		3				-	-	6
Tornionjoki (Finnish part)		2				-	-	10
Åland islands	9	6	7			-	-	4
Total	43	112	33	32				168

Number of monitoring stations in protected areas reported under the WFD

Notes:

1. the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 202 surface water monitoring stations for nitrates have been reported by Finland under the Nitrates Directive in 2008 (reference period 2004-2007). 347 surface water monitoring stations were reported under the Bathing Water Directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. Finland has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.

3. Finland applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.



Location of surface water and groundwater monitoring stations

SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

The surface water monitoring programme for each river basin district has a subprogramme for each of the relevant water categories present in the river basin district. Each subprogramme is used for both *surveillance and operational monitoring* purposes except for one river basin district where no operational monitoring is reported. The report and supporting documents state that the specific WFD design criteria for surveillance and operational monitoring programmes. There is no monitoring programmes for lakes in Aland river basin districts.

The density of monitoring stations for rivers and lakes is the lowest in the EU (see Table 7 in the Commission Staff Working Document). The Finnish river basin districts show the lowest density per 1000 km² of all river basin districts in the EU. The highest densities, present in some of the most populated river basin districts in the South of the country, do not reach 1 station per 1000 km².

Five out of the eight river basin district reports give an example of where *investigative monitoring* has taken place following, for example, a pollution incident or bird/fish kill. For the other three river basin districts the report states that no investigative monitoring has been required.

The reports provide some information on monitoring of *protected areas* but the information is generally not comprehensive.

It appears that there is some *international coordination* of monitoring activities, although the details are unclear. Reference is made to participation in the WISE-SoE (formerly EIONET-water) network, indicating some sites included. Monitoring stations included in a transboundary convention are also identified.

Development of Biological Assessment Methods

Information on the sampling, analysis and standards methodology is provided. There are methods developed for most biological quality elements and a national fish index for use in rivers and lakes is said to be under development. It is stated for rivers that metrics for macrophytes will be developed.

There are no numeric indications of *levels of confidence* anticipated, but general statements are given about training and guidance, assuring data reliability.



Summary of available biological assessment methods

<u>Note</u>: In the context of the WFD intercalibration exercise, Finland has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers and macroinvertebrates in coastal waters. In addition, Finland has intercalibrated a parameter indicative of biomass of phytoplankton in lakes and in coastal waters (chlorophyll-a) (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at http://eur-lex.europa.eu/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF).

Selection of Quality Elements and Frequency of Monitoring

The fact that 18 out of 20 monitoring sub-programmes are identified as both surveillance and operational monitoring has complicated the analysis of the information as it is not clear which quality elements are monitored in which type of monitoring.

Surveillance monitoring is comprehensive in terms of quality elements except for priority substances and other specific pollutants that are monitored in rivers only.

Monitoring of hydromorphological quality elements is very limited in all water categories.

Information reported at the station level indicates that there is often a reduced set of biological quality element for operational monitoring for some river basin districts, although this is not clearly described.

There is no operational monitoring in one of the river basin districts.



Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters

Monitoring cycles presented in the report varies within the programmes between not decided and every 18 years and *frequency* between once per year to continuous monitoring. There is no general rule reported in determining the monitoring cycle. However, operational monitoring of the biological quality elements is reported to be less than the minimum frequency in the WFD for some or all of the biological quality elements in all river basin districts except one.

GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

The report indicate that there are two groundwater sub-programmes, both covering some of the selected sites, but it is not clear what the overall rationale is for the two sub-programmes in relation to the objectives of the WFD. The reference reports provide complementary information describing the selection criteria for groundwater monitoring sites.

It is unclear what selection criteria have been taken into account for *operational monitoring*. Three river basin districts do not have an operational monitoring programme. All operational monitoring programmes are also identified as surveillance.

The report for the Aland river basin district only presents one groundwater monitoring programme covering both *quantitative and surveillance monitoring*. The report does not provide information on the design or any reference report. The network includes only 1 station where only groundwater level is monitored.

Although, two of these river basin districts are *international*, there is no mention or information on any transboundary arrangements. The stations reports identify some stations as being used for drinking water abstractions and some of them take part in the WISE-SoE network.

Selection of Quality Elements and Frequency of Monitoring

All core *parameters* and other parameters are reported to be monitored under both subprogramme. It is however unclear how these parameters were selected especially regarding the operational monitoring programme.

All groundwater elements are monitored once a year, groundwater level 2 or 24 times in the two sub-programmes respectively. The *frequency* of the monitoring of general parameters and other pollutants is 2 or 4 under the two sub-programmes respectively.

FURTHER INFORMATION

http://www.ymparisto.fi/

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Overall good availability of methods for the assessment of ecological status
- Very low number and density of monitoring stations for rivers and lakes. The seven mainland Finnish river basin districts show the lowest density of all river basin districts in the EU.
- Frequency of monitoring for surface waters is in most cases just the minimum required in the WFD

Member State: FRANCE

INFORMATION SUPPLIED

France reported through WISE in the agreed format for surface water monitoring and for groundwater monitoring for its 13 river basin districts. A web link for further information was supplied.

FACTS AND FIGURES

France has a population of 63.4 million (Eurostat 2007) and an area of 642,767 km². France shares with neighbouring countries seven international river basins: Rhone, Adour Garonne, Seine, Rhine, Scheldt, Meuse and Sambre.



River Basin District	Surface (km²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Loire	156490	24	730	168	30	39	143
Rhone	120427	19	812	127	36	33	180
Adour Garonne	116475	18	732	105	12	11	105
Seine	93991	15	433	44	6	19	53
Guyane	90000	14	119	1	8	1	12
Rhine	23653	4	469	33	-	-	15
Scheldt	18738	3	119	4	4	5	16
Corsica	8713	1	63	6	4	14	9
Meuse	7787	1	139	5	-	-	11
Reunion	2512	0.4	24	3	-	13	2
Guadeloupe	1780	0.3	40	-	-	10	6
Martinique	1102	0.2	31	0	5	19	6
Sambre	1099	0.2	14	1	-	-	2
France	642767	100	3725	497	105	164	560

River basin districts and number of water bodies

Note: The Sambre is part of the Meuse international river basin district.

River Basin District	Riv	ers	Lakes		Transi wat	tional ers	Coastal	waters	Groundwaters		
District	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Loire	420	531	48	70	16	30	25	21	335	206	409
Rhone	396	572	45	48	12	17	15	8	338	348	313
Adour Garonne	310	295	52	39	11	8	7	3	308	163	369
Seine	216	524	23	45	5	7	12	10	439	301	276
Guyane	0	0	0	0	1	2	1	0	3	0	0
Rhine	80	43	17	0	-	-	-	-	145	83	69
Scheldt	42	32	4	2	2	4	4	5	50	136	68
Corsica	22	24	6	5	4	3	7	6	19	0	35
Meuse	27	9	2	0	-	-	-	-	54	20	17
Reunion	20	10	1	2	-	-	10	2	17	3	22
Guadeloupe	20	16	-	-	-	-	0	0	9	5	22
Martinique	20	8	1	0	3	0	12	6	20	16	29
Sambre	8	5	1	1	-	-	-	-	5	3	5
Total	1581	2069	200	212	54	71	93	61	1742	1284	1634
Total number of monitoring stations	28	57	3	12	8	5	1:	13	22	73	1634

Number of surveillance, operational and quantitative monitoring stations

Note: Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

Number of monitoring stations in protected areas reported under the WFD

	Surface water										
River Basin District	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water			
Loire		242	16	17	35	509	858				
Rhone								372			
Adour Garonne	11	241			7	124	142	187			
Seine	24	87		10	18	514	611	395			
Guyane								3			
Rhine		2			-	39	112	135			
Scheldt	6	8			6	63	60	106			
Corsica								18			
Meuse		1			-	12	30	55			
Reunion	2						11	15			
Guadeloupe	4										
Martinique								2			
Sambre					-			5			
Total	47	581	16	27	66	1261	1824	1293			

Note: the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 1950 surface water monitoring stations for nitrates have been reported by France under the nitrates Directive in 2008 (reference period 2004-2007). 3312 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.



Location of surface water and groundwater monitoring stations

SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

There is a national methodology for surface water monitoring which has been applied across the all river basin districts. Specific sub-programmes have been established for surveillance and the operational monitoring and for each of the relevant water categories, except for rivers and lakes in Guyane and for coastal waters in Guadeloupe, in which the programmes are not yet finalised. Investigative monitoring as well as additional monitoring programmes is foreseen for drinking water protection areas. This covers abstractions of water providing on average more than 100 m³ per day.

Surveillance monitoring is aimed at providing an assessment of the general quality status of surface waters. A network of perennial sites has been established across all river basin districts to provide a long term monitoring of the different aquatic media and to assess the impacts of natural changes (i.e. climate change) and of anthropogenic activities. This programme also contributes to the update of the 2004 analysis of impacts of human activities and to the selection of surface water bodies at risk to be part of the operational network.

Operational monitoring focuses on surface water bodies at risk and is based on a first selection of sites which will not reach the objectives in 2015. Operational monitoring will only start in January 2008⁴. The final list of quality elements to be monitored as well as the frequency of monitoring will be specified in the first river basin management plan. For most river basin districts, the number of sites to be monitored for each quality element is not reported. Therefore, it seems that the operational programmes are still under development

There is a clear explanation of how the selection of sub-sites is done and how the water bodies are grouped for monitoring.

⁴ An important part of the operational monitoring network was reported to the Commission in an update of information received in October 2008 that complemented the original report of 2007.

Investigative monitoring can be established to carry out controls on surface water bodies as soon as one of the following conditions arises: 1. in the event of a water body probably not reaching the environmental objectives and information on the causes is missing; 2. in the event of accident pollution, to determine the extent and the origin of it.

A number of river basin districts have provided information on monitoring of protected areas.

Some information on international co-ordination was provided in the Article 8 reports. Some river basin districts are involved in bi-lateral conventions (including for the Moselle and Sarre) and the International Commissions for the Protection of the Rhine, Scheldt and Meuse Rivers. For the latter two active hyperlinks were provided to further information.

Development of Biological Assessment Methods

The information provided on the development of biological assessment methods is generally the same across France with some differences in the overseas river basin districts for which the information is incomplete in some cases. The comprehensiveness of the information provided varies depending on the water categories and quality elements. There is no information provided on the *level of confidence and precision*.

For rivers, the methodologies are available for benthic invertebrates, phytobenthos and fish, but the assessment methods for macrophytes are still being developed. Phytoplankton is not monitored in rivers. For lakes, the methods are available for phytoplankton and benthic invertebrates. The assessment method for macrophytes is under development; for fish there are no methods developed. For coastal and transitional waters, the methodologies for macroalgae and angiosperms are reported to be under development. The method for fish in transitional waters is under development and the method for benthic invertebrates in coastal waters is not yet available. In addition, in the overseas reports methods for benthic fauna are missing.

Summary of available biological assessment methods



Note: In the context of the WFD intercalibration exercise, France has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers (Central, Alpine and Mediterranean geographical areas) and macroinvertebrates in North-East Atlantic coastal waters and macroalgae in Mediterranean coastal waters. In addition, France has intercalibrated a parameter indicative of biomass of phytoplankton in lakes (Central, Alpine and Mediterranean), a parameter indicative of taxonomic composition and abundance of phytoplankton in Mediterranean lakes (reservoirs only), parameters indicative of biomass of phytoplankton in coastal waters (both Mediterranean and North-East Atlantic), a parameter indicative of biomass of phytoplankton in coastal waters (both Mediterranean and North-East Atlantic), a parameter indicative of biomass of phytoplankton in coastal waters (both Mediterranean and North-East Atlantic), a parameter indicative of biomass of phytoplankton in coastal waters and a parameter indicative of taxonomic composition of phytoplankton in Mediterranean coastal waters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <a href="http://eur-lex.europa.eu/LexUriServ/LexUriS

Selection of Quality Elements and Frequency of Monitoring

The surveillance monitoring programmes in Guyane river basin district for rivers and lakes are not yet defined, neither are those for coastal waters in Guadeloupe. For the rest of river basin districts, the surveillance monitoring for rivers and lakes covers all quality elements, except phytoplankton in rivers and in the Loire river basin district, where other aquatic flora in rivers is missing. In transitional waters, other aquatic flora is not monitored in the Escaut, Loire, Seine and Martinique river basin districts. In the latter district, phytoplankton is also not measured in transitional waters.

For operational monitoring, the reports for most of the river basins indicate that the quality elements to monitor are not yet decided. However, they indicate that there will be a targeted approach in selecting the various quality elements according to existing pressures.





The *frequency* for surveillance monitoring varies depending on the water categories and the quality elements. For rivers, macroinvertebrates are measured every year, while aquatic flora and fish are monitored every second year and priority substances every 3 years. In lakes all quality elements are monitored every 6 years. Transitional waters are monitored for biological quality elements every 3 or 6 years except for fish that is monitored every second year. In coastal waters phytoplankton is monitored every year and the rest of biological quality

elements every 3 or 6 years. Priority substances in coastal and transitional waters are monitored every 6 years.

The monitoring cycle of operational monitoring is indicated to be every year for biological quality elements and priority substances in rivers, every three years for lakes and very variable (from every year to every 6 years) for transitional and coastal waters. However, as indicated above for most river basin districts there is no indication of the number of stations and therefore it appears as if the operational monitoring were under development.

GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

There is a national methodology for groundwater monitoring which has been applied across all the 13 river basin districts. The design of surveillance and quantitative monitoring networks are based on a number of perennial sites to ensure a long-term assessment. The minimum density of the networks (per km²) has been defined at the national level and depends on the type of groundwater body. In each river basin district, specific sub-programmes and networks have been established for quantitative, surveillance and operational monitoring of groundwater.

For the *quantitative monitoring*, it is reported that the pressures have influenced the density of the network.

According to the textual information in the report, *surveillance monitoring* is divided into 2 sub-programmes: one extensive programme covering a large selection of parameters and one more intensive programme covering a more limited list of parameters. This division is however not reflected in the information provided for the monitoring programmes, which indicate annual monitoring of all parameters. The density of the monitoring networks depends on the water body characteristics. It is not explicitly mentioned in the reports how the results of the 2004 pressures and impact analysis have been used in the design of the surveillance monitoring programme. There is no reference to the criteria for surveillance monitoring given in the Directive.

Operational monitoring is focused on groundwater bodies at risk and is designed to detect the impacts from existing pressures and measures. Long-term trends are not mentioned as a design criterion. Operational monitoring will only start in 2008 to ensure that the list of sites is completely based on the results of the first surveillance monitoring campaign.

Some river basin districts have not yet selected monitoring sites.

There is no information provided on additional requirements for monitoring drinking water *protected areas*.

There is no information in the reports on the specific arrangements for *international coordination* of transboundary groundwater bodies although there are seven international river basin districts in France.

Selection of Quality Elements and Frequency of monitoring

For surveillance monitoring, the reports indicate that the monitoring programmes are comprehensive and that *all parameters* are covered. For operational monitoring, the reports indicate that there is a targeted approach in selecting the various quality elements depending on the pressures to which the water body is subject. These will be selected after the first results of surveillance monitoring.

The *frequency* for quantitative monitoring is reported to be every year across all the river basin districts. The number of measurements per year varies depending on the type of groundwater body. For sedimentary groundwater bodies the monitoring is carried out at least twice a year and varies from once a month to once a day for the other types of groundwater bodies.

Chemical surveillance monitoring is carried out for all parameters once per year. The frequency varies depending on the type of groundwater body: once a year for sedimentary groundwater bodies and twice a year for the other types of groundwater bodies.

According to the information provided, only nitrates and other specific pollutants are monitored in operational monitoring at least once per year.

FURTHER INFORMATION

http://www.surveillance.eaufrance.fr/

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Quality of the report
- + Frequency of surveillance monitoring in rivers is higher than the minimum required in the WFD
- No monitoring programmes have been established for rivers and lakes in Guyane nor for coastal waters in Guadeloupe
- Operational monitoring started later than the required in the WFD and from the report still appears to be under development

Member State: GERMANY

INFORMATION SUPPLIED

Germany has reported through WISE in the agreed format for its ten river basin districts. For all river basin districts a reference was made to the main website which includes more detailed reports on the surface water and groundwater monitoring programmes.

FACTS AND FIGURES

Germany has a population of 82.3 million (Eurostat 2007) and an area of 358 622 km². Germany shares with neighbouring countries eight international river basins: Rhine, Elbe, Danube, Ems, Oder, Schlei/Trave, Eider and Meuse. All river basin districts except one (Eider) span across two or more "Länder" (federal states).



River Basin District	Surface (km²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Rhine	102809	29	2255	69	-	-	432
Elbe	97175	27	2779	434	1	5	217
Danube	56295	16	655	51	-	-	49
Weser	49000	14	1384	27	1	6	167
Ems	15008	4	500	6	2	6	40
Warnow/Peene	13645	4	473	83	-	20	38
Oder	9756	3	441	51	-	1	19
Schlei/Trave	6184	2	217	51	-	25	19
Eider	4757	1	137	16	1	11	23
Meuse	3993	1	227	1	-	-	32
Germany	358622	100	9068	789	5	74	1036

River Basin Districts and number of water bodies

GERMANY

River Basin District	Riv	ers	Lakes		Transi wat	tional ers	Coastal waters		Groundwaters		
District	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Rhine	100	1641	5	39	-	-	-	-	1776	966	1327
Elbe	42	2318	28	349	2	2	4	3	1469	1357	4083
Danube	39	92	12	6	-	-	-	-	513	54	176
Weser	43	895	2	26	2	2	4	4	1151	774	897
Ems	9	137	0	5	2	3	4	4	340	390	489
Warnow/Peene	7	65	9	74	-	-	4	34	72	86	264
Oder	4	323	6	43	-	-	1	1	97	68	853
Schlei/Trave	9	105	6	37	-	-	10	16	79	32	438
Eider	3	63	0	5	1	0	7	8	75	52	196
Meuse	4	89	0	1	-	-	-	-	110	200	237
Total	260	5728	68	585	7	7	34	70	5682	3979	8960
Total number monitoring stations	59	52	64	44	1	1	8	1	76	11	8960

Number of surveillance, operational and quantitative monitoring stations

Notes:

1. The above figures represent the monitoring stations reported through WISE. In a consultation carried out shortly before publishing this report, it was communicated that the actual operational monitoring stations in rivers in the Rhine river basin district were 3155, and the operational monitoring for rivers and lakes in the Danube were respectively 601 and 24. The smaller numbers reported in WISE were due to the grouping made for reporting purposes by the Länder of Bayern, Baden-Württemberg and Rheinland-Pfalz (see below the section Design of monitoring programmes for surface waters).

2. Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

River Basin District	Surface water									
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water		
Rhine	543	266	281	397	-	1370	1574	543		
Elbe	555	1070	205	279	2	2091	2092	74		
Danube	350	91	11	16	-		27	235		
Weser	209	210	148	105	1	973	973	395		
Ems	90	31	5	38	2	159	159	74		
Warnow/Peene	208	160	51	7		193	193	2		
Oder	70	245	29	18		345	345			
Schlei/Trave	211	58	1	6	3	151	147			
Eider	61	29		2	9	68	69			
Meuse	13	24	2	65	-	94	94	41		
Total	2310	2184	733	933	17	5444	5673	1364		

Number of monitoring stations in protected areas reported under the WFD

Note: the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 184 surface water monitoring stations for nitrates have been reported by Germany under the nitrates Directive in 2008 (reference period 2004-2007). 2310 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.



Location of surface water and groundwater monitoring stations

<u>Note</u>: In Southern Germany (Länder of Bayern, Baden-Württemberg and Rheinland-Pfalz) the surface water monitoring stations appear to be less dense, because the operational monitoring stations have been aggregated to so-called "information points" (see below the section Design of monitoring programmes for surface waters). The actual monitoring sites cannot be depicted as the coordinates of those have not been reported.

SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

The sub-programmes for *surveillance monitoring* have been established for all relevant water categories in the ten river basin districts. The programme design criteria have been summarised. The main criteria are listed, including supplementation and validation of the pressure and impact analysis, as well as status and trend analyses to assess natural and anthropogenic changes, and including the impact of programmes of measures.

The *operational monitoring* sub-programmes have been established for all relevant water categories and the design criteria summarised. The main objective is to ascertain the status of water bodies at risk on the basis of pressure-related criteria. In addition, the programmes have been designed to supplement status and trend data, to monitor specific discharges (e.g. industrial), and to inform the design of programmes of measures and their impact. The programmes are kept flexible, allowing adjustments to be made in the light of new information, e.g. changes in status (impact of control measures, local conditions, etc.).

The Länder of Bayern, Baden-Württemberg and Rheinland-Pfalz (Rhine and Danube river basin districts) have not provided information on the actual monitoring stations for operational monitoring but have grouped those into "virtual" monitoring stations called "information points". These reduced numbers of monitoring stations reported in WISE have been used for the calculation of the indicators in this report. This practice, which purpose is unclear, has altered the results of some of the indicators for Germany.

General information is provided on *investigative monitoring*. There is a brief summary of the successful establishment and operation of the 'Rhine Alarm Monitoring Programme' following the 1986 Sandoz pollution incident. The Danube river basin district report includes a link to the ICPDR (International Commission for the Protection of the Danube River) where

information on the AEWS (Accident Emergency Warning System) and an accident risk spot inventory can be found.

The reports provide information on the stations located in *drinking water protected areas*. All except the Eider and the Schlei/Trave river basin districts, which do not have any surface water abstraction for the provision of drinking water supplies, mention targeted monitoring strategies for sites where there is >100m³/d drinking water abstraction. This includes monitoring of all *priority substances* if discharged into the water, and other substances discharged in significant quantities, which could affect the water quality and which are required to be monitored under the Drinking Water Directive. These requirements are combined and incorporated into other monitoring requirements.

The design of the monitoring sub-programmes takes into account the requirements of other EU directives and international commitments where appropriate. The *international co-ordination* of the monitoring programmes is carried out by bi-lateral conventions (including for the Mosel and Saar, Wadden Sea, Bodensee, HELCOM's PLC, OECD, OSPAR's JAMP) and the International Commissions for the Protection of the Danube, Rhine and Elbe Rivers. The relevance of EU directives and international monitoring networks in relation to international river basin districts is indicated for each monitoring site, and a brief summary of the coordination through the international conventions, where relevant, is provided. Coordination in relation to other relevant international agreements is usually referred to in general terms.

Development of Biological Assessment Methods

Some reports include full details on the *biological assessment methods* and include information where methods are still under development or in the testing phase. For some of the river basin districts, though, the information is incomplete or missing.

In some reports, brief information on the *levels of confidence and precision* is included.

Summary of available biological assessment methods



Note: In the context of the WFD intercalibration exercise, Germany has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers (Alpine and Central geographical areas), macrophytes in lakes (Alpine and Central) and macroinvertebrates in coastal waters (North-East Atlantic). In addition, Germany has intercalibrated a parameter indicative of biomass and taxonomic composition and abundance of phytoplankton in lakes (Alpine), a parameter indicative of biomass of phytoplankton in lakes (Central), a parameter indicative of biomass of phytoplankton in lakes (Central), a parameter indicative of biomass of phytoplankton in coastal waters (Baltic Sea and North-East Atlantic), a parameter indicative of blooms of phytoplankton (North-East Atlantic) and a parameter indicative of abundance of angiosperms in coastal waters (depth limit, in the Baltic Sea) (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Intercalibration exercise, available at <a href="http://europa.eu/LexUriServ/LexUr

Selection of Quality Elements and Frequency of Monitoring

The *selection of quality elements* in surveillance monitoring in rivers is comprehensive, covering all quality elements. In lakes, monitoring covers all quality elements except priority substances and other specific pollutants in the river basin districts of Oder and Warnow/Peene, and other specific pollutants in the Rhine. Monitoring of phytoplankton in transitional waters is missing in the Ems, Weser and Elbe river basin districts whereas other specific pollutants are not included in the Ems and Weser. The coverage of quality elements for coastal waters is comprehensive.

The *frequency* of monitoring varies a great deal, with monitoring of many quality elements still to be decided. Where decided, the frequencies are on the whole in compliance with minimum WFD requirements or higher, with few exceptions.



Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters

GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Surveillance, operational and quantitative monitoring programmes have been established in all ten river basin districts.

The selection of sites is generally driven by hydrogeological/geological conditions, pressures (water usage, land use, and properties of potential pollutants), connections with surface waters and, where relevant (i.e. at risk) dependent terrestrial ecosystems. The sites are selected to be representative of the water bodies and to enable trend assessment.

In those water bodies that were characterised in the pressure and impact analysis as 'at risk' or 'unclear', monitoring density is increased. The programmes will be optimised according to monitoring results.

The report indicates those monitoring stations that are located in drinking water *protected areas*.

There is a reference to *international cooperation* or cooperation between "Länder" on groundwater bodies near the border.

Selection of Quality Elements and Frequency of Monitoring

All *core parameters and 'other pollutants'* are monitored, the latter are selected according to existing pressures.

The *frequency* of quantitative monitoring is mainly once per year, except in the Rhine river basin district, that reports to monitor once every 6 years, and in the Warnow/Peene, that is not yet decided. The reports indicate that the frequency may be optimised later according to results obtained.

In general, the frequency of chemical surveillance monitoring is at least once a year, except in the Weser, every 2 years, in the Rhine, Eider and Schlei/Trave, every 3 years and in the Elbe, every 6 years. Operational monitoring is carried out also at least once per year except in the Rhine, every 2 years and in the Elbe, every 4 years. The reports indicate that the frequency may vary in the future for individual water bodies and/or parameters depending on results obtained in the first years.

No information is reported on the quality elements or their monitoring frequency in the Warnow/Peene river basin district.

FURTHER INFORMATION

The main website given for all river basin districts is: <u>http://www.wasserblick.net/servlet/is/34778/</u>

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Quite comprehensive information on monitoring of protected areas
- + Overall high density of monitoring stations both for surface and groundwater
- + International coordination
- Reporting detail and quality very variable, in particular in the reporting of methods for the assessment of ecological status
- Grouping of operational monitoring stations in "information points"

Member State: GREECE

INFORMATION SUPPLIED

Greece has not reported on its monitoring programmes for surface and groundwater.

FACTS AND FIGURES

Greece has a population of 11.2 million and an area of $131,966 \text{ km}^2$.

Greece shares the following five international river basins with neighbouring countries: Western Macedonia, Thrace, Central Macedonia, Epirus and Eastern Macedonia.



River Basin District	Surface (km²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Western Macedonia (09)	13440	10	67	10	2	2	16
Thessalia (08)	13377	10	96	2	0	5	21
Eastern Sterea Ellada (07)	12341	9	84	3	1	19	25
Thrace (12)	11177	8	91	3	5	12	8
Central Macedonia (10)	10390	8	85	4	1	10	12
Western Sterea Ellada (04)	10199	8	102	12	3	7	14
Epirus (05)	10026	8	94	4	5	14	17
Aegean Islands (14)	9104	7	55	0	4	86	37
Eastern Peloponnese (03)	8477	6	62	0	0	13	21
Crete (13)	8336	6	3	3	0	21	15
Northern Peloponnese (02)	7310	6	83	3	4	18	14
Western Peloponnese (01)	7301	6	95	1	2	12	19
Eastern Macedonia (11)	7281	6	47	2	1	4	12
Attica (06)	3207	2	13	1	0	11	10
Greece	131966	100	977	48	28	234	241

River basin districts and number of water bodies

Member State: HUNGARY

INFORMATION SUPPLIED

Information was timely provided in WISE in the agreed format together with a supplementary summary report containing basic statistics and information on the monitoring programmes. A weblink to further information was also provided. The report covers the only river basin district of Hungary, the international Danube river basin district.

FACTS AND FIGURES

Hungary has a population of 10 million (Eurostat, 2007) and an area of $93,030 \text{ km}^2$.

Hungary is entirely situated within the Danube international river basin.

Hungary has no transitional or coastal waters.



River basin districts and number of water bodies

River Basin District	Surface (km²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Danube	93030	100	891	221	-	-	108
Hungary	93030	100	891	221	-	-	108

Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Danube	121	307	21	32	-	-	-	-	1742	0	1772
Total	121	307	21	32	-	-	-	-	1742	0	1772
Total number of monitoring stations	338		46		-		-		174	42	1772

Note: Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water								
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water	
Danube	30	115	13	23	-	197	27	1154	
Total	30	115	13	23	-	197	27	1154	

Note: the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 535 surface water monitoring stations for nitrates have been reported by Hungary under the nitrates Directive in 2008 (reference period 2004-2007). 256 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

Location of surface water and groundwater monitoring stations



SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Hungary has put surveillance, operational and investigative monitoring programmes in place.

Surveillance monitoring: 2 sub-programmes for surveillance monitoring are established, one for rivers and one for lakes. It takes account of the validation of the 2004 pressure and impact analysis and the assessment of long-term changes in natural conditions; the needs of the assessment of changes resulting from widespread anthropogenic activity; the full range of status criteria; the volume of water present and sites identified under the Information Exchange Decision.

Operational monitoring: 8 sub-programmes for operational monitoring are established. The assessment of water bodies at risk is a clear objective of the operational monitoring programme. The operational monitoring programme is already in place. Monitoring sites for water bodies at risk were selected to represent different impacts such as hydromorphological changes, organic pollution, nutrients and hazardous substances loads.

Investigative monitoring: The report provided information about investigative monitoring as well. No specific examples are given.

Monitoring of protected areas: The report provides complete information on the monitoring of protected areas. Drinking water protected areas are monitored based on the basis of a ministerial order.

International coordination: The report indicates that the selection of the monitoring sites was coordinated with other commitments and provides details of the monitoring networks for those commitments. WISE-SoE sites (formerly EIONET-Water) have been indicated.

Development of Biological Assessment Methods

Sufficient information is given about *methods* of sampling and monitoring methods. The report indicates that the methods of assessment of surface waters ecological status are under development especially for fish and macrozoobenthos. Sampling methods, taxonomy determination and classification methods and reliability of measurements will be determined after field experiences. Numeric information on the *level of confidence* is not available for all assessment methods.

Summary of available biological assessment methods



Selection of Quality Elements and Frequency of Monitoring

The surveillance monitoring includes all quality elements in all water categories.

The selection of quality elements for monitoring in operational monitoring is targeted to address existing pressures.

The report indicates differences in *frequencies* and cycle for different monitoring programmes. It gives detailed information for river and lake monitoring for each quality element concerning the number of sites, frequency and cycle.

Surveillance monitoring is carried out every year, between 1 and 6 samples per year, for all biological quality elements except fish, which is monitored once every 6 years. Priority substances are monitored once every 6 years.

Operational monitoring is carried out every year except for fish, which is every 3 years for rivers and every 6 years for lakes. Priority substances are monitored every year in operational monitoring.



Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters

GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Hungary have put quantitative and surveillance monitoring programmes in place. There is no operational programme established yet.

Quantitative monitoring: the 2 programmes take into account the needs of representative network that could characterize the spatial and temporal changes in the groundwater bodies. The density of the network is higher for water bodies at risk for thermal groundwater bodies.

Surveillance monitoring: 4 sub-programmes are mentioned in the report. These supplementary ones focus on some specific areas such as karstic waters, thermal waters, some hilly regions and some small creek watersheds and sources.

There is no *groundwater operational monitoring* programme established yet, it will be established based on the results of the complete survey of water bodies carried out in the surveillance monitoring.

Monitoring of protected areas: drinking water protected areas are monitored. The report provides information on monitoring of transboundary water bodies, protected areas – such as karstic regions, vulnerable alluvial areas, etc.

International coordination: surveillance monitoring programmes include the requirements of bilateral transboundary agreements that Hungary signed with neighbouring countries. The report does not identify the monitoring stations in the WISE-SoE network.

Selection of Quality Elements and Frequency of Monitoring

The report indicates that the surveillance monitoring programmes cover all core *parameters* required in WFD. Monitoring of specific pollutants is not indicated.

Groundwater level is monitored with monthly *frequency* and there is a supplementary quantitative programme for karstic area water bodies, water bodies at some hilly and mountainous areas and for some thermal waters there (4 measurements per year). In case of two surveillance monitoring programmes out of four monitoring is carried out only every second year for three parameters (conductivity, nitrate and ammonium).

FURTHER INFORMATION

http://www.euvki.hu

SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Clear report of good quality
- + Comprehensive information on monitoring of protected areas
- + Extensive groundwater surveillance monitoring
- + Frequency of monitoring well beyond the minimum required in the WFD
- Density of monitoring stations for rivers and lakes seems low (although monitored every year)
Member State: IRELAND

INFORMATION SUPPLIED

Ireland submitted the report timely in the requested format to WISE for monitoring programmes, groundwater and surface water stations and summary statistics on each of its 7 river basin districts. There is limited information in the electronic report for some aspects but two additional reports were uploaded in WISE that contain detailed information on the monitoring programmes (the first of which is accessible on the weblink provided):

- Water Framework Directive Monitoring Programme. Prepared to meet the requirements of the EU Water Framework Directive (2000/60/EC) and National Regulations implementing the Water Framework Directive (S.I. No. 722 of 2003) and National Regulations implementing the Nitrates Directive (S.I. No. 788 of 2005). Environmental Protection Agency (2006).
- Explanatory note to accompany WFD groundwater monitoring network submission (undated)

FACTS AND FIGURES

Ireland has a population of 4.3 million (Eurostat, 2007) and an area of 83,714 km².

The Republic of Ireland shares with Northern Ireland three international river basins districts: Shannon, North Western and Neagh Bann.



River Basin District	Surface (km ²)	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Shannon	19450	23	885	114	20	11	242
South Eastern	13941	17	655	11	21	9	151
Western	16952	20	951	323	68	30	105
South Western	15076	18	885	90	43	27	84
North Western	9661	12	665	227	22	24	72
Eastern	6657	8	356	28	13	8	75
Neagh Bann	1977	2	71	16	9	4	28
Ireland	83714	100	4468	809	196	113	757

River basin districts and number of water bodies

IRELAND

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Surv	Ор	Quant
Shannon	46	602	17	34	5	7	0	2	51	28	25
South Eastern	33	536	0	5	6	9	1	4	71	39	42
Western	31	423	26	38	6	12	3	4	31	15	37
South Western	30	391	7	16	3	16	3	5	33	24	8
North Western	20	262	19	42	3	4	3	3	5	1	5
Eastern	15	244	6	10	2	6	1	4	20	7	16
Neagh Bann	5	66	1	4	1	2	1	1	8	2	7
Total	180	2524	76	1 49	26	56	12	23	219	116	140
Total number of monitoring stations	2724		19	98	8	4	3	3	21	9	140

Number of surveillance, operational and quantitative monitoring stations

Note: Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water								
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water	
Shannon	4	133	49			-	23	51	
South Eastern		257	17			-	52	67	
Western	1	206	54	2	11	-	6	24	
South Western		172	30		2	-	22	30	
North Western		102	28		1	-	4	5	
Eastern	1	77	18			-	14	18	
Neagh Bann		3	6			-	9	8	
Total	6	950	202	2	14	-	130	203	

Notes:

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 385 surface water monitoring stations for nitrates have been reported by Ireland under the nitrates Directive in 2008 (reference period 2004-2007). 131 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. Ireland has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.



Location of surface water and groundwater monitoring stations

SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

There are surveillance and operational monitoring programmes established in Ireland.

The Irish surface water monitoring programme is divided into 4 subprogrammes for each river basin district, one for each water category. Each sub-programme is further subdivided into sub-networks each designed to fulfil one or more of the main objectives of *surveillance monitoring*.

The report on the WFD monitoring programmes provides a clear overview of the main design criteria.

In *operational* monitoring there are subnets of sites for assessing the effectiveness of measures to control and reduce point source, diffuse source and hydromorphological pressures and also to monitor whether high and good status water bodies could deteriorate in quality.

Investigative monitoring is planned for rivers and lakes.

There are specific subprogrammes for *protected areas*. There are sub-nets for species and habitats protected areas in all water categories. There is also additional monitoring for drinking water abstraction areas.

There is a clear attempt to integrate the monitoring networks from different Directives into a coherent framework.

International coordination: the report on EPA website describes the common work that has been done with the UK to inform the design of the network. Reference is also made to WISE-SoE and OSPAR.

Development of Biological Assessment Methods

There is information provided on the status of development of the assessment methods and metric for the biological quality elements for rivers, coastal and transitional waters. The report states that all biological quality elements for lakes are under development.

The report on the EPA website provides some information about the assessment methods in use for all water categories, some of which have been developed together with the UK. The information is spread in several chapters (2.6, 7.2.8, 8.3.9 and 9.3.1-5) and the information is not always consistent. For this reason the status of development of the methods is not clear in some cases and it is deemed to be "under development.

Morphological quality elements are reported to be under development for all water categories.

There is a full chapter on quality control and quality assurance for rivers including the use of relevant standard methods etc. There is also a chapter on level of confidence where some confidence estimates are given for some of the most used biological quality elements.



Summary of available biological assessment methods

Note: In the context of the WFD intercalibration exercise, Ireland has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers (Central and Northern geographical areas), macrophytes in lakes (Northern) and macroinvertebrates in coastal waters. In addition, Ireland has intercalibrated a parameter indicative of biomass of phytoplankton in lakes (Atlantic and Northern geographical areas), and in coastal waters parameters indicative of biomass of phytoplankton, a parameter indicative of phytoplankton blooms, a parameter indicative of macroalgae composition and a parameter indicative of angiosperms taxonomic composition and abundance (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as а result of the intercalibration exercise. available at http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF).

Selection of Quality Elements and Frequency of Monitoring

The fact that all sub-programmes reported are marked as covering both surveillance and operational monitoring and that quality elements are not declared at station level has complicated the analysis of the information reported in WISE as it is not possible to know which quality elements are monitored in which type of monitoring. Some excel sheets available in the EPA website provide more information but these have not been analysed in detail.

From the electronic reporting in WISE, it seems that the selection of quality elements is not comprehensive, but the information is not fully coherent with the report in the EPA website (this has not been thoroughly checked). According to the WISE report, the quality elements monitored in the Neagh Bann river basin district are not defined. Monitoring of fish in lakes is missing in Eastern and South Eastern river basin districts. Other specific pollutants are not monitored in lakes in Eastern river basin district. Monitoring of transitional waters does not cover all quality elements: fish and priority substances are missing in Eastern; priority substances is missing in Shannon; other specific pollutants is missing in North Western, Eastern and Shannon. In coastal waters all quality elements are monitored except phytoplankton in Shannon. Phytoplankton is not monitored in rivers in any river basin district.

According to the information in the EPA website, rivers surveillance monitoring covers all biological except phytoplankton⁵. Operational monitoring covers macroinvertebrates and fish. For lakes, there is no information about monitoring of biological quality elements other than phytoplankton in the EPA website.

The WISE report indicates that the *monitoring frequency* has not yet been decided. The information in the EPA website indicates that the biological quality elements will be monitored every three years in rivers except macroinvertebrates in seriously polluted water bodies (i.e. bad status) that will be monitored every year.

⁵ The report in the EPA website states that phytoplankton is only relevant in a few Irish rivers because of the short residence times. This quality element is said to be monitored in a few rivers.



Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters

GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

In Ireland, there is a quantitative monitoring programme, a qualitative surveillance monitoring programme, a qualitative operational monitoring programme for groundwater.

The report specifically mentions that the overall objectives of the *quantitative and surveillance monitoring programmes* are to provide information that can be used to supplement and validate the risk assessment analysis and the assessment of long-term trends both as a result of changes in natural conditions and through anthropogenic activity.

The report also clearly states that *operational monitoring* programme is focused on assessing groundwater bodies at risk, establishing the presence of any long-term anthropogenic induced upward trend in the concentration of any pollutant, supporting the design of Programme of Measures and assessing the effectiveness of such measures within groundwater bodies.

The design of the groundwater monitoring network in Ireland is based on key sub-networks; each designed to fulfil one or more of the main objectives of the groundwater monitoring programme.

The report indicates that existing groundwater monitoring locations have been reviewed to determine their suitability for WFD monitoring and where appropriate, these monitoring locations have been integrated into the WFD monitoring programmes. Where necessary, the compliance monitoring may be supplemented by additional monitoring.

It was confirmed that sampling would begin on December 22nd 2006 at all monitoring sites that currently exist, with monitoring beginning at new sites once they are installed in 2007. Ecosystem monitoring will be phased in between 2007-2009, initially focusing on the ecosystems that are known to be at risk and where groundwater is potentially contributing to the ecosystem being damaged. New monitoring points will be installed in the poorly productive aquifers.

The monitoring programme covers *protected areas* used for abstraction of drinking water. The monitoring programme also covers protected areas such as Habitats Protection Areas or groundwater dependent terrestrial ecosystems.

Monitoring is proposed in groundwater bodies that were identified as being at risk because of associated terrestrial ecosystem. Monitoring is also proposed in groundwater bodies associated with terrestrial ecosystems that are considered to be high status ecosystems. The proposed monitoring will be phased over three years its results will provide the basis for future terrestrial ecosystem monitoring.

Ecological monitoring associated with the Habitats Directive will be required in conjunction with chemical and quantitative groundwater monitoring.

The report also mentions that specific arrangements have been made for *transboundary groundwater bodies* and that monitoring programmes are being designed to coincide with monitoring in Northern Ireland, so an assessment can be made of the rate and direction of flow across Member State boundaries.

As with surface water, there is a clear concept to integrate networks coming from different obligations.