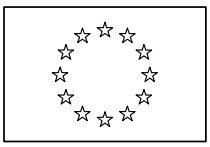

COMMISSION OF THE EUROPEAN COMMUNITIES

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IMPACT ASSESSMENT

Proposal for a Directive of the European Parliament and of the Council on environmental quality standards in the field of water policy and amending Directive 2000/60/EC

{COM(2006) 397 final}
{COM(2006) 398 final}

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1. INTRODUCTION

Surface waters are at risk from certain specific chemicals (priority substances) that could cause harm to the aquatic ecosystem (fish, plants, food chain, etc.) or affect human health through exposure to water (e.g. drinking, bathing, seafood, etc.). The Water Framework Directive (WFD)[1] requires the Commission to come forward with a strategy on pollution of surface waters.

In 2001 the European Parliament and the Council agreed the first list of priority substances[2] incorporating 33 pollutants or groups of pollutants (see Table 1 and Annex 1). As a next step, the Commission was required to come forward with environmental quality standards and emission controls for these priority substances[3]. This proposal implements this obligation with the exception of introducing additional emission controls (based largely on the findings of this impact assessment and on the consultation process undertaken). In addition, the proposal addresses the identification of priority hazardous substances (PHS). Although some PHS had already been identified,[4] for 14 substances – now called "priority substances under review"[5]- the final identification could not be made at the time and the Commission was invited to propose classification at a later stage. Finally, the proposal repeals the legislation that has regulated these problems up to now.[6]

This Impact Assessment (IA) has been prepared by the Commission Services to inform the preparation of the legislative proposal.

2. PROCEDURAL ISSUES AND CONSULTATION

The present proposal derives directly from the WFD, and in particular its Article 16, and like the WFD is based on Article 175(1) of the Treaty. The Commission started work on it in 2000 and since then has conducted extensive consultations and gathered a considerable amount of information and data. Surprisingly it discovered that some basic data on current environmental concentrations were not available and that other crucial information from risk assessments under other EU legislation, e.g. on plant protection products and existing chemicals, was available only on a piecemeal basis.

During this whole preparatory phase, several documents were produced which became the technical basis for the various parts of the proposal. Several rounds of consultation took place on each document and the final version takes account of contributions from this process. The key documents[7] are:

- a report on EQS, including the methodology used and substance-specific datasheets

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[1] Directive 2000/60/EC (OJ L 327, 22.12.2000, p. 1). For more information on the Water Framework Directive, please refer to europa.eu.int/comm/environment/water

[2] Decision 2455/2001/EC (OJ L 331, 15.12.2001, p. 1).

[3] Article 16 (6), (7) and (8) of the WFD

[4] In Decision 2455/2001/EC under Article 16 (3) of the WFD

[5] See Annex of 2455/2001/EC

[6] Under Article 16 (10), which requires a review of these existing directives

[7] All these reports are available on the EUROPA webpages of DG Environment at: http://europa.eu.int/comm/environment/water/water-dangersub/pri_substances.htm

- a concept paper on emission controls
- a report on the identification of priority hazardous substances
- a report on the conclusions of the Expert Group on the Analysis and Monitoring of Priority Substances (AMPS).

In addition, two studies[8] were commissioned by DG Environment to support the preparation of this impact assessment:

- a study report on "Assessing economic impacts of the specific control measures for priority substances and priority hazardous substances regulated under Article 16 of the Water Framework Directive" carried out by ECOLAS
- a study report on "Proposed environmental quality standards for priority substances - current compliance and potential benefits" carried out by WRc.

The consultation process is consistent with the Commission's minimum standards for consultation and the main outcomes are described in more detail in Annex 2.

3. THE PROBLEM

What is the issue?

One of the main threats to water quality is pollution resulting from inputs of chemical substances. These chemicals can be naturally occurring (such as metals) or man-made (such as pesticides). There are more than 30 000 chemicals produced and marketed in the EU (see new EU regulatory framework for the Registration, Evaluation and Authorisation of Chemicals (REACH)[9]). In addition, there are chemicals which are not produced intentionally but which are also emitted through human activities and some of these are very dangerous (e.g. dioxins or polyaromatic hydrocarbons). So the first challenge is to identify those chemicals which are of particular concern for fresh and marine waters and need to be controlled, which is hampered by the limited amount of available information.

One example of the negative impact of this chemical pollution is the occurrence of hazardous substances in rivers or lakes which are used for the abstraction of drinking water. Of course, there are many treatment technologies available and used by water suppliers to ensure that drinking water is safe for human consumption. However, treatment is expensive and is often reflected in higher water prices in those areas where pollution problems occur. Another example is the accumulation of hazardous substances in fish. The Baltic Marine Environment Report 1999-2002[10] shows that despite reductions in concentrations of cadmium in the Baltic, cadmium concentrations in herring are tending to increase. This is because heavy metals are often accumulated and concentrated along the food chain (for more examples see Box 1).

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8 Both final reports are available at http://europa.eu.int/comm/environment/water/water-dangersub/pri_substances.htm

9 See http://europa.eu.int/comm/environment/chemicals/reach.htm

10 http://www.helcom.fi/stc/files/Publications/Proceedings/bsep87.pdf

There are many international assessment reports illustrating current environmental and human health concerns about the chemical pollution of fresh and marine waters (see Annex 3).

Box 1: Examples of environmental concerns caused by priority substances

Priority substances cause many potential negative impacts, and this has been clearly demonstrated under controlled laboratory conditions. Some substances produce a short- or long-term toxic reaction in fish or other aquatic organisms. Others accumulate in the food chain and might have negative impacts at a later stage when "top predators" (e.g. humans, eagles, seals) eat food that is contaminated with these chemicals. Another effect is that precious drinking water resources may be contaminated to such an extent that treatment to provide safe drinking water becomes too expensive.

To demonstrate that these cause/effect relationships exist in the environment is more complex, but a few examples are mentioned briefly below (please refer to references listed in Annex 3 for more detail).

- **Wastewater discharges change the sex of fish:** In recent years there have been increasing scientific reports that substances with hormone-like effects or medical substances can cause changes – including sex changes - to fish downstream of discharges from treated wastewater. The consequent change in the ratio between male and female species might threaten reproduction.

- **Mussels, oysters and snails off the menu:** Tributyltin is known for its potential as a hormone-like substance. Even low concentrations can cause a phenomenon called "imposex" (development of male sex organs in females of certain species) which has been observed in the environment. Such changes could lead to reductions in or even the extinction of populations. In addition, contaminated seafood would no longer be fit for human consumption and this could lead to considerable income losses. (*Source: REACH Impact Assessment, Case Study 4: TBT*)

- **Arctic inhabitants and polar bears:** Concentrations of some persistent priority substances (e.g. HCB, HCH, SCCP, PBDE, TBT and metals) in animal tissue and food are increasing in some Arctic regions. Assessments suggest that current mercury exposures are posing a health risk to some people and animals in the Arctic. These risks include subtle neurobehavioral effects. (*Source: AMAP POPs Report 2002*)

Who and what is affected?

Water constitutes one of the key economic resources of Europe, the primary importance of which relates to the supply of drinking water and water for other domestic, industrial and agricultural purposes. In many areas, rivers, lakes, estuaries and coastal waters are attractive features of the landscape that help to promote tourism and increasingly provide outlets for recreational activities such as angling, swimming and boating. Europe's waters also support many important habitats and species. However, the increasing economic development of Europe has not only increased the dependence on water resources but also in many areas created more intensive pressures on them, in particular on the maintenance of their quality. Pollution of waters can threaten economic development, human health and the protection of

ecosystems. For example, pesticide and metal contamination of drinking water supplies has been identified as a problem in many European countries.

Chemical substances reach the aquatic environment in a variety of ways. They may be directly discharged into rivers, streams and lakes in effluent from industry or from waste water treatment plants. Or they may enter water indirectly through the use of plant protection products, biocides and fertilisers in agriculture, or through leaching from landfill sites, or as fall-out (atmospheric deposition) from pollutants initially released into the air. So in order to develop mitigation/remediation measures it is essential to systematically analyse emission sources and the pathways leading to the pollution of surface waters.

What has been achieved, what is still the problem?

This environmental problem is not new. In the early 1970s, alarming reports on the Rhine and other major European river basins documented high levels of chemical pollution causing regular fish kills. In response, the Council adopted the Directive on discharges of dangerous substances into the aquatic environment of the Community[11], which has clearly helped to reduce pollution from certain dangerous substances.

Since then, a considerable number of pieces of EU legislation have been adopted. These regulatory efforts are now beginning to show increasingly positive effects on water quality. The non-authorisation of certain pesticides under Directive 91/414/EEC is slowly reducing levels of the most dangerous plant protection products (e.g. lindane, atrazine and simazine). Similar trends are expected from decisions already taken to restrict the marketing and use of certain hazardous substances (e.g. nonylphenol or SCCP). The proposed REACH Regulation will do even more to improve the situation by reducing the environmental impact of the use of chemicals, and so will complement implementation of the IPPC Directive.

Despite the clear successes that can be demonstrated in reducing pollution from industrial point sources and public waste water treatment, there have been a number of significant implementation problems. Several Commission reports[12] assessing the experiences of Member States mention the obstacles encountered in implementing this legislation (see Box 2). From these reports, it can be concluded that the chemical pollution of surface waters is still a problem, but it has become more complex and more diverse.

Firstly, the pollutants are different from those of the 1970s and 1980s, and every year new substances are being found in aquatic ecosystem (e.g. endocrine disruptors).

Secondly, analysis and monitoring is expensive and as a result there is still a considerable knowledge gap regarding the state of the environment (see Box 3).

Thirdly, there is a serious implementation deficit, since measures agreed some time ago have still not been applied (see the above-mentioned Commission reports on 76/464/EEC).

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[11] Directive 76/464/EEC (OJ L 129, 18.05.1976, p. 23).

[12] List of reports available at http://europa.eu.int/comm/environment/water/water-framework/library.htm

Box 2: Achievements and obstacles in the implementation of Directive 76/464/EEC

In 2003 DG Environment published a study report on "Achievements and obstacles in the implementation of Council Directive 76/464/EEC on aquatic pollution control of dangerous substances (1976-2002)" carried out by WRc (available online, see footnote 7). The study showed reductions in discharges of some dangerous substances, especially heavy metals, certain pesticides (e.g. DDT and lindane), chlorinated hydrocarbons (e.g. TCM and HCB), phosphorous and ammonium, in particular for point source discharges from industry. This subsequently resulted in an improvement of water quality through a significant reduction in the concentrations of these substances in Europe's rivers and in some marine biota. The improvement in water quality led to an improvement in biological quality, as is well documented in cases such as the Rhine.

The long lists of dangerous substances and their classification into List I and List II appear to have slowed down the implementation progress of Directive 76/464/EEC. Implementation may also have been hampered by insufficient guidance on the Directive; limited exchange of information between MS, as well as between MS and the Commission; lack of clarity in the division of responsibilities between the Community and MS; and the lack of deadlines in the Directive. In addition, monitoring programmes undertaken for dangerous substances in many MS were insufficient resulting in information deficiencies. The WFD aims to address all of these issues, with key elements being clear objectives and a strategy for addressing the chemical pollution of water.

Fourthly, the effects of chemical pollution are often felt a long way from the source and a long time afterwards. In the past the focus tended to be on the acute and direct effects of individual pollutants, and negative impacts on ecosystems were clearly detectable within a short period. But as scientific understanding improves, and now that we have reduced the highest and most concentrated emissions, environmental assessments reveal a considerable number of non-acute (chronic) effects which are often detectable only over a long period. In addition, persistent and bioaccumulating substances are increasingly being found at great distances from the sources (see Box 1 and Annex 3). Moreover, assessments in the past focused mainly on single substances. We are only just beginning to understand the interactions of "chemical cocktails".

Finally, past efforts at pollution reduction focused on the "easy" point sources. Major investment in wastewater treatment often reduced emissions by 50 to 80 % (see for example the OSPAR Quality Status Report 2000[13]). However, this does not seem to be happening in the new Member States, which are only just starting to implement EU pollution reduction legislation. Consequently, the pollution loads in the Baltic tend to be markedly different from those in the North-East Atlantic (see HELCOM PLC-4 2004[14]). While we have made particular progress with direct and easily identifiable emission sources (point sources), there is a lot more to be done on diffuse sources (e.g. pesticides and fertilisers from agriculture and pollution from households).

13 http://www.ospar.org/eng/html/welcome.html

14 The Fourth Baltic Sea Pollution Load Compilation (PLC-4). Baltic Sea Environment Proceedings No. 93. http://www.helcom.fi/stc/files/Publications/Proceedings/bsep93.pdf

Box 3: Availability of results of monitoring hazardous substances in European waters

The EEA regularly cites lack of data on hazardous substances as a serious problem when assessing the state of the environment, trends, and policy development, and evaluating policy effectiveness. Topic Report No 1/2003 "Europe's water: an indicator-based assessment" concludes that "the monitoring of hazardous substances in surface waters is very variable between countries and so it is very difficult to draw conclusions about current concentrations and trends".

The 2003 report assesses the inputs and concentrations in mussels and fish of only six hazardous substances for which sufficient data are available, namely: cadmium, mercury, lead, lindane, DDT and PCB. The first four are on the WFD list of 33 priority substances.

How would the problem evolve?

There are various trends that can be expected to result in deterioration of water quality.

Firstly, although the use of pesticides has declined considerably in the new Member States, mainly as a result of the dramatic economic developments in the 1990s, there are indications that agricultural productivity and the related use of pesticides will increase again (see "Danube Basin Analysis - Roof Report 2004"[15]).

Secondly, the number of substances that can potentially pollute the environment is considerable. Once the risks from a few hazardous substances have been successfully managed, it is likely that other substances will be detected. Some of them may be substitutes for the regulated substances, while others, such as endocrine disruptors, are substances which may pose risks that we are only just starting to understand. A dynamic and iterative approach is therefore necessary.

Thirdly, many of the substances of highest concern persist in the environment for a long time. Even after their use has been banned and discharge restricted, these substances continue to be found in high concentration in the environment 10, 20 or more years later, and some of them have travelled to remote areas.

Finally, regulation of a substance does not necessarily mean that the chemical is not released into the aquatic environment. Lack of implementation and enforcement, illegal use and non-proper application of substances can still lead to significant releases.

The transboundary component of the pollution of watercourses should also be mentioned. Pollution tends to increase and accumulate from the source of a river to its mouth, so in international river basins concentrations of pollutants are often higher in downstream countries. In addition, it is the coastal and marine areas that are most affected since river transport and atmospheric deposition put high pollution loads into these sensitive ecosystems. This makes it essential to coordinate effective strategies against water pollution internationally, and here the EU plays a crucial role. The management of water quality is a

15 www.icpdr.org

policy of shared competence. It is therefore necessary to define which parts are to be regulated at EU level and which are to be left to the Member States according to the principle of subsidiarity. The WFD has an effective mechanism for clarifying this point: it first identifies the priority chemical substances of Community-wide concern and then introduces a mechanism to identify the most cost-effective measures, at either EU or Member State level.

4. THE OBJECTIVES

The WFD establishes a comprehensive framework for sustainable management of European waters. As part of the Directive, Article 4 sets out the environmental objectives and the deadlines by which these should be achieved. The key objective of the Directive is to achieve good water status for all waters by 2015. The objectives and provisions of the proposed Directive are fully consistent with the Lisbon and Gothenburg Strategies. It is also one of the actions to be taken under the 6th Environmental Action Programme (see Article 7 of Decision 1600/2002/EC).

As early as 1976, Directive 76/464/EEC "on pollution caused by dangerous substances discharged into the aquatic environment of the Community" tackled the problem of chemical pollution of surface waters by establishing a regulatory framework to address the environmental problems resulting from discharges and losses of dangerous substances. This Directive is now integrated into the WFD and will be repealed once the provisions of the present proposal come into force. Full account was taken of the problems encountered with implementation of the 1976 Directive (as discussed in Section 3) when designing the new water policy.[16]

The WFD requires the achievement of "good chemical status" by 2015 as a rule, but there are cases where deadlines can be extended or objectives lowered. In addition to this principal objective, there are requirements for "no deterioration" of water quality and the obligation for Member States to progressively reduce pollution from priority substances and to cease emissions, discharges and losses of priority hazardous substances.

The WFD considers the objective of "good chemical surface water status" to be achieved in a water body if concentrations of pollutants do not exceed the relevant EQS established at Community level. Environmental quality standard (EQS) means *"the concentration of a particular pollutant or group of pollutants in water, sediment or biota which should not be exceeded in order to protect human health and the environment"* (Article 2 (35)).

In order to make these objectives operational, the Commission was then required to submit a proposal (or proposals) to fix EQS (limits which should not be exceeded in the environment) and to control emissions (see Article 16 of the WFD).

Article 16 WFD requires a step-by-step approach towards a strategy for chemical pollution of surface waters.

As a first step, the Commission was required to submit a proposal establishing a list of "priority substances" (Article 16(2) of the WFD), including a sub-group of "priority *hazardous* substances" to which more stringent requirements on phasing out emissions, discharges and losses within 20 years were to apply (Article 16(3) of the WFD). The

[16] For more details, please refer to http://europa.eu.int/comm/environment/water/pdf/report2.pdf

European Parliament and the Council adopted the first list of 33 priority substances in 2001[17] and this automatically became Annex X to the WFD. Of the list of priority substances, 11 were identified as "priority *hazardous* substances" and 14 as "priority substances *under review*" (for possible classification as priority hazardous substances at a later stage) and the remaining 8 chemicals were considered "normal**"** priority substances.

[17] Decision N° 2455/2001/EC of the European Parliament and of the Council of 20 November 2001 establishing the list of priority substances in the field of water policy and amending Directive 2000/60/EC [OJ L 331, 15.12.2001, p.1.]

Table 1: List of priority substances, including priority hazardous substances, in accordance with Decision 2455/2001/EC

PRIORITY SUBSTANCES	PRIORITY SUBSTANCES UNDER REVIEW	PRIORITY HAZARDOUS SUBSTANCES
Alachlor	Anthracene	Cadmium and its compounds
Benzene	Atrazine	C10-13 – Chloroalkanes (SCCP)
Chlorfenvinphos	Chlorpyrifos	Hexachlorobenzene (HCB)
1,2-Dichloroethane	Di-Ethyl-Hexyl-Phthalate (DEHP)	Hexachlorobutadiene (HCBd)
Dichloromethane	Diuron	Hexachlorocyclohexane (HCH)
Fluoranthene	Endosulfan	Mercury and its compounds
Nickel and its compounds	Isoproturon	Nonylphenols
Trichloromethane	Lead and its compounds	Polyaromatic hydrocarbons (PAH)
	Naphthalene	Pentachlorobenzene
	Octylphenols	Polybrominated Biphenylethers (PBDE)
	Pentachlorophenol (PCP)	Tributyltin compounds (TBT)
	Simazine	
	Trichlorobenzenes (TCB)	
	Trifluralin	

As a second step - the purpose of the present document - the Commission is required by the WFD to submit a proposal (or proposals) covering the following elements:

(1) quality standards applicable to the concentrations of the priority substances in surface water, sediments or biota " (EQS) - Art. 16 (7);

(2) (for priority substances) controls for:

- *the progressive reduction of discharges, emissions and losses of the substances concerned and in particular*
- *the cessation or phasing out of (priority hazardous substances), including an appropriate timetable for doing so. The timetable shall not exceed 20 years. In doing so (making its proposals), it (the Commission) shall identify the appropriate cost-effective and proportionate level and combination of product and process controls for both point and diffuse sources and take account of Community-wide uniform emission limit values for process controls - Art. 16(8).*

(3) the identification of priority hazardous substances (PHS) from among the 14 priority substances under review which could not be finalised by Decision 2455/2001/EC.

(4) the review or repeal of five existing directives (listed in Annex IX of the Water Framework Directive) dealing with the chemical pollution of water - Art. 16(10).

The overall objectives and the strategy for addressing the chemical pollution of surface water are laid down by the WFD. The Commission was to publish its proposals by 15 December 2003. This proposal for a Directive (and the related Communication) has been prepared by the Commission pursuant to Article 16 of the WFD in order to make these objectives operational. If there is no agreement at Community level by 22 December 2006 (six years after adoption of the WFD), the Member States are required to establish their own EQS and to impose controls on the principal sources of discharge.

5. THE POLICY OPTIONS

Given that the legal instrument establishing the obligation to submit proposals on priority substances is itself a directive and given that Article 16 of the WFD also makes it clear that the proposals are to be submitted under the co-decision procedure, the only appropriate legal instrument for the present proposal(s) is a Parliament and Council directive. For the sake of legislative simplicity and transparency it has been decided to address all the relevant issues in the preparation of this proposal. Alongside the proposed directive and this impact assessment, the Commission will also adopt and publish a Communication setting out the overall approach for controlling the chemical pollution of water.

The development of environmental quality standards (EQS) and consideration of potential emission control measures (elements 1 and 2 above) are the most important components of the proposal and various options have to be considered and decided upon. Finalisation of the list of priority hazardous substances (element 3) and the repeal of Directive 76/464/EEC and its daughter directives (element 4) are discussed later on as they do not affect the main issue of choosing the most appropriate policy option.

5.1. Principal policy options

In making its proposal on the development of EQS and control measures the Commission had to consider a number of possible options.

1. Not to make a proposal at all and thus leave regulation of quality standards and emission control measures entirely to the Member States.

2. To propose EQS only, but no detailed emission control measures.

3. To propose both EQS and specific emission control measures, including emission limit values.

The pros and cons of these various options are examined in greater detail below.

5.1.1. Option 1: No proposal

This baseline scenario assumes full implementation of relevant Community legislation, in particular the Integrated Pollution Prevention and Control Directive (96/61/EC), the Urban Wastewater Treatment Directive (91/271/EEC), the legislation on the placing on the market of plant protection products (91/414/EEC) and biocides (98/8/EC), and other key legislation regulating the assessment, use and marketing of chemicals (in particular Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations, and Regulation No. EEC 793/93 on the evaluation and control of the risks of existing substances). This scenario also assumes full implementation of Directive 76/464/EEC on pollution caused by dangerous substances discharged into the aquatic environment of the Community and its daughter directives.

If there is no proposal from the Commission, Member States will be required to establish EQS and emission limits and controls for all priority substances by the end of 2006. They will then have to implement these standards and controls within their territory.

As we do not know how the different countries would tackle this, it is impossible to assess the quantitative impact of such a scenario. However, it is possible to give a qualitative assessment of the likely outcome.

What would happen?

First of all, each of the 25 Member States would be obliged to develop its own national legislation laying down EQS and emission controls for the principal sources of discharges of priority substances. This would entail considerable duplication of scientific, administrative and legislative efforts and costs.

The different countries could well come to different conclusions concerning the standards and controls to be adopted. By way of illustration, Annex 4 shows the range of existing national EQS as compared with expectations for the future. On the basis of current national standards we could expect EQS values for specific substances to differ by factors of 100 or even 1000. The different countries might

also take different lengths of time to complete the process of developing and adopting national measures.

In shared river basins – and approximately 60% of the surface area of the EU forms part of the catchment of a transboundary or shared river basin – there is also the danger that as a river passes across a national border the quality standards and emission standards and control measures could change despite the fact that environmental conditions remain exactly the same.

If Member States adopt different standards – and introduce these standards at different times – economic operators in the different countries will be faced with potentially wide fluctuations in the costs associated with implementation of the WFD. In this context the principle of a level playing-field is relevant.

On the basis of this preliminary assessment, it was decided that Option 1 would result in considerable confusion (see Annexes 4 and 10) as each Member State would adopt its own approach. The quality of environmental protection would then vary from one Member State to another, management of the chemical water quality of transboundary rivers would become impossible, and economic operators would face sharply varying costs. For these reasons it was decided not to pursue Option 1 any further.

5.1.2. Option 2: Setting environmental quality standards but not specifying detailed emission control measures.

In order to improve the current situation, EQS must be harmonised at Community level. There is considerable diversity between existing national EQS (for most substances), not to mention the EQS they might adopt in the future, so a national approach to setting EQS will not create comparable and high levels of protection across the EU for the priority substances which are by definition substances of EU-wide concern. Moreover, the strength of the WFD is that it sets clear and comparable common objectives and leaves the Member States flexibility as to how they will achieve them. Not setting objectives in the form of EQS would make it difficult, if not impossible, to implement the WFD in practice. It would, for example, be impossible to apply the exemptions under Article 4 of the WFD consistently if the EQS varied across the EU. Furthermore, when preparing numerical EQS, a variety of sub-options (e.g. standards for water, sediment or biota) can be considered. These were discussed in the preparatory process and will be presented in detail in Section 5.2.4. The costs and benefits of Option 2 are examined in Section 6.

5.1.3. Option 3: Setting environmental quality standards and specifying detailed emission control measures, including emission limit values.

This option builds on Option 2 but extends the scope of the proposal to include specific emission control measures for priority substances, and the setting of emission limit values for certain sectors where appropriate. Since the same arguments for setting EQS still apply, the following considerations focus mainly on the additional element of this option, namely the emission controls.

Since the adoption of the WFD in 2000, a considerable number of Commission proposals and decisions already entail substantive pollution reduction measures for

several priority substances (e.g. Commission Decision in the context of Directive 91/414/EEC,[18] proposal for a Regulation on persistent organic pollutants, and Commission proposals amending Directive 76/769/EEC,[19] Commission proposal for REACH[20]). So this existing set of EU emission control legislation is contributing significantly to achievement of the WFD environmental objectives for priority substances as defined by the proposed EQS under Option 2 and the "cessation target" for priority hazardous substances. Indeed, this legislation on chemicals, industry policy, etc. (for a more comprehensive list, refer to the Communication and Annex 5 and Annex 6 of this document), already defines measures which constitute "best available techniques" (BAT) or "best environmental practices" (BEP) for priority substances.

Nevertheless, there may still be some very specific regulatory gaps where certain sources of emissions of priority substances and priority hazardous substances are not adequately and effectively addressed. These are very specific sources, e.g. lead ammunition or mercury in thermometers, or point source pollution from small- and medium-sized enterprises not covered by the IPPC Directive. Although the preparatory process gathered a lot of data on these issues, there is still not enough evidence to justify EU-wide measures to fill these regulatory gaps, and there is still no comprehensive set of emission limit values for priority substances in the Member States.

The costs of specifying Community-wide emission control measures, including if appropriate the setting of emission limit values, were assessed in the ECOLAS study (see Section 6). Overall the estimated costs for this scenario could be as much as 43 billion euros over 20 years (see Box 4 for more details). In comparison with Option 2, there would be cost increases for all industrial sectors, and these increases could be small (e.g. in chloralkanes), moderate (e.g. in non-ferrous-metals and refineries) or large (e.g. in iron and steel). In addition, there could be significant impacts on employment and downstream users. For example, there might be an increase in fuel prices because refineries would pass on costs to downstream users. A more detailed overview of the impacts associated with Option 3 is given in Section 6.2.1, and in particular Table 2.

These costs are considered disproportionately high. In addition, the study found that leaving Member States more flexibility allows them to use the most cost-effective combinations of measures. As a result, Option 3 was not pursued any further in the development of the proposal.

5.1.4. Conclusions

As explained above, the Commission considered a "no proposal" scenario to be unacceptable. And because of the economic consequences of Option 3, the scenario investigated in the ECOLAS study (see Box 4), and the fact that the EU already has measures on emission controls, it was decided to reject that option too and to pursue Option 2, the introduction of EU-wide EQS.

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[18] Atrazine, chlorfenvinphos, endosulfan, lindane, pentachlorophenol and simazine are not included in Annex I of Directive 91/414/EEC.

[19] E.g. Nonylphenol, SCCP, TBT, TCB.

[20] http://europa.eu.int/comm/environment/chemicals/reach.htm

Box 4: Estimated costs of Option 3 - Setting environmental quality standards and specifying detailed emission control measures, including emission limit values (Source: ECOLAS study, July 2005)

The scenario assessed as part of the ECOLAS study was based on Community-wide emission limit values designed to achieve the proposed EQS. This emission reduction approach was combined with binding reduction targets (80% by 2015 not 2021) and a strict cessation of discharges, emissions and losses of priority hazardous substances by 2025, with discharges of PHS from known point sources to be halted by 2015.

The estimated costs of these emission controls for the industries selected in the case studies were between 1.63 and 2.87 billion euros annually (depending on the discount rates: 12% or 4% respectively). In particular, the iron and steel industry might face significant impacts on cost, profits and employment. Other sectors would also be affected chiefly by the strict and swift implementation of the cessation target. Over 20 years, total costs could amount to 43 billion euros (4% discount rate).

5.2. Development of EU-wide environmental quality standards

5.2.1. Setting common EU EQS

The character and purpose of EQS is imposed by the WFD, and more detailed guidance on the methodology for determining EQS from toxicological and ecotoxicologial data, and data on persistence and bioaccumulation, is given in Section 1.2.6 of Annex V to the WFD. The WFD provides that EQS can be established for *water*, for the *sediments* at the bottom of a surface water body, and/or for *biota* (the living tissue of animals and plants present in water). Moreover, the WFD refers to the Technical Guidance Document (TGD) for the risk assessments developed and agreed in the context of the Existing Substances Regulation (EEC) No 793/93. The TGD provides an agreed methodological basis and data requirements for sound risk assessment.

What does this mean in practice?

Essentially it means collecting all the relevant data on the chemistry, toxicology and ecotoxicology of a substance and then following an established methodology for deriving a concentration which represents a safe limit for the protection of the fauna and flora of surface waters, and the protection of human health where it is affected by water quality (e.g. drinking, bathing, eating seafood). The WFD describes more methodological details for determining EQS values expressed as annual average (or arithmetic mean) concentrations. These EQS are intended to protect flora and fauna against the persistent low-level pollution typical of water bodies receiving constant or regular inputs of pollutants, e.g. from municipal wastewater, industrial effluent or diffuse pollution from agriculture.

However, one potential weakness of expressing EQS as annual averages is that they may, as is implied, average out temporary peak concentrations, which, if they are

high enough, may have seriously detrimental and acute effects on the ecology of a water body. Consequently the Commission also proposed establishing EQS values expressed as Maximum Acceptable Concentrations (MAC), based on the standard scientific methodology in the TGD.

Once EQS values are established at EU level, it would be a legal obligation for the Member States to ensure that these standards are respected in all bodies of surface water other than those covered by the exemptions and extensions provided for in Article 4 of the WFD.[21] In other words, if, on the basis of the monitoring and assessments required under the WFD, a Member State concluded that a water body might not respect the EQS values by 2015, it would need to implement appropriate measures to reduce pollution to a level consistent with achievement of the EQS. It also means that if at any time after 2015 a water body is found not to respect the EQS for one or more substances, the Member State would be required to take the appropriate remedial measures to bring the water body back into compliance.

5.2.2. Determining the EQS values

The EQS were arrived at with the input and support of an Expert Advisory Forum on Priority Substances (see Section 2) which included Member States, candidate countries, industry and environmental NGOs. The data used for the exercise was collected with the help of this Forum, which peer-reviewed the methodologies, the data and the proposed EQS. In addition, the Scientific Committee on Toxicity, Eco-toxicity and the Environment (SCTEE)[22] gave its opinion on the EQS and the methodology applied.

The economic and social implications of the EQS were not taken into account as grounds for changing the severity of the standards, which as explained above, were determined scientifically using standard methodologies agreed at EU level. However, particular attention was given to assessment of uncertainties. The overall socio-economic impacts of the proposed EQS are discussed in Section 6.

Cases where non-compliance with EQS values at water body level will give rise to social or economic difficulties can be addressed within the framework of the exemptions allowed under the WFD in terms of the most cost-effective combination of measures.[23] The key exemptions are:

- Article 4.4 (WFD) which allows Member States to extend deadlines for achieving the environmental objectives by a maximum of 12 years (2027) if improvements cannot reasonably be achieved by 2015;

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21 A policy summary and background document on "Environmental Objectives under the Water Framework Directive" was agreed upon at the last meeting of the Water Directors. The document can be found in the public WFD CIRCA library or directly at: http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/thematic_documents/environmental_objectives&vm=detailed&sb=Title

22 Opinion of the SCTEE adopted on 43rd Plenary Meeting of 28.5.2004. Full text available at: http://europa.eu.int/comm/health/ph_risk/committees/sct/documents/out230_en.pdf

23 See footnote 21

- Article 4.5 (WFD) which allows Member States to set less stringent quality standards for a particular water body if it is infeasible or disproportionately expensive to achieve general objectives.

These exemptions would be applied on a case-by-case basis using concrete data on the specific pollution problem which is available only at Member State level. Furthermore, Member State authorities are obliged to publish their measures, the related costs, and the application for an exemption so that the public and interest groups can comment. Therefore, it is not possible to assess these questions in more detail here.

In addition, it is proposed that Member States can designate a "transitional area of exceedance" close to the point of discharge where sewage and industry discharges can exceed the EQS (mixing zone), so as to avoid excessive, additional costs for wastewater treatment.

In conclusion, using the framework laid down in the WFD, the Commission has developed its proposals for EQS using standard scientific EU methodologies, extensive stakeholder input, and expert scientific advice. Descriptions of the detailed methodology and data sheets on the EQS for each priority substance are on DG Environment's website.[24]

5.2.3. Link to EU risk assessments and scientific review

During preparation of the EQS, there was close co-operation with the European Chemicals Bureau (on existing substances) and DG SANCO (on pesticides). And during assessment of the priority substances also covered by the review procedures specified in the Existing Chemicals Regulation (No 793/93) or the Plant Protection Products Directive (91/414/EEC), the Member States acting as "rapporteurs"[25] were asked to participate in the review process for the priority substances proposal and to peer-review the EQS proposals. The data from the risk assessment reports associated with these other pieces of legislation were given high priority consideration, and preference was also given to industry's voluntary risk assessment data. Finally, the rapporteurs met other experts from the Expert Group on Quality Standards, which included specialists from all the Member States, industry (there were approx. 20 industry experts) and environmental NGOs, to discuss and agree methodology and data.

The proposals for EQS that emerged from this consultation were peer-reviewed by the SCTEE (see Section 5.2.2 above). However, some of the SCTEE comments refer to methodological issues of principle, which have more to do with the outcome of the EU risk assessments under Regulation 793/93 or Directive 91/414/EEC, than to the proposed EQS. Such issues include the use of the Toxicity Equivalence Factors (TEF) approach for polyaromatic hydrocarbons (pages 16-18 of the SCTEE opinion), bioavailability considerations for metals (pages 13-15 of the SCTEE opinion) and the assessment of pesticides (page 3 of the SCTEE opinion). The Commission was not

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24 http://europa.eu.int/comm/environment/water/water-dangersub/pri_substances.htm

25 A Rapporteur is the Member State authority responsible under the respective legislation (in this case Regulation (EEC) No 793/93 and Directive 91/414/EEC) for preparing a risk assessment report on a particular substance for discussion.

able to take account of these comments for two reasons. Firstly, there are no concrete methodologies yet available for many of these suggestions, albeit scientifically sound, and it would take years to develop and agree them (e.g. TEF). Secondly, the paramount objective for the Commission in proposing EQS is consistency between the derivation of EQS and the outcome of risk assessments under Regulation 793/93 and Directive 91/414/EEC. So even when the SCTEE disagreed with the findings of these risk assessments, the proposed EQS were nevertheless maintained if they were consistent with these risk assessments.

After the SCTEE had published its opinion, some new more recent data became available and this was taken into account for some substances (mainly DEHP, octylphenol, lead and trichloromethane). Annex 8 gives an overview of the EU risk assessments which were used to help determine the EQS. It also highlights some of the timing inconsistencies in the preparatory process, which to some extent explain the delay in preparing this proposal. For most of the substances concerned, risk assessments have now been finalised and the proposed EQS are fully consistent with the final results under Regulation 793/93 and Directive 91/414/EEC.

However, in the case of nickel and lead, there are considerable delays in finalising the risk assessments, and the process could take until late 2006 or 2007. Therefore, the Commission proposes to set interim EQS for nickel and lead and to commit to revising these EQS after finalisation of the risk assessments.

5.2.4. EQS sub-options

In addition to the above considerations, a number of sub-options were discussed during the preparatory phase. These included the approach for setting EQS in sediment and biota, for metals, and in drinking water protected areas. Aspects of analysis and monitoring were also discussed, particularly those with relevance for compliance checking. The choices were made on the basis of scientific considerations and, as far as possible, consensus during the preparatory process. In particular, the opinion of the SCTEE was considered. Details of the most important sub-options are presented in Annex 7.

5.3. Framework for pollution control measures

Before preparation of the proposal started, several possibilities for incorporating emission control measures were discussed, and in particular the setting of emission limit values for certain sectors. At a later stage, there was the idea of introducing general pollution reduction targets, such as to cut pollution in a given river basin by 50% and 80% within a certain timeframe.

In Section 5.1, it was demonstrated that the most cost-effective combinations of measures are best identified at Member State level. In consequence, the proposal does not include any specific measures for pollution controls in addition to those already existing under Community law. Under existing legislation, Member States must establish pollution control measures for priority substances in the programmes of measures required under the WFD for each river basin district, including those measures required to put a stop to discharges, emissions and losses of priority hazardous substances. Within these programmes, they must incorporate the actions required by other Community legislation (see Annex 5 for details).

In order to allow for the Commission to check compliance of these provisions, it is proposed to establish an inventory of discharges, emissions and losses for each river basin against which progress towards phasing out or halting pollution can be measured. In fact, the inventory will act as an indicator to help monitor progress of Member States towards achieving the WFD objectives during the implementation phase. Member States should be able to carry out these tasks without any significant additional administrative burden, since the inventory can be built on the European Pollutant Release and Transfer Register (Regulation (EC) No. 166/2006) and can be complemented with the results of the analysis carried out in accordance with Article 5 and the monitoring under Article 8 of the WFD.

6. MAIN IMPACTS OF SETTING EU-WIDE ENVIRONMENTAL QUALITY STANDARDS

Two study reports were commissioned by DG Environment to assess the socio-economic costs of the proposal and its benefits (see Section 2).

6.1. Current compliance with EQS

Assessment of current compliance was carried out in several ways. The main synthesis was based on the data available from the European Environment Agency comparing water quality monitoring data with the proposed EQS.[26] The overall result is that compliance is generally high, in particular for MAC-EQS. For organic priority substances, the compliance rate for annual average concentrations (AA-EQS) is mostly above 75% (and above 90% for MAC-EQS) and for metal priority substances it varies between 50 and 80 % depending on the metal and the assumptions made (MAC-EQS above 90%). The main substances of concern are nickel, lead and some organic substances. However, there is a considerable lack of comparable data for certain substances and for certain countries (in particular the new Member States). The key figures that give a more detailed overview of the findings of this study[27] are in Annex 9.

An alternative assessment looked at the "risk of failing the good chemical status" objective of the WFD as identified by the Member States in their analysis reports submitted pursuant to its Article 5. Overall, the risks are lower in comparison with other major impacts on water quality (e.g. nutrients and hydromorphology). The "at risk" levels reported by some countries were very low in comparison with others which were very high (see table in Annex 10). However, these data are not necessarily comparable since the assessment methods of the Member States use different criteria (national EQS - see Section 5.1.2). This emphasises the point that it is absolutely necessary to harmonise methodologies for setting EQS and determining compliance. Furthermore, the availability of data is rather poor and many Member States have now started targeted monitoring programmes to improve the situation.

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[26] It should be noted that the EQS proposed for the compliance study were the ones presented to the SCTEE for peer review. Some of these EQS have been amended in line with the suggestions of the SCTEE. Most of these changes resulted in less stringent EQS values (cf. Annex 4). The values used in the compliance study can be found in the report (see Note 27).

[27] The entire study report can be found at: http://europa.eu.int/comm/environment/water/water-dangersub/pri_substances.htm

Another indicator are the questionnaires sent to the Member States as part of the study in preparation for the present impact assessment (see Box 5 below). Although the return rate was not satisfactory, the findings do support the principal conclusions of the above assessments.

Looking at results in more detail, there seems to be evidence that compliance is higher in the original 15 Member States than in the ten new ones. This is only to be expected, since the level of implementation of relevant EU pollution control legislation is more advanced in the 15. This difference in compliance between different countries at different stages of implementation is very evident in the Danube basin. The extensive Danube Basin Analysis Report[28] demonstrates that the upstream countries (DE, AT) have very few remaining problems with hazardous substances. The possibility of not achieving "good chemical status" increases in the new Member States which share the Danube Basin (HU, CZ, SI, SK), while the accession countries (RO, BG, HR) and the non-EU Member States (CS, BH, UA, MD) have serious problems with chemical contamination. This is illustrated in Figure 1 where cadmium levels in the Danube can vary by a factor of approximately 300 between upstream and downstream. The highest levels in the downstream part by far exceed the environmental objective for cadmium of 5 microgrammes per litre set by Directive 83/513/EEC.

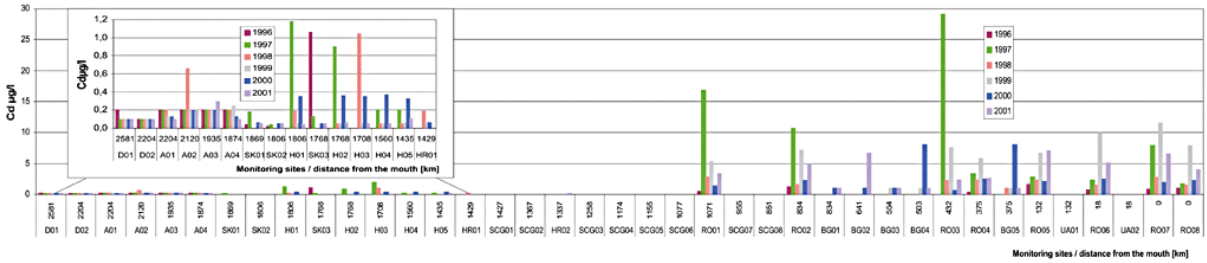

Figure 1: Cadmium concentrations (1996-2001) from the source to the mouth of the Danube [Note the difference in scale] (Source: ICPDR)

[28] See report under www.icpdr.org

Box 5: Questionnaires to Member States – results of ECOLAS study

During the preparation of the economic impact study, ECOLAS sent out questionnaires to all Member States (see Annex 2). One part of the questionnaire covered percentages of exceedance of concentrations in water bodies relative to the proposed Annual Average Quality Standards (AA-QS) which were submitted to the SCTEE for peer review in April 2004.

The response rate was very low and only six Member States (AT, CZ, CY, GR, IT and UK) sent any information on this question. Thus, the results cannot be considered as representative for the EU25. However, they do give a valuable indication which can be used to validate findings from other assessments.

For the large majority of priority substances, data suggested an average exceedance of the AAQS of less than 5%, in other words nearly full compliance can already be achieved for those substances in those countries. More than 5% of the water bodies exceeding the proposed AAQS were reported only for:

- lead and its compounds: 41% of the water bodies (response of 5 MS);
- nickel and its compounds: 37% of the water bodies (response of 6 MS);
- tributyltin compounds: 32% of the water bodies (response of 2 MS);
- PAHs, specifically for benzo(g,h,i)perylene: 22% of the water bodies (response of 2 MS) and for benzo(1,2,3-cd))pyrene: 18% of the water bodies (response of 2 MS));
- mercury and its compounds: 11% of the water bodies (response of 5 MS).

It should be noted, that the proposed EQS for lead, nickel, mercury and TBT have been changed following the advice of the SCTEE and/or new data becoming available in the meantime. The expected compliance rate for these substances would now be considered to be much higher.

Conclusions from the assessment of compliance consistently indicate that compliance with the proposed EQS standards for priority substances is already very high, in particular in those Member States where the relevant EU legislation on pollution control has been implemented more widely. Moreover, the findings suggest that an additional added value of setting common EU-wide EQS is that they can be used as an indicator to check implementation and enforcement of Community law.

6.2. Potential socio-economic impacts

6.2.1. Economic impacts on main industrial sectors

The ECOLAS study (see Section 2) considered the following sectors to be those most likely to be affected by the proposal: the chemical industry (in particular, chlorine and pesticides), the iron and steel industry, the non-ferrous metals industry, PVC conversion and refineries. Case studies have been carried out for all these sectors on the basis of data provided by each industry. In addition to the ECOLAS study, this section takes a separate look at the implications of the proposal for the water industry.

Estimating costs is complex as they will depend on the assumptions made for:

- the strategy chosen to control priority substances; for example, "reduction at source" appears to be less costly in most cases than "end of pipe" solutions;
- timetables and the rate of progressive reductions of discharges; here a key factor is how to interpret "cessation" for priority hazardous substances;
- differences between local conditions as regards pollution and flow, which in some cases can double costs; hence the importance of considering local conditions;
- whether to attribute costs to existing legislation ("baseline") or the new proposal (Options 1 and 2); this is difficult and can result in some double accounting;
- the ways in which the industrial sectors affected are likely to adapt;
- the proposed reduction targets. The actual compliance of a discharge from the industrial installation with EQS could not be considered in this approach since these data are not available.

The ECOLAS study looks at three scenarios[29]. Scenario 0 - the baseline scenario - is identical with Option 1, i.e. no action is taken.

Scenario 1 is to establish EQS together with binding emission reduction targets and the absolute cessation of losses and releases of PHS within 20 years. This scenario is in between Options 2 and 3 (Section 5.1) since Option 2 does not include quantitative emission reduction targets.

Scenario 2 is even more stringent and is based on Community-wide emission limit values combined with binding reduction targets and an accelerated cessation of losses and releases of PHS. This scenario is largely equivalent to Option 3 (Section 5.1).

For ease of analysis, the policy options in the proposal are referred to as *Options* and those in the study as *Scenarios*. DG Environment prepared a draft legal text of the directive which was largely the same as Scenario 2 in the study and which was the subject of consultation in June 2004. Following the ECOLAS study and internal and external consultation, the proposed directive was revised so that the policy option presented in this impact assessment is now equivalent to Option 2 (Section 5.1).

The study report concludes that the "*overall economic analysis of the Proposal gives a very different view on the potential impacts depending on the sector. Overall, implementing Community-wide EQS (scenario 2) will be the more cost-effective and economic approach creating less socio-economic impacts whilst guaranteeing a comparable and high level of environmental protection. This reflects in part the lower stringency of the regulation, but it is also due to cost savings that come with greater flexibility for the Member States. When considering the adoption of environmental limit values, and assuming this would lead to more stringent measures*

[29] The word "scenarios" is used when referring to the results of the ECOLAS study, since they differ slightly from the policy options identified in Section 5.

(scenario 3), there is a general cost increase which is quite different depending on the sector. The cost increase ranges from very small (such as SCCP) over a moderate increase (such as non-ferrous and refineries) to a major increase (such as iron and steel). The costs identified in this study have to be interpreted with caution. On the one hand, there is a lack of data to carry out a comprehensive analysis of the total costs of the Proposal and on the other hand the estimated costs may reflect the "worst-case" situation because some costs may actually be attributed to the implementation of other policies and because of the additional flexibility that the WFD provides to Member States. The scenario 2 was largely comparable to the initial ideas proposed by DG Environment in June 2004. The findings of this study, however, will contribute to the finalisation of the Proposal with the aim to improve cost-efficiency of the proposed measures."

Thus in Scenario 2 the overall estimate of the costs to those industries would be 730 million euros per year using a discounting rate of 4%. Over a 20-year period this could amount to 11.4 billion euros (at 4% discount).

Approximately 40% of the costs identified are associated with the refineries sector. However, the ECOLAS study concludes that for this sector "*although the absolute direct cost numbers of both scenarios are high for refineries, the measures are unlikely to have a negative effect on profit margins or employment at refineries."*[30]

It is clear that all of the figures are estimates based on certain assumptions and should be treated as such. As mentioned above, the estimates are worst-case assumptions and the actual figures should be lower. The legal proposal has been changed as a consequence of the impact assessment, so it no longer includes binding emission reduction targets. Moreover the interpretation of cessation allows certain exemptions, for example where cessation is technically unfeasible or disproportionately expensive. These changes will reduce the potential costs to a fraction of the ECOLAS figures. However, it was not possible to re-calculate the cost figures within the timeframe available.

Table 2 gives a more detailed summary of the total discounted costs, showing negative net present value (neg. NPV), annualised costs (annuity), and where possible the supplementary cost per tonne produced for the different industries. As the discount rate greatly influences costs, we present the results as ranges calculated for the three discount rates used in this study (4%, 8%, 12%). This means that the lower figure corresponds to a 12% discount rate (which may be close to the discount rates used by industry), while the higher figure has been calculated using a 4% discount rate (as recommended for impact assessments by the Commission).

It should be stressed again that the cost estimates include some of the investment costs which will be necessary in those Member States that do not yet comply with existing EU legislation. This applies in particular to the investments which will be necessary to comply with the IPPC Directive where existing plants will have to operate according to permit conditions based on BAT by October 2007. In addition, considerable investment will be necessary in those new Member States for which transitional periods have been agreed for the IPPC Directive.

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30 For more details, please refer to ECOLAS study report.

Table 2: Total discounted costs, annualised costs and costs per tonne produced for EU-25; with discount rates ranging from 12% (lower figure) to 4% (higher figure)

(Source: ECOLAS study report)

	Scenario 2			**Scenario 3**		
Cases	*-NPV (million €) (total discounted cost)*	*annuity (million €) (annualised cost)*	*cost in €/tonne produced**	*-NPV (million €) (total discounted cost)*	*annuity (million €) (annualised cost)*	*cost in €/tonne produced**
Chlorine#	-	-	-	-295 – +163	*-98 – +140*	-20 – +28
Iron & steel	< 461 – 1 911	*< 59 – 122*	< 0.32 – 0.67	<6 460 – 22 228	*< 824 – 1 423*	<4.49 – 7.75
Non ferrous	< 148 – 961	*< 20 – 61*	-	< 1 510	*< 56 – 97*	-
PVC (1)	< 58 – 247	*< 7 – 16*	< 1.2 – 2.7	< 340	*< 12 – 22*	<2.0 – 3.7
PVC (2)	< 306 – 1 381	*< 39 – 88*	< 6.6 – 15.0	< 1 899	*< 62 – 122*	<10.5 – 20.6
Refineries	<1 084–4 872	*< 138 – 312*	< 0.19 – 0.43	< 14 138	*< 502 – 905*	<0.70 – 1.26
SCCP	< 416 – 2 047	*< 53 – 131*	-	< 2 449	*< 80 – 157*	-

* per tonne produced of chlorine (chlorine), liquid steel (iron & steel), plasticised PVC (PVC), crude oil (refineries).

for chlorine, the negative numbers correspond to the results for a 4% discount rate while the higher figures correspond to a 12% discount rate. The negative numbers result from cost savings, chiefly electricity saved by introducing new technologies and by applying a discount rate of 4 % which is usually not applied in the chlorine industry (see ECOLAS study for detailed explanation).

Some industries were particularly concerned about the high costs entailed by a strict interpretation of the requirement to achieve "cessation" of emissions, losses and discharges for priority hazardous substances. Such concerns were confirmed by the study and partially explain why some industries would face elevated costs. These industries proposed applying the concept of "negligible load", arguing that compliance could be "ensured by accessible, economically sound technologies feasible on an industrial scale".[31] While the Commission proposal does not include this specific terminology, the approach followed by the WFD and the proposed Directive will be similar to the methodology proposed by industry, thereby considerably reducing the estimated costs.

As explained, Scenario 2 in the study is not identical to the Commission's Option 2. Following the ECOLAS study, there was further streamlining of the legal proposal, and then comments from the SCTEE, Member States, industry and NGO experts in

[31] For details see the Eurochlor final report "Consequences of existing and planned EU legislation on the competitiveness of the European Chlor-alkali industry", April 2005.

particular led to more simplification by the Commission[32]. The EQS for some priority substances were revised on the basis of new data and the SCTEE comments, in most cases resulting in less stringent standards. Furthermore, the EQS for lead, nickel, hexachlorobenzene (HCB) and hexachlorobutadiene (HCBd) were revised towards less stringent standards for water following the final consultations in the Commission. For HCB and HCBd the uncertainties introduced on the basis of the calculations from the biota to the water phase were considered as significant. In order to ensure the same level or protection but reduce unnecessary cost burden, separate EQS for water and biota have been set which need to be applied in a complementary way. For nickel and lead, the risk assessments are still ongoing and it has been impossible to predict the timetable and the outcome of the ongoing discussions. Proposed values now reflect, on the basis of information available now, a compromise to take account of drinking water protection and background values. However, it is recognised that these EQS values may need revision following the finalisation of the risk assessments in order to ensure comprehensive protection on a sound scientific basis.

In consequence of the amendments which were introduced subsequently to the finalisation of the supporting studies, the estimated costs of the final Commission proposal are much lower than those of the study's Scenario 2.

6.2.2. Economic impacts on the water and wastewater industries

For certain priority substances, particularly metals, and in certain regions, the amounts discharged from municipal waste may be significant. These are mostly releases from many different small sources, such as the use of these substances by households or small and medium-sized industries which discharge their wastewater into the sewerage system. If there is wastewater treatment, most of the substances are removed from the wastewater and, depending on their properties, end up in the sewage sludge.[33]

The wastewater industry, particularly in the UK,[34] raised concerns about the potential investment costs of additional treatment if EQS are proposed which are lower than the current concentrations in sewage effluent. They were concerned about nickel, lead and DEHP (a plasticizer) in particular. Independent from the changes in the proposal for EQS which were introduced for nickel and lead (see above), a number of other considerations apply.

It is true that the cost of introducing additional "end-of-pipe treatment" across the EU could be considerable. However, the current proposal does not provide for any additional control measures to be applied as regards wastewater treatment.

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32 From June to September 2004, the Commission carried out an extensive written consultation of experts on the basis of an informal draft Directive proposal.

33 E.g. see study report "Pollutants in urban wastewater and sewage sludge" http://europa.eu.int/comm/environment/waste/sludge/sludge_pollutants.htm

34 See e.g. UKWIR 2004 "Priority Hazardous Substances, trace organics and diffuse pollution (Water Framework Directive) treatment options and potential costs" (Ref. 04/WW/17/5). http://www.ukwir.co.uk/templates/UKWIRSite/ukwir_frame.asp

It is currently not possible to determine at EU level whether and to what extent discharges from wastewater treatment plants would lead to exceedance of the proposed EQS.[35] However, if an exceedance is identified, the aim is to identify the products or processes the substance might have come from. According to the WFD, the most cost-effective measures are to be applied. In most cases, it can be demonstrated that "end-of-pipe" measures are not cost-effective. It will be important to improve knowledge and data on the sources and pathways of priority substances into municipal wastewater in order to identify targeted and efficient control options.

In addition, and as a consequence of the concerns expressed, the notion of "transitional area of exceedance" was introduced into the proposal to ensure that no disproportionate measures are taken when effluent concentrations are higher than the proposed EQS. This additional requirement was necessary as the Member States use different approaches as to where to measure compliance with the EQS in receiving waters. Finally, in justified cases, Member States can apply the exemptions provided by the WFD where significant pollution from wastewater treatment discharges is the prime cause for exceedance of EQS and where control measures would be technically not feasible or disproportionately expensive.

6.2.3. Social impacts and employment

The main areas where the proposal is considered to have social impacts are employment and the labour market, and public health and safety, the latter mainly in terms of the benefits resulting from lower concentrations of chemical pollutants in water. This will be discussed in the next section.

The impacts of the proposal on employment are mostly from the additional costs that some industrial sectors might face (see Section 6.2.1). Where possible, the ECOLAS study (see section 0 in Annex 2) identified the impacts on employment in the sectors investigated. In most cases, the study did not identify significant negative effects on employment, in particular under Scenario 2. However, in some sectors, e.g. the iron and steel industry, Scenario 3 could result in serious job losses. Conversely, there is some potential for new jobs in the area of clean technologies. Overall, the negative impacts on employment identified confirm the conclusions regarding economic impacts, which means that the choices described earlier are confirmed by the quantitative assessment of the social impacts.

6.3. Potential benefits

Achievement of EQS should bring a considerable number of benefits, but it is difficult to quantify these on the basis of the information available. Examples will be given for specific cases where quantitative data are available.

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[35] The UKWIR study (see footnote above) gives an indication of the situation in the UK. However, the high potential costs in the study are overestimated by far, in particular since the EQS proposed by the European Commission for the most relevant pollutants are less stringent than those presented in the study. Furthermore, the study demonstrated that a more flexible risk-based approach to this problem applied at Member State level would greatly reduce these costs.

6.3.1. Direct economic benefits

Compared with the present situation, where there is a wide variety of national EQS (see Section 5.1.2), the first benefit will be a level playing-field for industry across the EU as regards the authorisation of discharges[36] of priority substances which are, by definition, substances of European-wide concern.

The reduction of water pollution levels will bring several direct economic benefits. First and foremost, reducing pollution levels will reduce treatment costs for some major water uses, in particular drinking water and process water for industry. The examples below demonstrate that, in the case of drinking water supply, these potential gains can be considerable. No data were available for process water.

Box 6: Potential cost savings for the drinking water industry

The preparatory study for this Impact Assessment estimated the potential cost savings for drinking water treatment at approximately 362.5 million euros per year. These figures refer only to the benefits from reducing the pesticide contamination of surface waters used for the abstraction of drinking water. Over 20 years this amounts to at least nine billion euros. However, the proposed EQS will not fully exploit these cost savings since some of them are higher than the limit values for drinking water, so advance treatment will still be necessary but at much reduced levels.

Other studies give similar or higher figures. A recent study by the Dutch RIVM [RIVM/Milieu-en Natuurplanbureau (2004): *Van inzicht naar doorzicht. Beleidsmonitor water, thema chemische kwaliteit van oppervlaktewater*] estimated the annual water treatment costs to remove metals from drinking water in the Netherlands at 70 million Euros. Over 20 years this amounts to at least 1.4 billion euros just for the Netherlands.

Second, the proposed measures will lead to cleaner sediment, which means reduced inputs of harmful substances and hence cheaper management of waste during dredging operations because of the lower contamination. Dredging of sediment is an essential activity for certain water uses, such as navigation. Europe-wide, the volume of dredged material is estimated at roughly 200 million cubic metres per year. The costs of disposing of sediment contaminated by hazardous substances are considerable. Box 7 shows one concrete example of the potential cost.

[36] According to Article 10 of Directive 96/61/EC (IPPC) and Article 10 and 11 of Directive 2000/60/EC (WFD).

Box 7: Potential reduction in cost of disposing of sediment from dredging operations in the port of Rotterdam (Source: Port of Rotterdam)

The port of Rotterdam is located in the Rhine estuary and is a sedimentation area. The eastern port areas are affected by fluvial sediment transported by the Rhine which needs to be dredged regularly so the port can operate. Due to the sometimes poor chemical quality of the Rhine water, the sediment tends to be contaminated and after dredging has to be disposed of at a special confined site, the "Slufter", where the storage costs of one cubic metre of contaminated material" are approximately €10.

Reducing the pollution loads has led to a significant reduction in the contaminated sediment that needs to be disposed of. From 1990 to 2004 the total amount was reduced from nearly 4.5 million to 1.5 million cubic metres. The cost savings already achieved by pollution reduction measures in the Rhine are in the order of several hundred million euros over a 15-year period. However, the volumes which still need to be disposed of entail costs which are estimated at roughly 10 million euros a year for the port of Rotterdam alone.

Third, the requirement to reduce losses of substances into the environment will trigger the development and commercialisation of cleaning - and cleaner - technologies. In particular, the obligation to halt discharges, emissions and losses of priority hazardous substances will require a leap in innovation. Given the long-term perspective of 20 years, there is enormous opportunity to develop new niche markets. The recent EU Initiative on the Environmental Technology Action Plan[37] will facilitate such developments, but the gain in turnover of new technologies and eco-solutions cannot be calculated at this stage.

Fourth, cleaner water will improve the quality of the fish and shellfish which are sold by the fishing or fish-farming industries. Cleaner waters will improve productivity and reduce the accumulation of dangerous substances in fish tissue, thereby reducing human exposure to hazardous substances. In some parts of Europe, there are bans on human consumption of fish caught by anglers because of the high levels of hazardous substances (for example, in the Mosel-Saar basin the health authorities issued warnings because of high PCB levels in fish[38]). There is very little data on losses in these industries, but one particular example is presented in Box 8.

6.3.2. Environmental and social benefits

In addition to the above-mentioned gains, there will be considerable positive environmental and social benefits from decreasing water pollution from chemical substances, although they are extremely difficult to quantify. Examples are:

– protection and enhancement of biodiversity;

– improved amenity value, e.g. tourism, angling, etc;

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37 http://europa.eu.int/comm/environment/etap/implementing.htm

38 www.iksms-cipms.org

– reduced exposure for humans using rivers, lakes, estuaries and coastal waters for bathing, surfing and other water sports;

– less exposure (occupational and other) to hazardous chemicals if substitution is used to control pollution;

– reduced bioaccumulation of many hazardous chemicals in humans, reduction in exposure if less hazardous substitutes are used;

– cleaner sediment will mean less potential for re-solubilisation in the water column and reduced uptake of harmful substances by plants and animals;

– cleaner water for watering live-stock when surface water is used directly, with reduced accumulation in meat and milk as a result and hence reduced human exposure to hazardous substances;

– likewise, cleaner water should mean less accumulation in meat from game drinking surface waters directly;

– reduced potential for accumulation of hazardous substances in crops when untreated surface water is used for irrigation.

The two cases below - taken from other Impact Assessments prepared by the Commission - are attempts to attribute monetary values to the potential benefits of decreasing water pollution from priority substances. In addition, Annex 11 gives some useful references describing in more detail the effects of the priority substances on health and the environment.

6.4. Impacts of other components of the proposal

6.4.1. Identification of priority hazardous substances

The WFD defines priority hazardous substances as *"substances or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances which give rise to an equivalent level of concern"* (Art 2.29 of the WFD). However, it does not lay down the thresholds for P (persistency), B (liability to bio-accumulate) and T (Toxicity).

Box 8: Examples of social and environmental benefits

Case 1: Potential benefits of phasing out mercury emissions to water

Annex 5 of the Mercury Strategy Extended Impact Assessment [SEC (2005)101] gives an idea of the potential benefits of tackling mercury pollution of water. A Norwegian study estimates the costs of environmental externalities associated with mercury in water at € 1000 per kilo of water (which would result in approximately € 2 billon based on the direct emissions into water reported by the EU-15 to the European Pollutant Emission Register in 2001). However, the document also discussed the uncertainties of the methodologies and studies available. It therefore concludes that "it appears unreasonable to attempt to monetise the costs of mercury pollution" at this stage. This conclusion can also be applied to this Impact Assessment.

Case 2: Calculated damages at Arcachon Bay based on TBT use

This case study is from a study carried out for the preparation of the REACH proposal (The impact of the new chemical policy on health and the environment, 2003). It has been estimated, for only one site, that the reduction in oyster production caused by TBT use has led to a reduction of income equal to a minimum of 140 million euros over a 10-year period (mid-1970s to mid-1980s).

Identification of priority hazardous substances was made in close coherence with other existing legislation and on the basis of an agreed methodology.[39] Early in the consultation process, the discussion about different criteria and options was concluded swiftly, since the overriding opinion was that any assessment must be consistent with other EU legislation, in particular the chemicals legislation. Since in parallel, the Commission has proposed its new framework policy on registration, evaluation and authorisation of chemicals (REACH), in which the question of PBT criteria is discussed, it was agreed to follow the conclusions made by the Commission for the purpose of identifying priority hazardous substances.

Criteria for the assessment of P, B and T are laid down in Part II (Environment) of the Technical Guidance Document on Risk Assessment.[40] Furthermore, additional criteria (such as very persistent and very bioaccumulative, or criteria defining persistent organic pollutants-POPs) have been agreed in order to substantiate the assessment of "other equivalent level of concern".

The assessment of the substances revealed that nine substances were clearly not fulfilling any of the criteria above. For three substances, atrazine, simazine and trichlorobenzenes, the assessments demonstrated that these substances do not meet

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39 See report on the "Identification of Priority Hazardous Substances" published at http://europa.eu.int/comm/environment/water/water-framework/library.htm

40 In support of the Commission Directive 93/67/EEC on risk assessment for new notified substances, the Commission Regulation (EC) No 1488/94 on risk assessment for existing substances and the Biocidal Products Directive (Directive 98/8/EC of the European Parliament and of the Council). See http://ecb.jrc.it/existing-chemicals/

all the critera for P, B and T. Also they are not very persistent and very bioaccumulative, nor do they meet the POP critera. However, on the basis of expert judgement, it was argued that they could be identified as "priority hazardous substances" on the basis of "equivalent level of concerns" based on several arguments and properties[41]. However, due to the potential impact of such a decision, the Commission services decided that specifc, clear and transparent criteria should be established first, before taking such a decision on the basis of "equivalent level of concern".

On the basis of the above-mentioned considerations, twelve substances were not proposed as priority hazardous substances. Thus, the additional environmental, social and economic impacts are considered to be zero.

Two substances are to be defined as priority hazardous substances in the proposal - endosulfan and anthracene.

Endosulfan

This pesticide is no longer authorised following the recent Commission Decision under 91/414/EEC[42], effectively phasing it out already. The use of endosulfan in plant protection products is by far its major use. In consequence, the identification of this substance as a priority hazardous substance does not have any real additional economic or social impact. However, there is an environmental benefit, since monitoring under the WFD will ensure that the ban decided in the context of 91/414/EEC will be effectively enforced and positive environmental trends will be documented, since it is expected that this persistent substance will continue to be detected in the aquatic environment for some time.

Anthracene

Anthracene was withdrawn from use as a pesticide in 2002 in the context of Directive 91/414/EEC[43]. There are few reported releases directly to water (according to the ECOLAS study), but there are considerable uncertainties as regards the data. Currently, there are various different products and uses (e.g. creosote) which intentionally or unintentionally contain anthracene. And emissions to air are significant, although the input of anthracene from air emissions into surface waters is considered to be low.

Furthermore, the risk assessment report under the Existing Substances Regulation (EEC) No. 793/93, which assesses these sources, is under preparation. If appropriate, risk reduction measures will be proposed subsequently which would contribute towards achieving the objectives set by the WFD. If there were still significant releases, the exemptions in the WFD and under the proposed Directive could be applied in order to avoid disproportionate impacts in return for only modest gains for the environment.

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41 For more details, refer to the document on "Identification of priority hazardous substances" (August 2005) at http://ec.europa.eu/comm/environment/water/water-dangersub/pri_substances.htm

42 Commission Decision 2005/864/EC (OJ L 317, 03.12.2005, p.1).

43 Regulation 2076/2002 of 20 November 2002 (OJ No L319, p. 3)

6.4.2. Repeal of daughter directives

The WFD calls on the Commission to review, revise and possibly repeal the controls in the Directives[44] listed in Annex IX to the WFD (Art 16(10)). These Directives regulate specific discharges of 17 dangerous substances[45] into the aquatic environment. Nine of these substances are also priority substances (mercury, cadmium, hexachlorocyclohexane, pentachlorophenol, hexachlorobenzene, hexachlorobutadiene, trichloromethane (chloroform), 1,2-dichloroethane and trichlorobenzene). The provisions relating to these substances are to be repealed and replaced by the provisions on priority substances in the proposed Directive. Eight other substances (carbontetrachloride, DDT, aldrin, dieldrin, endrin, isodrin, trichloroethylene and perchloroethylene) are not covered by the list of priority substances.

The Commission believes that repeal of the old legislation is necessary, whilst maintaining at least the same level of protection, for two main reasons. First, the emission limit values in them are outdated and have been surpassed by the more stringent requirements of Best Available Techniques set by the IPPC Directive. Second, the repeal of these directives would result in a considerable streamlining and simplification of Community legislation. In addition, existing and superfluous reporting burdens will be reduced considerably, since part of the water questionnaires provided by Decision 95/337/EEC would become obsolete.

In order to ensure the same level of environmental protection, the quality objectives set by these previous directives are taken over into the new proposal without modification. The WFD already requires these objectives to be achieved by 2015 as part of good chemical status. Consequently, the repeal of these directives has no cost implications. Instead it considerably reduces administrative costs.

6.5. Administrative impacts and benefits

The proposed directive is a "daughter" instrument under the WFD. This means that the major part of the administrative impact is already covered by the WFD. This includes, e.g. transposition of the main provisions, the monitoring of water quality, the assessment of compliance with EQS, the prior regulation or authorisation of discharges, and the reporting obligations to the European Commission. In fact, most of these administrative tasks did already exist through the regulatory framework of Directive 76/464/EEC and the WFD brought about a simplification and streamlining of the administrative burden.

However, any new proposal for a Directive will result in some additional administrative burden, namely:

- transposition of the Directive into national legislation;

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[44] Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC and 86/280/EEC.

[45] Counting 1,2,4-Trichlorobenzene and the sum of all trichlorobenzenes as one in accordance with the list of priority substances.

- development and agreement of guidelines for "transitional area of exceedance" and "inventories of emissions, discharges, and losses", as provided for under Articles 3 and 4 of the proposed Directive, through Comitology;

- implementation and reporting of "inventories of emissions, discharges and losses" and "transitional area of exceedance" by Member States and industry (where it exceeds obligations under the IPPC Directive 96/61/EC and the EPER or future e-PRTR[46]).

The new proposal also brings some administrative benefits. The proposal for common EQS will save the Member States from having to develop and agree national EQS, as would be necessary in the absence of Community legislation (see Section 5.1.1). Furthermore, the repeal of seven Directives will simplify the implementation burden and reduce reporting obligations considerably (see Section 6.4.2).

It is difficult to estimate the net administrative costs, i.e. the difference between the above-mentioned impacts and benefits. However, these additional costs will be much smaller than the gains resulting from a more flexible approach for the Member States, which drastically reduces the economic and employment impacts of the proposal as explained above (see Sections 5.1.4 and 6.2).

7. MONITORING AND EVALUATION OF IMPLEMENTATION

7.1. How will the policy be implemented?

The proposed Directive is to be implemented fully within the framework of Directive 2000/60/EC, which provides for overall objectives, possibilities of exemptions (e.g. in the case of disproportionate costs), timetables, implementation tools, implementation cycles, reporting mechanisms, analysis and monitoring requirements, requirements to review the measures proposed in the present Directive, and a Regulatory Committee.

In order to enhance implementation, an informal process – the "Common Implementation Strategy" - has been set up by DG Environment and the Member States bringing together key actors from Member States, EFTA countries, candidate countries, industry and environmental NGOs in a participatory process. The implementation of the proposed Directive will form a full part of the joint activities in that framework.

7.2. How will the policy be monitored?

The WFD includes a variety of indicators for monitoring and evaluating the impacts of the proposal. In particular the classification of "good chemical surface water status" will allow continuous progress in reducing pollution. The setting of EQS in the proposed Directive enables this indicator to be applied in a consistent and comparable manner across the EU. The WFD also includes provisions regarding the

[46] European Pollutant Emission Register and European Pollutant Release and Transfer Register, see http://www.eper.cec.eu.int/eper/default.asp

setting up of a monitoring network, which should become operational in 2006 and provide the first reports in 2009. This includes minimum standards for analysis, monitoring and reporting, in particular in Annex V to the WFD.

Whereas the "good chemical status" indicator focuses on environmental quality, there is an additional indicator on pressures which looks at the amount of releases (discharges, emissions and losses) of priority substances into surface waters. The WFD (Article 5) requires the setting up of an inventory and the proposed Directive complements these provisions by requiring the set up of an inventory for each river basin. The inventory is the starting point in relation to which the "progressive reduction" or the "cessation" of "discharges, emissions and losses" can be monitored.

Finally, the WFD Common Implementation Strategy established a system of indicators to monitor transposition, reporting and compliance as regards the WFD, which can also be used for the proposed Directive.[47] These types of information will ultimately be included and made publicly available through the "Water Information System for Europe"[48], which is currently being developed as a joint activity of DG Environment, the European Environment Agency, the Joint Research Centre and Eurostat.

7.3. What are the arrangements for any ex post evaluation of the policy?

The Commission is required to prepare regular reports on the implementation progress of the Member States as outlined under Article 18 of Directive 2000/60/EC. These reports will, where appropriate, also include elements of ex post evaluation. In addition, the Commission is to organise regular conferences of "interested parties on Community water policy" (Article 18 (5)) to discuss the implementation reports and share experiences.

8. CONCLUSIONS

Assessment of the potential impacts of this proposal highlighted the following key conclusions, which have been taken into account in the proposal. Harmonisation of EQS was identified as an essential step to ensure a high level of environmental protection and a level playing-field on the internal market. Current levels of compliance with the proposed EQS are already high, in particular in those Member States where most of the existing Community legislation is implemented. From the information available, the economic and environmental benefits are easily of the same order of magnitude as the potential economic costs. Moreover, the impact assessment process has revealed further ways of reducing potential costs and increasing cost-effectiveness.

The potential costs of tackling chemical pollution can be very different from one sector or river basin to another. Thus, the proposal is designed to leave the Member States the maximum degree of flexibility in designing appropriate measures to combat pollution from point and diffuse sources. The impact assessment demonstrates that subsidiarity in terms of setting measures is the most cost-effective way of addressing this environmental problem.

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47 For example, see the WFD Scoreboard: http://europa.eu.int/comm/environment/water/water-framework/scoreboard.html

48 http://europa.eu.int/comm/environment/water/water-framework/transposition.html

Where the possible solutions are technically unfeasible or disproportionately expensive, Member States can use the exemptions provided for in Article 4 (paragraphs 4 to 8) of the WFD. This also applies to the definition of "cessation", so as not to run the risk of spending huge amounts to achieve little environmental benefit.

Estimates have shown that the potential costs and potential benefits of setting EU EQS are of the same order of magnitude. However, the potential "winners" and "losers" are not the same. Therefore, the proposal has been designed to reduce additional costs and impacts to a minimum and leave the "losers" with sufficient scope to adapt, so as to avoid excessive economic impacts on particular sectors.

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ANNEX 1

Information on priority substances in the field of water policy

33 substances or groups of substances are on the list of priority substances (Decision 2455/2001/EC[49]), including selected existing chemicals, plant protection products, biocides, metals and other groups like Polyaromatic Hydrocarbons (PAH) that are mainly incineration by-products and Polybrominated Biphenylethers (PBDE) that are used as flame retardants.

The complete list is given below indicating the major use and the main environmental problem for the aquatic environment (this information is indicative for illustration purposes only). For more details and background documents on priority substances, please refer to the EUROPA web pages of DG Environment:

http://europa.eu.int/comm/environment/water/water-dangersub/pri_substances.htm

No.	Name	Major uses or emission sources	Main problem in the aquatic environment
1	Alachlor	Plant protection product (herbicide)	Direct effects on aquatic organisms and increased need/costs for drinking water treatment.
2	Anthracene	Chemical intermediate, wood preservative (creosote), combustion by-product	Direct effects on aquatic organisms.
3	Atrazine	Plant protection product (herbicide)	Direct effects on aquatic organisms and increased need/costs for drinking water treatment.
4	Benzene	Synthesis of other chemicals	Carcinogenic and (therefore) increased need/costs for drinking water treatment.
5	Brominated diphenylether	Flame retardants	Accumulation in food chain and sediments.
6	Cadmium and its compounds	Batteries, pigments, stabilisers, metal plating, discharges by several industrial sectors	Direct effects on aquatic organisms. Accumulation in food chain and sediments. Contamination of seafood.
7	C_{10}-$_{13}$-chloroalkanes	Metal working fluids, flame retardant	Accumulation in food chain and sediments.
8	Chlorfenvinphos	Plant protection product (insecticide)	Direct effects on aquatic organisms and increased need/costs for drinking water treatment.
9	Chlorpyrifos	Plant protection product (insecticide)	Direct effects on aquatic organisms and increased need/costs for drinking water treatment.
10	1,2-Dichloroethane	Production of vinyl chloride monomer for PVC production	May affect human health. Increased need/costs for drinking water treatment.

[49] OJ L 331, 15.12.2001, p. 1.

No.	Name	Major uses or emission sources	Main problem in the aquatic environment
11	Dichloro methane	Solvent, aerosol, foam blowing agent	Increased need/costs for drinking water treatment.
12	Di(2-ethylhexyl) phthalate (DEHP)	Plasticiser in soft-PVC	Accumulation in food chain and sediments.
13	Diuron	Plant protection product (herbicide)	Direct effects on aquatic organisms and increased need/costs for drinking water treatment.
14	Endosulfan	Plant protection product (insecticide)	Direct effects on aquatic organisms and increased need/costs for drinking water treatment.
15	Fluoranthene	Tar-based paints, creosote, fluorescent and vat dyes. By-product of combustion.	Direct effects on aquatic organisms, in particular in sediments.
16	Hexachloro benzene	No use in EU but unintentional by-product, e.g. in PVC	Accumulation in food chain and sediments.
17	Hexachloro butadiene	No use in EU but unintentional by-product	Accumulation in food chain and sediments.
18	Hexachloro cyclohexane	Plant protection product (insecticide)	Direct effects on aquatic organisms and increased need/costs for drinking water treatment.
19	Isoproturon	Plant protection product (herbicide)	Direct effects on aquatic organisms and increased need/costs for drinking water treatment.
20	Lead and its compounds	Batteries, rolled products, compounds, shots, weights, PVC stabilisers and many other products	Direct effects on aquatic organisms. Accumulation in food chain and sediments. Contamination of seafood.
21	Mercury and its compounds	Batteries, thermometers, tooth filling, chlor-alkali industry	Direct effects on aquatic organisms. Accumulation in food chain and sediments. Contamination of seafood.
22	Naphthalene	Chemical intermediate, wood preservative (creosote), combustion by-product	Direct effects on aquatic organisms.
23	Nickel and its compounds	More than 300.000 products mainly as alloys, e.g. stainless steel	Direct effects on aquatic organisms.
24	Nonylphenols	Chemical intermediate, industrial detergent and others	Direct effects on aquatic organisms. Hormone-like effects.
25	Octylphenols	Similar to nonylphenol	Direct effects on aquatic organisms.
26	Pentachloro benzene	Intermediate in the production of quintozene (Plant protection product)	Accumulation in food chain and sediments.
27	Pentachloro phenol	Biocide in wood or textiles	Direct effects on aquatic organisms.

No.	Name	Major uses or emission sources	Main problem in the aquatic environment
28	Polyaromatic hydrocarbons	Combustion by-products, metal treatment, wood treatment (creosote) and others	Direct effects on aquatic organisms. Accumulation in food chain and sediments.
29	Simazine	Plant protection product (herbicide)	Direct effects on aquatic organisms and increased need/costs for drinking water treatment.
30	Tributyltin compounds	Antifouling paints of ships	Accumulation in food chain and sediments. Hormone-like effects. Contamination of seafood.
31	Trichloro benzenes	Chemical intermediate, process solvent	Direct effects on aquatic organisms. Accumulation in food chain and sediments.
32	Trichloromethane (Chloroform)	Chemical intermediate, e.g. production of HCFC (blowing agent and refrigerant)	Direct effects on aquatic organisms, in particular in sediments.
33	Trifluralin	Plant protection product (herbicide)	Direct effects on aquatic organisms and increased need/costs for drinking water treatment.

ANNEX 2

Consultation of Interested Parties

Four main types of consultation in preparation of the proposal, which are consistent with the Commission's minimum standards for consultation, are described below.

1. Expert and stakeholder consultation

According to Article 16 (5) WFD, the Commission is invited to take account of recommendations from the Scientific Committee on Toxicity, Ecotoxicity and the Environment, the Member States, the European Parliament, the European Environment Agency, Community research programmes, international organisations to which the Community is a party, European business organisations including those representing small and medium-sized enterprises, European environmental organisations, and of other relevant information which comes to its attention. In order to respond to this obligation, the Commission established in March 2001 the Expert Advisory Forum on Priority Substances and Pollution Control (EAF PS). The EAF PS was composed of representatives (Focal Points) from all the Member States, from the Candidate Countries and Norway. In addition, experts from all interest groups, e.g. from industry, water suppliers and environmental NGOs, were also present. At the same time, the system of Focal Points ensured that all information and documents were circulated widely amongst national and regional groups (for system of Focal Points, see also box below).

Box: Organisation of input from stakeholders in the Expert Advisory Forum through Focal Points – example EUROMETAUX

EUROMETAUX represents the non-ferrous metal industry and nominated a Focal Point for the EAF PS from the beginning. The Focal Point informed the sub-sectors (lead industry, nickel industry etc.) and national organisations on a regular basis and ensured that consultation of documents was widely spread within this industrial sector. Thereby the feedback and consultation mechanism was widened and streamlined. If the Focal Point decided that a specific expert needed to contribute to a specific item on the agenda of the EAF meetings, he/she was able to bring along this expert to the meetings.

A large number of interest groups participated on a regular basis in the meetings of the EAF PS (see table below). The EAF PS met on eight occasions between March 2001 and June 2004. One of these meetings was entirely dedicated to emission controls and source screening. In addition, two expert sub-groups where set up under the EAF in order to gather more technical and scientific expertise (see below, section 2).

Table: List of interested groups, stakeholders and NGOs regularly participating in the Expert Advisory Forum on Priority Substances and Pollution Control

Abbreviation	Name	Description
CEFIC	European Chemical Industry Council	Umbrella organisation for the chemicals industry
CEPI	Confederation of European Paper Industries	Confederation of European Paper Industries
ECPA	European Crop Protection Association	Producers and manufacturers of plant protection products
EEB	European Environment Bureau	European umbrella organisation of 143 national and regional environmental organisations in 31 countries.
Eurochlor	European Chlorine Manufacturers Association	Representation of the chlor-alkali industry
EUROMETAUX	European Association of Metals	Metals industry representatives.
EUREAU	European Union of National Associations of water suppliers and wastewater services	One of the main representatives of water companies.
EWA	European Water Association	Another representation of the water sector.
UNICE	Union of Industrial and Employers' Confederations of Europe	General industry representatives.
WWF	World Wildlife Fund for Nature	Global environment and nature protection organisation

During this whole preparatory phase, several documents were produced which became the technical basis for the various parts of the proposal. Several rounds of commenting took place for each document and the final versions reflect contributions made by the Expert Advisory Forum. The key documents[50] are, in particular:

- A report on environmental quality standards including the methodology used and substance specific datasheets.
- A concept paper, on emission controls.
- A report on the identification of priority hazardous substances.
- A report of the conclusions of the Expert Group on the Analysis and Monitoring of Priority Substances (AMPS).

[50] All these reports are available on the EUROPA webpages of DG Environment under: http://europa.eu.int/comm/environment/water/water-dangersub/pri_substances.htm

Further to the intensive consultation on each technical issue, DG Environment invited the EAF PS members to comment on a first draft proposal for a Directive during the period June to September 2004. Extensive comments were received by 12 Member States, 12 industry organisations and two environmental NGOs. Many of those comments are reflected both in this Impact Assessment and in the selected options for the proposed Directive.

Briefly, the results of this consultation can be summarised as follows. On the setting of EQS and the PHS identification the majority of replies confirmed the line taken by the Commission.

The responses on the question of emission controls were more diverse. The key conclusions from the replies to the consultation on the draft directive were:

- existing legislation is comprehensive, and emphasis should be placed on adequate implementation of such instruments,
- all remaining sources and pathways can not be regulated at the same time, and priorities must be set,
- many data-gaps need to be addressed before developing further specific regulatory measures, but in the meantime a timely and pragmatic approach is required,
- the key principle is “control at source”, rather than “end-of-pipe”,
- key pieces of legislation – in particular the proposed REACH Regulation and the IPPC Directive - are not adopted or fully implemented yet. The full effect of these measures towards the achievement of WFD objectives should be awaited before taking additional measures in this policy area.
- Different opinions were raised on the level of EU harmonisation of pollution control measures. Some Member States expressed a preference for Community wide emission limit values, whilst other Member States expressed a preference for leaving concrete pollution control to Member States (‘subsidiarity principle’).

The outcome of the consultation and, in particular the comments in relation to the proposed emission control measures resulted in a considerable re-casting of the draft directive. In particular, several EQS were revised by taking into account further scientific data and considerations. The compliance part was streamlined and flexibility for the Member States to take account of background concentrations and bioavailaibility for metals was introduced. Moreover, the "transitional area of exceedance" and the "inventory of discharges, emissions and losses" were strengthened as the main tools for ensuring appropriate compliance with the primary requirements of the proposed Directive. Furthermore, the decision on identifying certain "priority hazardous substances" was revisited. Most importantly, the decision was taken that the proposal would not introduce new, additional emission controls. In addition, to the considerable range of existing Community acts to address pollution from priority substances, the Commission considered it more appropriate to use and, if necessary and appropriate, amend exisiting instruments. This approach was summarised in the associated Communication on "Integrated prevention and control of chemical pollution of surface waters in the European Union" that was agreed together with the proposal for a Directive.

2. Scientific expertise and peer review

To develop the proposals required the input of toxicologists and eco-toxicologists. Scientists and experts nominated by the EAF were brought together in the Expert Group on Quality Standards which met twice and peer reviewed the basic data sheet on each substance. These data sheets were the basis upon which the EQS values were derived. In addition, questions of analysis and monitoring were addressed by the Expert Group on Analysis and Monitoring of Priority Substances (AMPS).

At the end of this consultation and peer review process, the Scientific Committee on Toxicity, Eco-toxicity and the Environment (SCTEE) was consulted on the methodology and derivation of individual EQS[51].

The SCTEE accepted that, overall, the proposed methodology was based on standard methodology used in EU risk assessments. However, some methodological issues were raised and concrete suggestions were made, e.g. in relation to the correlation with risk assessments under other legislation, the evaluation of metals and the grouping of parameters. The Committee stressed that the databases used for EQS setting should be as "full and updated as possible" and that appropriate screening for "quality and relevance" should take place. Finally, the SCTEE gave a brief assessment of the proposed EQS for each priority substance.

Following this opinion, the Expert Advisory Forum was asked to take account of the opinion of the SCTEE and to provide further data. As a follow up, all data sheets for EQS were revised to take account of the SCTEE and EAF comments. In particular, the base data were updated and some new data were included. With regard to the suggestions concerning alternative methodologies it was not possible to implement all of the elements given in the advice of the SCTEE because some of these methodologies are still under development. A detailed assessment of the SCTEE comments and the action taken to address them has been compiled in a separate document[52].

3. Consultation on economic impacts

Two studies[53] have been commissioned by DG Environment to support the preparation of the Impact Assessment:

- Study report on "Assessing economic impacts of the specific control measures for priority substances and priority hazardous substances regulated under Article 16 of the Water Framework Directive" carried out by ECOLAS.

- Study report on "Proposed environmental quality standards for priority substances - current compliance and potential benefits" carried out by WRc.

For the purpose of conducting this study, a large number of associations were involved in the consultation process. In order to gather the relevant data, two questionnaires were designed, one for the Member States (EU-25) and accession countries Bulgaria and Romania as well as

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51 Opinion of the SCTEE adopted on 43rd Plenary Meeting of 28.5.2004, full text available under: http://europa.eu.int/comm/health/ph_risk/committees/sct/documents/out230_en.pdf

52 Internal working document is available on request.

53 Both final reports are available under http://europa.eu.int/comm/environment/water/water-dangersub/pri_substances.htm

Norway and another for those industrial sectors likely to be affected by the proposal. In total, 43 industrial sectors were consulted. The key findings of these questionnaires are presented in the above-mentioned study report. Unfortunately, the response rate was not as high as hoped for. For details on the industries consulted and the return rate of the questionnaires, please consult the table below.

4. Consultation with other Commission services

Other Commission services were invited to all meetings of the EAF. In order to ensure consistency with other Community legislation, they were invited to report relevant developments under the agenda item "information on other EU legislation" at each EAF meeting. Once the proposals became more concrete, in 2003 DG Environment established an Inter-Service Group which met four times to discuss the progress of the preparatory process.

Table: ECOLAS questionnaires – industrial sectors consulted

Sector	**Addressed to**	**Response received**
Car manufacturing	ACEA (Association des Constructeurs Européens d' Automobiles)	
Chemical industry and chlorine alkali industry	- Eurochlor	X
	- Isochem Company (1)	X
	- EBFRIP (European Brominated Flame Retardants Industry Panel) through CEFIC (European Chemical Industry Council)	X
	- ECPI (European Council for Plasticisers and Intermediates) through CEFIC (European Chemical Industry Council)	X
Detergents	AISE (European Soap and Detergent Industry Association)	
Electrical industry	EECA (European Electronic Component Manufacturers Association	
Fertiliser production	EFMA (European Fertilizers Manufacturers Association)	
Glass & Ceramics	- ECIA (European Composites Industry Associaton)	
	- CERAMIE-UNIE	
Incineration of waste	EURITS (European Union for responsible incineration and treatment of special waste)	
Laboratories	EUROLAB (European Federation of National Associations of Measurement, Testing and Analytical Laboratories)	
Large Combustion Plants	Eurelectric (European Electricity Industry)	X
Metal industry: - Ferrous metal - Non-ferrous metal - Surface treatment metals - Iron and steel	- Eurometaux - subsector specific answers from: - ENiG: European Nickel Group - ICA: Industrial Cadmium Association - LDAI: Lead Development Association Int - WirtschaftsVereinigung Metalle – Germany - EAA (European Aluminium Association) - Outokumpo Finland (1)	X

Sector	Addressed to	Response received
	- CETS (European Committee for Surface Treatment)	
	- EUROFER (European Confederation of Iron and Steel Industry)	X
	- EURO INOX (European Market - Development Association for Stainless Steel)	
Mining industry	EURMINES	
Oil and Gas production	- EOSCA (European Oilfield Speciality Chemicals Associaton)	
	- OGP (International Oil and Gas Producers' Association	
Pesticide production and formulation	- ECPA (European Crop Production and formulation)	X
	- ECCA (European Crop Care Association)	
	- Dow AgroSciences (1)	X
Pharmaceuticals	- EFPIA (European Federation of Pharmaceuticals and Industries Association)	
Polymers	- APME (Associaton of Plastics Manufacturers in Europe)	
	- EUPC (The Plastics Converters in Europe)	X
Pulp and Paper	CEPI (Confederation of European Paper Industries)	
Refineries	Concawe	X
Rubber industry	BLIC (Bureau de Liaison des Industries de Caoutchouc de la CE)	X
Shipbuilding sector	CESA (Committee of European Unions Shipbuilders' Association)	
Tanning	COTANCE (The European Leather Association Confederation of National Associations of Tanners and Dressers of the European Community)	
Textiles	Euratex (The European Apparel and Textile Organisation), answers from national organisations - TVI (Textile Industry of Germany) (1) - Febeltex (Belgian Textiles Federation) (1) - Arcotexteis Portugal (1)	 X X X
Drinking water production and waste water treatment	- Eureau (European Water suppliers and wastewater operators association)	X
	- EWA (European Water Association)	
	- Water UK	X
Wood treatment	CEI-Bois (European Confederation of Woodworking Industries)	

(1) These companies or national associations received a questionnaire through their relevant European associations, not from the European Commission directly.

ANNEX 3

Non-exhaustive list of references to other relevant literature

REACH document: The impact of the New Chemicals Policy on health and the environment
http://europa.eu.int/comm/environment/chemicals/pdf/envhlthimpact.pdf

REACH document: Extended Impact Assessment
http://europa.eu.int/comm/enterprise/reach/docs/reach/eia-sec-2003_1171.pdf

EU Mercury Strategy: Extended Impact Assessment
http://europa.eu.int/comm/environment/chemicals/mercury/pdf/extended_impact_assessment.pdf

European Environment & Health Action Plan – 2004-2010: Extended Impact Assessment
http://europa.eu.int/comm/environment/health/pdf/sec_2004_729_en.pdf

EEA Report No. 1 (2003): "Europe's Water: An indicator-based Report"
http://reports.eea.eu.int/topic_report_2003_1/en/Topic_1_2003_web.pdf

EEA Report No. 2 (2003): "Hazardous substances in the European marine environment: trends in metals and POPs"
http://reports.eea.eu.int/topic_report_2003_2/en/Topic_No_2_2003_web.pdf

EEA Report No. 10 (2003): "Europe's environment: third assessment"
http://reports.eea.eu.int/environmental_assessment_report_2003_10/en/kiev_chapt_08.pdf

EEA Report No. 38 (2004): "Arctic environment: European perspectives"
http://reports.eea.eu.int/environmental_issue_report_2004_38/en/Iss_38_Arctic_web.pdf

OSPAR: "Quality Status Report 2000"
http://www.ospar.org/eng/html/welcome.html

HELCOM: "The Baltic Marine Environment Report 1999-2002"
Baltic Sea Environment Proceedings No. 87
http://www.helcom.fi/stc/files/Publications/Proceedings/bsep87.pdf

AMAP Report (2002): "Persistent Organic Pollutants (POPs)"
http://www.amap.no/

AMAP Report (1998): "Assessment Report: Arctic Pollution Issues"
http://www.amap.no/

UNEP (2002): "Global Mercury Assessment"
http://www.chem.unep.ch/mercury/Report/Final%20Assessment%20report.htm

Swedish EPA (1998): "Persistent Organic Pollutants"
A Swedish view of an international problem. Monitor 16. ISBN 91-620-1189-8
http://www.internat.naturvardsverket.se/

ICPDR (2004): "Danube Basin Analysis (Roof Report 2004)"
http://www.icpdr.org/pls/danubis/danubis_db.dyn_navigator.show

ANNEX 4

Current national EQS for Priority Substances in water
[Unit: microgram per litre in water]

N°	Name of priority substance	Range of existing EQS in EU Member States	Proposed EU EQS	Current EU EQS
(1)	Alachlor	0.035- 3	0.3	0.1 [c]
(2)	Anthracene	0.01- 0.09	0.1	0.01 [b]
(3)	Atrazine	0.1- 2.4	0.6	0.1 [c]
(4)	Benzene	1- 240	10	1 [c] 10 [b]
(5)	Brominated diphenylether	na	Na	
	Penta BDE	none	0.0005	-
(6)	Cadmium and its compounds (often hardness related)	0.01- 5 (total)	0.08 - 0.25 (dissolved)	1 [a] (total) 5 [c]
(7)	Chloroalkanes, C_{10-13}	0.05	0.4	-
(8)	Chlorfenvinphos	0.002- 0.1	0.1	0.1 [c]
(9)	Chlorpyrifos	0.0005-0.1	0.03	0.1 [c]
(10)	1,2-Dichloroethane	2- 1100	10	10 [a b] 3 [c]
(11)	Dichloromethane	10- 20000	20	10 [b]
(12)	Di(2-ethylhexyl)phthalate (DEHP)	none	1.3	-
(13)	Diuron	0.05- 2	0.2	0.1 [c]
(14)	Endosulfan	0.001- 0.1	0.005	0.001 [b] 0.1 [c]
(15)	Fluoranthene	0.024- 0.5	0.1	-
(16)	Hexachlorobenzene	0.007- 0.01	0.01	0.03 [a] 0.01 [b]
(17)	Hexachlorobutadiene	0.1- 0.5	0.1	0.1 [a b]
(18)	Hexachlorocyclohexane (lindane)	0.01- 0.9	0.02	0.1 [a] 0.1 [c]
(19)	Isoproturon	0.1- 2	0.3	0.1 [c]

N°	Name of priority substance	Range of existing EQS in EU Member States	Proposed EU EQS	Current EU EQS
(20)	Lead and its compounds	1- 220 (total)	7.2 (dissolved)	10 [c] (50)
(21)	Mercury and its compounds	0.04- 2 (total)	0.05 (dissolved)	1 [a b c] (total)
(22)	Naphthalene	1- 10	2.4	1 [b]
(23)	Nickel and its compounds	1.8- 1000 (total)	20 (dissolved)	20 [c]
(24)	Nonylphenols	0.3- 1	0.3	-
(25)	Octylphenols	1	0.1	-
(26)	Pentachlorobenzene	1	0.007	-
(27)	Pentachlorophenol	0.18- 5	0.4	2 [a] 1 [b]
(28)	Polyaromatic hydrocarbons	0.001- 1	-	0.1 [c] 0.2
	(Benzo(a)pyrene)	0.01- 5	0.05	0.01 [c]
	(Benzo(b)fluoranthene)	0.001	∑=0.03 (w)	-
	(Benzo(g,h,I)perylene)	0.003- 0.5	∑=0.002 (x)	-
	(Benzo(k)flouranthene)	0.003- 0.2	(w)	-
	(Indeno(1,2,4-cd)pyrene)	0.0016- 0.4	(x)	-
(29)	Simazine	0.02-2	1	1 [b] 0.1 [c]
(30)	Tributyltin compounds	0.0001-0.02	0.0002	0.001 [b]
(31)	Trichlorobenzenes	0.1-8	0.4	0.4 [a]
(32)	Trichloromethane (chloroform)	1-40 (590)	2.5	12 [a]
(33)	Trifluralin	0.03-0.2	0.03	0.1 [b c]

(w) sum parameter for Benzo(b)fluoranthene and Benzo(k)fluoranthene
(x) sum parameter for Benzo(g,h,i)perylene and Indeno(1,2,4-cd)pyrene

[a]:Daughter Directives of 76/464/EEC (Directives 82/176/EEC, 83/513/EEC, 84/456/EEC, 84/491/EEC and 86/280/EEC as amended by Directive 88/347/EEC and 90/415/EEC)
[b]: CSTE (Scientific Committee on Toxicity and Ecotoxicity) (1994) EEC Water Quality Objectives for Chemicals Dangerous to the Aquatic Environments (List I) Scientific Committee on Toxicity and Ecotoxicity of Chemicals of the European Commission (CSTE(EEC)). Reviews of Environmental Contamination and Toxicology, Vol. 137, Springer Verlag, New York.
[c]: Drinking Water Directive 98/83/EC (Official Journal L 330 , 05/12/1998, p. 32 – 54)

ANNEX 5

Overview of relevant Community legislation constituting emission control measures in the sense of Article 16 (8) WFD

A non-exhaustive overview of other relevant EU policy areas is presented below. These policies are contributing to the achievement of environmental objectives for priority substances and priority hazardous substances under the Water Framework Directive.

1. Most important EU legislation controlling priority substances

1.1 Controlling marketing and use of priority substances

If chemical substances either do not enter the market or have restrictions placed on their use this will clearly have a significant impact upon the potential for pollution. EU legislation dealing with the marketing and use of chemicals dates back to the 1960s and has proven effective at reducing the overall pollution burden on the environment.

The **"Existing Substances Regulation"**[54] on the evaluation and control of existing substances, requires manufacturers or importers to submit information on the substances they produce or import. From the 141 substances selected, risk assessments on risks to human health and the environment have been or are being carried out for 11 of the priority substances.

In cases where a risk to or via the aquatic environment has been identified, risk reduction measures are being proposed. One of the main risk reduction measures is the **"Marketing and use"** Directive[55] which aims at EU wide restrictions of marketing and use of certain dangerous substances and preparations that pose risks to human health and/or the environment. This Directive is regularly updated by amendments and adaptations to technical progress. Currently, Directive 76/769/EEC restricts 17 priority substances (or groups of priority substances). Additional marketing and use restrictions are under consideration.

The proposal for a Regulation concerning the **Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)**[56] will provide a range of tools to protect man and the environment against negative effects from chemicals. As foreseen in the Commission's proposal, manufacturers and importers of dangerous substances in quantities of 10 tonnes or more per year will have to perform chemical safety assessments, in which they demonstrate that the risks from the use of substances, including to the aquatic environment, are adequately controlled. If a risk to the aquatic environment needs to be addressed on the Community level, the manufacture, placing on the market and use of the substance causing that risk, will be restricted, i.e. prohibited or subjected to conditions. Once adopted, REACH will have a significant positive contribution on the risk reduction of priority substances and the cessation of discharges, emissions and losses of priority hazardous substances.

The WFD recognises the significant role of **Directive 91/414/EEC (placing of plant protection products on the market)** for the fulfilment of the WFD objectives. Since the

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54 Regulation (EEC) No. 793/93, OJ L 84, 5.4.1993, p. 1.
55 Directive 76/769/EEC, OJ L 262, 27.9.1976, p. 201.
56 COM(2003) 644 final of 29.10.2003.

adoption of the WFD, the Commission decided not to include four priority substances (atrazine, lindane, simazine and endosulfan) in Annex I of Directive 91/414/EEC. Furthermore, two priority substances (pentachlorophenol and chlorfenvinphos) were not included in Annex I to Directive 91/414/EEC because no company expressed an interest in submitting the required dossier for the assessment. Such a decision means that those substances cannot be authorised to be used in plant protection products in the EU which largely equals the cessation requirements for priority hazardous substances under the WFD. For the priority substances isoproturon and chlorpyrifos, the Commission decided to include them in Annex I but with stringent use restrictions targeted at protection of the aquatic environment. The other three priority substances used as pesticides (alachlor, diuron and trifluralin) are currently being assessed.

In 2006, the Commission will bring forward a proposal for a **Thematic Strategy on the Sustainable Use of Pesticides**. It will focus on the use phase ensuring that plant protection products are applied only where necessary, according to the authorised use conditions, by trained/well informed users with appropriate spraying equipment and according to the highest safety standards. General and specific measures will be proposed which will make a considerable contribution to achieving the WFD objectives in relation to pesticides. In particular, the Commission recommends that Member States apply a set of practices specifically targeted to reduce risks to the aquatic environment from the use of pesticides. In addition, a set of indicators will be established eventually in the framework of the Strategy. These indicators intend to measure the risks from the use of plant protection products to the aquatic environment and document the trends of such risks over time. Should the trends be unsustainable, any existing measures can be refined or reviewed on this basis.

Although the products covered by the **Biocidal Products Directive 98/8/EC**[57] are generally applied under more confined conditions of use than plant protection products, the release of biocidal substances into the aquatic environment, in particular from product types such as antifouling paints, water disinfectants, cooling water preservatives or others will be another source of pollution. However, any unacceptable risks to the aquatic environment established during the evaluation of the dossiers submitted for active substances will lead to non-inclusion in Annex I to the Directive, so that the substance can no longer be used for the application leading to such unacceptable risks. The effects of the relatively new legislation on biocides will become visible after 2006, when the first evaluations of active substances for use in biocidal products will be finalised.

In addition, the **Common Agricultural Policy (CAP)** also established rules that contribute to water protection. Farmers receiving direct payments under the first pillar of the CAP have to respect requirements resulting, *inter alia,* from the Council Directive 91/414/EEC of 15 July 1991. Under the second pillar (Rural Development), agri-environment payments and compensatory allowances are subject to the respect of Good Farming Practices (GFP), which entails at least statutory requirements. Furthermore, farmers who take more stringent measures going beyond GFP may be compensated under the agri-environmental measures. The above-mentioned recommendations on practices for the protection of the aquatic environment can assist in the effective targeting of the available funding instruments under Rural Development.

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57 Directive 98/8/EC, OJ L 123, 24.4.1998, p. 1.

The **"Classification and labeling"** Directives require substances[58] and preparations[59] to be classified according to their intrinsic hazards for human health or the environment. In the latter case the classifications can be for the aquatic environment and can indicate acute toxicity to aquatic organisms or the potential for the chemical to have a long term effect in the environment. The same legislation also imposes prior notification and risk assessment requirements on new substances before they are marketed in the EU.

Other Community product policies or initiatives may contribute to the achievement of the WFD objectives. Examples are the Community **eco-label award scheme**[60] and the Commission's strategy on an **integrated product policy** in its 2003 Communication[61]. Another example concerning a specific product group is the Council Directive on **construction products**[62] which states that an essential requirement of construction products is that the construction work shall not lead to "pollution or poisoning of the water and soil".

1.2 Controlling emissions and discharges of priority substances

The Directive on **Integrated Pollution Prevention and Control (IPPC**)[63] aims at achieving integrated prevention and control of pollution arising from a significant number of installations[64] with a high potential environmental impact. It controls emissions and discharges of priority substances to the aquatic environment, including the emissions to air of pollutants that may, through deposition reach the aquatic environment. The IPPC Directive will be fully implemented by 2007, the deadline by which existing installations must comply with the "best available techniques" (BAT).

The **European Pollutant Emission Register** (EPER[65]), established by the Commission in 2000, publishes every three years an inventory of principal emissions and responsible sources reported by the Member States under the IPPC Directive. 10,000 industrial facilities reported to EPER for the first reporting year 2001. 17 priority substances are among 26 pollutants for which emissions into waters were reported. The next EPER report, covering data for 2004, is due in 2006. Thereafter, EPER will be replaced by the recently adopted **European Pollutant Release and Transfer Register (E-PRTR)**[66]**.** This includes all priority substances of Annex X of the WFD.

1.3 Controlling priority hazardous substances

Regulation (EC) No 850/2004[67] **on Persistent Organic Pollutants** translates international instruments on persistent organic pollutants into Community law. Currently, three (groups of) priority hazardous substances (hexachlorobenzene, HCH/lindane and PAHs) are among those prohibited, restricted or subject to release reduction and waste provisions. Thereby, this regulation implements the cessation target for these priority hazardous substances.

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58 Directive 67/548/EEC, OJ 196, 16.8.1967, p. 1

59 Directive 1999/45/EC, OJ L 200, 30.7.1999, p. 1

60 Regulation (EC) No 1980/2000, OJ L 237, 21.9.2000, p. 1

61 COM(2003) 302 final of 18.6.2003.

62 Directive 89/106/EEC, OJ L 40, 11.2.1989, p.12

63 Directive 96/61/EC, OJ L 257, 10.10.96, p. 26

64 It covers installations above a certain size threshold as well as being limited to certain types of economic activities listed in Annex 1 of 96/61/EC.

65 Commission Decision 2000/479/EC (OJ L 192, 28.7.2000, p. 36)

66 Regulation (EC) No 166/2006, OJ L 33, 4.2.2006, p. 1

67 OJ L 158, 30.4.2004, p. 7.

The use and release of the metals **mercury** and **cadmium** is controlled in several Community instruments. The Community strategy concerning mercury[68] aims to protect human health and the environment from the release of mercury based on a life-cycle approach, taking into account, *inter alia,* production, use, waste treatment, trade of mercury as a commodity and emissions. It considers what aspects of the mercury problem will be addressed by action under the present and already-planned Community legislation and policies (including the WFD), what will remain, and what further steps should therefore be taken. The strategy will contribute to the implementation of the cessation objective for mercury releases to the aquatic environment.

In addition to the ongoing risk assessment on cadmium in the framework of Regulation 793/93, some sources are currently being considered for regulation. The Commission proposed in 2003 a revision of the Directive on Batteries and Accumulators[69] which contain, e.g. cadmium. Cadmium also occurs as a natural impurity in mineral phosphate which is used as a basis for producing fertilizers. The Commission is considering bringing forward a proposal to establish an upper limit for the cadmium content of phosphate fertilizers, thereby limiting the input of cadmium to agricultural soils and its subsequent migration to the water compartments.

2. Emission controls to air

Chemical pollutants emitted to **air** from mobile or stationary sources can reach surface waters through deposition. The exact impact on the chemical status of surface and ground waters due to such deposition is not yet known and further research is needed. The relative impact of airborne pollutants will increase as other sources become more strictly regulated, and emissions to air may also need to be considered to achieve the WFD objectives. Community legislation on **ambient air quality** exists for some priority substances – **Lead[70], Benzene[71], Cadmium, Mercury and PAHs[72]**. The integrated approach of the IPPC Directive also offers an opportunity to address the emissions to air from such installations. Other legislation aiming at improving air quality may have a positive impact on the aquatic environment such as on **quality standards for petrol and diesel**[73].

3. Waste and wastewater management

The final stage of the life-cycle of products or of processes may lead to the release of priority substances, and hence should be considered. Community legislation on waste covers hazardous substances, for example the **Waste Framework Directive[74]** requires Member States to recover or dispose of waste without risk to water. The future **Thematic strategy on prevention and recycling of waste** will also be important, in that the whole life cycle of waste containing priority substances is considered, which should mean that less substances are released to the environment through the waste treatment process, but also that products made of recycled material do not lead to further losses to the aquatic environment. The

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68 COM(2005) 20 final of 28.1.2005
69 COM(2003) 723 final of 22.11.2003
70 Directive 1999/30/EC, OJ L 163, 29.6.1999, p. 41
71 Directive 2000/69/EC, OJ L 313, 13.12.2000, p. 12
72 Directive 2004/107/EC, OJ L 023, 26.1.2005, p.3
73 Directive 98/70/EC, OJ L 350, 28.12.1998, p.58
74 Directive 75/442/EEC OJ L 194, 25.7.1975, p.47

prevention strategies for hazardous waste should also contribute to less releases to the aquatic environment.

Many of the chemical substances polluting our surface waters are reaching the aquatic environment via Urban Waste Water Treatment Plants. From such plants, the output is either in the form of discharges to surface waters or in the form of sewage sludge. The **Urban Waste Water Directive (91/271/EEC)**[75] is crucial for controlling releases from consumer products and importantly from industrial waste water entering the collection system (often from small or medium sized industrial point sources not falling under the scope of the IPPC Directive). Such industrial discharges are subject to prior authorisation. The existing treatment requirements to reduce organic and nutrient loads also contribute to reducing pollution from certain priority substances, although, in particular, heavy metals are accumulated in the sewage sludge and thereby transferred to another environmental compartment. However, there is still pollution of priority substances stemming from sewage discharges and strormwater overflows of sewerage systems, though the amounts and the significance are not known to date.

Other examples of measures of relevance include the **Sewage Sludge Directive**[76]**,** which has limits for certain priority substances in sewage sludge used for agricultural purposes, and the recent **Commission proposal**[77] **on the management of waste from extractive industries** where the concerns of chemical pollution of surface water have been integrated.

4. Thematic Strategies

The **Community Strategy for Endocrine Disrupters**[78] sets out a number of short and long term actions for chemical substances showing evidence of endocrine disruption or potential endocrine disruption in man and/or wildlife, such as information gathering and test methods development. On a long term perspective the outcome should lead to the review and adaptation of existing legislation.

Dioxins, furans and PCBs were not included in the initial list of priority substances under the WFD as they were considered to be historic pollutants and adequately controlled, but may be considered for future inclusion depending on new monitoring data. As an example, fish from the Baltic Sea have relatively elevated dioxin levels and constitute an important part of the diet in the surrounding countries. A **2001 Dioxin Strategy**[79] assesses the state of the environment and aims at reducing human exposure to dioxins, furans and PCBs. It proposes actions *inter alia* to reduce emissions, and control the quality of the environment.

Regarding the Thematic Strategies prepared in the context of the 6th Environmental Action Programmes, in addition to the one on "Sustainable Use of Pesticides" mentioned already, the following upcoming policies are relevant:

- **Soil,** which will include a component on contaminated soils and sediments, which is important for pollution of both surface and ground water, as is the issue of soil erosion.

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75 OJ L 135, 30.5.1991, p.40.
76 Directive 86/278/EEC, 4.7.1986, p. 6
77 COM(2003) 319 final, 2.6.2003.
78 COM(1999) 706 final, 17.12.1999.
79 COM(2001) 593 final. First progress report (COM(2004) 240 final.

– **Sustainable use of natural resources** addresses water as it is one of the most important natural resources. The Water Framework Directive sets out an integrated and sustainable use strategy fully capturing the general objectives and principles set out by the Thematic Strategy. The WFD also includes provisions to implement the polluters-pays-principle through the water pricing requirements. A close link between both policies provides the opportunity to use the WFD as an example for the use of other natural resources. As regards other natural resources, their sustainable use will contribute to reducing the pollution load of priority substances.

– **Urban environment,** the protection of surface and ground water is an integral part of this strategy as local authorities are responsible for water management, for instance wastewater treatment and the provision of storm water overflow systems. Measures envisaged under the strategy related to land planning or sustainable construction can further help reduce releases of priority substances to the environment.

5. Occupational safety and health

There is extensive legislation to cover the various risks in the workplace[80], with the Framework Directive from 1989 (89/391/EEC) laying down the general principles for health and safety at work. The Framework Directive lays down requirements for a prevention policy with the overarching responsibility resting on the employer. Under the Directive there has to be risk assessments for all possible risks to workers, and appropriate measures like information, training and consultation have to follow. On chemicals there are various legislation, such as the Directive on chemical agents (98/24/EC) and there is also a Directive on exposure to carcinogens and mutagens (2004/37/EC).

6. Research and development

Many aspects of the strategy against chemical pollution of surface waters require further research. One example mentioned above relates to the impact of depositions from air. Other areas requiring further research are:

- predictive modelling of the behaviour of chemicals in the aquatic environment and how chemical compounds interact between environmental compartments such as sediment/water, surface water/groundwater and air/surface water/soil

- assessment of the potential use for regulatory purposes of the bioavailability concept (metal speciation, adsorption on particles, influence of organic matter, etc.)

- identification of new hazards and substances of concern presenting a risk to or via the aquatic environment

  – identification and quantification of new sources and pathways

  – impact of mixtures of chemicals

[80] More information, see http://europa.eu.int/comm/employment_social/health_safety/index_en.htm

- cost-effective analytical methodologies enabling compliance of monitoring programmes

- risk assessment of chemical pollution of sediments and the impacts of elevated levels of priority substances in sediment and biota on "ecological status"

- significance of EQS for ephemeral waters.

Ongoing calls for proposals under the 6th Research Framework programme (2002-2006) have opened priority research areas such as the development of integrated risk assessment methodologies and the appraisal of environmental quality with regard to multiple exposures and low-dose exposures of chemicals. It also foresees the creation of a network among European reference laboratories and related organisations dealing with emerging environmental chemical pollutants. This work will enhance the European capabilities for large scale monitoring and bio-monitoring. Alternative methodologies, management options and monitoring systems for source control of priority substances have also been addressed within FP6. The output of these projects may provide the basis for measures of phasing-out and substitution.

ANNEX 6

List of pollution control measures falling under Article 16(6) WFD proposed by the Commission since 2000

PROCESS CONTROLS INCLUDING EMISSION CONTROLS FOR POINT SOURCES

- Waste Incineration Directive - 2000/76/EC
- Large Combustion Plants Directive – 2001/80/EC
- Commission proposal[81] on the management of waste from extractive industries
- Community strategy concerning mercury[82]
- Regulation (EC) No 850/2004[83] on Persistent Organic Pollutants
- Proposals for directive on ambient air quality exists for some priority substances – Lead[84], Benzene[85] Cadmium, Mercury and PAHs[86]

PRODUCT AND PROCESS CONTROLS INCLUDING EMISSION CONTROLS FOR POINT SOURCES

- proposal for a Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)[87]
- Amendment proposals for **"Marketing and use"** Directive[88] in particular for:
- PAHs in creosote (Commission Directive 2001/90/EC – OJ L 283, 27/10/2001, p. 41)
- Pentabromo and octa bromo diphenylether (Council and European Parliament Directive 2003/11/EC-OJ L 42, 15/02/2003)
- Chloroalkanes, C10-13 (Directive 2002/45/EC -OJ L 177 , 06/07/2002, p. 21)
- TBT (Commission Directive 2002/62/EC-OJ L 183, 12/07/2002, p. 58)
- Nonylphenol (Council and European Parliament Directive 2003/53/EC -OJ L 178 , 17/07/2003, p. 24)
- Trichlorobenzenes (Directive 2005/59/EC - OJ L 309, 25/11/2005, p. 13)
- PAHs in extender oils and tyres (Directive 2005/69/EC – OJ L 323, 09/12/2005, p. 25)

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81 COM(2003) 319 final, 2.6.2003.
82 COM(2005) 20 final of 28.1.2005
83 OJ L 158, 30.4.2004, p. 7.
84 Directive 1999/30/EC, OJ L 163, 29.6.1999, p. 41.
85 Directive 2000/69/EC, OJ L 313, 13.12.2000, p. 12
86 Directive 2004/107/EC, OJ L 023, 26.1.2005, p.3
87 COM(2003) 644 final of 29.10.2003.
88 Directive 76/769/EEC, OJ L 262, 27.9.1976, p. 201.

PRODUCT CONTROLS

Commission Decisions or Regulation in implementing Directive 91/414/EEC:

- 1,2-dichloroethane-Pesticide use banned by Directive 79/117/EEC
- Pentachlorobenzene - Pesticide use banned by Directive 79/117/EEC.
- HCH, mixed isomers (2000/801/EC, OJ L324, 21.12.2000, p. 42)
- Isoproturon (2002/18/EC, OJ L55, 26.2.02, p. 29)
- Anthracene, chlorfenvinphos and pentachlorophenol (2076/2002 of 20 November 2002; OJ No L319, p. 3)
- Simazine (2004/247/EC, OJ N° L 78, 16.03.2004, p. 50)
- Atrazine (2004/248/EC, OJ N° L 78, 16.03.2004, p. 53)
- Hexaclorobenzene (POP Regulation No. 850/2004)
- Chlorpyrifos (2005/72/EC, OJ L 279, 22/10/2005, p. 63)
- Endosulfan (2005/864/EC, OJ L 317, 03/12/2005, p. 23)

Furthermore,

- Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electric and electronic equipment (OJ L 37, 13.12.2003, p. 19)
- Commission Proposal for a revision of the Directive on Batteries and Accumulators[89]

FUTURE PROPOSAL WITH RELEVANCE TO ARTICLE 16

- Thematic Strategy on Sustainable Use of Pesticides
- Pending decisions on control measures based on risk assessments under Directive 91/414/EEC (in particular for alachlor, diuron and trifluralin), under Directive 98/8/EC (in particular TBT and PCP) and Regulation (EEC) No 793/93 (in particular nickel, cadmium, lead, PAHs).

[89] COM(2003) 723 final of 22.11.2003

ANNEX 7

Overview of specific sub-options in the development of environmental quality standards

A number of sub-options were discussed during the preparatory phase. The choices were made on the basis of scientific considerations and, as far as possible, consensus during the preparatory process. In particular, the opinion of the SCTEE has been considered. The most important sub-options are presented subsequently.

1. EQS FOR WATER, SEDIMENT OR BIOTA

According to the WFD (Article 16 (7)), EQS can be set for the water phase, the sediment phase or the concentration in biota. The water phase can be expressed as the concentration in the dissolved fraction, the concentration in the suspended solid fraction contained in a natural water sample or the total concentration which is the sum of the dissolved phase and the suspended solids.

The intrinsic nature of the different priority substances has been assessed by the Expert Group on Analysis and Monitoring of Priority Substances (AMPS). Regarding the methodologies for deriving quality standards for sediments and biota, there are still some open issues on which no systematic approach could be agreed upon[90]. The biggest obstacle for deriving EQS for sediment and biota was the considerable lack of data. Wherever possible, the data sheets include proposals for sediment or biota EQS (e.g. mercury). However, on the basis of current information, it was not possible to derive systematically such EQS for all those priority substances for which it would be called for on the basis of their intrinsic properties. The development of EQS standards for the water phase was possible. When deriving such standards, several protection goals were considered including, e.g. secondary poisoning and accumulation in the food chain. The water based EQS should therefore be protective also for biota. Since the total water EQS include the suspended solids, present pollution from substances which accumulate on particulate matter can be detected. Such suspended solids are also the main source of creating new sediment in rivers, lakes, transitional and coastal waters. However, such standards cannot detect historic pollution of sediments which has occurred before the WFD became operational. Finally, a particular approach had to be chosen for metals (see next section).

In conclusion, it was decided that no EQS were proposed for sediments and only three EQS were proposed for biota. The costs of monitoring and the uncertainties relating to the assessment led such an introduction to be perceived as premature in most cases. However, given the biological relevance of sediment and biota standards and the fact that many persistent substances accumulate in these media, it is a high priority to develop the methodologies and gather further data in order to ensure that such EQS can be set in the near future.

2. APPROACH FOR METALS

Metals occur naturally in the environment and their chemistry differs significantly from organic pollutants. Initially, the "added risk approach" was introduced and proposed where

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[90] Please refer to document on EQS methodology available under http://europa.eu.int/comm/environment/water/water-dangersub/pri_substances.htm

natural background concentrations are added to the EQS (or Maximum Permissible Addition - MPA) for the purpose of assessing compliance with the standard. During the preparatory process, the discussions in the context of the risk assessments for cadmium, and lead on the one hand, and the opinion of the SCTEE on the other hand, favoured the use of the "total risk approach" where the natural background concentrations are considered when deriving the "predicted no effect concentrations" (PNECs). In order to ensure consistency with the risk assessments and take account of the SCTEE opinion, the Commission services changed the proposed approach for EQS for metals before finalising the proposal. Furthermore, it was highlighted that the proposed EQS can be regarded as provisional in the absence of a final risk assessment. It it not possible at this stage to anticipate the outcome of the ongoing discussions. So the proposed values are taken on the basis of the available scientific data considering aspects of drinking water protection and background concentrations but acknowledging that modifications may be necessary in the future, particularly depending on the outcome of the discussions on bioavailability.

In addition, dissolved concentrations (not total) are monitored which is a pragmatic approach to take account of the fact that only part of the total metal concentrations are "bioavailable". However, it is recognised that such an approach may over- or underestimate the actual bioavailability. Bio-availability also changes with environmental conditions which vary considerably over short and long periods of time. All in all, the use of the dissolved concentrations for metals was agreed as the best available proxy indicator.

Moreover, water quality parameters (e.g. hardness, pH, etc) can influence the cause-effect relationships for metals. Such parameters are considered to qualify the EQS where there is a proven quantitative relationship between these parameters and the no effect concentrations for metals. Unfortunately, such a relationship only exists for cadmium and hardness. For other metals such models are still under development and are not expected to be available in the coming years (see example in Box A). As mentioned above, the risk assessments for nickel and lead are still ongoing. Until their completion, the proposed EQS for nickel and lead are considered preliminary and will be updated as soon as the discussions are concluded. Furthermore, the proposed directive introduces an option for Member States to take account of background concentrations and bioavailability in the implementation of the proposed EQS.

Box A: Excerpt of draft voluntary lead risk assessment on availability of models to describe bioavailability and influence of water quality parameters (Status: May 2005)

Page 330: "Physico-chemical water characteristics such as hardness, ionic strength, pH and redox potential influence the chemical speciation of lead and other metals in water and thus may influence its bioavailability and toxicity. With respect to the abiotic factors influencing the toxicity of metals in freshwater, total hardness (determined by the calcium and magnesium content in the water) is usually considered as one of the main factors or as the main factor." "The unequivocal establishment of the relative importance of the parameters [pH, hardness, etc.] on the ecotoxicity of lead and the development of quantitative relationships which may be applied in the lead risk assessment requires an in-depth study involving a series of tests on standard organisms relevant to the EU risk assessment procedures. However such a study is currently not within the scope of the voluntary lead risk assessment."

Page 332: "Finally it is thus noted that, as far as known, a profound evaluation of the influence of water hardness/pH/alkalinity and DOC on chronic toxicity for various lead compounds has not been performed. Further in-depth research would be needed to investigate and validate the chronic effects of Pb on aquatic organisms."

3. SPECIFIC CONSIDERATION OF DRINKING WATER STANDARDS

Many surface waters are used for the abstraction of drinking water. Directive 75/440/EEC sets quality standards for pollutants in waters used for the abstraction of drinking water. These standards needed to be updated in the light of scientific development. The EQS development has gathered effect data in order to assess the risk to human health via drinking water. However, the setting of EQS is different from the limit values set by the Drinking Water Directive 98/83/EC since the drinking water standards apply at the tap and not in the raw water for abstraction. The water treatment carried out by water suppliers is, depending on the levels of pollution, very costly. Therefore, EUREAU argued that some of the costs should be shifted to other water users (pesticide manufacturers, farmers, …) and this could be best achieved by lowering the EQS to the levels of the DWD. Currently, the extent of the cost shift is difficult to predict. In addition, there was a lack of data and the advice of the SCTEE was not favourable towards such a proposed approach.

In many cases, the EQS set on the basis of ecotoxicity are more stringent than drinking water limits. However, in particular for certain pesticides (mainly isoproturon and diuron), the values based on protection of the ecosystem are less stringent than needed to protect drinking water supplies assuming that there would be no additional treatment. The proposed EQS are consistent with the risk assessments under 91/414/EEC and thereby it is argued that any consideration of drinking water concerns needs to be strengthened under 91/414/EEC. The need to improve Annex VI of 91/414/EEC in this context has been recognised and a process is underway to rectify this situation.

4. ANALYSIS AND MONITORING

The compliance checking of EQS is carried out against measured concentrations of the priority substances as part of the monitoring programmes. In order to ensure a comparable and consistent approach for compliance checking, several aspects of analysis and monitoring need to be agreed upon. Such aspects include sampling regime, sampling techniques, frequency and location of monitoring, quality assurance, laboratory practices, etc. The WFD provides for some of these aspects and gives some general guidance. However, the WFD also recognises that more details and specifications would need to be defined for such issues related to priority substances. Some examples for such substance-specific issues are provided in Box B.

Many of these issues have been addressed already by the Expert Group on Analysis and Monitoring of Priority Substances (AMPS). It was considered, however, that these aspects are too technical to be included in a regulatory instrument and such considerations would be better placed in guidelines agreed by Committee procedures. A mandate to do so is already provided by the WFD (see Article 20, paragraph 1). The Commission services have started such preparatory work and it is intended to present first results to the Article 21 WFD Committee later in 2006.

Box B: Examples of particularities of monitoring priority substances

1. Adaptation of monitoring frequencies for intermittent uses of priority substances such as pesticides

Annex V WFD recommends a minimum monitoring frequency for priority substances of once per month. Most pesticides, however, are used only for a few months of the year mainly during the growing season. In consequence, high peak concentrations occur during one or two months whereas the pesticide is not detected during the rest of the year. In order to make the monitoring programme more efficient and cost-effective, a higher frequency (e.g. times per month) should be applied during the growing seasons but a lower one in the rest of the year (e.g. every 3 months). Such recommendations need to be tailored towards differences for different pesticide use and differences between crops.

2. Dredging of polluted sediments

The location of monitoring sites should be selected as to provide a representative picture of the pollution of a certain surface water. This means that such sites should not be influenced by specific activities which cause pollution and thereby bias the result of the monitoring. The dredging of sediments for ensuring navigation would be such an example. If the dredged sediments are polluted by priority substances, the dredging operation inevitably increases temporarily the suspended solid concentration and thereby the total concentration of priority substances in the water phase. Such "losses" should be accounted for in the context of the pressures analysis but not in the compliance checking against the annual average EQS. Such an aspect would need to be considered when selecting the monitoring site.

Both above-mentioned issues, amongst several others, will be addressed by analysis and monitoring guidelines to be approved through Commitology.

ANNEX 8

Overview of relevant Risk Assessments under other Community legislation

Part 1: WFD Priority Substances falling under Pesticides Directive 91/414/EEC

WFD No.	Compound	Identified as "priority hazardous substances"	Inclusion in Annex I of 91/414/EEC	Comments
(1)	alachlor	-	Proposal: no	RA finalised, formal decision on non-inclusion voted on 04/04/2006
(3)	atrazine	Proposal: no	no	Withdrawal in 2004 (2004/248/EC, OJ N° L 78, 16.03.2004, p. 53)
(9)	chlorpyrifos	Proposal: no	yes	RA finalised, formal decision on inclusion voted on 03/06/2005
(13)	diuron	Proposal: no	Not decided	RAR finalised but decision pending
(14)	endosulfan	Proposal: yes	No	RA finalised, formal decision on non-inclusion voted on 15.2.2005
(18)	HCH, mixed isomers	yes	No	Withdrawn in 2000 (2000/801/EC, OJ N° L324, 21.12.00, p. 42)
(19)	isoproturon	Proposal: no	yes	Inclusion in 2002 (2002/18/EC, OJ N° L55, 26.2.02, p. 29)
(29)	simazine	Proposal: no	No	Withdrawal in 2004 (2004/247/EC, OJ N° L 78, 16.03.2004, p. 50)
(33)	trifluralin	Proposal: no	Not decided	RAR finalised but decision pending

Part 2: WFD Priority Substances falling under Existing Substances Reg. No. 793/93

WFD No.	Compound	Identified as "priority hazardous substances"	Comment
(2)	anthracene	Proposal: yes	Latest draft RAR (ENV part) available from 19/09/2005. Further discussion at TCNES III '06 (September '06). Under 91/414/EEC, withdrawal for pesticide use in 2002. (2076/2002 of 20 November 2002; OJ No L319, p. 3)
(4)	benzene	-	Final RAR available, reviewed by CSTEE but not published in OJ. Publication of the report as ECB volume expected by the beginning of 2007.
(5)	brominated diphenylether	yes (penta)	Final RAR available, CSTEE reviewed and published in OJ (05/03/2001). Publication as ECB Volume no. 5.
(6)	cadmium	yes	Final RAR available, reviewed by CSTEE but not published in OJ. Publication of the report as ECB volume expected by the end of 2006.
(7)	chloroalkanes, C10-13	yes	Final RAR available, CSTEE reviewed and published in OJ (12/10/1999). Publication as ECB Volume no. 3.
(12)	phthalic acid 2-ethylhexyl-ester (DEHP)	Proposal: no	Final RAR available, reviewed by CSTEE but not published in OJ. Final commenting round in May 2006. Publication of the report as ECB Volume expected by the end of 2006
(22)	naphthalene	Proposal: no	Final RAR available, reviewed by CSTEE but not published in OJ. Publication as ECB Volume no. 20 on 14/07/2003. Under 91/414/EEC, Decision 129/2004 withdrawal as pesticide, banned from 06/2007.
(23)	nickel	-	Latest draft available from May 2006. Discussions set to continue in 2006/07. Further testing needed. Estimated finalisation 2007.
(24)	nonylphenol	yes	Final RAR available, CSTEE reviewed and published in OJ (07/11/2001). Publication as ECB Volume no. 10.
(31)	trichlorobenzenes (all isomers)	Proposal: no	Final RAR available, CSTEE reviewed and published in OJ (29/04/2004). Publication as ECB Volume no. 26 (CAS no. 120-82-1).
(32)	trichloromethane (chloroform)	-	Latest draft RAR available from 08/2003, updated in Sept. 2005 in relation to testing. Final evaluation process depending on decision on further testing. Estimated finalisation 2006.

Part 3: WFD Priority Substances not covered by above

WFD No.	Compound	Identified as "priority hazardous substances"	Other risk assessment available**	Comments
(8)	chlorfenvinphos	-	No	Data from the EU Endocrine Strategy have been used. Several reports of Member States, international organisations and industry exist which constitute part of a targeted risk assessment. Under 91/414/EEC, pesticide use banned in 2003 (2076/2002 of 20 November 2002; OJ No L319, p. 3).
(10)	1,2-dichloroethane	-	No	Data from the EU Endocrine Strategy have been used. Several reports of Member States, international organisations and industry exist which constitute part of a targeted risk assessment. Pesticide use banned by Directive 79/117/EEC.
(11)	dichloromethane	-	No	EUROCHLOR made a targeted risk assessment for the marine environment which has been used. Data from the EU Endocrine Strategy have been used. Several reports of Member States and international organisations exist which constitute part of a targeted risk assessment.
(15)	fluoranthene	-	No	Several reports of Member States and international organisations exist which constitute part of a targeted risk assessment.
(16)	hexachlorobenzene	yes	No	EUROCHLOR made a targeted risk assessment for the marine environment which has been used. Data from the EU Endocrine Strategy have been used. Several reports of Member States and international organisations exist which constitute part of a targeted risk assessment. Banned by POP Regulation No. 850/2004
(17)	hexachlorobutadiene	yes	No	EUROCHLOR made a targeted risk assessment for the marine environment which has been used. Data from the EU Endocrine Strategy have been used. Several reports of Member States and international organisations exist which constitute part of a targeted risk assessment.
(20)	lead	Proposal: no	Yes	Voluntary risk assessment by industry, first draft report submitted in May 2005. Discussions about to start. Estimated finalisation expected in 2006 or 2007. Data of first draft have been used to set EQS. Several reports of Member States and international organisations exist which constitute part of a targeted risk assessment.
(21)	mercury	yes	No	EUROCHLOR made a targeted risk assessment for the marine environment which has been used. Several reports of Member States and international organisations exist which constitute part of a targeted risk assessment.
(25)	octylphenol	Proposal: no	Yes	UK has carried out a targeted risk assessment in the context of OSPAR. Expertise and data have been used for EQS development. Several reports of Member States, international organisations and industry exist which constitute part of a targeted risk assessment.
(26)	pentachlorobenzene	yes	No	Several reports of Member States and international organisations exist which constitute part of a targeted risk assessment. Pesticide use banned by Directive 79/117/EEC.

Part 3 continued

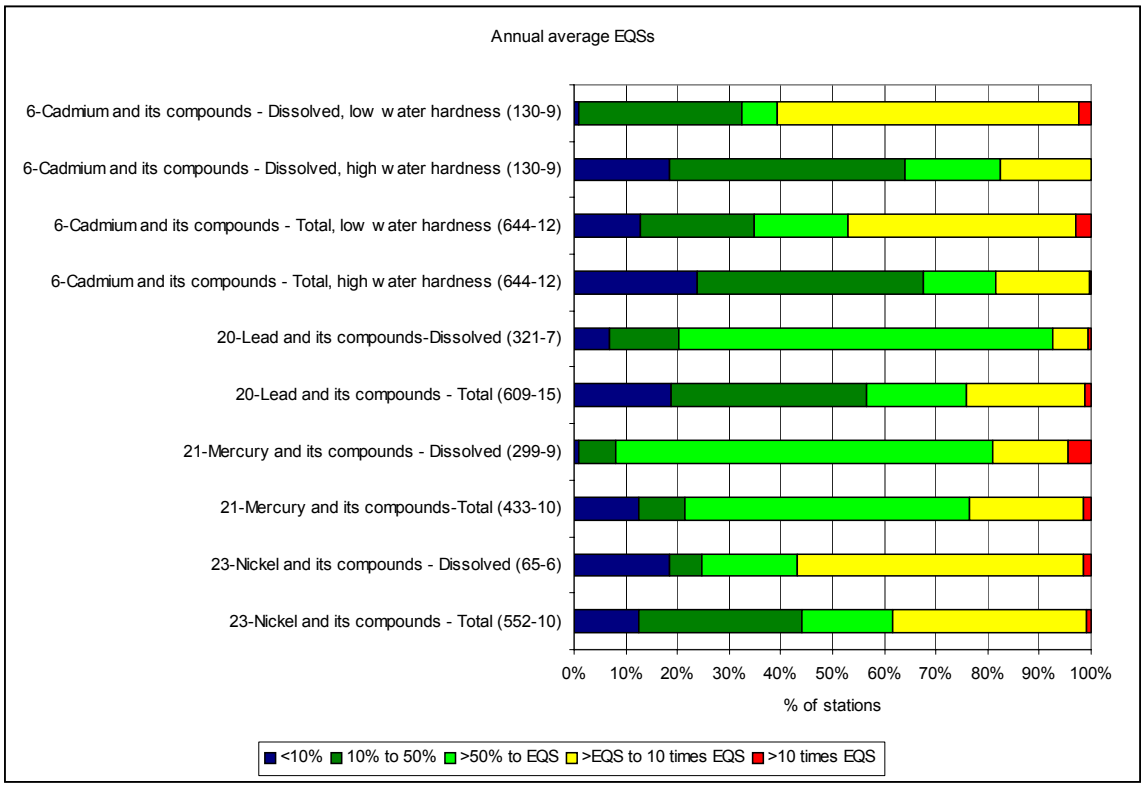
WFD No.	Compound	Identified as "priority hazardous substances"	Other risk assessment available**	Comments
(27)	pentachlorophenol	Proposal: no	No	EUROCHLOR made a targeted risk assessment for the marine environment which has been used. Data from the EU Endocrine Strategy have been used. Several reports of Member States and international organisations exist which constitute part of a targeted risk assessment. Under 91/414/EEC, pesticide use banned in 2003 (2076/2002 of 20 November 2002; OJ No L319, p. 3) It is unclear whether a risk assessment under the Biocide Directive 98/8/EC will be carried out in the future.
(28)	PAH	yes	No	Data from the EU Endocrine Strategy have been used. Several reports of Member States, international organisations and industry exist which constitute part of a targeted risk assessment.
(30)	tributyltin compounds	yes	No	Data from the EU Endocrine Strategy have been used. Several reports of Member States and international organisations exist which constitute part of a targeted risk assessment.

**: If the answer is no, DG ENV D2 carried out its own targeted risk assessment in consistency with the Technical Guidance Documents for risk assessment under the Existing Chemicals Regulation No. 793/93.

ANNEX 9

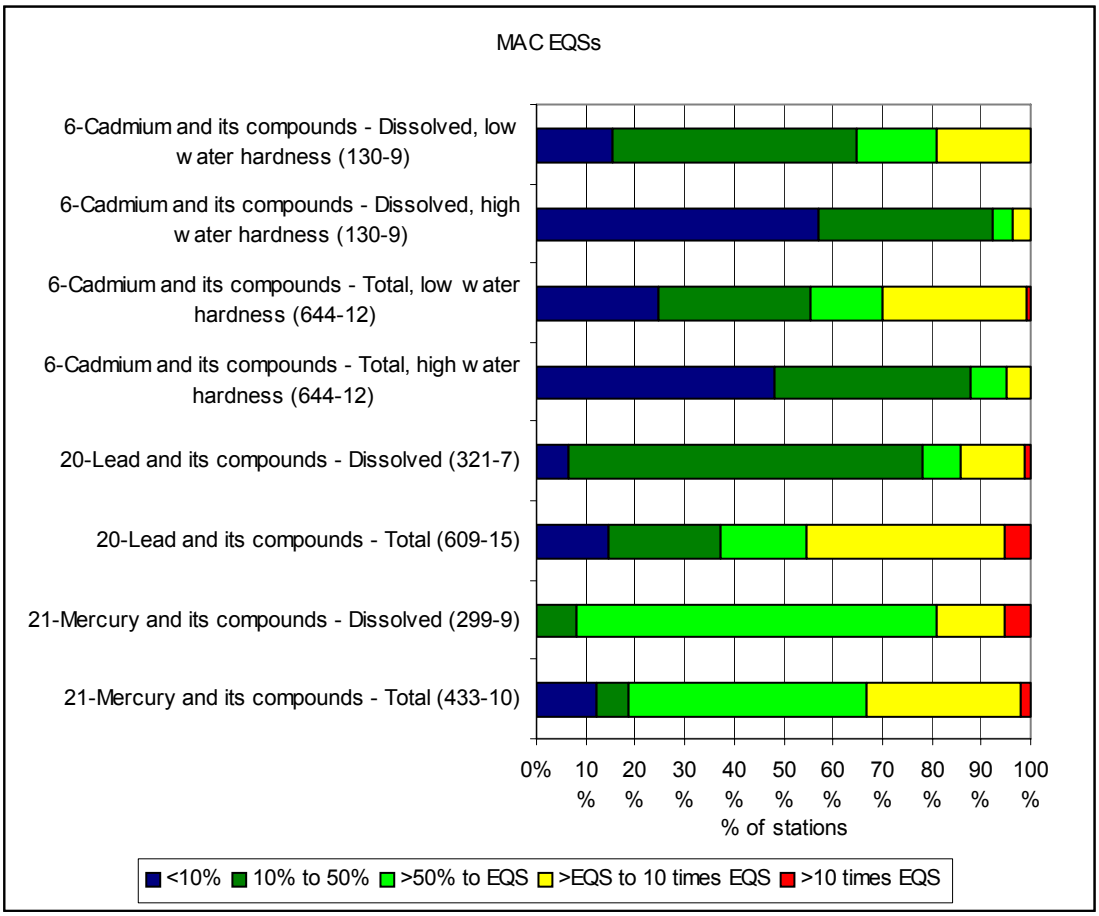
Key figures on the compliance of proposed EQS of June 2004 (Source: WRc study report)

Figure 1: Summary of aggregated information on concentrations of cadmium, mercury, lead and nickel in rivers in comparison to proposed annual average quality standards



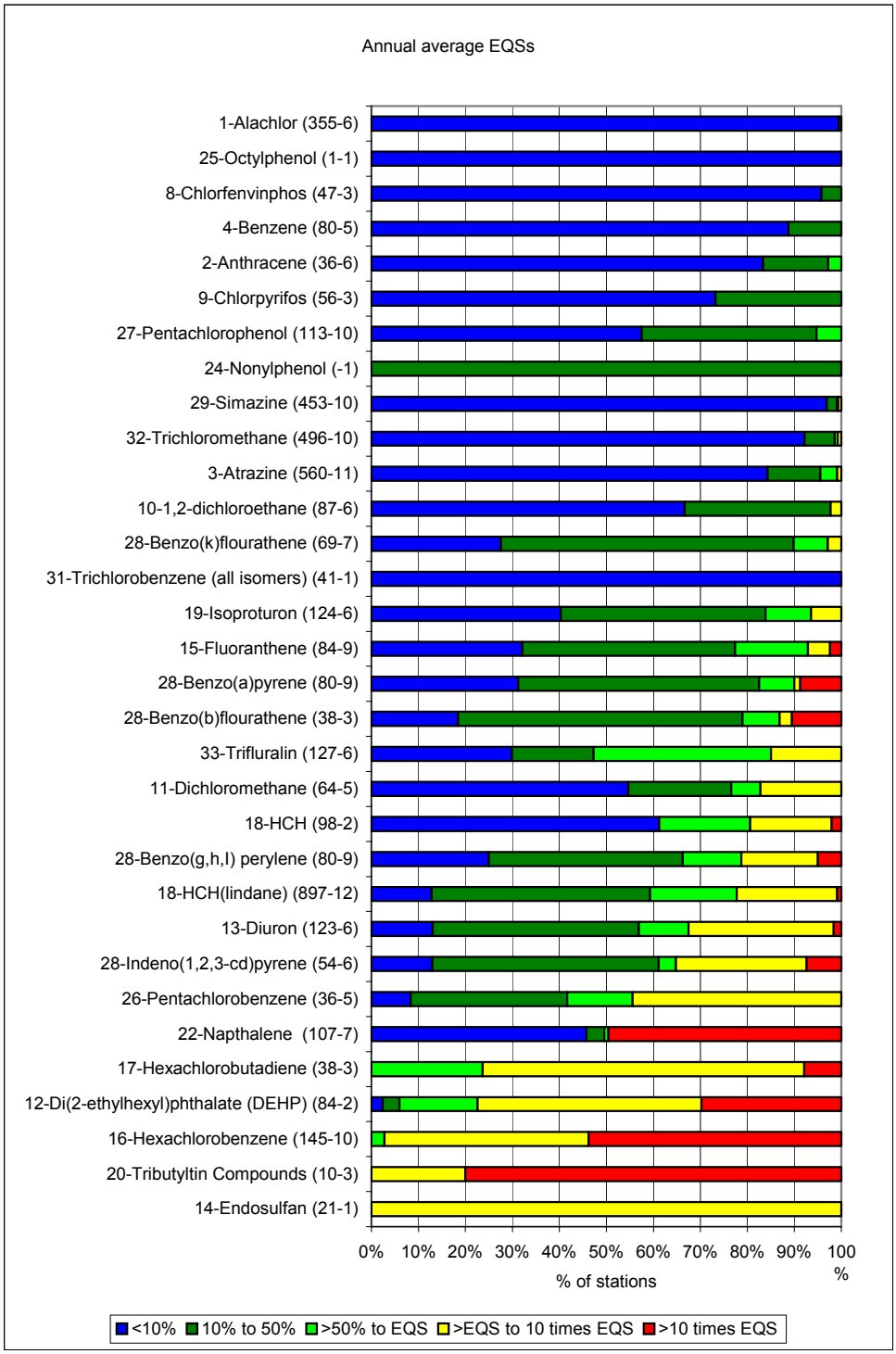
Notes: The substance number as given in the Commission proposal precedes the substance name. The number of locations/stations and countries on which the assessment is in parenthesis following each substance's name, for instance for nickel and its compounds (dissolved) there were 65 monitoring stations from 6 Member States.

Figure 2 Summary of aggregated information on concentrations of cadmium, mercury, lead and nickel in rivers in comparison to proposed MAC quality standards



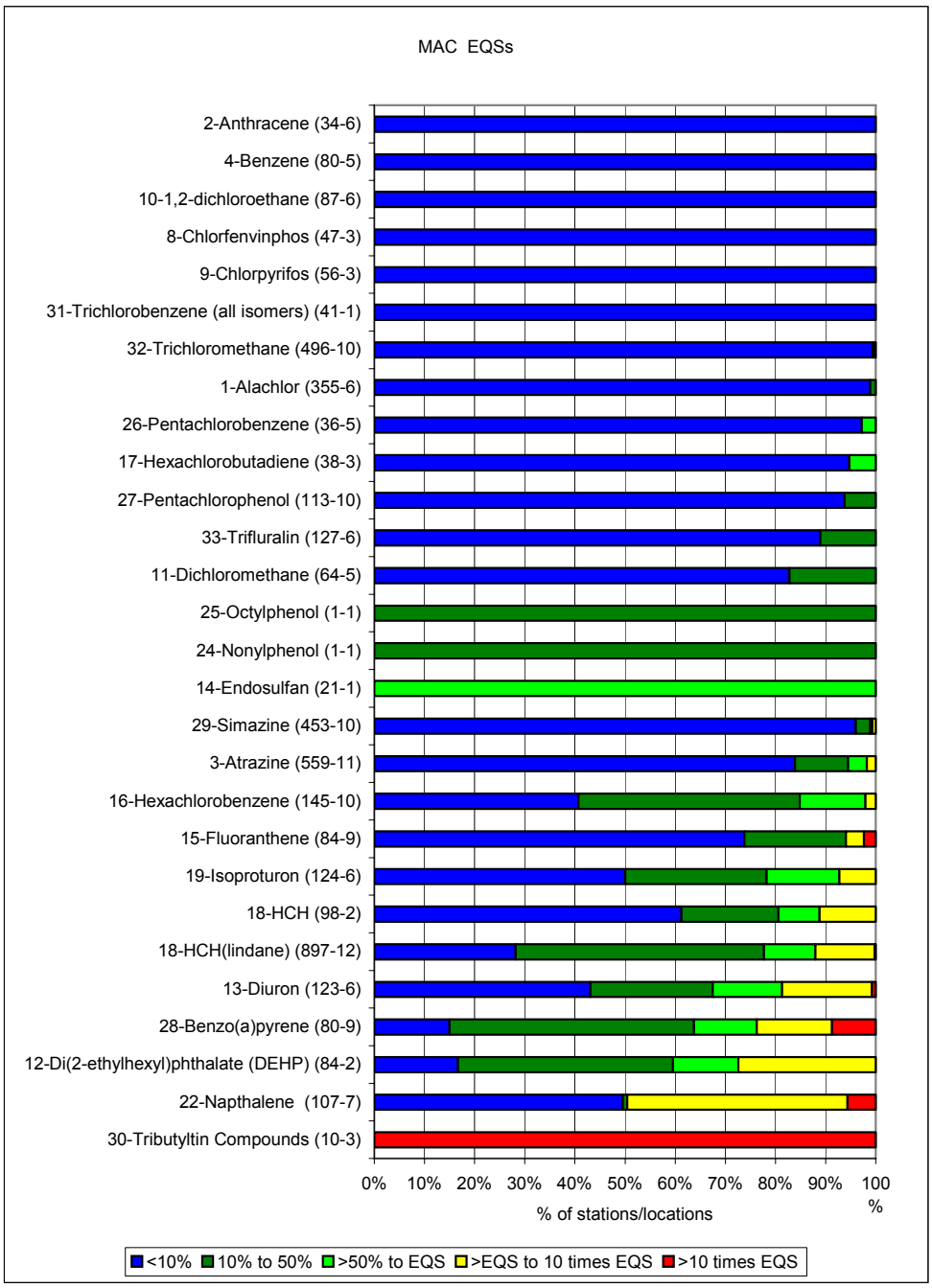
Notes: The substance number as given in the Commission proposal precedes the substance name. The number of locations/stations and countries on which the assessment is in parenthesis following each substance's name, for instance for mercury and its compounds (total) there were 433 monitoring stations from 10 Member States.

Figure 3 Summary of aggregated information on concentrations of organic substances in rivers in comparison to proposed annual average quality standards



Notes: The substance number as given in the Commission proposal precedes the substance name. The number of locations/stations and countries on which the assessment is in parenthesis following each substance's name, for instance for Alachlor, there were 355 monitoring stations from 6 Member States. No data for penta BDE and C10-13 chloroalkanes were available.

Figure 4 Summary of aggregated information on concentrations of organic substances in rivers in comparison to proposed MAC quality standards



Notes: The substance number as given in the Commission proposal precedes the substance name. The number of locations/stations and countries on which the assessment is in parenthesis following each substance's name, for instance for anthracene there were 34 monitoring stations from 6 Member States. No data for penta BDE and C10-13 chloroalkanes.

ANNEX 10

Overview table on the "risk of failing good chemical status" as reported by the Member States in accordance with Article 5 WFD

Member States were required to prepare information on "risk of failing good chemical status" as part of the pressure and impact analysis under Article 5 of the WFD. The compilation below has been facilitated by Member State experts providing a summary overview. Every Member State has also provided additional information on methodology, risk thresholds, main pollutants and interpretation of results. Some Member Sates also indicated that they have started a wider monitoring campaign in order to fill the identified data gaps.

The overview has been kept simple in order to provide a quick generic picture, however, the additional information can be made available on request. In addition, the national Article 5 report should present the results and the methodologies in more detail. The Commission services will make these national reports publicly available under:http://europa.eu.int/comm/environment/water/water-framework/index_en.html

The results of this analysis demonstrate that it is necessary to improve the data availability and the comparability of the results in order to ensure a comparable level of implementation. The proposed Directive will contribute significantly towards this aim.

Member State	**Percentage of water bodies at risk of failing good chemical status**			**Risk thresholds / preliminary EQS**
	Definitely	Possibly (incl. no or lack of data)	Definitely not	
Austria	3	5	92	National EQS
Belgium (Flanders)	75	20	5	National EQS
Cyprus	8	22	70	National EQS
Czech Republic	No information	No information	No information	
Denmark	Not available yet	Not available yet	Not available yet	Proposed EC EQS (June 2004)
Estonia	19	6	75	National EQS
Finland	No information	No information	No information	
France	26-28	72-74	0	National EQS (SEQ system)
Germany	9	28	63	National EQS

Member State	Percentage of water bodies at risk of failing good chemical status			Risk thresholds / preliminary EQS
	Definitely	Possibly (incl. no or lack of data)	Definitely not	
Greece	No information	No information	No information	
Hungary	20	20	60	Proposed EC EQS (June 2004)
Ireland	0	16-20	80-84	Pressure thresholds
Italy	No information	No information	No information	
Latvia	18	61	21	National EQS
Lithuania	0	62	34	National EQS
Luxemburg	No information	No information	No information	
Malta	No information	No information	No information	
Netherlands	87	11	2	Proposed EC EQS (June 2004)
Poland	3-4	Ca. 46	Ca. 50	Mainly emissions data
Portugal	3	31	66	Proposed EC EQS (June 2004)
Slovakia	2	40	58	Proposed EC EQS (June 2004) (MAC)
Slovenia	4	55	41	National EQS
Spain	No information	No information	No information	
Sweden	No information	No information	No information	
United Kingdom	0-3	1-3	96-97	National EQS

EC EQS: These were proposed EQS by the Unit ENV D.2 of the European Commission during the written consultation of a first informal draft of a Directive proposal in June 2004.

ANNEX 11

Potential environmental and social benefits from reduction in chemical pollution of water resulting from compliance with EQSs
(source: WRc study report)

Ecological/welfare use category	**Benefits**	**Comment**
Human Health	Overall reduction in exposure to dangerous substances	E.g. through bathing, seafood consumption, etc.
Biodiversity/Ecosystem Health	Maintenance and improvement of a healthy biodiversity	
Water Treatment	Reduced costs	
Long range transport	Reduced impact on sensitive eco-systems as a result of long-range transport of pollutants	Most likely to be via the air compartment
Commercial and recreational fishing	Reduction in numbers of fish failing to meet required standards for human consumption Reduction in negative impact on consumption of fish as a result of perceived health threats Reduction in exposure to chemical pollutants as a result of fish consumption Potential for increased stocks and variety of stocks Inreased revenue from commercial and recreational fishing	
Fish farming	Improved productivity Reduced accumulation in meat Reduced exposure of humans to hazardous substances	This does not consider the use of chemicals in the fish farms themselves

Ecological/welfare use category	Benefits	Comment
Shellfisheries	Improved productivity (e.g. impact on shell thickening or imposex) Reduced accumulation in meat Reduced exposure of humans to hazardous substances	
Recreational/commercial hunting/trapping	Reduced accumulation in meat Reduced exposure of humans to hazardous substances	Most game will drink directly from surface waters
Live stock watering	Reduced accumulation in meat and milk Reduced exposure of humans to hazardous substances	Relevant for live stock drinking directly from surface waters
Irrigation of crops	Reduced potential for accumulation of hazardous substances Reduced exposure of humans to hazardous substances Improved soil quality	
Cleaner sewage sludge	More sludge can be disposed to agricultural land More sludge/m^2 can be applied reducing the cost of sludge disposal Plants grown will have lower contaminant levels Reduced uptake by livestock exposed to sludge treated land Improved soil quality	Especially relevant if diffuse inputs can be reduced by product controls

Ecological/welfare use category	Benefits	Comment
Cleaner sediment	Reduced cost of disposing of dredging material Reduced potential for re-solubilisation to the water column Reduced uptake of harmful substances by plants and biota Reduced impact of dredging on water quality/ecology	Reduced inputs of harmful substances will result in cleaner sediments
Rain water	Improved soil quality Improved run off to surface waters Reduced potential of accumulation in plants and animals	Especially important if substitution is applied
Surrogate for the removal of other hazardous substances	Reduced exposure of humans and the environment to other known or unknown (non-PS) hazardous substances	Removing by end of pipe treatment one hazardous substance may at the same time remove other substances (e.g. reducing benzene discharges will also reduce exposure to toluene)
Because of the need for monitoring of the EQSs a better understanding of the levels of hazardous substances found in surface waters	Possibility to target measures for reducing the impact of PS on the water environment	(REACH (2003)
Suppliers of cleaner technologies or less hazardous substances	Increased market and income stream	

Reference for further reading:

Foundation for Water Research (FWR) (1996). Assessing the benefits of surface water quality improvements manual. FR/CL 0005, December 1996

Reach (2003). Extended Impact assessment (of REACH) COM (2003) 644 final. http://europe.eu.int/comm/enterprise/reachdocs/reach/eia-sec-2003_1171pdf

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WWF (2004a). Contamination: the next generation – results of the family chemical contamination survey October 2004. http://www.wwf.org.uk/filelibrary/pdf/family_biomonitoring.pdf

WWF (2004b). Bad Blood? A survey of chemicals in the blood of European Ministers October 2004 http://www.panda.org/downloads/toxics/badbloodoctober2004.pdf

United States Environmental Protection Agency (EPA 2002). A framework for the economic assessment of ecological benefits. US EPA, February 2002 http://epa.gov/osa/spc/htm/feaeb3.pdf