JOINT ACTION PROGRAMME

for the Danube River Basin

January 2001 – December 2005

Information

ICPDR – International Commission for the Protection
of the Danube River / Permanent Secretariat
Vienna International Centre, D0412
P. O. Box 500, 1400 Vienna / Austria
Tel: 0043-1-260 60-5738, Fax: 0043-1-260 60-5895
e-mail: icpdr@unvienna.org, www.icpdr.org

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Foreword

The “Convention on the Protection and Sustainable Use of the Danube River” (Danube River Protection Convention, DRPC) is a corner stone in the efforts of the States in the region to achieve sustainable and balanced management of waters, including the protection and effective use of surface waters and groundwater bodies. The DRPC, and thus the ICPDR as the body charged to implement the DRPC, have created a new atmosphere and spirit of cooperation among the States that are bound economically, culturally and historically by this remarkable river.

The DRPC entered into force on the 22 October 1998 and has since then already exercised a positive effect both on the protection and reduction of pollution of the Danube Basin waters as well as on the trans-boundary impact of the River on the environment of the Danube Basin and the Black Sea. The Convention also initiated the elaboration of the basic documents needed by the ICPDR; these documents also cover future short-term and long-term activities.

The present Joint Action Programme (JAP), developed through joint efforts of the participating States and the Permanent Secretariat, is the basic document for these short-term and long-term activities. The JAP defines large-scale, integrated measures for attaining a highly effective status of the environment related to the waters in the Danube River Basin.

In order to attain this status, wastewater treatment plants (WWTP) to be constructed by the year 2005 have been systematically described, prioritized and coordinated with each State. The construction of wastewater treatment plants will lead to a significant reduction in pollution load from municipalities and industry; and reduction of agricultural point-source pollution is also addressed. These reductions will improve the situation in the drainage network of the Danube River, and finally also in the Black Sea. The total investment foreseen by the States is almost 4 billion EURO for WWTPs serving settlements, and about 300 million EURO for process-related measures and WWTPs in industry and agricultural point sources. Investment in the rehabilitation of the Danube Basin wetlands – for which a total of more than 220 million EURO is foreseen – also plays an important role in the Joint Action Programme.

The listed priorities are also aimed at reducing the risk of accidental pollution and improving the existing accidental and emergency warning system. The sad experience of the calamity in the Tisza River

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and the lower Danube in the year 2000 highlights the need for an urgent implementation of the measures indicated in the Joint Action Programme.

The Joint Action Programme places special importance on the coordinating role of the ICPDR in the development of a unified River Basin Management Plan (RBMP) for the Danube River Basin based on the plans of the riparian States. Such an approach is one of the basic requirements of the Water Framework Directive of the European Union that entered into force on 22 December 2000. To this end, the ICPDR shall coordinate the exchange of information and the analysis of the characteristics of the Danube River Basin, review the effect of human activities on the status of the waters as well as an economic analysis of water use in the basin at the basin-wide (international) level. An important item in the Joint Action Programme is also an agreement on a harmonized methodology for arriving at the water balance of the riparian States, and the consolidation of these balances into a water balance for the whole Danube Basin.

The participation of the FRY (Federal Republic of Yugoslavia) in the aforementioned activities is also noted with contentment.

The creation of this Joint Action Programme is the result of the significant efforts of the Permanent Secretariat and the Emissions Expert Group (EMIS/EG). Essential input also came from other Expert Groups of the ICPDR, as well as from the Delegations of the Danube Basin States. However, the efforts leading to the preparation of the Joint Action Programme are only the beginning of the work facing the ICPDR, whose main challenge lies in the implementation of the JAP in the coming years. To achieve this, joint efforts of the participating countries' governments, industries, municipalities, research institutes, and NGOs are needed.

The Joint Action Programme is a good example of joint and coordinated basin-wide activities in achieving a common goal – protection and effective use of the waters in the Danube River Basin. The JAP takes one of the first steps of the Danube Basin States (via the coordinating role of the ICPDR at the international level) towards the implementation of the basic principles and ideas of the Water Framework Directive of the European Union.

Introduction

The Basin of the Danube River is – after the Volga River – the second biggest in area in Europe with a size of about 800,000 km^2 and about 82 mil. inhabitants. With about 200 km^3 it contributes per year to the receiving Black Sea, its flow is as big as the one of the Volga River. The catchment area of the Danube River presently covers the territories of Albania, Austria, Bosnia-Herzegovina, Bulgaria, Croatia, the Czech Republic, the Federal Republic of Germany, Hungary, Italy, Macedonia, Moldova, Poland, Romania, the Slovak Republic, Slovenia, Switzerland, Ukraine and the Federal Republic of Yugoslavia. 13 of these 18 riparian States States hold in the Danube Basin territories bigger than 2,000 km2. These 13 States (provided they are internationally recognised) plus the European Community have access to the Danube River Protection Convention (DRPC) as Contracting Parties. The DRPC was signed on 29 June 1994 and entered into force on 22 October 1998. With the entry into force of the DRPC, the International Commission for the Protection of the Danube River (ICPDR) was set up and made responsible for the implementation of the DRPC. The ICPDR is supported by the Permanent Secretariat and by Expert Groups.

Out of the 10 Contracting Parties as States in the Danube Basin (status: end of September 2000), two are members of the European Union (Austria; Germany) and six (Bulgaria, the Czech Republic, Hungary, Romania, the Slovak Republic, Slovenia) are undergoing an accession process in order to become future Member States of the European Union. Member States of the European Union are bound by EU legislation; the States acceding to the European Union are obliged to comply with the 'acquis communautaire' of the EU, which also relates to environmental issues.

The 1999 Kosovo conflict brought the Danube Basin region in the spotlight and triggered public interest in it worldwide. Although direct damage to aquatic life could not be proven to be due to

the bombing of industrial sites in the Federal Republic of Yugoslavia, future impacts cannot be excluded. If not properly handled, the reconstruction of the bombed industrial sites could result in immediate releases of harmful substances that could in the next step impact human health and damage aquatic life.

'Baia Mare' and 'Baia Borsa' are terms referring to the accidental spill of cyanide in particular and/or heavy metals from sedimentation ponds in the mining industry. These events clearly show that an accident in one State can have huge transboundary effects even at the distance of many hundreds of kilometres. The Baia Mare and Baia Borsa accidental pollution spills have shown that risk analysis and the prevention of such events have to be improved.

Extremely high floods have in recent years hit certain areas of the Danube Basin. Floods in the Tisza Basin, and especially the large and unexpected flood in the Morava Basin (CZ / SK), have had severe impacts on human property and life.

There is an overall agreement among all the Contracting Parties to the DRPC concerning nutrient loads transported from the Danube Basin to the Black Sea. They acknowledge that all Danube River Basin countries contribute nutrient loads to the Black Sea and agree to strengthen their efforts to implement the necessary steps for the reduction of water pollution in order to keep the Black Sea ecosystems healthy.

Concerted and coordinated actions are needed in order to arrive at an efficient and effective status of the water environment in the Danube River Basin and the Black Sea. The first Joint Action Programme of the ICPDR is the beginning of a joint move in that direction.

2. Situation of the water environment in the Danube River Basin

2.1 Demographic and economic issues

The Danube River Basin is populated by slightly more than 80 mil. inhabitants (see Table 1). The data are all based on information provided by the States that co-operate under the umbrella of the DRPC.

Table 1: Areas of the Danube Basin States and their estimated population size

State	Total area of the State	Area in the Danube Basin (DB)	Total number of inhabitants	Estimate of number of inhabitants in DB (1997)
	km^2	km^2	mil.	mil.
Federal Republic of Germany (D)	356,974	56,240	81.7	9.1
Austria (A)	83,855	80,565	8.1	7.7
Czech Republic (CZ)	78,866	21,119	10.3	2.7
Slovak Republic (SK)	49,036	47,064	5.4	5.2
Hungary (H)	93,030	93,030	10.3	10.3
Slovenia (SI)	20,253	16,842	1.9	1.7
Croatia (HR)	56,542	34,404	4.8	3.2
Bosnia-Herzegovina	51,129	38,719	3.2	2.5
Federal Republic of Yugoslavia (YU)	102,173	88,919	10.4	9.1
Bulgaria (BG)	110,994	46,896	8.4	4.4
Romania (RO)	238,391	232,200	22.6	21.8
Moldova (MD)	33,700	12,025	4.3	1.1
Ukraine (UA)	603,700	32,350	50.9	3.1
Other States	exists	exists	exists	exists
Σ Σ	-----	> 800.373	-----	> 81.9

The number of inhabitants has been slightly increasing in the Western States of the Basin; in other parts it has been decreasing. The overall population in the Basin can presently be described as stagnant to declining.

The socio-economic situation is described by a strong west-easterly gradient in per-capita domestic products expressed in convertible hard currency nominally as well as on a purchase power parity (PPP) (see Table 2). Data are valid for the year 1998, but are not available for Bosnia-Herzegovina, Moldova or the Federal Republic of Yugoslavia.

Table 2: Per-capita gross domestic product in riparian Statesto, expressed nominally and in purchase power parity (PPP), with US$ as the basis (1998 values)

State	D	A	CZ	SK	H	SI	HR	BG	RO	UA
GDP, nominal, in US$ per head	28,280	26,300	5,470	3,840	4,710	8,790	4,440	1,500	1,690	830
GDP, in PPP, in US$ per capita	21,170	21,670	13,100	10,190	10,780	14,990	7,050	5,360	6,060	3,270

The Danube Region is considered to have a high economic development potential. A Danube Basin Map is found overleaf.

2. Situation of the water environment in the Danube River Basin

Source of the data for the map: City of Vienna

2.2 Hydrography and hydrology

The Danube River has its source (by agreement) in a spring in the castle of Donaueschingen. However, there are claims that the source of the Breg is also the source of the Danube River. Still another definition puts the beginning of the Danube River at the confluence of the Brigach and the Breg rivers. Its length from the confluence of the Breg and Brigach rivers close to Donaueschingen to the zero station at Sulina is 2,778 km. Downstream from Tuttlingen, in a karstic region, much of its flow reaches Lake Constance. The Danube receives its increasing flow from the rivers coming from the Alps (Lech; Isar; Inn; Enns; Mura-Mur/ Drava-Drau), the northern Morava, the rivers coming from the Carpathian mountains (Vah; Nitra; Hron; the Tisza with all its tributaries), those from the Dinarian ridge (the Sava and the southern Morava with all their tributaries), and from the rivers coming from the outer Carpathian mountains (Jul; Olt; Arges) and the Balkan mountains (Iskar; Yantra), as well as from the Siret and the Prut rivers.

Table 3: Hydrographic and hydrologic characteristics of the Danube River at selected stations.

Station	Distance from Sulina, in km	Catchment area, in km^2, from old Planimetry	Average yearly flow, in m3/s
Ulm, downstream Iller	2,586	7,578	~ 114
Passau, downstream Inn	2,225	76,597	~ 1,410
Bratislava, downstream northern Morava	1,869	131,290	~ 2,050
Novi Sad, downstream Drava	1,255	254,100	~ 3,000
Zemun, downstream Tisza, opposite Beograd	1,173	412,800	~ 3,900
Beograd, downstream Sava	1,171	512,800	~ 5,620
Giurgiu, downstream Olt and Yantra, opposite Russe	493	668,700	~ 5,900
Braila, upstream Siret and Prut	170	717,000	~ 5,980
"At Mouth", with all the arms discharging into the Black Sea	0	817,00	~ 6,430

Floods (with a recurrence interval of around 100 years) at mouth are characterised by ~ 17,000 m3/s, and droughts by ~ 1,700 m3/s.

2. Situation of the water environment in the Danube River Basin

The average area yield of the tributaries varies between 25 to 35 l/sec.km3 for alpine tributaries, 19 l/sec.km3 for the whole Sava catchment, 6.3 l/sec.km3 for the whole Tisza catchment, and values as low as 2 – 8 l/sec.km3 for the tributaries from the outer Carpathian mountains and the Balkan mountains, but also within the inner Carpathian plain. These values indicate that where a high population density or a big industrial discharge coincide with a low runoff, the anthropogenic riverine impact could be considerable.

The variation in flow over the average year is not very pronounced. Up to Novi Sad there are average maximum values in flow usually in early summer and minimal in winter, whereas downstream of Beograd the maximum values are usually reported in late spring and the minimum values in autumn.

The slope of the Danube is another interesting feature of the River. In Lower Bavaria, its value is 0.21 ‰; from the Inn to some distance downstream of Bratislava 0.43 ‰; across the inner Carpathian Basin to the former cataract at the Iron Gate 0.06 ‰; in the cataract section of the Iron Gate 0.32 ‰ (this is where the Balkan and the Carpathian mountain chains are very close); and below the Iron Gate from 0.05 ‰ to well below at mouth. Because it is fed by alpine tributaries, the Danube River carries a big bed-load as well as sediment load, and beyond Komarno / Komarom – where the bed-load settles out - the sediment load starts to increase strongly. Quite a number of tributaries are dammed (for hydropower generation, but also for various kinds of water supply), and along the main river there are man-made lakes upstream from the hydropower stations Gabcikovo / Boes and from Iron Gate I. Due to the sedimentation that takes place in parts of the whole basin drainage network, the Danube River itself deepens along many stretches and erodes its banks downstream the Iron Gate II hydropower station. This is also a cause of erosion along the Romanian Coast of the Black Sea.

The floods in the main river are critical in the Austrian section and somewhat downstream, because the biggest propagation speed of the flood-wave takes place there (up to several kilometres per hour).

2.3 Quality status of surface waters in the Danube Basin

General Overview

Beginning in 1987, the quality status of surface waters in the Danube River was assessed through co-operation established under the Bucharest Declaration. The data – obtained as a result of an accepted monitoring programme, but without analytical intercalibration - were annually reported by the participating States to Romania ('central point for data'); they were processed, discussed and agreed by the participating States before being documented in the Annual Reports. The information contained in the respective reports refers to the physical, chemical and biological status of the Danube River water body as well as to loads of a number of pollutants transported by the river to the Black Sea. Twelve samples per year were taken at monthly intervals.

Since 1996, the quality status of surface waters in the Danube River Basin has been documented in the results of the Trans-National Monitoring Network (TNMN), i.e. the Danube Basin Monitoring Network of the ICPDR. Several physical, chemical and biological parameters have been observed at selected monitoring stations along the main River and some of its tributaries.

Water quality status and hydrological situation in the Danube River Basin in the year 1999.

Hydrological situation. In the upper Danube area, an enormous precipitation rate resulted in several floods in the late spring and early summer of 1999. In the Alpine region of southern Bavaria, extremely intense rain fell on May 20-22. The highest 24-hour precipitation was registered as 234 mm, far exceeding the previous maximum value of 137 mm reported in 1940. The resulting high flood was one of the biggest such events of the last 100 years. In Austria, Styria and Tyrol regions suffered from floods with flows exceeding 100-years probability values. This extreme hydrological situation also influenced the Danube flow in its middle part where the highest discharges occurred in May with values by 50% – 60% higher than long-term mean monthly values (Qmax (1931-80)). In the lower Danube area, flash floods occurred nearly throughout the year in many tributaries, especially in those with small reception basins. During the winter and spring seasons, the significantly increased discharges in Romania and Bulgaria resulted mainly from the superposition of rain precipitations and rapid snowmelts. Such an extreme regime caused a large flood in the Yantra River Basin on 11-13 February. During summer, an intense precipitation also led to intensive floods in several sub-basins in Romania. The long-term daily mean flow of the Danube River is about 6500 m3s-1; this represents an average annual discharge of 207 km^3. The mean flow in 1999 exceeded this average long-term value by more than 21%, leading to a total volume of 250,1 km3 of water discharged into the Black Sea.

Water quality trends. Reduction in discharges belongs to the primary actions designed to improve the Danube water quality. In Germany, technical improvements aimed at N-reduction were performed at several plants. A remarkable

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reduction in loads has been attained at the two City of Munich wastewater treatment plants. In Austria, reduction in nutrients in the Drau (Drava), the Inn/Salzach and the Danube rivers was achieved through some technical measures (enlargements; nutrient-removal) at the urban wastewater treatment plants of the cities of Klagenfurt and Salzburg (Siggerwiesen). Several improvements of wastewater treatment plants in the Czech part of the Morava River Basin resulted in decreased discharges of organic and nutrient pollution into receiving waters. In Slovakia, the total annual BOD5 discharge was reduced by 5% and the total annual CODCr was reduced by 4% when compared to 1998. The reduction or termination of industrial activities from several major polluters in Romania has led to a general improvement in water quality over the last decade. In this way, the percentage of streams having 'degraded' water quality (according to Romanian classification) decreased from 22% in 1989 to 9% in 1999 and the ratio of streams having first class water quality (according to Romanian classification) increased from 35% in 1989 to 59% in 1999. This improvement was also influenced by a stricter inspection and permit granting policy pursued by the Romanian water authorities. Similarly, the consequences of the transition period in Bulgaria caused an improvement in the water quality of the local tributaries of the Danube River. In general, it can be stated that the Danube water quality in the year 1999 did not change significantly in comparison with 1998. A simplified example of the water quality status in 1999 can be demonstrated by the concentration ranges of nutrients measured in the middle Danube reach (km 1718,8 – 1873,5, Slovak part of the Danube, downstream of the cities of Vienna and Bratislava).

Parameter	Lowest concentration in 1999	Highest concentration in 1999
$N\text{-}NO_3$ (mg/l)	1.04	3.12
Total-P (mg/l)	0.043	0.21

These results were obtained in the frame of the 'Transnational Monitoring Network (TNMN)' of ICPDR and will be available in the Yearbook 1999.

Investigations on heavy metals in the1984 - 1996 period

Scientific work concerning heavy metals in the Danube River (Wachs, Large Rivers, Vol. 11, No. 4, p. 533-556, April 2000) has yielded data showing contamination of the water body (incl. suspended solids) and the sediments (1994 – 1996 period) and their accumulation in fish (1984 – 1989 period). In general, all the investigated heavy metals (Cd, Cr, Cu, Hg, Ni, Pb, Zn), have shown an increasing trend in the concentration levels along the path of flow of the Danube River. Deviations from this trend were in general caused by local conditions.

Link between the Danube River and the Black Sea

The loads of nitrogen and phosphorus transported via the Danube River can during certain periods combine with inputs from other rivers to lead to an increased algal growth in the shelf area of the Black Sea. Estimates for the values of the loads of nitrogen and phosphorus transported in the Danube River exist but are not reliable enough due to insufficient sampling and/or a lack in analytical possibilities. Obligations established by the EU Water Framework Directive will harmonize the assessment of water quality on the European scale.

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2.4 Sustainable use of water resources in the Danube River Basin

The Danube River Basin is characterised by an ecosystem with a high environmental, economic and social value.

Water bodies from the Danube Basin supply drinking water for households, industry and agriculture. Further, water is used for irrigation and for cooling purposes. The Danube River and many of its tributaries are spawning grounds for fish thus contributing to the nutrition of humans. They also serve for recreation. Also important for the population of the Danube Basin is the generation of electricity by hydropower and the possibility to discharge treated wastewater.

The Danube River is also important as an international waterway. It should also be mentioned that gravel and sand are extracted from it.

Sustainable use of water resources comprises not only these 'direct uses' mentioned above, but also 'indirect ones' within the overall drainage area, impacting the aquatic ecosystem. Examples of these, amongst others, are:

- drainage of agricultural areas;
- overapplication of fertilisers and pesticides, and
- deposition of air pollutants via rainfall.

Social values such as the aesthetic ones (looking at natural wetlands or natural rivers) should also be mentioned.

2.5 Impacts of the Kosovo Conflict and accidental pollution such as the Baia Mare and Baia Borsa accidents

Kosovo Conflict

The Kosovo Conflict of the year 1999 brought the region of the Danube Basin into a worldwide public interest. A large part of the Kosovo drains into the Danube River Basin, and large parts of the Federal Republic of Yugoslavia, which also drain into the Danube River Basin, were also impacted by the conflict. Following the conflict, investigations took place to assess its environmental impacts in adjacent countries (which are Contracting Parties to the DRPC) like Bulgaria and Romania. Although major direct damages to aquatic life could not be proven to be due to the bombing of industrial sites in the Federal Republic of Yugoslavia and other conflict activities, future environmental impacts cannot be excluded. Clear-up operations and the reconstruction of the bombed industrial sites - if not properly handled - could result in immediate or medium-term releases of harmful substances that could in further course impact human health and damage aquatic life. The environmental outcome of the Kosovo conflict highlightedh the need to register and assess the risks stemming from old and existing industrial dumpsites or destroyed industrial areas.

Accidental spills at Baia Mare and Baia Borsa

'Baia Mare' and 'Baia Borsa' are terms designating the accidental spill of cyanide and/or heavy metals from sedimentation ponds in the mining industry. These events clearly show that an accident in one State can have huge transboundary effects even at the distance of many hundreds of kilometres. The Baia Mare and Baia Borsa accidental pollution spills showed that the risk analysis and the prevention of such events have to be improved. In addition, there was a need to identify the best available techniques for the mining industry.

2.6 Impacts of flood events

Extremely high floods have hit certain areas of the Danube River Basin in recent years. Floods in the Tisza Basin, and especially the large and unexpected flood in the Morava Basin (CZ-SK), have had severe impacts on human property and life. Changes in morphological characteristics and in river dynamics can also take place during large floods. After severe floods, dikes need to be reconstructed, which is often quite costly. The damage inflicted by large floods may influence the way flood-endangered areas are used.

3. Objectives and actions of the Joint Action Programme for the Danube River Basin

3.1 General objectives

The general objectives of this Joint Action Programme are in line with the three main objectives laid down in Article 2 of the DRPC: "The Contracting Parties shall strive at achieving the goals of a sustainable and equitable water management, ... shall make all efforts to control the hazards originating from accidents ... and shall endeavour to contribute to reducing the pollution loads of the Black Sea from sources in the catchment area".

The 2001–2005 Joint Action Programme is directed towards:

- improvement of the ecological and chemical status of the water,
- prevention of accidental pollution events,
- minimisation of the impacts of floods.

In addition to these main objectives, the implementation of the Joint Action Programme will:

- improve the living standard of the DRB population,
- enhance economic development of the region,
- contribute to the process of accession to the European Union,
- restore the region's biodiversity,
- strengthen co-operation between the Contracting Parties.

3.2 Reduction of pollution from point sources

3.2.1 Municipal discharges

Inadequate management of municipal wastewater has been identified as one of the core problems in the Danube River Basin. This is due to the improper collection of wastewater (only 46% of households in the middle and lower Danube regions are connected to central sewerage systems), discharge of 31% of municipal waste water without previous treatment, insufficient capacities of treatment facilities, improper operator performance at treatment facilities and inadequate control of individual wastewater treatment (septic tanks).

Municipal discharges are a common cause of these deficiencies in those areas where heterotrophic self-purification processes, low oxygen tension, eutrophication processes and a deterioration of hygienic conditions are observed.

Improvement of the situation concerning municipal discharges is a well-accepted necessity and one of the major tasks set by this Joint Action Programme.

Annex 1 lists the planned measures for the reduction of pollution load from municipal waste water discharges.

Planned load reductions for COD (more than 214 kt per year), total-nitrogen (more than 36 kt per year) and total-phosphorus (more than 5.2 kt per year), plus an unknown reduction of pathogens, will ease the burden of pollution in the Danube River Basin and the Black Sea.

Actions to be taken:

❍ Get commitment by the Contracting Parties to implement the proposed measures provided the availability of financial resources during the implementation period of the JAP, i.e. till 2005

3.2.2 Industrial discharges

Ecologically unsustainable industrial and mining activities have been identified as another core problem in the Danube River Basin. This is due to the use of outdated technologies and dangerous substances that could be substituted, a discharge of waste water into the sewerage systems without pre-treatment, and inadequate functioning of the existing treatment facilities.

Industrial discharges significantly raise the level of nutrients, heavy metals and organic micropollutants discharged into the river network of the Danube River Basin.

Annex 2 lists the planned measures for the reduction of pollution loads from industrial discharges and also includes some agricultural point discharges (see also 3.2.3.).

It is expected that additional measures - as yet unspecified - will be taken during the implementation of the Joint Action Programme.

Actions to be taken:

❍ Get commitment by the Contracting Parties to implement the proposed measures, provided the necessary financial resources are available during the implementation period of the JAP, i.e. till 2005

3.2.2.1 Recommendations on the application of Best Available Techniques in priority sectors

The ICPDR has identified the chemical, food, and pulp and paper industries as being amongst the main industrial polluters in the Danube River Basin.

Those discharges shall comply with the Best Available Techniques (BAT) as defined in the DRPC. The ICPDR has established Recommendations on Best Available Techniques in those priority industrial sectors, including time-tables for their implementation. The Best Available Techniques Reference Notes (BREF-Notes), published by the European Commission in the framework of Directive 96/61/EEC (IPPC-Directive), were taken into consideration in making these Recommendations.

The Recommendations on Best Available Techniques for these important industrial sectors should be made available on a large scale to the administrative authorities, the industry, and the interested public. There is, therefore, an urgent need for those Recommendations to be translated into the different administrative languages used in the Danube River Basin.

Actions to be taken:

❍ Ensure that Recommendations on Best Available Techniques in the chemical, food, pulp and paper industries are translated into the relevant administrative languages used in the Danube States and made available by the ICPDR (through Danubis) by June 2002 at the latest.

3. Objectives and actions of the Joint Action Programme for the Danube River Basin

3.2.3 Point discharges from agriculture

Information about the existence and status of point discharges from agricultural activities such as pig farms is still insufficient. Many of these discharges are assumed to exert a major influence on the water bodies.

The ICPDR will by the end of 2002 at the latest establish an inventory of all relevant point discharges from agriculture. The ICPDR will also establish a recommendation on the reduction of these discharges, by the end of 2004 at the latest.

Actions to be taken:

❍ Establish an inventory of point discharges from agriculture, by the end of 2002

❍ Establish a recommendation on the reduction of point discharges from agriculture, by the end of 2004

3.3 Wetland and floodplain restoration

River corridors were far less confined in the past than they are in most cases today. Even today, some important wetlands exist in the Danube Basin, e.g. the Delta, and along the Danube, the Drava, the Morava and the Sava rivers. Wetlands serve as habitats for endangered species (flora, fauna). Under certain conditions wetlands could serve as potential elimination areas for nitrogen and phosphorus. The main problem regarding investment in wetlands and floodplains as elimination systems is a lack of knowledge about their long-term efficiency in nutrient removal.

It is obvious that wetlands also fulfil the function of flood routing. The flood peaks are evened out under certain conditions, and the impacts of floods are thus reduced.

Annex 3 contains projects proposed by the Contracting Parties for implementation in the frame of this Joint Action Programme.

Actions to be taken:

❍ Get commitment by the Contracting Parties to implement these proposed projects in the 2001 – 2005 period.

3.4 Reduction of pollution from non-point sources

Many pollutants – e.g. nutrients, heavy metals and pesticides – reach surface waters not only from point source inputs, but also from non-point (diffuse) sources. The diffuse sources, respectively the pathways of those pollutants, range from tile drainage and groundwater infiltration to rivers, to erosion, combined sewer overflows and storm water runoff, as well as atmospheric deposition.

Based on data by Lampert and Brunner (1999), it is estimated that diffuse source inputs into the river drainage network of the Danube Basin (excluding Bosnia-Herzegovina, Croatia, and FR Yugoslavia) have been in the range of 450 kt/a (450) of totN and 49 (39) kt/a of totP for the years 1988/89 and 1992 respectively. These estimates are based on the Phare-funded Project EU/AR/102A (Nutrient Balances for Danube Countries). Transport, transformation and deposition of such loads take place along the river network.

To some extent, the Contracting Parties are already implementing measures for the reduction of non-point source nutrient losses into the waterbodies of the Danube River Basin or for keeping the application of nutrients in agriculture as low as possible (e.g. the KULAP Programme in Germany, the OePUL Programme in Austria, starting with the year 2001 the Code of Good Agricultural Practice in the Czech Republic).

Once the ICPDR has completed the project "Harmonised Inventory of Point and Diffuse Emissions of Nitrogen and Phosphorus in the Danube River Basin" in May 2002 – with the support of statistical, environmental and scientific institutions of the States that participate in the work of the ICPDR – the size of diffuse sources for nitrogen and phosphorus will be estimated in a uniform way within the whole Danube River Basin.

Based on the results of this research and development project, the ICPDR will propose distinct recommendations and measures.

Actions to be taken:

❍ Finalize by the end of 2003 the Inventory of Diffuse Sources of Nitrogen and Phosphorus and propose further measures for their reduction.

❍ Set up by the end of 2003 an Inventory of the Programmes of Measures Taken in the States of the Danube River Basin.

3.5 Continuing basin-wide cooperation in the field of monitoring

The objectives set by the ICPDR can only be reached if data and information collected and assessed at the national level are harmonized, validated and made available for later use at the basin-wide level. Such an approach has already been applied in two fields: (a) the 'Trans-National Monitoring Network (TNMN)' and the related Yearbook, run by MLIM Expert Group and its Expert Sub-Groups, and (b) the drafting of the first emission inventories (for municipal and wastewater discharges respectively) and their subsequent gradual improvement, which belongs to the tasks of EMIS/EG. The text of the Danube River Protection Convention (DRPC) clearly states that 'each Contracting Party bears the cost of the current monitoring and assessment activities carried out in its territory'. The main task of the ICPDR is to ensure that the methods applied in the monitoring and assessment work are truly harmonized in a way that allows the data to actually be used in a comparative way and serve as a reliable basis for making decisions throughout the Basin.

In order for the aims of the DRPC to be reached through a harmonization and validation of data and related information, the Danube Basin States should commit themselves to bearing the full financial cost of the national work needed for the TNMN and its future improvements, as well as for the improvement of the Emission Inventory (through the application of the ICPDR Recommendation on the Monitoring of Wastewater Discharges and the compiling of the revised inventory).

3. Objectives and actions of the Joint Action Programme for the Danube River Basin

Actions to be taken:

❍ The ICPDR shall commit itself to continuing with the work needed for the TNMN (incl. the Yearbook) and its future improvements;

❍ The ICPDR shall commit itself to continuing with the work needed for improving the Emission Inventories (through the application of the ICPDR Recommendation on the Monitoring of Wastewater Discharges and the compiling of revised inventories);

❍ The Contracting Parties shall bear the financial cost of all national work needed for the accomplishment of these actions.

3.6 Improving the scope of TNMN to bring it in line with the EU Water Framework Directive and enable its timely operation

The Transnational Monitoring Network (TNMN) has so far served to deepen the insight of the Danubian States (cooperating via the ICPDR) into the quality status of the Danube and some of its main tributaries. After some years of experience, the need to improve the TNMN concerning the parameters and selected stations was recognized and a broad discussion was launched.

The requirements emanating from the EU Water Framework Directive, which entered into force on December 2000, clearly imply a broadening of the scope of the monitoring and the accompanying quality assuring activities. This will primarily concern the necessary investigations to assess the ecological status of the Danube River and the main Danubian surface water bodies, using macrozoobenthos, phytobenthos, fishes and macrophytes (where applicable) as indicators. A revised set of sampling locations will have to be agreed upon not only for the ecologically based investigations, but also for an enlarged set of chemical quality parameters including a set of applicable priority substances. Further quality control procedures for chemical and biological determinands as well as sampling will have to be in place and run in an assured way.

Actions to be taken:

❍ The States co-operating under the DRPC (Contracting Parties; Signatory; Observing States) agree to orient the ICPDR's 'Transnational Monitoring Network (TNMN)' – in accordance with the provisions of the EU Water Framework Directive – by the year 2003 towards a broadened monitoring and investigation programme needed for the assessment of the ecological and chemical quality status of the Danube River and of important water bodies in the overall Danube Basin;

❍ The ICPDR shall further promote the continuation and introduction of quality control procedures that will allow a validated representation of in-stream water status (quality control schemes for chemical analyses and ecological determinands; representative site-specific sampling in space and time), including a progress report in the year 2006 about the results achieved.

3.7 List of Priority Substances

Water pollution is often generated by the occurrence of hazardous substances in water. The term 'hazardous substances' means substances that have toxic, carcinogenic, mutagenic, and teratogenic or bio-accumulative effects, in particular those that are persistent and have a significant adverse impact on living organisms.

Article 7 (3) of the DRPC refers to its Annex II whose Part 2 contains a 'Guiding List of Hazardous Substances and Groups of Substances'. The discharge of those hazardous substances and groups of substances shall be prevented or considerably reduced. According to Article 7 (3), the responsibility for updating this 'Guiding List' lies with the ICPDR. The ICPDR will in the year 2001 present a List of Priority Substances, which may include the following parameters: chemical oxygen demand (COD), total nitrogen (totN), ammoniacal nitrogen (NH4-N) and total phosphorus (totP), and - in addition - certain heavy metals and selected organic micropollutants, not yet specified. The main assessment basis for this list will be work carried out in the frame of Component VI of the Phare Project ZZ 97 25, in which EMIS/EG participated. This project considered especially the occurrence of substances and group of substances in the Danube River Basin that are part of the EU List of Priority Chemicals. The final 'List of Priority Substances' should be thorough and comprehensive. Besides, it should reflect the most recent developments at the level of the European Union, whose 'EU List of Priority Substances' contains priority hazardous substances whose emissions, discharges and losses will have to cease within 20 years. The remaining priority substances on the 'EU List of Priority Substances' will be subject to a combined approach (emission controls and water quality standards).

The application of a combined approach includes the monitoring of such substances in discharges and in stream. If there is a likelihood that such Priority Substances - to be regulated either via a phasing-out or via a combined approach - are present in discharges or are used, it is strongly suggested that the States co-operating under the DRPC (Contracting Parties; Signatory; Observing States) introduce them into permits or regulate their use via other relevant legislation. The 'Recommendations on Best Available Techniques (BAT)' for industrial sectors, and also any 'Recommendation on Best Environmental Practice (BEP)' (e.g. for agriculture), should specifically address the prevention or reduction of those substances.

Actions to be taken:

❍ Establish a List of Priority Substances for the Danube River Basin in the year 2001, taking into account the latest developments at EU level;

❍ Introduce subsequently the substances on such a list into the monitoring programmes for discharges and in-stream chemical status;

❍ The ICPDR shall ask the States co-operating under the DRPC (Contracting Parties; Signatory; Observing States) to introduce such substances into national permits or to regulate their use via other relevant national legislation;

❍ Introduce such priority substances into 'Recommendations on Best Available Techniques' in industrial sectors and any 'Recommendation on Best Environmental Practice', thus addressing the prevention or reduction of those substances

3. Objectives and actions of the Joint Action Programme for the Danube River Basin

3.8 Water quality standards

According to the ECWFD, a good status has to be achieved within a certain timeframe in all surface water bodies and in groundwater. The status of surface waters is determined by its ecological status and its chemical status. The assessment of the ecological status is based on an analyses of the aquatic community (benthic macroinvertebrates, algae, macrophytes, fish).

The chemical status is based on quality standards laid down for specific pollutants to protect aquatic life (e.g. EU Priority List, Danube Priority List of Hazardous and Other Substances). As the Water Framework Directive looks at the river basin as the "boundary frame" for actions and management, it will be necessary to set uniform water quality standards for those priority substances in the Danube River Basin.

Prerequisites for the implementation of an EU-conform ecological assessment include an identification of ecoregions, a definition of water body types, a definition of type-specific reference conditions, and the establishment of a harmonised evaluation system.

The ICPDR shall be responsible for coordinating the efforts leading to consistent definitions of a good status of water bodies.

Actions to be taken:

❍ The ICPDR shall by the end of the year 2004 establish in-stream Water Quality Standards for the Danube priority list(s) of substances, in order to protect aquatic life in the Danube River Basin;

❍ The ICPDR shall in 2004 publish progress reports on work towards a consistent definition of a good status of waters.

3.9 Prevention of accidental pollution events and maintenance of the Accident and Emergency Warning System

Following the Baia Mare and Baia Borsa accidental pollution events, investigations were launched with the aim to prevent such accidents from occurring in the future.

The ICPDR shall establish a list of industrial activities in the Danube River Basin which relate to the production, storage and use of chemicals and which involve a major risk of accidental pollution. Recommendations for reducing and preventing such risk will be elaborated, e.g. recommendations on emergency response and training. The existing EU legislation, recommendations by UN/ECE, and the experience from other river protection commissions (e.g. for the Rhine and the Elbe rivers) will be considered.

Transboundary warning in the Danube Basin is organised through the Accident and Emergency Warning System (AEW system). The system needs to be maintained and may have to be expanded for additional purposes (e.g. for flood warnings).

Actions to be taken:

❍ Establish by the end of 2001 a list (inventory) of industrial activities in the whole Danube Basin which involve a major risk of accidental pollution;

❍ Develop by 2002 recommendations for reducing the risk of accidental pollution at the identified sites;

❍ Maintain and improve the existing AEW System and consider its use for additional related purposes (e.g. flood warnings).

3.10 Reduction of pollution from inland navigation

Article 3(3) of the DRPC regulates water protection against pollution from inland navigation, thus making it another responsibility of the ICPDR. Pollution from inland navigation relates to the discharge of bilge water from all types of boats and sewage from passenger boats, as well as to the polluting discharges resulting from the cleaning of vessels associated with a change of cargo.

Action to be taken:

❍ The ICPDR shall by the end of 2004 evaluate the situation concerning such polluting discharges, including the needed cooperation with the Danube Commission.

3.11 Product controls

Certain products that are used in big amounts in households and industry often cause water pollution; e.g. a large amount of P-discharge can originate from polyphosphate-containing detergents used in households. The comprehensive report entitled 'Removal of Phosphates from Detergents in the Danube Basin' (Phare-funded Project EU/AR/205/91) gives clear recommendations as to how the discharge of phosphorus into the water-bodies can be minimised. One of the conclusions of the report is that phosphate-free detergents can to a significant extent reduce the phosphate-load in surface waters.

According to the experience of western European States, where phosphate-free detergents are already widely used, the cost of the introduction of phosphate-free detergents is much less than the additional cost of the improvement of sewage treatment with phosphate elimination. The introduction of phosphate-free detergents does not involve any additional direct cost to either the consumer or the national budgets.

The ICPDR shall take the initiative to approach the detergent industry and get its commitment to foster the use of phosphate-free detergents in the Danube River Basin. The detergent industry may achieve this by economic instruments or voluntary agreements.

Actions to be taken:

❍ Get by the end of 2002 a self-binding agreement under which the detergent industry pledges to the ICPDR or to the Danube Basin States to put only phosphate-free detergents for household and industrial use on the market in the Danube Basin.

3. Objectives and actions of the Joint Action Programme for the Danube River Basin

3.12 Minimising the impacts of floods

That floods are inevitable has been proven by the events in the northern Morava and Tisza Basins. Their occurrence can strongly affect human health and life, the aquatic ecosystem and urban development of the affected areas.

Within the scope of the DRPC, the responsibility for flood control lies with the ICPDR (see Articles 3, 9 and 16, DRPC).

Transboundary cooperation is the first prerequisite towards minimising the impact of large floods. The cooperation relates to emergency procedures as cited in Article 16(2), and to an integral monitoring of the causes of the impacts of large floods and an analysis of the measures available at the basin or sub-basin level in order to improve the situation.

Article 16(2) of the DRPC substantiates the need for cooperation at the transboundary level in the context of flood events. The Article reads: 'The Contracting Parties shall in the framework of the International Commission inform each other about competent authorities or points of contact designated for this purpose in case of emergency events such as (amongst other events) floods. The competent authorities shall cooperate to establish joint emergency plans, where necessary, supplementary to the existing plans on bilateral level'.

The ICPDR shall summarise past experience with floods in the Danube River Basin, check the need for joint emergency plans and propose measures for the minimisation of the impacts of floods. The UN/ECE-Guidelines will be considered.

Actions to be taken:

❍ Report by the end of 2003 on the experience gained from studying the cause and impacts of floods in the Danube River Basin;
❍ Consider applying the UN-ECE-Guidelines on 'Sustainable Flood Prevention' in concrete terms, e.g. via an 'Action Programme for Sustainable Flood Prevention' adapted to the specific situation of the overall Danube Basin. In case the overall Danube Basin proves to be too wide a span for such a Programme, the setting-up of 'Action Programmes for Sustainable Flood Prevention for Selected Parts of the Basin' should be considered. The results of these activities should be presented at the end of 2005 at the latest.

3.13 Water Balance

According to Article 9 (3) of the DRPC the "Contracting Parties shall establish on the basis of a harmonized methodology, domestic water balances, as well as the general water balance of the Danube River Basin. As an input for this purpose the Contracting parties to the extent necessary shall provide connecting data, which are sufficiently comparable through the application of the harmonised methodology. On the same data base water balances can also be compiled for the main tributaries of the Danube River."

The "water balance (budget)" in the conventional sense, with resources allocated to various uses, means to define a 'bookkeeping process' by which the dynamics of water movement through the soil and into the groundwater reservoir with gradual discharge as base flow,

can be managed in an integrated approach. In this manner, the resource can be sustained with a balance between the dynamics of the natural drainage system and the consumptive demands of human use.

"Domestic water balances" are the starting point of the task for which a harmonized methodology has to be developed. A harmonized methodological approach is needed because the respective national situations are rather diverse; in some States with high precipitation, the consumptive use of water practically does not influence the connecting data to be provided, whereas in other States there can be a marked impact. In developing the water balance one will have to bear in mind both the protection and the sustainable use of the Danube River Basin.

Action to be taken:

❍ The ICPDR will develop a harmonised methodology for establishing domestic water balances and will by the end of 2005 present a first general water balance for the whole Danube River Basin including water balances for the main tributaries.

3.14 River Basin Management

The future water policy in an united Europe will have to be based on the EC Water Framework Directive. The frame for the implementation of the WFD is not formed by the political boundaries, but by the hydrographic boundaries of a river basin. For every River Basin District, a Basin Management Plan will have to be established. According to Article 16 of the WFD and in the case of an International River Basin District extending beyond the boundary of the Community – which is the case for the Danube River – EU Member States shall endeavour to produce a single River Basin Management Plan. Where this is not possible, the Plan shall cover the portion of the International River Basin District lying within the territory of the Member States concerned.

The ICPDR strongly supports the idea of designing a single plan for the management of the whole Danube Basin, irrespective by which mode of coordination such a single plan is arrived at (e.g. by sub-basin or by national arrangements). This also takes into consideration that some of the Contracting Parties to the DRPC are in the process of accession to the European Union.

The ICPDR has already established an ad-hoc Expert Group WFD/RBM; it is responsible for starting to 'coach' the process of the implementation of the WFD (incl. the development of a single Management Plan for the Danube Basin) and for bringing in relevant proposals to the ICPDR Meetings. By the end of 2004 at the latest, the analysis of the characteristics of the Danube River Basin District, the review of the impact of human activity on the status of waters and the economic analysis of water use have to be completed and handed in to the European Commission. The ad-hoc EG WFD/RBM presently sees this analysis as the most important task to be pursued in the frame of the implementation of the WFD.

3. Objectives and actions of the Joint Action Programme for the Danube River Basin

Action to be taken:

❍ The ICPDR shall by the end of 2004 present a report on its achievements in preparing for the development of a coordinated Danube River Basin Management Plan and, in particular, in co-ordinating the implementation of Article 5 EC WFD concerning the analysis of the characteristics of the Danube River Basin District, the review of the impact of human activity on the status of waters, and the economic analysis of water use.

3.15 Implementation of the Joint Action Programme for the Danube River Basin

Schedule

The time foreseen for the implementation of the Joint Action Plan is from 1 January 2001 till 31 December 2005

Organisation

The responsibility for organising the implementation of the Joint Action Programme lies with the ICPDR and its supporting bodies as far as transboundary cooperation is concerned. As far as national tasks are concerned, the responsibility lies with the Contracting Parties to the DRPC.

Reporting

The ICPDR shall report on the implementation of the Joint Action Programme for the 2001-2003 period in the summer of 2004 at the latest; a report for the 2001-2005 period is due in the summer of 2006 at the latest.

Estimated costs

Some of the work indicated herein is contained in the work the ICPDR has to undertake anyhow in order to implement the DRPC; the estimated costs for the implementation of the projects shown in Annexes 1 to 3 will amount to more than 4.3 billion EURO.

Expected results of the Joint Action Programme

This first Joint Action Programme will contribute to a far better understanding of the benefits of joint activities in the Danube River Basin; there will be reductions of pollution loads for organic matter, nutrients, and heavy metals (see the Annexes 1 to 3); there will also be a reduction of pathogens and micropollutants that can presently not be quantified. In addition to the reduction of pollution and improvements in other areas, the Joint Action Programme improves the cooperation and coordination among the Contracting Parties to the DRPC; it will form a good basis for arriving at a single Danube River Management Plan. Besides, it is expected that the joint activities will improve information exchange, give access to BAT, aid in preventing and minimising the impact of unexpected environmental events, strengthen the interaction between public administration and NGOs, and extend the lessons learned to other regions of the Contracting Parties

Annex 1
Planned measures for the reduction of municipal waste water discharges

Austria (In accordance with the Programme to comply with Article 4, EU Directive 91/271/EEC, and to implement the 'Ordinances for the Limitation of Wastewater Emissions from Urban WWT Plants', Source: HoD)

Name of Location	Reductions in loads (New: After investment; Old: around 1996/97), in t/year				estimated investment cost – includes also sewerage
	BOD-load	COD-load	totN-load	totP-load	
Zellerbecken	5	10	30	6	8
Salzach – Pongau	15	29	44	13	12
Linz – Asten		1.280	770	64	48
Ager – West	13	60	50	1	7
RHV – Attersee	62	290	70	2,2	9
Wien - Simmering	5.500	10.000	2.000	40	215
Spittal			70		10
Villach				14	0,1
St. Veit			60	20	7
Leoben			230	40	17
Graz	30		740	150	37
Sum	5.625	11.669	4.0645	350	370

Remark: No reduction was achieved for BOD and COD, partially because of an increase in the collection rate. For these waste water treatment plants no values are indicated.

Annex 1
Planned measures for the reduction of municipal waste water discharges

Bosnia-Herzegovina (Source: The Danube River Nutrient Reduction Programme)

Name of Location	Reductions in loads (New: After investment; Old: around 1996/97), in t/year				Estimated investment cost – includes also sewerage
	BOD-load	COD-load	totN-load	totP-load	
Tuzla-Lukovac	1,540	4,140	1,080	160	58.0 mil. EURO
Sarajevo	6,150	10,660	1,015	150	15.0 mil. EURO
Banja Luka	n.a.	n.a.	910	140	50.0 mil. EURO
Bjeljina	n.a.	n.a.	n.a.	n.a.	12.0 mil. EURO
Brcko	n.a.	n.a.	n.a.	n.a.	12.0 mil. EURO
Sums	> 7,690	> 14,800	> 3,005	> 450	147.0 mil. EURO

Bulgaria (Source: HoD in response to a request by the ICPDR President, plus the cost as revised from the The Danube River Nutrient Reduction Programme)

Name of Location	Reductions in loads (New: After investment; Old: around 1996/97), in t/year				Estimated Investment Cost – includes also sewerage
	BOD-load	COD-load	totN-load	totP-load	
Sofia	4,819	5,670	1,036	135	26.5 mil. EURO
Veliko Tarnovo	1,696	2,413	131	40	9.2 mil. EURO
Gorna Orahowitza (load reductions only municipal)	1,584	2,614	63	24	n.a. mil. EURO
Montana	2,308	4,950	160	49	17.7 mil. EURO
Pleven	1,346	2,984	93	59	2.0 mil. EURO
Dobrich	n.a.	n.a.	n.a.	n.a.	1.0 mil. EURO
Gabrovo	91	209	n.a.	15	2.0 mil. EURO
Razgrad	34	n.a.	n.a.	0	1.0 mil. EURO
Troyan	1,794	3,796	150	30	9.2 mil. EURO
Vratza	412	1,335	214	37	2.0 mil. EURO
Samokov	1,300	3,079	130	57	2.0 mil. EURO
Lovech	1,382	2,927	119	44	9.3 mil. EURO
Sevlievo	1,194	1,962	136	42	12.5 mil. EURO
Popovo	913	1,891	52	24	13.8 mil. EURO
Stragitza	77	91	3	1	0.9 mil. EURO
Dulovo	241	390	11	2	2.0 mil. EURO
Isperih	257	407	10	3	1.0 mil. EURO
Sums	> 19,448	> 34,718	> 2,308	> 562	> 111.9 mil. EURO

Croatia (Source: The Danube River Nutrient Reduction Programme)

Name of Location	Reductions in loads (New: After investment; Old: around 1996/97), in t/year				Estimated investment cost – includes also sewerage
	BOD-load	COD-load	totN-load	totP-load	
Vinkovci – financing assured (part of the ongoing reconstruction project – phase I biological treatment)	190	n.a.	n.a.	n.a.	12.0 mil. EURO
For the following four cities the preparation work is assured, but the financing not yet completely					
Cakovec – construction of two collectors and extension of WWT plant for tertiary treatment (116 400 pop. equivalents)	n.a.	n.a.	n.a.	n.a.	7.3 mil. EURO
Varazdin – reconstruction of the blower station and sludge treatment	1,1	1,7	132	1	12.0 mil. EURO
Koprivnica – extension of the WWTP (secondary and tertiary treatment for 90,000 PE)	604	806	n.a.	n.a.	10.8 mil. EURO
Zagreb – biological treatment for 1.5Mio PE 10,438	10,4	29,7	1,3	220	256.0 mil. EURO
For the following two cities the preparation work is assured, but the financing not yet					
Sisak (cost includes some sewerage)	700	919	48	2	60.0 mil. EURO
Karlovac / Duga Resa (cost includes some sewerage)	2,0	1,1	9	16	50.0 mil. EURO
Sum for other cities (financing still open)	190	n.a.	n.a.	n.a.	25.4 mil. EURO

Annex 1
Planned measures for the reduction of municipal waste water discharges

Czech Republik (Source: HoD in response to a request by the ICPDR President)

Name of WWT Plant	Reductions in loads (New: After investment; Old: 1998), in t/year				Estimated Investment Cost – includes also some Cost of Sewerage
	BOD-load	COD-load	totN-load	totP-load	
Brno *	40	60	417	15	46.1 mil. EURO
Uh. Hradiste *	34	51	65	1	5.8 mil. EURO
Hodonin *	0	0	10	2	2.7 mil. EURO
Prostejov *	0	0	42	0	15.2 mil. EURO
Prerov *	59	74	63	3	10.1 mil. EURO
Breclav *	25	93	36	3	11.7 mil. EURO
Trebic	47	151	81	10	12.9 mil. EURO
Vyskov	1	18	46	10	10.6 mil. EURO
Jihlava	39	27	68	0	16.2 mil. EURO
Val. Mezirici	0	0	0	6	11.9 mil. EURO
Vsetin	0	0	18	2	11.2 mil. EURO
Kromeriz	80	123	71	0	11.3 mil. EURO
Other plants	1,070	n.a.	377	34	42.1 mil. EURO
Sums	1,394	> 597	1,306	86	207.8 mil. EURO
Remark: The ratios of COD removed versus BOD removed are at some plants small, they should be in the order of 1.7 to 1.0					

*Reconstruction will be finished before 2005

Federal Republic of Germany (Source: HoD in response to a request by the ICPDR President, plus The Danube River Nutrient Reduction Programme)

Name of WWT Plant	Reductions in loads (New: After investment; Old: Around 1999/2000), in t/year				Estimated Investment Cost – not only for load reduction!
	BOD-load	COD-load	totN-load	totP-load	
Leutkirch	1	9	57	2.9	4.6 mil. EURO
München I *	0	0	1,200	0	85.0 mil. EURO
München II – Gut Marienhof *	0	0	300	0	15.0 mil. EURO
ZV Starnberger See	0	0	80	0	n.a. mil. EURO
ZV Chiemsee	0	?	60	0	5.1 mil. EURO
Sums	1	9	1,700	~ 3	> 110 mil. EURO

* The WWT plants were adopted for partial N-removal before or in 2000; further N-removal by additional measures and by optimisation of plant operation step by step until 2005

Hungary (Source: The Danube River Nutrient Reduction Programme)

Name of WWT Plant	Reductions in loads (New: After investment; Old: 1996/97), in t/year				Estimated investment cost – includes also some cost of sewerage
	BOD-load	COD-load	totN-load	totP-load	
Budapest North	n.a.	n.a.	308	183	32.3 mil. EURO
Budapest South	n.a.	n.a.	203	122	27.9 mil. EURO
Budapest Central	n.a.	n.a.	900	140	407.0 mil. EURO
Szeged (c. includes sewerage)	n.a.	n.a.	600	250	68.0 mil. EURO
Gy_r	n.a.	n.a.	273	43	12.7 mil. EURO
Tatabánya	n.a.	n.a.	30	40	8.0 mil. EURO
Székesfehérvár	n.a.	n.a.	160	25	15.0 mil. EURO
Dunaújváros	n.a.	n.a.	53	23	10.6 mil. EURO
Sopron	n.a.	n.a.	40	30	9.0 mil. EURO
Szekszárd	n.a.	n.a.	80	20	3.3 mil. EURO
Salgótarján (c. incl. sewerage)	n.a.	n.a.	80	20	23.4 mil. EURO
Gödöll_ (c. incl. sewerage)	n.a.	n.a.	128	37	11.3 mil. EURO
Kerka-Mura, incl. sewerage	n.a.	n.a.	100	20	11.1 mil. EURO
Veszprém/Northern Bakony, incl. sewerage	n.a.	n.a.	100	20	11.9 mil. EURO
Baja	n.a.	n.a.	227	40	3.5 mil. EURO
Sums	n.a.	n.a.	3,282	1,013	655.0 mil. EURO

Annex 1
Planned measures for the reduction of municipal waste water discharges

Moldova (Source: The Danube River Nutrient Reduction Programme)

Name of WWT Plant (it seems that the Cost of all these locations not only refers to WWT but also to sewerage)	Reductions in loads (New: After investment; Old: around 1996/97), in t/year				Estimated investment cost – includes also cost of sewerage
	BOD-load	COD-load	totN-load	totP-load	
Cahul	20	33	52	11	53.8 mil. EURO
Ungheni	22	29	55	12	57.7 mil. EURO
Comrat	18	24	50	9	11.7 mil. EURO
Ciadir-Lunga	13	17	57	11	8.9 mil. EURO
Edineti	12	9	65	7	4.5 mil. EURO
Falesti	8	18	46	5	15.4 mil. EURO
Vulcanesti	15	20	35	4	8.2 mil. EURO
Nisporeni	12	21	30	4	15.2 mil. EURO
Taraclia	11	18	35	4	7.6 mil. EURO
Glodeni	9	14	45	5	8.8 mil. EURO
Leova	15	30	20	4	5.8 mil. EURO
Briceni	14	26	45	6	8.9 mil. EURO
Cupcini	12	29	15	3	12.2 mil. EURO
Rascani/Costesti	12	27	15	2	7.2 mil. EURO
Cantemir	11	24	20	3	20.8 mil. EURO
Other communities	45	120	200	30	50.0 mil. EURO
Sums	249	459	785	120	296.7 mil. EURO

Remarks: The load reductions shown – big on the side of nutrients, comparatively smaller for BOD and COD – can only be valid if WWT plants exist in all those places, and in case the investment into these WWT plants goes into plant expansion for nutrient removal.

Romania (Source: The Danube River Nutrient Reduction Programme)

Name of WWT Plant	Reductions in loads (New: After investment; Old: around 1996/97), in t/year				Estimated investment cost – not only for load reduction!
	BOD-load	COD-load	totN-load	totP-load	
Bucharest	10,600	14,120	3,363	444	492.5 mil. EURO
Craiova	660	864	597	63	32.0 mil. EURO
Braila	3,220	3,750	126	26	21.9 mil. EURO
Galati	4,355	4,540	224	37	29.5 mil. EURO
Zalau	108	146	39	11	7.0 mil. EURO
Resita	126	127	85	22	3.5 mil. EURO
Campulung	228	238	38	7	1.5 mil. EURO
Deva	150	156	86	21	5.6 mil. EURO
Timisoara	3,284	2,561	444	101	1.5 mil. EURO
Iasi	1,390	772	165	35	1.9 mil. EURO
Sums	24,121	27,274	5,167	767	596.9 mil. EURO
Remark: The ratios of COD removed versus BOD removed are small, they should be in the order of 1.7 to 1.0					

Slovak Republic (Source: The Danube River Nutrient Reduction Programme)

Name of WWT Plant	Reductions in loads (New: After investment; Old: around 1996/97), in t/year				Estimated investment cost – not only for load reduction!
	BOD-load	COD-load	totN-load	totP-load	
Kosice	1,596	3,110	405	18	20.2 mil. EURO
Banska Bystrica	3,720	7,700	424	47	13.1 mil. EURO
Nitra	2,041	3,613	287	32	13.1 mil. EURO
Liptovsky Mikulas, incl. sewerage	253	612	258	3	6.8 mil. EURO
Ruzomberok	975	1,986	22	1	0.1 mil. EURO
Topolcany	299	408	144	3	0.9 mil. EURO
Michalovce	1,142	2,251	135	3	2.6 mil. EURO
Hummene	867	1,586	106	2	11.1 mil. EURO
Trencin (righthand side), incl. sewerage	819	1,692	57	3	10.6 mil. EURO
Roznava	359	776	40	1	0.5 mil. EURO
Svidnik, incl. sewerage	446	849	27	1	10.9 mil. EURO
Banska Stiavnica, incl. collector	256	526	53	5	9.1 mil. EURO
Cadca, incl. sewerage	197	350	41	6	4.4 mil. EURO
Sums	12,968	25,459	2,001	125	103.4 mil. EURO

Annex 1
Planned measures for the reduction of municipal waste water discharges

Slovenia (Source: The Danube River Nutrient Reduction Programme)

Name of WWT Plant	Reductions in loads (New: After investment; Old: around 1996/97), in t/year				Estimated investment cost – not only for load reduction!
	BOD-load	COD-load	totN-load	totP-load	
Maribor	4,900	8,000	900	140	52.0 mil. EURO
Ljubljana	9,433	15,400	1,733	270	109.5 mil. EURO
Murska Sobota	1,103	1,800	203	32	9.2 mil. EURO
Celje	1,715	2,800	315	49	20.8 mil. EURO
Rogaska Slatina	294	480	54	8	16.0 mil. EURO
Lendava	1,103	1,800	203	32	13.0 mil. EURO
Krsko	490	800	90	14	11.0 mil. EURO
Brezice	245	400	45	7	5.5 mil. EURO
Velenje	1,225	2,000	225	35	16.5 mil. EURO
Sevnica	245	400	45	7	5.5 mil. EURO
Vrhnika	490	800	90	14	20.4 mil. EURO
Trbovlje	441	720	81	13	7.1 mil. EURO
Bohinjska Bistrica	270	440	50	8	5.0 mil. EURO
Radovljica	735	1,200	135	21	10.0 mil. EURO
Kranjska Gora	159	260	30	5	9.6 mil. EURO
Trzi	490	800	30	4	11.8 mil. EURO
Litija	466	760	86	13	7.5 mil. EURO
Zagorje	417	680	77	12	6.7 mil. EURO
Hrastnik	270	440	50	8	4.3 mil. EURO
Dravograd	221	360	41	6	4.8 mil. EURO
Mislinja	61	100	12	2	1.3 mil. EURO
Slovenj Gradec	490	800	90	14	10.7 mil. EURO
Ptuj	2,573	4,200	473	74	24.3 mil. EURO
Sums	27,836	45,440	5,053	786	382.5 mil. EURO

Ukraine (Source: The Danube River Nutrient Reduction Programme)

Name of WWT Plant	Reductions in loads (New: After investment; Old: around 1996/97), in t/year				Estimated investment cost – not aonly for load reduction!
	BOD-load	COD-load	totN-load	totP-load	
Uzhgorod	218	392	293	29	25.0 mil. EURO
Chernivtsi	318	n.a.	65	22	4.7 mil. EURO
Izmail	31	58	n.a.	9	12.4 mil. EURO
Mukachevo	111	171	128	6	3.0 mil. EURO
Vilkovo	n.a.	n.a.	n.a.	n.a.	6.5 mil. EURO
Reni Sea Port	n.a.	n.a.	n.a.	n.a.	2.8 mil. EURO
Kolomia	n.a.	n.a.	n.a.	n.a.	? mil. EURO
Sums	> 678	> 621	> 486	> 66	> 54.4 mil. EURO

Remark: The load reductions shown – big on the side of nutrients, comparatively smaller for BOD and COD – can only be valid if WWT plants exist in all those places, and in case the investment into these WWT plants goes into plant expansion for nutrient removal.

Federal Republic of Yugoslavia

Name of WWT Plant	Reductions in loads (New: After investment; Old: around 1996/97), in t/year				Estimated Investment Cost – not only for load reduction!
	BOD-load	COD-load	totN-load	totP-load	
Remark: The data of FRYU will be integrated as soon as the necessary links are established with FRYU.					

Summary of the discharges of municipal wastewater, by State

Name of Location	Reductions in loads (New: After investment; Old: around 1996/97 and 2000), in t/year				Estimated Investment Cost – not only for load reduction, but also to some extend for end collectors of sewer systems
	BOD-load	COD-load	totN-load	totP-load	
Austria	~ 14,000	~ 30,000	~ 9,500	~ 1,000	~ 730.0 mil. EURO
Bosnia-Herzegovina	> 7,690	>14,800	> 3,005	> 450	147.0 mil. EURO
Bulgaria	> 19,448	> 34,718	> 2,308	> 562	> 111.9 mil. EURO
Croatia	> 15,310	> 34,426	>1,509	> 239	433.5 mil. EURO
Czech Republic	1,394	> 597	1,306	86	207.8 mil. EURO
Fed. Republic of Germany	1	9	1,700	~ 3	> 110 mil. EURO
Hungary	n.a.	n.a.	3,282	1,013	655.0 mil. EURO
Moldova	249	459	785	120	296.7 mil. EURO
Romania	24,121	27,274	5,167	767	596.9 mil. EURO
Slovak Republic	12,968	25,459	2,001	125	103.4 mil. EURO
Slovenia	27,836	45,440	5,053	786	382.5 mil. EURO
Ukraine	> 678	> 621	> 486	> 66	> 54.4 mil. EURO
Fed.Republic of Yugoslavia	(to be added in the future)				mil. EURO
Sum over these States ("Danube Basin")	> 123,695	> 213,803	> 36,102	> 5,217	> 3,829.1 mil. EURO

Annex 2
Planned measures for a reduction in industrial waste water discharges, including agricultural (point) sources

Austria (Source: HoD in response to a request by the ICPDR President)

Name of Location	Remarks as to load reductions	Estimated investment cost of load reduction
MoDo Hallein, Pulp and Paper	Biological WWT plant, removes biodegardable organic carbon, around 6,000 t BOD per year	33 mil. EURO

Bosnia-Herzegovina (Source: The Danube River Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Estimated investment cost of load reduction
Chlorine-Alkali-Complex Tuzla	Reconstruction of pre-treatment facilities. Removes COD, BOD, N and P.	2.2 mil. EURO
Pulp and Paper Industry Maglaj	Rehabilitation / reconstruction; no further data	3.0 mil. EURO
Coke and Chemical Industry Lukavac	Reconstruction of pre-treatment; removes COD and BOD	2.8 mil. EURO
Cellulose / Viscose Factory Banja Luka	Reconstruction and improvement of WWTP; no further data	3.5 mil. EURO
Iron Works Zenica	Reconstruction of WWTP	1.6 mil. EURO
Pulp and Paper Industry Prijedor	Construction of WWT Plant; no further data	14.0 mil. EURO
Pig Breeding Farm Brcko	Construction of WWTP; will remove 1,570 t N per year and 350 t P per year	2.3 mil. EURO
sum		29.4 mil. EURO

Bulgaria (Source: HoD in response to a request by the ICPDR President)

Name of Location	Remarks as to load reductions	Estimated Investment Cost
Gorna Oriahovitza	Reductions of organic carbon (BOD and COD)	n.a. mil. EURO

Croatia (Source: The Danube River Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Estimated investment cost
	Croatia has not nominated reductions with industrial or agricultural point source discharges	mil. EURO

Czech Republik (Source: HoD in response to a request by the ICPDR President)

Name of Location	Remarks as to load reductions	Estimated investment cost of load reduction
Otrokovice tannery	Joint treatment with municipality, incl. nitrification and nitro-gen removal	2.8 mil. EURO
Tanex Vladislav	Glue production; expansion of WWT plant	0.4 mil. EURO
Snaha Brtnice tannery	General reconstruction of WWT plant; COD/BOD, NH4-N, Cr	0.8 mil. EURO
Prudká Brno, paper production	Construction of WWT Plant (biology); will remove COD/BOD	0.2 mil. EURO
MORPA Jindrichov paper production	Construction of WWTP (biology); Removal of COD/BOD	0.2 mil. EURO
Other Industries	Nutrient removal	0.9 mil. EURO
Gigant Dubnany pig farm	Remedial measures; slurry reduction	5.3 mil. EURO
sum		10.6 mil. EURO

Federal Republik of Germany (Source: HoD in response to a request by the ICPDR President)

Name of Location	Remarks as to load reductions	Estimated Investment Cost of load reduction
Esso Refinery Ingolstadt *	COD: +/- 0 t/year; totN: 20 t/ year; totP: +/- 0 t/year;	0.6 mil. EURO
Nitrochemie Aschau *	COD: +/- 0 t/year; totN: 55 t/year; totP: +/- 0 t/year;	2.4 mil. EURO
sum		3.0 mil. EURO

* Considerable load reduction measures were introduced already between 1997 and 2000; here indicated figures refer to reductions between 2001 and 2005.

Annex 2
Planned measures for a reduction in industrial wastewater discharges, including agricultural (point) sources

Hungary (Source: HoD in response to a request by the ICPDR President)

Name of Location	Remarks as to load reductions	Est. investm. cost of load reduction and demonstration projects.
Nitrokemia Balatonfüzfö	totN: 420 t/year; totP: 6 t/year;	5.9 mil. EURO
Piggery Mosonmagyarovar	totN: 200 t/year; totP: 50 t/year	0.7 mil. EURO
MOL Company (reduction of oil pollution)	Oil 60 t/ year	48.7 mil. EURO
BORSODCHEM Company	Saltwater reduction programme	2.9 mil. EURO
Bábolna Poultry Ltd.	Grease, COD	0.6 mil. EURO
Demonstration projects, non-point source pollution:		
Tisza Basin	Pollution minimization from agricultural activities,totN: 100 t/year; totP: 20 t/year	0.5 mil. EURO
Körös-Maros	Agro- and nature conservation training in Körös-Maros National Park, totN: 200 t/year; totP: 50 t/year	3.0 mil. EURO
Hajdú-Bihar county	Minimising of pollution from agricultural origin	1.3 mil. EURO
Danube Basin in Hungary	Rational farming for decreasing nutrient inputs in the Hun-garian part of the Danube Basin, totN: 2,000 t/year; totP: 200 t/year	1.4 mil. EURO
Babocsa / Drava floodplains	Organic farming, totN: 100 t/year; totP: 20 t/year	1.7 mil. EURO
sum		66.7 mil. EURO

Moldova (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions				Est. investm. cost – not only for load reduction
	BOD	COD	totN	totP	
Town Falesti, WWTP	4	12	20	4	7.5 mil. EURO
Town Lipcani, WWTP	3	9	15	3	8.0 mil. EURO
Town Ocnita, WWTP	2	9	12	3	6.5 mil. EURO
Village Cucoara, WWTP	1	4	5	1	4.5 mil. EURO
Village Congaz, WWTP	0	1	4	1	5.5 mil. EURO
Village Cociuela, WWTP	0	1	4	1	7.0 mil. EURO
Village Cioc-Maidan, WWTP	0	1	3	1	7.5 mil. EURO
Village Mereseni, WWTP	0	1	3	1	6.0 mil. EURO
Town Glodeni, WWTP	2	5	14	3	3.5 mil. EURO
Town Briceni	3	8	20	5	4.2 mil. EURO
Town Cupcini	5	9	30	6	4.5 mil. EURO
Other WWTPs	7	15	50	10	20.0 mil. EURO
Other type of activities:					
Manure treatment facilities	5	20	45	13	7.0 mil. EURO
Afforestation Programme	5	20	195	2	3.5 mil. EURO
Soil Conservation Programme	5	20	80	5	8.0 mil. EURO
Other activities	5	10	30	5	8.0 mil. EURO
Sums	47	145	530	64	111.2 mil. EURO
Remark: For the removal of the loads shown, the indicated investment is rather high.					

Romania (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Estimated investment cost of load reduction
Iasi, Antibiotics Industry	Organic carbon (COD; BOD)	1.8 mil. EURO
Pitesti, Arpechim	Organic carbon (COD; BOD)	13.9 mil. EURO
Somes Dej	Organic carbon (COD; BOD; totN)	0.6 mil. EURO
Oltchim Rm. Valcea	Organic carbon (COD; BOD; totN)	0.7 mil. EURO
Fibrex Savinesti	Organic carbon (COD; BOD; totN)	1.2 mil. EURO
Romfosfochim	Reconstruction of mill area	2.8 mil. EURO
Integrata Arad	Organic carbon (COD; BOD; totN)	1.0 mil. EURO
Comsuin Ulmeni, agriculture	Nutrients	1.0 mil. EURO
Suinprod Independentea, agric.	Nutrients, organic carbon	0.8 mil. EURO
Comsuin Beregsau	Nutrients, organic carbon	1.9 mil. EURO
sum	The total indicated removals are 6,300 t BOD per year, 6,300 t COD per year, 2,060 t totN per year and 153 t totP per year. Remark: The ratio of COD removed versus BOD removed is small, it should be in the order of 1.7 to 1.0	25.7 mil. EURO

Annex 2
Planned measures for a reduction in industrial wastewater discharges, incl. agricultural (point) sources

Slovak Republic (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Estimated investment cost of load reduction
Istrochem Bratislava	WWTP, removal of BOD, COD and totN	8.2 mil. EURO
Povazske Chemical Plants	Reconstruction of WWTP	0.5 mil. EURO
Biotika Slovenska Lupca	Extension of WWTP by anaerobic stage	3.4 mil. EURO
Chemko Strazske	Reconstruction of sewerage system	2.1 mil. EURO
Sum		14.2 mil. EURO

Slovenia (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Estimated investment cost of load reduction
Podgrad / Gornja Radgona	pig farm (BOD/COD, nutrients)	1.7 mil. EURO

Ukraine (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Estimated investment cost of load reduction
	Ukraine has not nominated reductions with industrial or agricultural point source discharges	mil. EURO

Federal Republic of Yugoslavia

Name of Location	Remarks as to load reductions	Estimated investment cost of load reduction
Remark: Data from the Federal Republic of Yugoslavia will be incorporated as soon as cooperation has been established.		

Summary of investment into industrial discharges, by State (also includes large agricultural point discharges and some other agricultural activities)

State	Cost (investment)
Austria	33.0 mil. EURO
Bosnia-Herzegovina	29.4 mil. EURO
Bulgaria	n.a. mil. EURO
Croatia	
Czech Republic	10.6 mil. EURO
Federal Republic of Germany	3.0 mil. EURO
Hungary	66.7 mil. EURO
Moldova	111.2 mil. EURO
Romania	25.7 mil. EURO
Slovak Republic	14.2 mil. EURO
Slovenia	1.7 mil. EURO
Ukraine	
Federal Republic of Yugoslavia (to be filled in later)	
Sum over the Danube Basin >	295.5 mil. EURO

Annex 3
Planned projects for wetland and floodplain restoration

Austria (Source: HoD in response to a request by the ICPDR President)

Name of Location	Remarks as to load reductions	Cost estimate
Austria has nominated the following wetland projects:		
In Nationalpark Donauauen 5,150 ha with a cost estimate of		10.94 mil. EURO
In the March-Thaya region 1,000 ha with accost estimate of		0.95 mil. EURO
At other rivers (e.g. Drau, Lech, Mur)		4.38 mil. EURO
Sum		16.27 mil. EURO

Bosnia-Herzegovina (Source: The Danube River Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Cost estimate
Bosnia-Herzegovina has not nominated any wetland projects.		

Bulgaria (Source: HoD in response to a request by the ICPDR President, and also via the The Danube River Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Cost estimate
Bulgaria has nominated wetland projects for the Kalimok and Brushlen Marshes and the Belen wetland complex.		13.5 mil. EURO

Croatia (Source: The Danube River Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Cost estimate
Croatia has not yet nominated wetland projects.		

Czech Republic (Source: HoD in response to a request by the ICPDR President)

Name of Location	Remarks as to load reductions	Cost estimate
Morava; activation of oxbows at Rohatec/Hodonin		0.019 mil. EURO
Dyje; activation of oxbows at Lanzhot/Breclav		0.083 mil. EURO
Rehabilitation of river Miroslavka		0.139 mil. EURO
Rehabilitazion measures in polder Pritluky		0.117 mil. EURO
Rehabilitation of wetland area along Morava river at Rohatec, Straznice and Vnorovy		0.222 mil. EURO
Rehabilitation of river Dlouha at Buchlovice		0.167 mil. EURO
Rehabilitation of river Prasnice at Hluk		0.069 mil. EURO
Rehabilitation of up-reach parts of river Haraska at Boleradice		0.139 mil. EURO
Rehabilitation of river Roketnice at Jirikovice, Velatice and Ponetovice		0.067 mil. EURO
Rehabilitation of the stream Moutnicky potok at Moutnice, Tesany and Menin		0.128 mil. EURO
Rehabilitation of river Zamecka Morava at Mladec and Litovel		0.417 mil. EURO
Construction of the fish pass at the Nove Mlyny weir		0.069 mil. EURO
Rehabilitation of littoral zones in the natural reservation Chomoutovske jezero		0.222 mil. EURO
Rehabilitation of the rivers Tridvorka and Cerlinka at Litovel and Cervenka		0.194 mil. EURO

Annex 3
Planned projects for wetland and floodplain restoration

Czech Republic ...

Name of Location	Remarks as to load reductions	eCost Estimate
Rehabilitation of river Morava next to Nove Zamky, at Mladec		0.167 mil. EURO
Rehabilitation of the Morava river / overcoming anthropogenic interventions, at Stepanov		0.222 mil. EURO
Reconstruction of the water junction at Hynkov, incl. a fish pass		0.194 mil. EURO
Rehabilitation of the rivers Pisecna, Kobylnik and Treti voda		0.083 mil. EURO
Flow optimisation at Dije river downstream of the Vranov dam		not stated
Rehabilitation of forest channel network at Tvrdonice, Kostice and Lanzhot		0.167 mil. EURO
Rehabilitation of forest channel network at forest Vranovsky les (Vranov, Pouzdrany)		0.139 mil. EURO
Rehabilitation of floodplain forests at the confluence of Dyje and Morava rivers		0.194 mil. EURO
Rehabilitation of forest Bori les / overcoming anthropogenic impacts (Valtice / Postorna)		0.056 mil. EURO
Rehabilitation of the floodplain forest Drnholecky luh		0.083 mil. EURO
Sum		3.357 mil. EURO

Federal Republic of Germany (Source: HoD in response to a request by the ICPDR President, and also via the Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Cost estimate
The Federal Republic of Germany has nominated wetland and floodplain projects as follows: Rehabilitation of rivers; strengthening natural retention at e.g. Danube, Iller, Wertach, Isar, Wörnitz, Regen, Mindel, Schwarzach, Lauterach, Kollbach, Strogen, Glonn, Schmutter. For land purchases and for reducing the agricultural intensity, the amount of 13.0 mil. EURO has been allocated		

Hungary (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Cost estimate
Hungary has nominated wetland projects. They are located in the Danube-Drava area (Gemenc), and at the mouth of the Bodrog into the Tisza River, and in the Hanság area		17.9 mil. EURO

Moldova (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Cost estimate
Moldova has nominated wetland projects. The main ones are located in the Lower Prut area, and in the Lower Yalpugh River area.		85.0 mil. EURO

Romania (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Cost estimate
Romania has nominated wetland projects. They are located in the Lower Prut area and at Balta Potelu, the area of the Bulgarian Danube, the Island Balta Greaca, and in the Calarasi area.		73.9 mil. EURO

Slovak Republic (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Cost estimate
The Slovak Republic has nominated projects for floodplain / wetlands restoration. They are located in the Olsavica River Basin, in the Lower Morava River Basin and in the Laborec River Basin.		0.9 – 1.155 mil. EURO

Slovenia (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Cost estimate
Slovenia has not nominated wetland projects.		

Ukraine (Source: Nutrient Reduction Programme)

Name of Location	Remarks as to load reductions	Cost estimate
Ukraine has not nominated wetland projects.		

Federal Republic of Yugoslavia

Name of Location	Remarks as to load reductions	Cost estimate
Data from the Federal Republic of Yugoslavia will be incorporated as soon as cooperation has been established.		

Annex 3
Planned projects for wetland and floodplain restoration

Summary of the investment into wetlands, by State
(also includes large agricultural point discharges and some other agricultural activities)

Name of location	Remarks as to load reductions	Cost estimate
State		Cost (investment)
Austria		16.3 mil. EURO
Bosnia-Herzegovina		
Bulgaria		13.5 mil. EURO
Croatia		
Czech Republic		3.4 mil. EURO
Federal Republic of Germany		13.0 mil. EURO
Hungary		17.9 mil. EURO
Moldova		85.0 mil. EURO
Romania		73.9 mil. EURO
Slovak Republic		0.9 – 1.155 mil. EURO
Slovenia		
Ukraine		
Federal Republic of Yugoslavia (to be filled in later)		
Sum over the Danube Basin		223.9 – 224.2 mil. EURO

Annex 4
Recommendation Concerning the Treatment of Municipal Wastewater

(ICPDR Document IC/24 – Final, February 2000)

The Commission,

recalling Paragraph 1 of Article 2 of the Danube River Protection Convention in which the Contracting parties shall strive at achieving the goals of a sustainable and equitable water management, including the conservation, improvement and the rational use of surface waters and ground water in the catchment area as far as possible,

recalling also Paragraph 2 of Article 2 of the Danube River Protection Convention according to which the Contracting Parties pursuant to the provisions of this Convention shall cooperate on fundamental water management issues and take all appropriate legal, administrative and technical measures, to at least maintain and improve the current environmental and water quality conditions of the Danube River and of the waters in its catchment area and to prevent and reduce as far as possible adverse impacts and changes occurring or likely to be caused;

recalling further Paragraph 4 of Article 2 of the Danube River Convention in which the Contracting Parties agree with that the 'Polluter pays Principle' and the 'Precautionary Principle' constitute a basis for all measures aiming at the protection of the Danube River and of the waters within its catchment area;

recalling further Paragraph 2 b of Article 5 in which the Contracting Parties agree with to adopt legal provisions providing for requirements including time limits to be met by waste water discharges;

recalling further Paragraph 1 of Article 7 in which is agreed with by the Contracting Parties that for municipal waste water, emission limits shall be based in the application of at least biological or an equivalent level of treatment;

recognizing that the treatment of municipal waste waters including phosphorus and nitrogen removals has been found to be necessary in all parts of the Danube River catchment area in order to improve the ecological status of its waters and that of the Black Sea;

recognizing that some Contracting Parties have to implement and other Contracting Parties will have to implement the requirements established in European Directives concerning urban waste water treatment;

recognizing also that in an urban area the sewerage system and the sewage treatment plant must be regarded as a unit when the pollution load is dealt with;

recognizing also that the major pollutants of municipal waste water are organic matters (measured e.g. as BOD_5), nitrogen and phosphorous;

desiring to limit this pollution by effective treatment of municipal waste waters;

recommends to the Contracting Parties of the Danube River Protection Convention that:

a) municipal waste water (waste water from households of the mixture of waste water from households with industrial waste water and/or run-off rain water), loaded with more than 2000 population equivalents (1 p. e. = 60 g BOD_5/d), should be collected and treated before being discharged into water bodies. Where the establishing

Annex 4
Recommendation Concerning the Treatment of Municipal Wastewater

of a collecting system is not justified either because it would produce no environmental benefit or because it would involve excessive cost, individual systems or other appropriate systems which achieve the same level of environmental protection should be used.

b) municipal waste water which is collected in a sewerage system and treated in waste water treatment plants, loaded with more than 2,000 population equivalents, should be treated by biological methods or other methods giving equivalent results, in order to achieve the following results (homogenized unfiltered, un decanted sample; flow-proportional or time-based 24 hour-samples[1]):

BOD_5 [2]	25 mg/l or 70 - 90 minimum percentage of reduction
CODcr	125 mg/l or 75 minimum percentage of reduction[3]

For these two parameters the maximum number of samples which are allowed to fail the requirements, expressed in concentrations and/or percentages reductions is specified in the Annex. For the parameters, expressed in concentrations, the failing samples must not devi-ate from the required values by more than 100 %. Alternative methods to those just mentioned may be used provided that it can be demonstrated that equivalent results are obtained.

c) municipal waste water, loaded with more than 10,000 p. e., which is foreseen for nitrogen and phosphorus removal, should be treated in order to achieve the following results (homogenized unfiltered, undecanted sample, annual mean values):

Total Phosphorus	2 mg/l P (10,000 - 100,000 p. e.) 1 mg/l P (more than 100,000 p.e.)	} or 80 minimum percentage } of reduction [3]
Total Nitrogen [4]	15 mg/l N [5] 10,000 - 100,000 p. e.) 10 mg/l N [5] (more than 100,000 p. e.)	} or 70 - 80 minimum } percentage of reduction [3]

One or both parameters may be applied depending on the local situation.

The requirements for Total Phosphorus and Total Nitrogen need not apply for every municipal waste water treatment plant, if it can be shown, that the minimum percentage of reduction of the overall load entering all municipal waste water treatment plants in that area is at least 75 % for total phosphorus and at least 75 % for nitrogen.

In case of lack of investments for tertiary treatment priorities should be aimed first at phosphorus removal, starting with plants bigger than 100,000 p. e. Nitrogen removal should at least be considered in the planning process.

d) Sludge arising from waste water treatment should be re-used whenever appropriate. The disposal of sludge to surface waters should be phased out. The disposal of sludge should be subject to general rules or authorization.

Recommends further that inventories of municipal discharges or waste water treatment plants loaded with more than 10,000 p. e. are compiled by the Contracting Parties every second year beginning one year after the adoption of this Recommendation and sent to the Com-mission including a report of actions.

Recommends further that in the light of possible new developments this Recommendation should be rediscussed at the latest in 2004.

Annex to the Recommendation concerning the Treatment of Municipal Waste Water

Series of samples taken in any year	Maximum permitted number of samples which fail to conform
4 - 7	1
8 - 16	2
17 - 28	3
29 - 40	4
41 - 53	5
54 - 67	6
68 - 81	7
82 - 95	8
96 - 110	9
111 - 125	10
126 - 140	11
141 - 155	12
156 - 171	13
172 - 187	14
188 - 203	15
204 - 219	16
220 - 235	17
236 - 251	18
252 - 268	19
269 - 284	20
285 - 300	21
301 - 317	22
318 - 334	23
335 - 350	24
351 - 365	25

1 *Alternative methods may be used provided that it can be demonstrated that equivalent results are obtained.*

2 *Determination of dissolved oxygen before and after five-day incubation at 20°C F 1°C, in complete darkness. Addition of a nitrification inhibitor.*

3 *Reduction in relation to the load of the influent.*

4 *Total Nitrogen means the sum of NH4-N, NO2-N, NO3-N and organic N.*

5 *The implementation of these limit values indicated for nitrogen which are annual mean values could be checked by daily mean values, if daily mean values do not exceed 20 mg/l. This requirement refers to a water temperature of 12 °C or more during the operation of the waste water treatment plant. As a substitute for the condition concerning the temperature, it is possible to apply a limited time of operation, which takes into account the regional climate conditions.*

Annex 5
Glossary

BAT	best available techniques
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
Danube Commission	Danube Navigation Commission
DRPC	Danube River Protection Convention
EU WFD	EU Water Framework Directive ("Directive establishing a framework for Community action in the field of water policy")
EU	European Union
HoD	Heads of Delegations of the Contracting Parties
ICPDR	International Commission for the Protection of the Danube River
Nutrient Reduction Programme	Danube Regional Project on Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin (UNDP/GEF Assistance)
River Basin Management Plan	A plan that – according to the EC WFD – has to cover the whole River Basin District, that describes via which measures good water status can be achieved, and that after approval by the European Commission will become legally binding
tot N	sum of inorganic and organic bound Nitrogen
tot P	sum of inorganic and organic bound Phosphorus
UN/ECE	United Nations/Economic Commission for Europe
UNDP/GEF	United Nations Development Programme / Global Environment Facility
Water Quality Standard	Quantified value of a certain pollutant or group of pollutants in water, sediment or biota which should not be exceeded in order to protect human health and the environment
WWTP	Waste Water Treatment Plant