
Issue Paper on Organic Pollution in the Danube River Basin

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of the Danube River

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der Donau



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Status Cover Page

This draft issue paper on organic pollution provides an overall guidance on how to approach the implementation of measures in the Danube River Basin according to the EU Water Framework Directive (2000/60/EC).

It is still a living document that will need continuous input and improvements as application and experience build up in all Danube countries and beyond.

Preliminary drafts of the issue paper on organic pollution were discussed at the P&M EG and RBM EG meetings. At the 9th ICPDR Ordinary Meeting in December 2006, as well as at the 5th Standing Working Group Meeting in June 2007, guidance was provided for finalising the document, expected to be endorsed by the ICPDR at the 10th ICPDR Ordinary Meeting in December 2007. This current draft, based on the discussions at the last P&M EG Meeting, September 2007, is presented to the 24th RBM EG meeting, October 2007.

A summary of the issues to be addressed in the DRBM Plan and JPM will be included in the document on Significant Water Management Issues in the DRB (ICPDR document IC/WD/268), which will be made available to the public in the end of 2007.

For general remarks and comments on the paper, please contact the members of the Drafting Group on Organic pollution of the P&M EG: Joachim Heidemeier, Elena Tuchiu, Milena Damjanovic and Mihaela Popovici.

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1 Introduction

The WFD places obligations on Member States to implement measures to achieve specific environmental objectives for all categories of water bodies (surface water bodies - rivers, lakes, transitional waters, coastal waters, and groundwater bodies).

The WFD requires the reaching of *good ecological and chemical status* for surface water and *good quantitative and chemical status* for groundwater bodies, environmental objectives that should be achieved within 15 years of adoption of the Directive (2015).

River Basin Management Plan (RBMP) will provide the context for setting out a comprehensive programme of measures designed to achieve the objectives that have been set for water bodies.

ICPDR member countries have agreed that the ICPDR provides the platform for the coordination necessary to develop and establish the River Basin Management Plan for the Danube Basin.

The first main output of the joint efforts to implement the WFD in the Danube River Basin is the Roof Reports 2004, which has been prepared in line with Art. 5, 6 and Annexes II, III, IV of the WFD. The RBM EG provides the coordination of the development of a Danube River Basin Management Plan, according to the agreed ICPDR documents related to the specific strategy “*Development of a Danube River Basin District Management Plan – Strategy for Coordination a Large River Basin*” (ICPDR DOC-101) and related to “*Road Map for the Development of a Danube River Basin District Management Plan 2005- 2010*” (ICPDR DOC 110, 2005). As part of the strategy, issue papers are being developed on the significant water management issues, which are subsequently described (see Chapter 2).

This issue paper addresses organic pollution in compliance with the requirements of the EU WFD and the Danube River Protection Convention. At the ICPDR Ministerial Meeting in December 2004 the Danube countries endorsed the *Danube Declaration* expressing their commitment to further reinforce transboundary cooperation on sustainable water resource management within the Danube Basin. The Danube Declaration contains the following goals and objectives related to organic pollution issues (Part 6):

We, the Ministers, High Officials and the Representative of the European Commission, being responsible for the implementation of the DRPC,

(6) agree that in the coming years we aspire to achieve the following goals and objectives, taking into account the sometimes more ambitious commitments already made by other countries at the national or EU level:

6 iv) to stop, by 2015 at the latest, all discharges of untreated wastewater from towns with more than 10,000 inhabitants and from all major industrial installations and to increase the efficiency and level of treatment thereafter;

This issues paper will be the basis of making the objectives - outlined in the Danube Declaration - operational within Danube River Basin Management Plan by 2009 by implementing the Joint Programme of Measures (JPM).

2 Problem Description

The results of the first analysis in the DRB are reasons for concern. Across the Danube Basin a high proportion of surface water bodies are at risk of failing to meet the Water Framework Directive's objectives due to the impact caused by:

- **organic pollution**
- nutrient pollution
- pollution resulting from hazardous substances
- hydromorphological alterations

These four significant water management issues will be in focus for the further management steps within the WFD implementation to develop the final Danube River Basin Management Plan by 2009. There will be a considerable shared challenge in the next years to address these issues and ensure sustainable water management through a correct and timely implementation of the WFD.

The measures within the DRB will be built on these four identified management issues and for each of them a relevant strategy will be developed to enable the achievement of good ecological and chemical status in all affected surface waters. Therefore, for each of the above mentioned water management concerns, issue papers will be drafted. This one deals exclusively with issues related to **organic pollution** and corresponding measures.

The Art. 5 WFD reports are a valuable source of information for targeting the areas of high organic pollution and setting the objectives of the measures. The results of the pressures and impact assessment of the Roof Report enables a good understanding of the relationships between the response and the causes in order to quantify appropriate reductions in organic inputs as well as the most cost-effective solutions for achieving these reductions.

The risk assessment for organic pollution was based on a combined evaluation approach considering both significant pressures and in-stream quality data. If a water body is subject to a significant pressure from municipal, industrial or agricultural point sources through exceeding the limit values for organic pollution as defined by the agreed criteria on the basin-wide level, then the water body is classified as being "at risk".

The discharge of partially treated or untreated wastewater from urban areas is especially significant and does not meet the requirements of relevant EU legislation, in particular the EU Urban Wastewater Treatment Directive (UWWTD) and the Directive for Integrated Pollution Prevention and Control (IPPC Directive). In 2005, the COD and BOD discharges from significant point sources (municipal, industrial and agricultural) were 741,069 tonnes and, respectively 281,132 tonnes, at the level of DRB.

From impact of organic pollution point of view, the Saprobic Index (SI) utilising benthic invertebrates was used. The critical thresholds were defined at the basin-wide level for the category "at risk".

The evaluations of the risk analysis for the Danube are based on the length of the water bodies that have been identified. Data on the risk assessment are available for the total length of the Danube. Based on the assessment, the percentages of river length were calculated that are "at risk", "possibly at risk" and "not at risk". In total, 58 % of the Danube is "at risk" or "possibly at risk" due to organic pollution. Also, 43 % of the Danube tributaries (with catchment > 4,000 km²) are "at risk" or "possible at risk" due to organic pollution.

3 Scope and General Aims of this Issue Paper

3.1 Aims of this issue paper

The Danube River Basin Management Plan will include relevant measures addressing the significant water management issue of the organic pollution, in accordance to the Danube River Protection Convention and thereby fulfilling the requirements of the EU WFD by 2015.

This issue paper provides an overall strategy and guidance how to address the management issue of organic pollution, how to develop a relevant management approach regarding measures and how an improvement of status can be achieved - all on a basin-wide scale. The document includes management objectives for the basin wide scale, which are based on visions and which will guide the Danube countries towards a common environmental aim.

The ICPDR's basin wide vision for organic pollution is zero emission of untreated wastewaters into the waters of the Danube River Basin.

The objective is to develop a Joint Programme of Measures (JPM) within the frame of the Danube RBM Plan. The issue paper might also support the development of the national Programmes of Measures.

3.2 What is covered by this document?

Measures related to current pressures

This issue paper addresses current organic pollution and the starting point is the analysis of pressures and impacts according to the Roof Report 2004. For each pressure the needed input for the DRBM Plan and the preparatory process and the respective management objective is outlined in order to achieve a Joint Programme of Measures on the basin wide scale. The JPM is based on a compilation of national measures (bottom-up approach). The two issue papers – nutrient and organic should be discussed in parallel, considering the great overlap of the organic pollution and nutrient sources as well as of the measures.

Approach for future pressures

Through national implementation and enforcement of relevant EU legislation for operating new urban wastewater plants will contribute to reducing pollution at the source and will ensure the achievement of environmental objectives. The issue paper outlines needed inputs for the DRBM Plan.

This issue papers addresses the *improvement* related to the procedures within the Danube River Basin Analysis in order to achieve comparable approaches. Further, this includes the need to identify weaknesses in data and recommendations for data improvements. **Environmental objectives and exemptions** will be generally addressed in the document on Significant Water Management Issues (ICPDR document IC/WD/268). The correct application of exemptions should be ensured providing clarification when exemptions can be applied. This issue paper supplements the general approach by outlining specific examples regarding environmental objectives and exemptions. Further, the role of *monitoring within the JPM* is highlighted.

4 Measures related to current pressures

The list of current organic pressures in the DRB based on findings of the Danube River Basin Analysis and on the national reports will be provided as a starting point. This list of current pressures represents the basis for the Programme of Measures and List of Measures to address organic pollution.

A set of measures are suggested to be part of the first international Danube River Basin Management Plan 2009, built upon national measures. Hence, the JPM within the Danube RBMP is a continuation of the previous Joint Action Programmes and should build upon the past experiences.

4.1 Measures to reduce organic pollution from point sources

Results according to Danube River Basin Analysis

The major cause of organic pollution is insufficient **urban wastewater** treatment, due to a lack of wastewater treatment plants. The construction of wastewater treatment plants is therefore expected to be included as a priority action within the programme of measures.

Another important cause of organic pollution in the WBs is insufficient or lack of treatment of wastewaters discharged from **agricultural point sources** (animal breeding farms, manure depots, etc.) and from **industrial point sources**. It is well known that this wastewater contains large amount of organic substances and its treatment requires at least secondary stages. Also, because of the fact that installations for the intensive rearing of poultry or pigs are under the requirements of IPPC Directive, the application of BAT is seen as a way to reduce pollution. It is well known that biodegradable industrial wastewater from plants belonging to the industrial sectors listed in Annex III of the UWWT Directive (food industry) which does not enter urban waste water treatment plants before discharge to receiving waters shall respect conditions established of the UWWTD, in respect of all discharges from plants representing 4000 p.e. or more.

Drivers DRB scale

The Danube Basin Analysis lists the following **key organic drivers**:

1. Urban development
2. Industry
3. Agriculture

Possible impacts – failure of good status

1. Increased oxygen depletion
2. Changes in species composition (benthic invertebrates)
3. Decline of species biodiversity
4. Reduction of fish population or fish mortality

Basin Wide Management Objectives – Organic Pollution

The way towards the vision will be achieved through the implementation of the following management objectives by 2015:

EU Member States:

- ⇒ Phasing out – by 2015 at the latest – all discharges for untreated wastewater from towns with >10.000 population equivalents and from all major industrial and agricultural installations, through
 - ⇒ Implementation of the Urban Waste Water Treatment Directive (91/271/EEC)¹.
 - ⇒ Where required, identification of construction and/or improvement of wastewater treatment plants according to the ICPDR Emission Inventory by 2015.
 - ⇒ Implementation of the Sewage Sludge Directive (86/278/EEC) and the Integrated Pollution Prevention Control Directive (96/61/EC).
 - ⇒ Increase of the efficiency and level of treatment thereafter when necessary.

Accession Countries and non-EU Member States:

- ⇒ Specification of number of wastewater collecting systems (connected to respective WWTPs), which are planned to be constructed by 2015.
- ⇒ Specification of number of municipal and industrial wastewater treatment plants, which are planned to be constructed by 2015 including
 - ⇒ Specification of treatment level (secondary or tertiary treatment)
 - ⇒ Specification of emission reduction targets

Input for the Danube RBM Plan

Because of the fact that the measures which address the organic pollution are nationally established, an overview table/country on implementation targets and timelines regarding municipal, industrial and agricultural discharges has to be considered. The measures for current organic pressures on the basin-wide level are listed as priority projects/measures, but also listing of any other national measures is needed.

The deliverable for the Danube River Basin Management Plan/JPM will be established on the base of national planned measures (bottom up reporting). The measures will relate to reduction of organic substances, covering mainly with the Directive 91/271/EEC (UWWT Directive).

Possible basic measures:

- **for urban point sources**
 1. Implementation of the UWWT Directive for EU Member States;
 2. Implementation of the related national plans based on previous recommendations (2nd OM resolutions) for non-EU countries;
 3. Construction/extension/rehabilitation of sewerage networks;
 4. Construction/upgrading of waste water treatment plants;
 5. Construction/rehabilitation of sludge disposal/treatment facilities.

¹ For RO the implementation year is 2018 regarding agglomerations 2.000 - 10.000 Population Equivalents..

- **for industrial and agricultural point sources**

1. Construction/upgrading of waste water treatment plants;
2. Implementation of UWWT Directive (for food industry);
3. Construction/rehabilitation of sludge disposal/treatment facilities;
4. Implementation of the IPPC Directive for EU Danube countries;
5. Implementation BAT for EU countries;
6. Implementation Danube BAT (for non EU or accession countries).

Possible supplementary measures:

- **for urban point sources**

1. Additional decreasing thresholds of BOD and COD for discharges;
2. Additional increasing the efficiency of the UWWTPs;
3. Compliance with the UWWTD emission values for the agglomerations < 2,000 p.e.
4. Treatment of collected storm water;
5. Educational projects;
6. Research, development and demonstration projects.

- **for industrial and agricultural point sources**

1. Decreasing thresholds for organic substances discharged (emission controls);
2. Re-using the proper treated wastewater for irrigation;
3. Additional reduction of volumes of wastewater discharged;
4. Implementation BAT (for non EU or accession countries);
5. Economic or fiscal instruments;
6. Negotiated environmental agreements;
7. Educational projects;
8. Research, development and demonstration projects.

Preparatory Process

- Collection of all pressures (data for up-dating the emission inventories for municipal, industrial and agricultural point sources of pollution):
- In 2006, the Danube states were asked to fill in the templates on agglomerations with more than 10,000 p.e. (including data on wastewater treatments plants and their discharging points).
- In 2007 the data of the agglomerations between 2,000 and 10,000 p.e shall be collected. The aim is to compile an overview of the situation and development of the municipal wastewater treatment on an agglomeration level for agglomerations, which fall under the scope of the Urban Waste Water Directive (i.e. > 2000 p.e). This includes an estimation of the pollution loads discharged from the agglomerations to the Danube catchment.
- In addition, the national contributions on the reporting requirements for IPPC Directive implementation (European Pollution Emission Register - EPER II) will be

also collected. For the non-EU countries, the inventories of emission for industrial and agricultural point sources will be used.

- Collection of status of the EU related legislation (UWWTP Directive, IPPC Directive) implementation process (targets, timelines and transition periods).
- Collection the lists of national measures (basic and supplementary) – with or without available financing.
- The Significant Water Management Issues (including the deliverables for the PoM) will be provided for review to the public by the end of 2007. Integrating the review results, the first draft of the Danube River Basin Management Plan will be available by the end of 2008.

Documentation of implementation success:

Two steps are proposed:

- Design options to illustrate implementation objectives in a clear and measurable way in comparison with the basin wide management objective
- Develop suitable indicators/criteria to measure the implementation success by ICPDR EGs.

Economic aspects

In close cooperation with the ICPDR expert groups, the Economics Task Group will investigate on economic issues, which should be addressed on the basin wide scale. The Task Group will develop a general scheme and approach on economics according to WFD requirements for the basin wide level in relation to consideration on national level.

4.2 Measures to reduce organic pollution from diffuse sources

Results according to Danube River Basin Analysis

In the frame of the Danube River Basin Analysis the organic pollution caused by diffuse sources has not been considered as being relevant at the basin-wide level.

Drivers

For the organic pollution, the following drivers could be relevant at the sub-basin level:

1. Households (improper sludge storage, landfill sites)
2. Agriculture (manure handling and application)
3. Industry (industrial plants not provided with proper waste management facilities)

Possible impacts – failure of good status

1. Increased oxygen depletion
2. Changes in species composition (benthic invertebrates)
3. Decline of species biodiversity
4. Reduction of fish population or fish mortality

List of possible measures

1. Construction/rehabilitation of sludge disposal/treatment facilities
2. Properly landfill sites management – implementation of the relevant EU legislation
3. Properly manure storage and handling – Nitrate Directive implementation
4. Properly industrial waste management - implementation of the relevant EU legislation

These possible measures could be used for the national and sub-basins plans.

5 Approach for future pressures

The procedure related to future pressures and measures will be different than for current pressures.

Any specific future projects (new municipal facilities, new industrial plants, new animal farms) must be subject to an Environmental Impact Assessment and/or a Strategic Environment Assessment during the planning phase which takes account of the pressures and impacts to the aquatic environment and ensures that the conditions of Article 4 are met.

The new operating plants (sources of pollution with organic substances: UWWTPs, industrial plants, farm discharges) have to respect at least the EU legislation (e.g. UWWT Directive). Other additional requirements (e.g. decreasing thresholds of BOD and COD for discharges) could be asked from the start of operation.

For those future pressures with possible transboundary impact, the information exchange and transparency have to be ensured.

6 Improvement of methodologies and data availability

This chapter addresses issues, which need improvement related to the knowledge base and procedures within the Danube River Basin Analysis. Further, the issue of data availability will be dealt with - necessary improvements to fill specific data gaps will be identified. An approach on how a GIS could, through their presentation and analytical capabilities, be developed to combine land use, water and economic information and provide information of relevance for river basin authorities.

An updated inventory of pressures from point sources of organic pollution will be available in 2007 as an important basis for preparing the detailed List of basin-wide organic pollution reduction measures as part of the Danube River Basin Management Plan.

Input for the Danube RBM Plan

The description of activities and related achievements will be part of the DRBM Plan:

- Harmonised methodology for collecting and prioritise measures to address organic pollution;
- Economic analysis related to measures;
- Illustration of implementation success.

Preparatory Process

- Development of harmonised methodology for collecting and prioritising measures to address organic pollution (e.g. basin-wide significance criteria);

- Development of economic approaches and tools related to measures (scenarios development for a set of different measures addressing organic pollution, selection the most cost effective combination of measures, cost – benefit analysis);
- Development of indicators/criteria set to illustrate the implementation success of the proposed measures.

7 Environmental Objectives and Exemptions

For Environmental objectives and exemptions a formalised EU procedure exists. The WFD environmental objectives are clearly defined within the WFD and have to be reached in the most efficient way by 2015. After the finalisation of the risk analysis (Roof Report) – these theoretical objectives now have to be translated into practice on the different implementation levels (national, sub-basins and basin wide scale). The procedure and agreement on environmental objectives and exemptions are performed in parallel.

On the basin-wide scale the objectives and visions will consider the requirements of the Danube Protection Convention, the Danube Declaration and EU legislation, in particular the Urban Wastewater Treatment Directive.

In general, the overall objective is to prevent negative impacts through organic pollution on the good ecological/chemical status as well as to enhance deteriorated status in the DRB.

The agreed visions to achieve environmental management objectives will enable the specific demonstration of implementation success.

In addition, the application of exemptions throughout the Danube basin should be comparable and consistent. To this end, the exchange of information on national approaches and experiences should be ensured (e.g. through workshops) and the, if appropriate, guidelines for application of exemptions in the Danube River Basins should be developed.

8 Monitoring and the Joint Programme of Measures

Monitoring plays an essential role related to river basin management plans precisely related to the JPM. The monitoring of the implementation of JPM will be based on suitable indicators for the different sets of measures. This will give knowledge on the implementation successes, but not on the ecological effects.

This information will be provided by the monitoring and assessment according to the WFD. The monitoring results will be used for the subsequent tasks:

- a. Validation of the risk assessment performed according to Article 5: Status class assessments deliver clarification if respective water bodies are at risk. Operational as well as surveillance monitoring results are implemented for these analyses.
- b. Evaluation of the ecological efficiency of nutrient measures: The success of measures to improve the ecological status is assessed. Operational monitoring results are implemented for these analyses.

In the Danube River Basin the revised TNMN and national monitoring results according to the WFD will be used to implement the above tasks.

Precondition for this approach:

- Harmonized classifications approaches between the Danube states, which will be ensured by the intercalibration process and allow the comparison of results.
- Use of WFD compliant sampling and assessment methods in all Danube states.
- Data exchange using the Danube GIS.
- The ICPDR serves as a platform for knowledge and information exchange (e.g. a brief document on WFD compliant methods is drafted defining their composition and included elements).