

## Part Three

### GUIDELINES ON LICENSING WASTE-WATER DISCHARGES FROM POINT SOURCES INTO TRANSBOUNDARY WATERS

as prepared by the task force on water pollution control from point sources, with France as lead country, and adopted by the Committee on Environmental Policy at its third session in May 1996

#### INTRODUCTION

The *Convention on the Protection and Use of Transboundary Watercourses and International Lakes* (Helsinki, 1992), hereinafter referred to as the Convention, imposes Obligations on Parties to protect trans-boundary waters, *inter alia*, against pollution from point sources through the prior licensing of waste-water discharges, the application of the best available technologies for the treatment of industrial waste water containing hazardous substances, the use of at least biological treatment or equivalent processes for the treatment of municipal waste water, and the provision of information to the public on permits issued. The Convention also points to some specific cases where stricter requirements apply, which go beyond the obligation to use, for example, best available technology.<sup>6</sup>

With a view to providing guidance to countries when implementing the Convention and achieving a high level of protection of fresh water, ECE Governments should at least apply the following recommendations when considering granting permits for waste-water discharges from point sources located in catchment areas of transboundary waters which are likely to cause a transboundary impact, and when checking whether or not operators of installations comply with permit conditions.

These Guidelines draw on the experience of environmental and water experts designated by ECE Governments for the task force on the control of water pollution from point sources.<sup>7</sup> They also build upon the report on the prevention, control and reduction of water pollution

<sup>6</sup> Convention on the Protection and Use of Transboundary Watercourses and International Lakes done at Helsinki, on 17 March 1992. E/ECE/1267. Geneva, 1992.

<sup>7</sup> The task force on the control of water pollution from point sources was led by France. The task force was composed of experts designated by the Governments of Croatia, the Czech Republic, Finland, France, Germany, Hungary, Poland, Slovakia and Slovenia. The

ECE secretariat assisted the task force to draw up the Guidelines from point sources: experience and problems in ECE countries.<sup>8</sup>

#### I. GENERAL RECOMMENDATIONS

Water management plans, water-quality objectives and action programmes to cut pollution are tools to guide the licensing process at the national level and for transboundary catchment areas. Generally, the procedures for drawing up these instruments should be consistent with the *ECE Guidelines on the ecosystem approach in water management*<sup>9</sup> and the Recommendations to ECE Governments on water-quality criteria and objectives.<sup>10</sup>

Experience has shown, however, that efforts to develop jointly a common long-term strategy (e.g. a joint water management plan) for transboundary catchment areas among two or more countries riparian to the same transboundary waters may be time-consuming. For the purpose of licensing waste-water discharges into transboundary waters, it is therefore strongly recommended to start drawing up and implementing joint water-quality objectives and action programmes rather than immediately developing joint water management plans.

#### Licensing waste-water discharges and water management plans

Water management plans should consolidate requirements for the protection of water bodies and requirements for the actual and potential (future) uses of these waters. They should also define concepts regarding the conservation of water bodies and methods to improve or

<sup>8</sup> The updated version (30 April 1996) of this report is part of document ECE/CEP/31.

<sup>9</sup> See footnote 4, p. 9.

<sup>10</sup> Recommendations to ECE Governments on water-quality criteria and objectives. In: *Water Series No. 2—Protection and Sustainable Use of Waters—Recommendations to ECE Governments*. ECE/CEP/10. United Nations. New York and Geneva, 1995.

restore their quality by systematically resolving problems encountered in the light of established priorities. The water management plans also set out recommendations addressed to the different levels of government authority, including local governments, to resolve these problems.

Usually, water management plans are not legally binding. However, it is expected that they will guide decision-making regarding physical planning and licensing and other procedures.

Clear commitments by the governments of the riparian countries and environmental objectives set in the context of a broad cooperative approach, are a fundamental prerequisite for a successful long-term water management policy. As a strategic framework, water management plans should be directed towards a level of decision-making which can really modify physical planning and any significant polluting activity in the catchment area.

Water management plans should be drawn up at different levels depending on the distribution of competencies between national authorities. Plans drawn up at the local level should be used to support the drafting of water-quality objectives and action programmes for the whole transboundary catchment area or parts thereof and vice versa. Independent experts may be involved in such issues as the study and validation of basic ecological data, modelling of water systems, risk and hazard assessment and conflict analysis. Representatives of the operators of installations, both in the industrial and in the municipal sectors, should participate in the assessments of the current situation, and be consulted on the forecasts of structural, technological and economic development in their respective sectors and on the impact of emission targets on technology.

The involvement of all parties concerned (e.g. managers, planners, policy makers at the appropriate levels of government and representatives of major groups) and the utilization of technical know-how and research results, are vital if a water management plan is to be accepted and successfully implemented. Particular care should be given to the thorough assessment of the initial situation in the catchment area (i.e. the present status of waters, including data on water quality and quantity, causes of pollution and identification of emissions) and its links with the economic development in the area. Another critical issue is the forecast of economic development within the area and the assessment of trends in pollution sources and the volume and composition of waste waters within the catchment area.

#### Assessment of the current situation

Assessments of the current situation should cover as a minimum:

(a) Assessment of the current physical, chemical and biological quality of surface waters and their sediments, and groundwaters, including an evaluation of trends and a comparison with quality standards for receiving water bodies stemming from the legislation in force. Usually, the existing monitoring network can be used. In some cases, tailor-made monitoring systems may be necessary.

Geographical information systems (GIS) are frequently used for processing information and presenting it in map form;

(b) Recording of quantitative data, taking into account, *inter alia*, ecologically acceptable minimum flow rates, geomorphological aspects, and the variability of the water flow;

(c) The total input of the pollution load into the water bodies in the catchment area.

An inventory of pollution sources should be drawn up. The information required for the inventory should be gathered in close cooperation with the operators of the installations concerned.

The inventory of pollution sources should provide information on the location of those point sources of pollution in the given catchment area that may have a transboundary impact.<sup>11</sup> Moreover, the inventory should contain a description of production activity, the characteristics of discharged pollution and quantitative data on the individual components in the waste water (concentration and load per unit of time). The inventory should also specify existing waste-water treatment facilities (their efficiency, design capacity and capacity utilization) and include an evaluation of their efficiency and a comparison with the best available technology (BAT); it should also contain information on expected changes and developments.

#### Water quality objectives, targets to reduce the pollution load and priority-setting

Water-quality objectives are regarded as a policy goal to be attained within a certain period of time. Catchment planning (territorial development plans) together with national environmental policy as regards water should be at the root of water-quality objectives. Catchment planning should also provide the context in which demand from all water users can be balanced against water quality requirements. Moreover, it should be shown for each transboundary catchment area or its relevant parts that national and international requirements regarding pollution reduction are properly taken into account in the planning process.

Account should be taken of the fact that the setting of water-quality objectives is a political process which involves decisions on the use of the water body concerned, careful assessments of economic conditions and present and future water uses, forecasts regarding industrialization and the consideration of many other socio-economic

<sup>11</sup> According to the Convention, transboundary impact means any significant adverse effect on the environment resulting from a change in the conditions of transboundary waters caused by a human activity, the physical origin of which is situated wholly or in part within an area under the jurisdiction of a Party, within an area under the jurisdiction of another Party. Such effects on the environment include effects on human health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments or other physical structures or the interaction among these factors; they also include effects on the cultural heritage or socio-economic conditions resulting from alterations to those factors.

factors. In this process, special attention should also be given to the protection of biodiversity and the safeguarding of the ecological potentials.<sup>12</sup> "

Experience shows that, if not set with sufficient care, pollution reduction targets for point sources may affect the credibility of the environmental authorities. For point sources, it is therefore recommended that:

(a) The state of the industrial plants and activities that use or generate hazardous substances, and of the related transport and storage facilities, should be assessed before any targets are set;

(b) Reduction targets should be understandable to all parties involved and convertible into operational and cost-effective measures;

(c) It should be possible to monitor compliance with such targets. Targets that are either vague or too sophisticated should be avoided;

(d) Targets should be guiding, not normative, as the final emission limits are laid down in the licence;

(e) Reduction targets should have realistic time schedules; long-term targets can be set, showing the ultimate goal;

(f) The setting of priorities for the control of water pollution from point sources (e.g. categories of substances to be considered, discharges) should take place at the catchment level.

To set priorities so as to reduce pollution loads from those sources with the highest adverse impact on water quality first, the following actions are recommended: define the key negative factors and rank them according to their relative importance; list the requirements for water quality and quantity and/or protection and improvement of the environment most affected by these negative influences; evaluate the urgency of measures to be taken; estimate their economic feasibility on the basis of the results of environmental impact assessments, in order to formulate recommendations for priorities; and make adjustments in the public interest.

It is also expected that action programmes with time-scales will be drawn up to specify the concrete tasks to be carried out to attain the general objectives set out in the water management plan. The conditions for, and costs of, implementing the measures set out in water management plans are also expected to be further specified within the action programmes. Moreover, the action programmes should cover follow-up to the implementation of projects.

The control of point source emissions in a transboundary catchment area may be supported by a number of policy instruments and be subject to limitations and

exploitation of river banks or shorelines, environmentally sound infrastructure projects, water use restrictions, the outcome of impact assessments in a transboundary context, public inquiries and other consultations when granting permits. Therefore, an essential goal of, first, water-quality objectives and action programmes and, then, water management plans is to provide a set of proposals, for high-level decisions by riparian countries and/or proposals for drawing up appropriate bilateral or multilateral agreements.

The process of drawing up such instruments (water-quality objectives, action programmes and water management plans) has to be backed by all parties concerned. Moreover, the planning process should be approved and co-financed, if need be, by the governments of the riparian States and be coordinated by a joint body.

In addition to specific provisions of the Convention related to public information, the general public should also be well informed about the planning process and decisions taken on reduction targets and priorities of action in a transboundary catchment area. The implementation of water-quality objectives, action programmes and water management plans—possibly through an international agreement—usually remains the duty of authorities in the countries concerned, rather than that of the joint body.

Research, training and the exchange of information are needed to help decision makers to set reasonable priorities. Roles and responsibilities in water management should be clearly defined at the national, provincial and local levels, and cooperation between local authorities should be strengthened. This will also improve transboundary cooperation.

## II LICENSING WASTE-WATER DISCHARGES

Licensing waste-water discharges into rivers and lakes, and—if not prohibited by national law—into groundwaters, is a basic tool to ensure the protection, conservation and restoration of waters, with regard to both quality and quantity, and related ecosystems including aquatic flora and fauna. The integrated cross-media approach, which is being developed in various countries and international forums, should be further promoted.

Obligations set out in the Convention, supranational law, international agreements and national legislation on the protection and use of waters, for example, prohibiting emissions or setting emission limits for hazardous substances, lay down minimum requirements to be complied with for any permit to be granted. The emission limit values and equivalent parameters and technical measures should be based on BAT without prescribing the use of any technique or specific technology. However, the technical characteristics of the installation concerned and environmental conditions should be taken into account. In all circumstances, the condition of the permit should contain provisions on the minimization of

<sup>12</sup> See footnote 10, p. 31.

<sup>13</sup> Guidelines for developing water-quality objectives and criteria. In: *Annex 111 to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes done at Helsinki, on 17 March 1992*. E/ECE/1267, Geneva, 1992, specific requirements, such as nature conservation, limitations on the

long-distance or transboundary pollution and ensure a high level of protection of the environment as a whole. Exceptions can be made for small emission sources provided that these are not likely to have a transboundary impact.

A sound licensing system should preferably be based on case-by-case consideration of emission sources and on the outcome of impact assessments. This is because the characteristics and the capacity of watercourses vary with such factors as the geology, geomorphology and other features which determine the hydrological regime. Moreover, quality objectives set for a catchment area depend on the needs of current and future water users and the requirements for the protection and conservation of water bodies.

To establish limit values for both pollution concentration and load, it can be helpful to use mathematical models designed to assess the impacts from one or more point sources on waters and to predict the effects of, or to choose between, alternative options for setting permit conditions.

Some of the above-mentioned legal instruments applicable to licensing result in limit values for discharges being expressed solely in terms of concentration values. However, the setting of compulsory limit values which consider only the concentration of substances in effluents may give rise to an increase in the use of water to dilute waste waters or to the mixing of waste water from different production processes of the same enterprise which could be more efficiently treated separately. Therefore, limit values for the total discharge per polluting substance—expressed, for example, in mass units per time period—also have to be laid down in the permits.

In cases where stricter requirements than those related to the use of BAT apply, limit values for the discharge of polluting substances should be assessed case by case in the light of the requirements for the protection of aquatic ecosystems and to guarantee that needs are met for the most demanding water uses, for example, the supply of drinking-water. Special attention must be given to hazardous substances and nutrients. This is of major importance for watercourses that flow into lakes, for waters that suffer from eutrophication, and for waters which are prone to sedimentation and the subsequent release of hazardous substances from the sediments. If the water-quality objectives of the receiving water body cannot be met, additional measures exceeding BAT are required which may include restrictions or even a ban on the production and/or application of the mentioned hazardous substances and nutrients.

Compliance with quality objectives drawn up with due consideration of future economic development is only one objective of the licensing process. The conservation and, where possible, the restoration of aquatic ecosystems to a target state of high ecological quality—one of the major goals of water management policy—should become a guiding principle in the granting of permits. The minimization of emissions at the process level—a characteristic of the best available technology—is another requirement to be taken into account in the licensing process. This includes the control of pollutants within industrial processes, the saving of raw materials, the selective treatment of industrial waste water allowing

the recycling of water, and the recovery of valuable substances, where appropriate. The appropriate measures also include totally or partially prohibiting the production or use of hazardous substances. The use of less hazardous substitutes for potentially hazardous substances in industry, trade and services may be contemplated.

Licensing waste-water discharges is a cumbersome and time-consuming task for the competent authorities. It requires well-organized staff with competence in legal, technical and ecological matters in order to grant or refuse permits within a reasonable period of time, and to review granted permits at regular intervals. Particularly in countries in transition, special attention should be given to the human resources development and institutional capacity building.

Usually, the authorities have to cope with a large number of permit applications for small and medium-sized installations rather than applications for major installations. Simplified procedures have therefore been drawn up in some countries to authorize discharges from installations which would not have a significant impact on receiving waters. However, a decision on whether or not to follow a simplified procedure cannot be left to the discretion of the local authorities, which are usually in charge of granting permits. This practice has to be regulated at the national level. Such regulations stipulate, for example, that limit values for small discharges are based on normative prescriptions.

The decision to grant or refuse a permit for waste-water discharge requires adequate information on the characteristics of the installation, which must be provided by the operator. The drawing-up of a set of minimum information requirements to be sought from the applicant is an urgent task, in particular where the installation has potential impacts on transboundary waters.

At the very least, information on the production or activity and the possible sources of emissions from installations should be provided. This would include information on the quantity and quality of emissions, the proposed measures to prevent the discharge of pollutants from the installation, proposed treatment measures and the expected discharges. Moreover, an assessment of whether or not a transboundary impact is likely to occur should become an integral part of permit applications. Furthermore, an outline of proposed measures for the prevention of, preparedness for, and response to industrial accidents should become part of the permit application. A precise description of proposed measures and practices to monitor emissions into receiving environments and sewer systems should also appear in the permit application. Recent experience has also demonstrated the need to provide information on proposed measures to be taken in the event of a complete cessation of the operation of the installation, to ensure that no impact on waters occurs.

The licensing procedure should be impartial *vis-a-vis* the rights and interests of the applicant and transparent to any parties, including the public, that have an interest in the protection and use of the waters in question. This would make it necessary, *inter alia*:



- (a) To take advice from independent experts on environmental protection and public health issues;
- (b) To consult local authorities in whose jurisdiction significant impacts from the proposed activity may occur;
- (c) To conduct a public inquiry in the area subject to significant impacts.

Moreover, the applicant should have the right of reply to the outcome of these procedures.

After a period of time, the competent authority must consider the need to revise the prescriptions in the permit, or even to cancel it. To this end it must be able to draw on a very clear set of criteria drawn up for the purpose.

Usually, the procedures for the revision of permit conditions are similar to the procedures for granting the initial permit. A public inquiry or hearing may, however, not be required if the environmental impact of the activity under revision is unlikely to be significant.

Any licensing provisions would be ineffective if not accompanied by supervision and sanctions for non-compliance. Compliance monitoring is the responsibility of the competent national authorities. Penal sanctions are usually decided upon by the courts of justice or similar authorities.

There are several approaches to choosing an appropriate institutional framework for the management of transboundary waters, including the granting or refusal of permits. The possible solutions depend, *inter alia*, on:

- (a) Whether the water body forms or crosses the border;
- (b) The character of the water body;
- (c) The degree and character of its use;
- (d) The experience gained from earlier cooperation.

They also depend on whether or not the agreement in question contains specific obligations for the licensing, supervision and monitoring of pollution sources.

For licensing, an agreed notification system together with an agreed procedure for impact assessments of the pollution arising from point sources seem to be a minimum requirement for cooperation on transboundary waters. The joint body established by riparian countries should supervise the cross-border notification system.

To improve cooperation in the licensing of discharges of waste waters, some other issues may be of special interest, if not already regulated by applicable international law:

(a) Where a country is aware that the operation of an installation is likely to have a significant adverse impact on the environment of another country, or where a country likely to be significantly affected so requests, the country where the application for the permit was submitted should forward the information provided to the other country at the same time as it makes it available to its own nationals. Such information should serve as a basis for any consultation necessary in the framework of

bilateral/multilateral relations between the countries concerned on a reciprocal and equal basis;

(b) Within the framework of bilateral/multilateral relations, the public of the country likely to be affected should have the right to comment on permits before the competent authority takes a decision;

(c) If one of the parties so requests, the prescriptions proposed for a permit for discharges likely to cause significant transboundary impacts should be examined by an independent institution, within a limited period of time, before a decision is taken by the authority in the upstream country. Any recommendation made by this body should be duly taken into account when negotiating a compromise solution for the prescriptions of the permit itself, and/or when deciding on remedial measures and compensation for damage, if applicable. A procedure should also be established which gives major groups of a downstream country the possibility to appeal against the decisions taken by an upstream licensing authority;

(d) When emissions from a point source do not seem to cause significant downstream impact, the competent national authority in the upstream country could inform the other party of permits granted, without prior consultation.

### III. MONITORING OF POINT POLLUTION SOURCES AND SUPERVISION

All waste-water discharges from point sources which may have a transboundary impact should be monitored. In setting up and operating such monitoring systems, the methodology outlined in the Guidelines on water-quality monitoring and assessment of transboundary rivers<sup>14</sup> should be applied. Specific criteria and/or factors to be taken into account when assessing the significance of an impact and determining the content of monitoring programmes include the volume of waste water produced per time unit, the composition of the waste water, discharge patterns, and the characteristics of the receiving water bodies.

As monitoring of emission sources should provide information to help assess the potential hazards posed by point sources to the environment, it is important to obtain data on pollution loads rather than solely concentrations of pollutants.

Self-monitoring should be an integral part of the monitoring of point sources. This should include measurements of characteristics of side streams before treatment and the characteristics of the final waste water before discharge. Conditions and requirements for self-monitoring, such as parameters to be analysed, the frequency of measurements, quality assurance of data and the frequency and form of reporting to authorities, should be laid down in conjunction with the permit. Procedures should accordingly be established to that effect.

<sup>14</sup> Guidelines on water-quality monitoring and assessment of transboundary rivers. See part one above.

These procedures should also require—as further developed in the Guidelines on water-quality monitoring and assessment of transboundary rivers—that physico-chemical and biological tests of waste waters carried out by the operator of an installation or by a third party are certified and/or supervised by an independent, accredited laboratory which complies with international standards.

The programmes for monitoring waste-water discharges from point sources into transboundary waters should be designed and revised, if need be, to provide information which is necessary to assess whether or not the emissions have a significant adverse transboundary impact on human health and safety, flora, fauna, soil, air, water, climate, landscape and physical structures.

Monitoring the performance of production or processing operations should be part of pollution load supervision. Inspectors should have the right to enter facilities and check the pollution loads of the side streams and indoor streams and the waste water discharged into recipient water bodies. The specific pollution load per unit mass or volume of product or used raw materials and additives should be subject to monitoring and inspection as this helps to assess the environmental behaviour of the operator. The efficiency of waste-water treatment facilities should also be checked.

Operators of installations should provide all necessary assistance to the inspectors to enable them to carry out appropriate inspections, to take samples and to gather any other information required to check compliance with permit conditions.

Mechanisms should be set up to ensure that transboundary impacts are detected and reported without delay.

Joint supervision of point sources by the authorities of riparian countries may be necessary for installations that constitute a potential hazard to transboundary waters. Joint bodies could decide on criteria for the case-by-case selection of point sources that would be jointly supervised.

A comprehensive and systematic exchange of information between the riparian countries is a basic requirement of joint measures to prevent, control and reduce transboundary pollution from point sources. It should become an ongoing task of the competent national authorities of the riparian countries. If not classified as confidential, self-monitoring data should be included in the common programme of information exchange. To be effective, the exchange of such information should be governed by rules jointly agreed by the parties, specifying the format and frequency of reporting. The creation and maintenance of a joint database could also be useful.

#### IV. ECONOMIC INSTRUMENTS

Economic instruments should encourage operators of installations to apply best available technology. They should be considered as a supplement to direct regulations and administrative procedures for the control of water pollution from point sources. They should also motivate polluters to introduce pollution control measures voluntarily.

Economic instruments should be consistent with the polluter-pays principle. The most important instrument for the control of discharges from point sources is therefore a charge on activities that generate pollution, such as waste-water discharges. The efficiency of a charge system depends on the encouragement of the polluter to take pollution control measures in order to save money, rather than pay the charge.

Therefore, emission charges should reflect the potential harmfulness and volume of the pollutants discharged. Charges based on normative values of quantities of pollutant emissions from the production process or the activity prior to any waste-water treatment may also be used, combined with rebates for the abatement of discharges.

These charges should be high enough to provide a strong impetus to control and reduce waste-water discharges through appropriate in-process and/or waste-water treatment technology. Charges with little incentive impact may have negative effects on the polluter's behaviour. However, the actual amount of a charge should be tailored to the national situation, particularly in the countries in transition, and should be increased gradually to tackle the most severe environmental impacts first.

The revenue from such charges should be used for environmentally sound purposes. In many countries, the revenue or at least part of it is paid into a fund to promote pollution control measures.

#### V. CONSEQUENCES OF VIOLATION

There should be fines and sanctions for violating pollution control regulations. They should depend on the extent to which established limits, standards or norms are exceeded.

Fines and sanctions should be high enough to prompt compliance and compensate for damage. However, they should be based on a case-by-case examination of the infringement of legal and regulatory provisions.

There should be compensation for damage in addition to administrative and penal sanctions. Claims for compensation could be included in administrative or penal proceedings; however, they depend on private law.

Economic benefits arising from the infringement of regulatory prescriptions should be confiscated.