

Part One

RECOMMENDATIONS TO ECE GOVERNMENTS ON WASTE-WATER TREATMENT

as endorsed by the Senior Advisers to ECE Governments on Environmental and Water Problems at their first session in March 1988

Recognizing the importance and the growing economic and social significance of the need to protect water resources from pollution, ECE Governments have been prompted to increase their efforts towards implementing efficient water pollution control measures as part of national policy for environmental protection, including rational use of water and pollution abatement at source. A major concern of this policy would aim at promoting the development of waste-water collection and treatment methods, the construction of treatment facilities and the continuing improvement of purification processes. Waste-water treatment plants are fundamental to water pollution control and represent a major investment in the environmental sector. It is important that, in their planning, construction and operation, the highest standards of efficiency, competence and technology be used to achieve optimum abatement of water pollution as well as the most effective use of the considerable investment involved.

With a view to providing guidance in formulating national policies of water pollution control as well as strategies for integrated management of domestic sewage, trade and industrial waste water, its collection, treatment and disposal and in order to strengthen international co-operation in this field,

it is therefore recommended that for:

1. Integrated water management: National policies should strive for coordination of water-use management among the various administrative governmental and local levels by applying the same principles to planning, construction, operation and management of water supply, water use and pollution abatement at source, sewerage and waste-water treatment systems as well as to effluent and sludge disposal or further re-use.
2. Regional sewage systems: In densely populated areas, priority should be given to the creation of regional sewage schemes and central or collective waste-water treatment plants where the necessary level of technology,

automation, management, operating personnel and scientific control would ensure better purification performance, good effluent quality and safe sludge handling.

3. Remote areas: Policies and strategies should provide also for scattered rural settlements to have good sanitation facilities.
4. Storm water: When sewerage and storm-water systems are being planned, consideration should be given to the relative merits and costs of separate or combined systems and an optimum decision taken. Storm water should receive appropriate treatment, when necessary, before its discharge, in harmony with the quality objectives assigned for the natural environment.
5. Combined treatment of domestic sewage and industrial waste water: Environmental considerations, safety at work and process engineering aspects should be given priority in the decision to treat domestic sewage together with industrial waste water in one system. There should be no obligation to accept *a priori* the discharge of waste water from industries, manufacturing enterprises or intensive farming into domestic sewerage systems.
6. Sludge treatment: In formulating water pollution control strategies, attention should be given to the fact that waste-water treatment plants produce—apart from environmentally acceptable effluents—sludge bearing a potential pollution hazard. Government policies, therefore, should promote an integrated approach giving equal consideration to both sewage and sludge treatment. This attitude should already prevail in the stages of planning, selection of technology, financing and licensing.
7. Choice of technology: All appropriate measures should be promoted that allow for and facilitate the choice of the best practicable technology for the collection and treatment of waste water. Pollution of the aquatic environment by dangerous substances that are

toxic, persistent and bio-accumulative_ should be prevented by using the best available technology.¹

8. Environmental impact assessment: Planning of collection and treatment systems for waste water should be adequately coordinated with land-use planning and with water management planning as a whole. Environmental impact assessment should be integrated at an early stage in the planning process.

9. Equipment and monitoring standards: Waste-water treatment standards should be promoted, in particular regarding treatment technology, treatment processes, unit operations, mechanical and electrical equipment and related accessories and fittings. Standards for effluent monitoring, related testing procedures and equipment should also be pursued vigorously.

10. Automation: Automation in treatment plants should be promoted where it would achieve better performance of individual unit operations, and thus, optimal utilization of the available purification capacity of an entire treatment plant and where it would achieve reduction in consumption of energy and chemicals and less unpleasant tasks for personnel.

11. Energy saving: Efforts should be increased towards the development, demonstration and application of methods, procedures and technologies that encourage energy and resource conservation in waste-water collection and treatment processes without sacrificing effective pollution abatement.

12. Pilot plants: Experimental pilot schemes should be encouraged in order to assist in the choice and optimization of treatment schemes which best suit the particular circumstances.

13. Incentive instruments: Priority should be given to incentives not only for promoting the construction, but also for maintenance operations of waste-water treatment plants.

14. Waste-water charges: The general principle should be that, as far as possible, the direct or indirect costs attributable to pollution should be borne by the polluter and that waste-water dischargers should pay the costs of services used, including collection and treatment.

15. Operation and maintenance of installations: All appropriate measures should be taken to upgrade and improve the operation and maintenance of waste-water treatment plants with a view to optimizing the exploitation of existing installations and increasing the efficiency of purification, thus making the best use of the investment.

16. Control and supervision: Competent authorities should control and supervise on a regular basis internal operations of treatment plants so as to ensure their effectiveness.

17. Renovation programmes: Renovation programmes should be initiated for renewal and upgrading of old, deteriorating sewerage systems and waste-water treatment plant.

18. Security measures: Appropriate security measures should be imposed by competent authorities in order:

(a) To avoid unnecessary health hazards to treatment plant operators and assure proper working conditions;

(b) To reduce adverse impacts on the aquatic environment in case of accidental or deliberate spills from agricultural and industrial processes and in case of accidental breakdown or maintenance shut-down of some units of the treatment plant;

(c) To minimize risks of pollution transfer to adjacent water, air and soil via aerosols and during sludge storage, handling, transport, disposal or land application.

19. Staff training: In addition to control and supervision of treatment processes, personnel training of plant operators should be given highest consideration as a very important non-structural measure for improving purification performance and optimal use of treatment installations, particularly medium and small plants, as well as sewerage systems.

20. Staff responsibility and motivation: The profession of treatment plant managers, operators and other staff should be upgraded by all suitable means. This is essential to ensure that managers and operators are not only well-trained and sufficiently experienced but also well-motivated regarding environmental protection in general, and water pollution control in particular.

21. Public participation: In conformity with the governmental structure and existing regulations, the adequate involvement of users should be foreseen in decision-making processes regarding sewerage and waste-water treatment as well as effluent and sludge disposal systems.

22. Research and development: Research programmes should be launched, sponsored and promoted with a view to improving water pollution abatement methods, technology and operation of treatment plants as well as the development of innovative pollution control equipment. This research should be multi-disciplinary and should take into account trends in water-use management, environmental control, automation and standardization, as well as engineering practices.

23. Use of treated waste water: Properly treated waste water should be considered as an additional source of water for agricultural and industrial supply and its use should be encouraged.

¹ The best available technology which is economically feasible.