

ANNEX 10
TO MINUTES OF THE OSLO MEETING

INDUSTRY, ENVIRONMENT AND DEVELOPMENT

POLICY OPTION PAPER ON THE GLOBAL
ASPECTS OF HAZARDOUS WASTE MANAGEMENT
(WCED/85/17)

and

RESUME OF REMARKS BY COMMISSIONER STANOVNIK

WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT

THIRD MEETING
Oslo, 24-28 June 1985

WCED/85/17

Item 6.2 of the Provisional Agenda

GLOBAL ASPECTS OF HAZARDOUS WASTE MANAGEMENT:

POLICY OPTIONS

NOTE BY THE SECRETARY GENERAL

A draft of the policy options paper on "Global Aspects of Hazardous Waste Management" was reviewed by a group of experts which met in Geneva on 31 May 1985. The attached paper reflects most of the comments and observations made by the experts at the meeting, but needless to say, the ultimate responsibility for the present text rests entirely with the Secretariat.

In addition to the members of the Secretariat staff, the members of the expert group included:

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1. GLOBAL ASPECTS OF HAZARDOUS WASTE MANAGEMENT:

THE PROBLEM

1. The growing volumes of hazardous wastes are a serious threat to individual and societal well-being, national economy and the global environment. Their management presents social, economic, political and geo-political challenges to governments, industry and citizens alike.

HOW MUCH HAZARDOUS WASTE?

2. Industrialized countries probably generate about 90 per cent of the world's hazardous waste and while estimates contain potentially wide margins of error, some figures help to gain a broad appreciation of the problem. Total quantities of hazardous wastes generated worldwide in 1984 ranged from about 325 to 375 million tonnes. Of this total, European market economies generated about 20 million tonnes, 80 per cent of which arose in the European Community (1). The United States reported that 264 million tonnes were generated in 1981; much of this, however, was very dilute wastewater from a variety of industrial processes. The result is a much larger estimate of total hazardous wastes for the United States than for other countries (2). Canada reported that 3.3 million tonnes (wet weight) were generated in 1983. It is estimated that CMEA members generate over 15 million tonnes annually.
3. Around 5 million tonnes of hazardous wastes are being generated in the newly industrialized and developing areas of the world. Central and South America, plus Mexico, for example, probably generate over 1 million tonnes per year; Africa south of the Sahara (excluding South Africa) about 150,000 tonnes; the Near East about 900,000 tonnes; Southeastern Asia about 600,000 tonnes; and China about 750,000 tonnes per annum (1).

WHAT ARE THE MAIN SOURCES?

4. Industry contributes the primary source of hazardous wastes (3), but the public sector generates its share (4). The military is inevitably a major source. Agricultural operations often leave a residue of oil wastes, unused pesticides and fertilizers, as well as the packaging for these items. Small businesses can represent a significant source in a community; indeed, much of the hazardous waste collected by service contractors in parts of Europe and North America arises from such enterprises in lots of 10 kg or 5 liters or less (5). Households also dispose of hazardous wastes (6), a practice that can contaminate ordinary waste sites, storm sewers and water supplies.

HOW FAST IS IT GROWING?

5. During the 1980's, North American and European market economies may experience an annual growth in hazardous wastes of between two to four percent (10 and 11). In newly industrialized and developing areas, the real gain in GDP is likely to closely mirror annual increases in hazardous waste.
6. These estimates assume that no drastic changes in types of processes and waste yields will occur over the next ten to fifteen years. In fact, many large industrial generators of hazardous wastes are trying to reduce their total output of hazardous wastes. However, while these efforts may affect rates of generation they may not affect the total hazard to man and/or the environment; a waste reduction process may actually produce a smaller quantity of a more inherently dangerous material. Moreover, small quantity generators, e.g. small businesses, and industries, farmers and households are unlikely to change their processes drastically. Indeed, in developing countries these small generators are likely to proliferate dramatically in the next several years.

HOW MUCH HAZARDOUS WASTE MOVES ACROSS FRONTIERS?

7. In the time required to read this paper, about three or four shipments of hazardous wastes will have crossed an international boundary on the way to some disposition. On average, a shipment of these wastes crosses a frontier more than once every five minutes, 24 hours per day, 365 days per year. (7).
8. Many of these cargoes move across frontiers for reasons which are both sensible and legal. Unfortunately, the contrary is also true. If these movements were to proceed in an uncontrolled fashion, the Seveso affair - the saga of 41 drums of wastes contaminated with dioxin from the Seveso accident which were temporarily lost after having crossed the frontier from Italy into France, and were finally taken over by Switzerland - might in reality be but the visible tip of the iceberg.
9. There are strong indications that the amount of waste crossing national frontiers is increasing and that this upward trend is likely to continue. According to available information, between 1982 and 1983, wastes transported in Europe for disposal in another country virtually doubled. About 700,000 tonnes of waste fell into this category. Waste crossing national frontiers to recycling/reclamation facilities in another country in Europe reached 250,000 to 425,000 tonnes in 1983 (about 1-2 per cent of the total).

10. This increase may be attributed partly to the recent availability of relatively low cost legal, land-based disposal facilities in certain planned economy countries. For example, about 4,000 shipments of hazardous wastes went from the Netherlands to the GDR in 1984. The FRG sent about 20,000 shipments to the GDR in 1983. Approximately 5,000 shipments of such wastes are expected to enter France in 1985. Rumania is considering the development of a waste disposal facility in a used portion of a salt mine. International transport of wastes meant for disposal at sea, either by incineration or dumping, amounted to about 1.8 million tonnes in 1983. (7).
11. As of early 1985, there was no properly organized monitoring of international shipments of hazardous wastes; countries do not have sufficient knowledge of consignments of wastes entering or leaving their borders. (7 and 8). The European countries most likely to be concerned with traffic in hazardous wastes, given the location of their population centres, include Austria, Belgium, Czechoslovakia, Denmark, France, FRG, GDR, Hungary, Italy, Luxemburg, Netherlands, Poland, Rumania, Switzerland and Yugoslavia.
12. There are few figures on the export of hazardous wastes from developed to developing countries. But then, it is not likely to be reported. Such traffic could be very profitable and may well increase in the future. Many developing countries are experiencing rapid industrialization and a corresponding increase in hazardous wastes. Very few, however, have any legislation concerning the management of hazardous wastes. There is usually no policy regime, no institutional capacity and essentially no resources to devote to the issue. The potential for waste tourism, both North to South and South to South thus exists and is likely to grow. Developing countries must become aware of the potential dangers of such traffic in order to properly deal with transfrontier movements of hazardous wastes.

WHY MOVE HAZARDOUS WASTE ACROSS FRONTIERS?

13. There are many reasons, good and bad, but they are mainly economic. Laws and regulations to control hazardous wastes can result in an increase in disposal costs 2 to 5 times per unit of waste. Individual firms, acting in their own economic interest, will naturally seek to minimise these costs even if that means disposal in another place (e.g. the sea), or country.

14. Less expensive disposal may be legally available or controls may be less stringent in an importing country (8). Where this situation exists, certain generators will be strongly motivated to utilize the least cost or least stringent option. There may also be a certain temptation to "lose" waste in a country which has no strong internal control system meant to assure that wastes arrive at a licensed facility. A corollary of this is that exported wastes are likely to be highly hazardous, requiring destruction or great care in the home country and banned from legal disposal at sea.
15. Recently, some countries have proposed what amounts to a commodity trade system in hazardous wastes. For example, China has recently proposed to accept hazardous wastes from FRG in return for heavy machine tools and equipment. In other cases, the importation of hazardous waste may be seen as a means to obtain foreign currency, i.e., a cut-rate environmental service provided in return for cash.

WHAT ARE THE COSTS?

16. At a very rough guess, the world spends about US\$ 16 billion in aggregate in order to manage the hazardous wastes generated annually. About 40 to 50 per cent of this sum (\$7 to \$8 billion annually) represents the additional costs imposed by laws and regulations to assure that potentially hazardous wastes do not in fact harm man and/or the environment (1).
17. In past years, preceding the enactment of stringent controls, a large proportion of hazardous wastes was disposed of by land-fill or surface impoundment. In some instances, disposal took place in a public facility mixing hazardous wastes with municipal wastes or simply burying drums of hazardous waste in shallow pits having no containment. Some of the results of such practices have become famous as Love Canal (USA), Lekkerkerk (Netherlands), Vac (Hungary), and Georgswerder (FRG).
18. These cases have clearly increased public awareness of the existence of hazardous waste management problems of dangerous sites, thousands of which have now been identified in many countries. Assessing the health and environmental impacts of these sites is complex. Scientific and institutional capacity is often lacking, and in a number of cases public anxiety has forced remedial action.

19. The costs of remedial action in market economies could range from \$ 15 billion to over \$ 100 billion according to existing estimates (10). Figures for centrally planned economies are not available. Nor are figures for developing countries, but there is a strong possibility that a large number of potentially hazardous sites exist in concentrated industrial-urban areas in these countries. Problems associated with such sites are becoming apparent, but many developing countries may not be able to afford the very high costs associated with massive remedial action programmes.
20. It is possible to compare the current and projected costs of react and clean-up measures for abandoned or uncontrolled sites with the costs of preventive management of hazardous wastes. Results indicate that the additional costs of strict control of hazardous wastes are a sound investment for European market economies. Data for North America indicate that if prevention of improper disposal of about 3 per cent of currently generated wastes can be achieved, the incremental costs associated with preventive measures can be justified on economic grounds alone (11).
21. Compensation for injury claimed to have been caused by exposure to hazardous wastes is a growing issue in many countries and no concensus has been reached (1). One report estimates the potential costs of compensation programmes proposed in the United States at "billions of dollars" annually (12).

WHAT IS THE IMPACT ON HEALTH AND THE ENVIRONMENT?

22. Hazardous wastes can have significant adverse effects on health and/or the environment. Direct effects on health can involve toxic reaction, organ damage, cancer, gene mutation and more. Indirect effects can result from bio-accumulation, bio-magnification and uptake in the food chain of chemicals in hazardous wastes. Exposure to hazardous wastes can thus be direct, e.g. via drinking contaminated groundwater or inhalation of vapour from a waste deposit, or indirect via eating fish contaminated by waste.
23. The most recent epidemiological study to be published deals with the prevalence of health problems in children living near Love Canal (Niagra County, New York, USA). Seven health problems were found to be more prevalent in children living near Love Canal as compared to a control group of children living in Niagra County, but well removed from Love Canal. These seven were: seizures, learning problems, hyperactivity, eye irritation, skin rashes, abdominal pain and incontinence. No health problems were identified as more common in the control group.

Adverse effects fall to control levels beyond a distance of about 800 to 1000 meters from the Canal. According to the study "The fact that these health problems showed a dose-response strengthens the association of these problems with residence in the Love Canal neighbourhood" (13).

24. These findings may have highly significant consequences for hazardous waste management in developing countries. According to UNEP, waste management in developing countries suffers from a variety of problems (8). For example, countries in or near the tropical rain belt must cope with frequent and heavy rains; land-filled waste is thus subject to rapid leaching or even direct overflow. Since there may be little or no pre-treatment of the waste prior to land-filling, this could lead to contamination of water supplies (ground and surface water) as well as to direct exposure of nearby dwellers. Again, according to UNEP, most industrial production in developing countries is concentrated in congested areas. Land-filling hazardous waste generally occurs close to industrial estates which are surrounded by poor neighbourhoods, i.e. shanty towns (8). These dangers point up the clear need for land use planning in developing countries and the more urgent need to actually implement and enforce such plans.
25. On the other hand, a report prepared by the Universities Associated for Research and Education in Pathology (UAREP) on behalf of the US Chemical Manufacturers Association suggests that although solid evidence for serious health effects resulting from chemicals emanating from disposal sites is as yet generally lacking, a "substantial risk is presented by many sites". Moreover, the report states that uncertainties with respect to the health effects of chemicals at active or inactive disposal facilities should not postpone preventive or remedial action (14).
26. Hazardous wastes can also lead to severe problems for animals and marine life in groundwater and surface water contaminated by wastes. This problem is especially worrisome in areas with porous soil and subject to torrential rains. Run-off from hazardous waste sites can also contaminate large areas of land, e.g. as in Times Beach (U.S.). In communities strongly dependent on agriculture such an occurrence could be tragic with large amounts of land being rendered useless.

II. THE FUTURE MANAGEMENT OF HAZARDOUS WASTES: SOME POLICY DIRECTIONS

27. Looking to the year 2000 and beyond, in the face of growing economic activity, the overriding objective of policy action must be to reduce the amount of waste generated; to transform an increasing amount of that generated into resources for use and re-use and thus to reduce the volume that will otherwise have to be treated or disposed of through incineration, land disposal or dumping at sea (15).
28. This is first and foremost a problem of the industrialized countries. Generating over 90 % of the world's hazardous waste today, they are and will continue to be the source of the overwhelming bulk of the world's hazardous waste tomorrow. They are also the source of most of the hazardous waste in "trade", if that is how the growing movement of hazardous wastes in and between industrialized and developing countries is to be characterized.
29. It is also, however, a problem of the newly industrializing and developing countries. Rapid industrialization is bringing them the same severe problems of hazardous waste management as are evident in the developed countries, perhaps more severe per unit of waste generated because of the larger numbers exposed, because much of it is released directly into sewers and surface waters and open dumps, and because of the much weaker political institutional and financial capacity to control and manage it. Moreover, the problems stemming from the generation of waste domestically will be magnified in any country that decides to engage in "trade" in hazardous waste, establishing disposal sites in return for hard currency, access to technology or other things.
30. If future flows of hazardous waste are not reduced significantly through product change, substitution, recycling and transformation into resources for re-use, the basis for development in many communities and regions will be compromised. The damage to health and property that has provoked emergency responses in several developed countries during the past decade will grow, and water supplies for entire communities and regions may be threatened. The economic burden imposed on communities by these costs and the subsequent costs of clean-up and cure, not to mention victim compensation, could become enormous.
31. With increasing community awareness of the hazards, the "not-in-my-backyard" syndrome can be expected to grow, making it increasingly difficult for political leaders to site landfill and incineration facilities

and thus increasing pressure on governments and industries to find "buyers" in other countries prepared to accept such waste.

32. Some countries already have, and other countries will no doubt be tempted to become "buyers" and even "traders" in hazardous waste. Given comparative levels of development, awareness and information flows, they may be able to sustain such trade for some time. In the medium to longer term, however, such trade is not sustainable, neither economically nor politically.
33. Each improperly managed site reduces the future development potential of the country. In the longer term, moreover, the geo-politics of such trade are fraught with danger to the countries concerned. When development in the importing countries leads to higher levels of education, information flows and awareness in the communities suffering the consequences of such trade, the exporting countries concerned run the risk of being charged with taking advantage of unequal relations, of neo-colonialism and worse.
34. No-one gains through such "trade". Economically, it makes no sense for the buyer, except in terms of the most primitive short-term financial analysis. Improper disposal can end up costing a society 100 times more than environmentally sound management of the wastes. Neither does it make any sense for the seller. It simply removes the pressure to find environmentally and economically acceptable ways of managing the waste within the industries, communities and countries generating it.
35. The reduction of waste and its transformation into resources on the other hand, can be an economic proposition for the industries concerned. However, a substantial reduction of future flows of wastes, will require many changes on the part of governments and of industry, including measures to enable the full participation of industry. Industry can transform increasing amounts of waste into resources; governments can provide a climate of incentives, regulation and institutional linkages to enable this to happen. The co-operation of both is required.
36. The Commission has established an Advisory Panel on Industry and may wish to ask it to examine the policy and institutional pre-conditions to enable industry to decouple waste from growth in order to reduce substantially the amount of waste generated by the world's industrial system by the year 2020. In the meantime, the Commission should proceed to examine measures to control the increasing transboundary movement of hazardous waste.

III. TRANSFRONTIER MOVEMENTS OF HAZARDOUS WASTES

International Co-operation Today

37. Sovereign states are free to decide how to monitor and control hazardous wastes within their own borders. Until recently, however, there have been virtually no national laws or international guidelines governing the transfrontier movement of hazardous wastes, and no organized monitoring of international shipments of such waste. As a result, most countries have had little or no knowledge of consignments of waste entering or leaving their borders.
38. Strengthened international co-operating in this area is therefore coming to be seen as vital by many countries and several international bodies are now concerned with policies affecting the management and transport of hazardous waste (16). On December 6, 1984, the Council of Ministers of the European Communities adopted a Directive on the Supervision and Control of Transfrontier Shipments of Hazardous Waste within the European Communities. It comes into full force on October 1, 1985. On February 1, 1985 the OECD Council decided that Member countries "shall control the transfrontier movements of hazardous waste and, for this purpose, shall ensure that the competent authorities of the countries concerned are provided with adequate and timely information concerning such movements." This decision contained a recommended set of principles to guide legislative and regulatory action. UNEP has drawn up extensive draft guidelines for the environmentally sound management of hazardous wastes. They include provision for transfrontier movements, safety, packaging, labelling, licensing, documentation and international co-operation to minimize export from developed economies to developing countries (8).
39. National or international rules and regulations exist to monitor and control the more than one million annual transports of dangerous goods travelling by various modes. Indeed, some parties assert that hazardous wastes are a special form of dangerous "goods", and that the rules and agreements concerning dangerous goods can be adapted and, if necessary, extended in order to include hazardous wastes. The counter argument is that "goods" have economic value and hence are less likely to become lost en route, at least not intentionally. Still, the rules and protocols concerning transport of dangerous goods will play a role in formulating policies on hazardous wastes.

40. The Environment Ministers of OECD countries and the responsible Commissioner from the European Commission recently participated in a major policy conference on International Co-operation Concerning Transfrontier Movements of Hazardous Wastes. They recommended that OECD countries should promote the establishment of appropriate disposal facilities for the management of hazardous wastes at the national level, since such action may serve to reduce the need for transfrontier movement of hazardous wastes. They also resolved not to apply any less strict controls on transfrontier movements of hazardous wastes involving non-OECD countries than they would for movements involving OECD countries; and not to allow export of hazardous wastes to non-OECD countries without the consent of the appropriate authorities of the importing country and of any non-OECD transit country, and without assurance that the hazardous wastes will be directed to adequate disposal facilities in the importing country. They further recommended that necessary initiatives be taken to ensure that adequate measures are taken to prevent or reduce the generation of hazardous wastes in all development or investment projects in which they or their enterprises are involved, and that adequate facilities exist or are made available for the handling and disposal of such wastes.

POLICY PRINCIPLES FOR MANAGEMENT OF TRANSFRONTIER MOVEMENTS

41. While these intentions represent major steps in the right direction, a wide range of solid actions will be required both nationally and internationally to put them into effect and implement them.
42. Several policy principles have evolved to help maintain control over management of the transfrontier movements of hazardous wastes. Looking to the year 2000 and beyond, they must become reflected in international agreement, law and, most of all, practice. These include:
- Prior notification by the exporting country to the importing country and countries of transit that a shipment of hazardous waste is scheduled for delivery.
 - Prior consent by the importing country (or a Sea Disposal Commission if sea disposal is envisaged) and the transit countries.
 - Full disclosure, including clear identification of the wastes to be shipped (consignor, consignee, waste type, hazards, quantity, form, packing, date of arrival, management requirements and probable

fate of the waste). Full disclosure pre-supposes some commonly accepted definition of wastes. At present hazardous wastes are identified by a different code in virtually every country which regulates such wastes.

- Timeliness - prior notification should occur sufficiently in advance of any intended shipment to enable the competent authorities in the countries affected to decide whether or not to accept the shipment and, if so, under what conditions. Timeliness also assures the exporting country and the consignor that, provided the information tendered and the waste load are identical, shipment can occur legally without undue hindrance.
- "Cradle to grave" monitoring of hazardous wastes meaning that the whereabouts of the wastes are known at all times and that the wastes do arrive at the appropriate place for treatment or disposal. Monitoring must be accomplished in a simple fashion and at lowest practicable cost in order to effectively protect man and/or the environment.

43. The Commission will wish to consider these principles and perhaps to endorse them as a guide to future work on this and related issues.

POLICY QUESTIONS

44. In applying these principles, two major questions arise: liability and insurance. Liability for damage to humans and/or the environment arising from international movement of hazardous wastes is handled differently by different countries. In cases where custody of hazardous wastes is transferred, the key issue is whether or not liability for future risk is also transferred. Some environmental laws in this area tend to try to maintain liability with the generator from cradle to grave, and perhaps, past the grave, i.e. the imposition of strict and joint and several liability onto generators whose wastes are found in uncontrolled land disposal sites (7).
45. This issue is perhaps of particular concern to developing countries importing or proposing to import hazardous wastes. In this regard there appears to be a trend emerging in the legislation and regulations of several countries to retain liability with the generator of hazardous wastes. Thus, the generator may not be able to transfer title, property and risk to any third party.

46. While this may be favoured, there is a difficulty in that the generator may not be able to determine the probable limit of his liability for certain actions which might be involved with the management of his hazardous wastes - whether by himself or his contractors, e.g. transporters, re-cyclers, disposers. Furthermore, he may well be concerned about disclosing information concerning the process of origin and characteristics of the waste.
47. Insurance is tied closely to the question of liability. Insurance meant to provide guarantees against accident or mishap may be expensive to obtain. More critically, in the case of transfrontier movements of hazardous wastes, it may be impossible to obtain. Questions of reasonable and equitable means to assess and cover the risks involved need to be examined in order to evolve valid bases for establishing such insurance policies (17).

IV. HAZARDOUS WASTE MANAGEMENT IN DEVELOPING COUNTRIES

48. As noted earlier, some developed and most developing countries are in no position to deal with the growing menace to their health, environment and economy represented by the uncontrolled disposition of hazardous wastes. Developed countries may expect to overcome the remaining obstacles to sound management in the future. Significant progress has been made over the past decade and it may be largely a matter of time, imagination, public pressure and political will. Developing countries, however, will find it much more difficult to act nationally and to play their role in any international regime. Most have no specific laws dealing with hazardous wastes; no policy regime; no institutional capacity; and no enforcement capacity. They lack professional and financial resources and even if they had them, most lack the public awareness that could generate the political will to provide them.
49. Thus, while developing countries are in a position where they could avoid the experience of the industrialized countries, and the heavy burden on their economies that the uncontrolled disposition of hazardous wastes has imposed, the prospects of them in fact doing so are not good. On the contrary, the prospects are very high that they will experience ever increasing damage to their health and environment, damage that will both reduce the basis for their development and impose heavy burdens on their economy in the future when they have to react and cure and perhaps compensate.

50. Broadly speaking, one can identify three primary sources of hazardous wastes in developing countries:
- a. wastes generated within the country either by foreign-owned, state-owned or joint-venture firms;
 - b. wastes imported into the country; and
 - c. wastes generated within the country by small entrepreneurs such as electroplaters, metal finishers, etc., as well as local farmers and householders.
51. What options are available to the international community to strengthen the capacity of developing countries to deal with the management of hazardous wastes in an environmentally and economically sound manner? The following five proposals are offered as a point of departure for the Commission's discussion.

PROPOSAL No 1: Action to Reduce the Burden of "New" Wastes.

52. As noted above, a significant proportion of new wastes generated within or entering many developing countries will derive from externally controlled private investment. The responsibility for the sound management of new wastes can and should be tied, in the first instance, to the investment that gives rise to that waste. With this in mind, the Commission could propose that developing countries establish laws, policies and practices under which any foreign enterprise proposing to expand an existing plant or establish a new plant would be required to submit a plan for the sound management of the wastes generated by that plant. Approval of the plan and financing its implementation would be a pre-condition to approval of the investment.
53. In the case of industries producing new products and employing new processes, (whether new to the world market or only to the market of the country concerned) the industry concerned is in the best and sometimes the unique position to know what wastes it will generate and how they should be managed. The plan could call for treatment and disposition locally, or it could call for transit back to the home country for treatment and disposal. Questions of auditing and liability should be included as part of the contractual obligations of the enterprise. Independent experts could be utilized to advise both parties as to the type and cost of such special arrangements so as to protect man and/or the environment at lowest practicable cost. At least one industry-sponsored NGO is now providing such expertise. It should be noted that advance knowledge by an industry that it will be required to produce a plan and to finance the management of their own wastes should also act as an incentive to ensure maximum reduction of waste at source, re-cycling etc.

54. In the case of some developing countries, a further proportion of their new wastes will derive from national investment assisted by bilateral or multilateral agencies, the World Bank, etc. Where the financing of an enterprise is so assisted, the Commission could propose that the agencies concerned should induce and/or re-inforce the development and implementation of appropriate national law and policy by similarly requiring the enterprise to produce an approved plan for the sound management of the wastes generated by the enterprise as a pre-condition for assistance.
55. Some developing countries have imported and others are contemplating the importation of hazardous wastes. In this respect, the Commission may wish to propose that when a developed country proposes to export hazardous wastes to a developing country, the export should occur only under a legally binding mechanism. This could ensure not only that such movements would not occur without the consent of the appropriate authorities in the importing country (and in any transit countries), but also that the hazardous wastes are directed to environmentally secure disposal facilities in the importing country.

PROPOSAL No 2: Action to Develop a Trained Cadre of Senior Policy Personnel

56. The major requirement in most developing countries is to recruit, train and put in place senior policy personnel who can determine the issues the country faces with respect to hazardous waste management, and advise on and implement policies in the context of the myriad of other problems and priorities faced by the country. Technical expertise, e.g. waste site operators, is of secondary importance at present.
57. This requires resources and funding, something which few developing countries are ready to assign to this priority. One possibility, therefore, in the case of wastes of foreign origin, is similar to that contained in the first proposal, i.e. to tie funding for training and engaging management personnel to the investment that gives rise to the wastes that need to be managed. Furthermore, where the financing of an enterprise is assisted by bilateral or multilateral agencies, they may be asked to re-inforce such a policy and facilitate training. Industry-sponsored NGO's may also be effective in sponsoring such training.

PROPOSAL No 3: Establish and Earmark Financial Resources for Hazardous Waste Management

58. Some developing countries, especially the newly industrializing countries, will require funds and other resources beyond the above. There are two classes of uncontrolled sites that they may expect to encounter: the first is associated with the past practices of a firm which is still operating, and the second consists of abandoned sites. In the case of the former, the polluter may not be able to pay in all cases, even if his assets are seized. Hence funds for remedial action may be required for both classes of uncontrolled sites.
59. Hazardous waste accidents occur infrequently, but the cost of appropriate action to deal with such accidents can be enormous. Few developing countries have the means to take costly remedial action. What then are the options? The only apparent choices are to use public funds, external emergency funds (if obtainable) or to fail to remedy the problem.
60. In this regard, the build-up of a fund earmarked for environmental remedial action may be considered. Current generators would pay a levy to the fund in order to assure availability of resources when needed. This notion of a national (or international?) superfund raises a number of questions however: Who pays the levy? How is the amount of the levy to be determined, and how is it assessed? Who administers the fund?

PROPOSAL No 4: Strengthen International Co-operation at the Regional Level

61. Strengthening international co-operation on a regional basis could open the door to other options. It could also re-inforce the basis for national action given that the efforts of one country in a developing region to manage hazardous wastes may be discounted by transboundary movements from neighbouring countries. There is, in fact, evidence of hazardous waste tourism from newly industrializing to neighbouring countries. Movements can also be subtle and insidious. Groundwater, for example, contaminated by hazardous wastes in country "X" might be used ultimately for drinking purposes in country "Y".
62. Given developing countries' priorities, resources for hazardous waste management, and environmental management generally, are and will remain extremely scarce. Strengthened international co-operation at the regional level could greatly increase the effectiveness of all resources provided from whatever

source . An appropriately mandated and structured regional body, for example, could provide policy advisory services to the countries in the region; it could suggest legislation, policy and regulations ; it could receive "notification" of shipments on behalf of countries not equipped to handle them and advise on whether or under what conditions a country should "consent" to a shipment of waste; it could advise on negotiations with new industries that will produce new wastes. Such bodies could produce contingency plans and manage contingency resources. It could maintain a regional quick-response capacity for use in case of accidents due to improper hazardous waste management. Such a body, moreover, could be the overseer and administrator of funds earmarked for hazardous waste management in the region. The pooling of talent and resources in this way could also increase awareness and strengthen the political capacity of governments in a region to deal with both external and internal sources of hazardous waste.

V. International Agreement on the Transfrontier Movement of Hazardous Wastes

63. Looking to the year 2000 and beyond, the international dimensions of hazardous wastes management all point in the same direction: the need for an internationally recognized regime, binding on all parties.
64. Such a regime could take the form of an international agreement or convention. It would need to reflect the policy principles and issues discussed above. It should also deal with the questions of liability and insurance and, no doubt, many other questions. Implementation could be phased over an agreed period of time. The questions of timely notification, prior consent and identification could probably be agreed and implemented more expeditiously than other aspects. The question of liability and its allocation is also very important, but considerable additional investigation will, no doubt, be required before any internationally agreed regime on liability can be formulated, let alone agreed and implemented. The same is true of insurance.
65. The urgency of achieving legally binding international instrument(s) has been emphasized at the highest levels by many countries. Ministers and senior officials attending the recent OECD Conference hosted by Switzerland, for example, concluded that an international agreement or convention should be drafted prior to the close of 1987. Other countries would, no doubt, support such a move. Thus, some months after the Commission's report is submitted, a first step in the direction of an international regime

may have been taken. Experience shows, however, that great imagination and enormous effort and political leadership will be needed to take the additional steps forward to consensus, agreement and, finally, implementation of an environmentally and economically sound regime for the management of the world's growing volume of hazardous wastes.

Reference and Notes

- (1) Yakowitz, H., "Global Aspects of Hazardous Waste Management", Prepared for WCED, 49pp plus Annexes, 15 May 1985.
- (2) Westat, Inc., "Final Report - National Survey of Hazardous Waste Generators and Treatment, Storage and Disposal Facilities Regulated under RCRA in 1981", submitted to USEPA, 20th April 1984 - 232 pp and Appendices.
- (3) Petroleum and petro-chemical operations, synthetic organic chemicals production, metal mining, machinery fabrication and many other industries generate a wide variety of wastes as by-products of their production process. So do photographic laboratories, printing operations, pharmacies, paint shops, tanning operations and even food preparation enterprises.
- (4) Virtually all hospital wastes, for example, can be infectious and dangerous. School with laboratory facilities may be sources of very potent hazards. Dental operations often result in mercury entering the environment.
- (5) Electroplating shops, metal workshops, electronics fabricators, tyre retreaders, jewellers and construction contractors generate significant amounts of such wastes.
- (6) In the form of unused medicines, automobile engine oil, batteries containing mercury or cadmium or lead, paints and similar products.
- (7) OECD, Background Papers for OECD Conference on International Co-operation Concerning Transfrontier Movements of Hazardous Wastes (Basel, Switzerland, 26th-7th March 1985), OECD, Paris, 1985, 38 pp
- (8) UNEP, "Transfrontier Movements of Hazardous Wastes with Regard to Developing Countries", prepared for First Session, ad hoc Working Group of Experts on Environmentally Sound Management of Hazardous Wastes, Munich, March 1984. UNEP/WG.95/2, 15th November 1983, 11 pp.
- (9) Treatment, storage and/or disposal costs, including transport expenses, may be lower in an importing country because: better technology is available; the importing country's facility can take advantage of economies of scale; or the treatment, storage and/or disposal facility in the importing country is nearer to the generation site than any such facility in the

home country. Other valid reasons for the transfrontier movement of hazardous wastes include the fact that no firm in the exporting country has the technology to treat the wastes to the standard required in that country; or that a multinational corporation which has provided for an appropriate facility at one of its sites may elect to transport all suitable wastes from its sites in other countries to that facility.

- (10) Office of Technology Assessment, U.S. Congress, "Superfund Strategy", 10th March 1985.
- (11) House of Representatives, U.S. Congress, "Should Producers of Hazardous Waste be Legally Responsible for Injuries Caused by the Waste?" Document 98-93 compiled by the Congressional Research Service (Library of Congress) 1983, pp 586. (Contains seventy-one separate articles concerned with all aspects of compensation for injury caused by hazardous wastes.)
- (12) Main, J., "Hazards of Helping Toxic Waste Victims", Fortune Magazine for 31st October 1983, pp 158-170.
- (13) Paigen, B., Goldman, L.R., Highland, J.H., Magnant, M.M. and Steegman, J., A.T., "Prevalence of Health Problems in Children Living Near Love Canal", Hazardous Waste and Hazardous Materials 2 (1), 23-44 (1985).
- (14) Universities Associated for Research and Education in Pathology Inc., (U.S.), "Report of the executive Scientific Panel on the Health Aspects of the disposal of Waste Chemicals" UAREP, Bethesda, Maryland 20814, 15th March 1985.
- (15) Policies for dealing with societal wastes have evolved over a long period of time in many countries. There is general agreement that the management options for these wastes, ranked in order of desirability from the point of view of environmental amenity, are as follows:
 - a. Reduce generation of wastes, e.g. by more efficient process in manufacturing, reduction of disposable material in consumer goods or increase of durability in products;
 - b. Separate usable components of the waste at their source, e.g. by more efficient control of effluents from manufacturing processes, separation of paper, glass, plastic and metals by householders, or concentration of used tyres or oil at collection centres;

- c. Re-use of waste products directly if possible, e.g. return of an effluent to the production process as in steelmaking or cement kiln operation, burning of household wastes to recover energy or exchange of material which is a waste from one process, but may be a feedstock for another process;
 - d. transformation or other physical or chemical treatment in order to re-cycle usable materials from waste, e.g. magnetic separation of ferrous scrap from household waste and subsequent use of the material to prepare ferrous products, reclamation of non-ferrous metals from mixed industrial wastes by thermal processes, re-refining of waste lubricating oils, or distillation and regeneration of spent solvents;
 - e. Destruction of the waste by physico-chemical treatment or incineration, e.g. neutralization by mixing alkaline and acid wastes or during of pumpable liquid waste or solid wastes;
 - f. Permanent storage of the waste in or on land;
 - g. Dumping at sea.
- (16) This includes OECD, Commission of the European Community, United National Environmental programme (UNEP), United National Economic Commission for Europe (including its sponsorship of activities of UNIDROIT), UN Group of Experts on the Transport of Dangerous Goods (UN Economic and Social Council), International Maritime Organization, International Road Transport Union, Central Office for International Rail Transport, and the administrators of the Oslo, London, Barcelona and Helsinki Conventions dealing with waste disposal at sea.
- (17) Environmental Impairment Liability and Developing Countries
- a) Given the complex set of situations with respect to generators of hazardous wastes in developing countries, some means of environmental impairment liability (EIL) insurance for accidents arising from hazardous waste management would seem to be desirable. The problems of obtaining such insurance, paying the premium and utilizing the funds for remedial action are, however, immense. Private insurers are reluctant to enter the EIL market in many developed economies.

- b) Because EIL coverage is relatively new, underwriters do not have an actuarial data base on which to base premiums. For the underwriting market, an environmental audit serves as a valuable baseline for the existing situation at the time the application was filed. The audit is an important tool for establishing rates, deductibles, limits of coverage, exclusions, and other terms. Also the baseline, coupled with the manner in which the applicant implements the report recommendations, can give the underwriter a fair picture of the client's good faith attempts to minimize the overall risk. The audit can also give the underwriter a mechanism that can be used to improve the terms of the insurance at renewal time, e.g. by offering improved premiums or policy terms.

- c) The alternatives to an insurance solution are likely to be development of government controlled compensation funds or a continued reliance on direct public funds to respond to emergency situations or long-term difficulties which may occur as a result of accident involving hazardous wastes.

- d) There might well be ways for developing countries to obtain or assure access to, and placement of, EIL insurance coverage for hazardous waste accidents. Nevertheless, considerable effort and negotiations are likely to be required before a fully satisfactory insurance solution is achieved. In addition to the basis components outlined, some participation by the state may be desirable in the form of a statutory liability limit for private firms.

Stanovník: Hazardous waste

Recommendations:

- (1) Reduce the amount of hazardous waste produced
- (2) Recycling of hw
- (3) Product change (multinationals)
- (4) No dumping in global commons (air, water, and other "not-owned" commons)
- (5) Transport notification, monitoring
- (6) Advisory Panel on industry, Decouple waste and growth
- (7) Bring in ICC to draw up guidelines/convention