Status Report on Management of Hazardous Waste in India

1.0 Preamble

India is the second most populous country, which has about 16% of the world population and 25% of the land area. Rapid industrialization last few decades have led to the depletion of pollution of precious natural resources in India depletes and pollutes resources continuously. Further the rapid industrial developments have, also, led to the generation of huge quantities of hazardous wastes, which have further aggravated the environmental problems in the country by depleting and polluting natural resources. Therefore, rational and sustainable utilization of natural resources and its protection from toxic releases is vital for sustainable socio-economic development.

Hazardous waste management is a new concept for most of the Asian countries including India. The lack of technical and financial resources and the regulatory control for the management of hazardous wastes in the past had led to the unscientific disposal of hazardous wastes in India, which posed serious risks to human, animal and plant life.

2.0Regulatory Frame Work

India is the first country that has made constitutional provisions for protection and improvement of the environment. In the Directive Principles of State Policy of the Constitution, Article 48-A of Chapter IV enjoins the state to make endeavor for protection and improvement of the environment and for safeguarding the forest and wild life of the Country. In Article 51 A (g) of the Constitution, one of the fundamental duties of every citizen of India is to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures.

In order to manage hazardous waste (HW), mainly solids, semi-solid and other Industrial wastes which are not covered by the Water & Air Acts, and also to enable the authorities to control handling, treatment, transport and disposal of waste in an environmentally sound manner, Ministry of Environment & Forests (MoEF). Government of India notified the Hazardous Waste (Management & Handling) Rules (HWM Rules) on July 28, 1989 under the provisions of the Environment (Protection) Act, 1986 and was further amended in the year 2000 & 2003. These amendments enable to identify hazardous wastes by means of industrial processes and waste streams in Schedule I and also by way of concentrations of specified constituents of the hazardous waste in Schedule II. Categories of wastes banned for export and import have also been defined (Schedule-8) The procedure for registration of the recyclers /re processors with environmentally sound facilities for processing waste categories such as used lead acid batteries, non-ferrous metal and used oil as contained in schedule-4 and schedule-5 respectively has also been laid down.

Further, separate Rules have also been notified in continuation of the above Rules for bio-medical wastes as well as used lead acid batteries.

3.0 The Basel Convention on hazardous wastes

India is a Party to the Basel Convention on trans boundary movement of hazardous wastes. The basic objectives of the Basel Convention are for the control and reduction of trans boundary movements of hazardous and other wastes subject to the Convention, prevention and minimization of their generation, environmentally sound management of such wastes and for active promotion of the transfer and use of cleaner technologies.

As a party to the Convention, India is obliged to regulate and minimize the import of hazardous waste or other wastes for disposal or re-cycling and also to prohibit export of waste to parties, which have prohibited the import of such wastes. As a party India is also required to minimize generation of hazardous waste in the country taking into account social, technological and economic aspects. Further, hazardous waste generated in the country is also required to be managed in an environmentally sound manner. India, as a party, can prevent the import of hazardous waste or other waste if it has reason to believe that the waste in question will not be managed in an environmentally sound manner.

4.0 Present Hazardous Waste Generation Scenario

The hazardous waste generated in the country per annum is estimated to be around 4.4 million tons (Table 1) while as per the estimates of Organization for Economic Cooperation and Development(OECD) derived from correlating hazardous waste generation and economic activities, nearly five million tons of hazardous waste are being produced in the country annually. This estimate of around 4.4 million MTA is based on the 18 categories of wastes which appeared in the HWM Rules first published in 1989.Out of this, 38.3% is recyclable, 4.3% is incinerable and the remaining 57.4% is disposable in secured landfills. Twelve States of the country (Maharashtra, Gujarat, Tamil Nadu, Orissa, Madhya Pradesh, Assam, Uttar Pradesh, West Bengal, Kerala, Andhra Pradesh, Karnataka and Rajasthan) account for 97% of total hazardous waste generation. The top four waste generating states are Maharashtra, Gujarat, Andhra Pradesh and Tamil Nadu . On the other hand, states such as Himachal Pradesh, Jammu & Kashmir, all the North Eastern States excepting Assam generate less than 20,000 MT per annum. Given the wide variations in quantity and nature of waste generated across states and union territories (UTs) and also considering the wide variations in climatic as well as hydro-geological conditions in different regions of the country, the approach to waste management has to be essentially state-specific.

Consequent upon amendments made in the year 2000 and subsequently in 2003,the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) are in the process of re-inventorising hazardous waste generated. The current exercise has brought to light the serious short-comings in the earlier inventorisation.

State-wise status of number of units generating hazardous waste, and quantities generated in wastes types (recyclable, incinerable and disposable).

S. N.	State	No. of Districts		No. of Units Generating Wastes		Quantity of Waste Generated (Waste Type) [in TPA]			
		Total	H.W. Units	Autho-rised	Total	Recycl-able	Inciner-able	Disposal	Total
1	Andhra Pradesh	23	22	478	501	61820	5425	43853	111098
2	Assam	23	8	18	18	-	-	166008	166008
3	Bihar	55	12	31	42	2151	75	24351	26578
4	Chandigarh	1	1	37	47	-	-	305	305
5	Delhi	9	9	-	403	-	-	-	1000
6	Goa	2	2	25	25	873	2000	5869	8742
7	Gujarat	24	24	2984	2984	235840	34790	159400	430030
8	Haryana	17	15	42	309	-	-	31046	32559
9	Himachal Pradesh	12	6	71	116	-	63	2096	2159
10	Karnataka	27	25	413	454	47330	3328	52585	103243
11	Kerala	14	11	65	133	93912	272	60538	154722
12	Maharashtra	33	33	3953	3953	847436	5012	1155398	2007846
13	Madhya Pradesh	61	38	183	183	89593	1309	107767	198669
14	Orissa	30	17	78	163	2841	-	338303	341144
15	J & K	14	5	-	57	-	-	-	1221
16	Pondicherry	1	1	15	15	8730	120	43	8893
17	Punjab	17	15	619	700	9348	1128	12233	22745
18	Rajasthan	32	27	90	344	52578	6747	95000	140610
19	Tamil Nadu	29	29	1088	1100	193507	11564	196002	401073
20	Uttar Pradesh	83	65	768	1036	36819	61395	47572	145786
21	West Bengal	17	9	234	440	45233	50894	33699	129826
	TOTAL	524	373	11138	13011				4434257

Source: Report of the High Power Committee on Management of Hazardous wastes, 1999

As a result, the total quantum of waste generated as well as its composition in terms of landfillable, incinerable etc. would undergo substantial changes. Nevertheless, the geographical distribution of waste generated and its distribution amongst the states is unlikely to undergo major changes.

While it is well recognised that inventorisation has to be reviewed and updated periodically to account for growing industrialisation, it is necessary to prepare a reliable inventory as this forms the basis for formulating a suitable hazardous waste management strategy & developing infrastructure (treatment/disposal facilities) for their management. While field verification supplemented by

stoichiometric assessments would be the ideal way forward, reasonably reliable estimates can be made based on product wise waste streams generated and quantities thereof. In India, there are over 13,000 industrial units located in 340 districts, out of which nearly all units have been granted authorization for multiple disposal practices encompassing incineration, storage, land disposal and other disposal (mostly recycle and reuse)options.

Small and medium sized enterprises (SMEs), however, are the major hazardous waste generators.

The amount of hazardous waste generated in this country is quite small in comparison to that of the USA, where as much as 275 million tons of hazardous waste was generated annually. However, considering the fragile ecosystem that India has (The State of India's Environment, Part I, National Overview, The Citizens Fifth Report, Centre for Science & Environment, 1999), even this low quantum of hazardous wastes (around 4.4 million MTA) can cause considerable damage to natural resources if untreated before releases. India's fragile ecosystem could be seen from the following:

Air pollution in Indian cities is highest amongst the world

Over seventy percent of the country's surface water sources are polluted and, in large stretches of major rivers, water is not even fit for bathing

India has among the lowest per capita availability of forests in the world, which is 0.11 ha as compared to 0.50 ha in Thailand and 0.8 ha in China

The security of Indian fragile ecosystem, therefore, warrants sustainable consumption of natural resources and protection from environmental degradation.

5.0 Significance of SMEs in Industrial Output and Hazardous Waste Generation

Nearly fifty percent of the total industrial output in India is contributed by the SMEs. They also account for 60 to 65 percent of the total industrial pollution. However, most of these industries generate hazardous wastes, which find their way uncontrolled into the environment. According to the National Productivity Council, New Delhi (India), there are more than 3 million small and medium scale industries, which are spread throughout the country in the form of clusters/industrial estates. SMEs in India cannot afford to adopt and maintain adequate hazardous waste treatment and disposal technologies. In the absence of common disposal facilities, the waste generators have been accorded temporary permission to store waste in their premises except in areas serviced by common facilities that have come up in the States of Gujarat, Maharashtra and Andhra Pradesh(where storage period should not exceed for more than 90 days). The lack of common facilities has been a major factor in mushrooming of illegal dump

sites since most of the units in the small and medium sector do not have adequate space within their premises to arrange for storage over several years. Therefore it is urgently required to make available common hazardous waste treatment and disposal facility in the areas in all the states where SMEs are operating.

There has been considerable delay in notifying sites for hazardous waste disposal. Of the 93 sites identified, only 30 have been notified. The State Governments should not only expedite notification of sites based on environmental impact assessment but play a catalytic role and persuade the industry associations to set up common facilities. Such common facilities would need to be planned based on reliable estimate of current waste generation and projections for the future. As this was not done, hazardous waste dumping was rampant in all the states which prompted in public interest litigations in High Courts and Supreme Court.

6.0 Supreme Court Interventions on non-implementation of HWM Rules

6.1 Petition complaining the violation of fundamental rights

Though the HWM Rules came into existence in 1989, Rules they were never implemented in letter and spirit. The non-implementation resulted in indiscriminate & illegal dumping of hazardous waste on land. Due to alarming situation created by illegal dumping of hazardous waste, its generation and serious and irreversible damage as a result thereof to the environment, flora and fauna, health of animals and human beings, a petitioner approached the Supreme Court under Article 32 complaining of violation of Article 14 and 21 of the Constitution of India. The petitioner has, inter alia, relied upon the Basel Convention which was signed by India on15th March, 1990 and ratified on24th June, 1992. The ratification of Basel Convention by India shows the commitment of the country to solve the problem on the principles and basis stated in the said document.

The HWM Rules have been amended twice (2000 & 2003) during pendency of this petition, the latest amendment being on23rd May, 2003.

Considering the magnitude of the problem and the extent of hazardous waste generated, this Court issued notices to all the State Governments, Central Pollution Control Board and State Pollution Control Boards, Pollution Control Committees in the Union Territory, so as to identify the problem, and the extent of such waste, availability of the disposal sites and various other aspects relevant to minimizing the generation, its proper handling and disposal with a view to safeguard the environment.

6.2 Orders of the Supreme Court prior to this petition

Prior to above-mention petition, the Supreme Court had issued the following orders which are listed in a chronological order:

By order dated 5th May, 1997, considering the decision that have been taken by 65 conference parties by consensus to ban all exports of hazardous wastes from Organisation for Economic Co-operation and Development (OECD) to non-OECD countries immediately for disposal, the Court, inter alia, directed that no authorization/permission would be given by any authority for the import of hazardous waste items which have already been banned by the Central Government or by any order made by any Court or any other authority and no import would be made or permitted by any authority or any person, of any hazardous waste which is already banned under the Basel Convention or to be banned hereafter with effect from the dates specified therein. In view of the magnitude of the problem and its impact, the State Governments were directed to show cause why an order be not made directing closure of units utilizing hazardous waste where provision is not already made for requisite safe disposal sites. It was further ordered that cause be shown as to why immediate order be not made for closure of all unauthorized hazardous waste handling units.

In the order dated4th August, 1997 it was observed that all State Governments and Union Territories have not taken steps required under the applicable laws as well as earlier directions of the Court and have not placed before the Court all materials facts in spite of considerable time having been given. It has been further observed that all the authorities do not appear to appreciate the gravity of situation and need for prompt measures being taken to prevent serious adverse consequences. Even Central Government was not given full information by all the State Governments about the compliance of the Directions of this Court. Under these circumstances, it was observed that an appropriate Committee deserves to be constituted to ensure that needful is done to arrest further growth of the problem.

6.3 Constitution of the High Power Committee

In this background, by order dated13th October, 1997, a High Power Committee (HPC) with Prof. MGK Menon as its Chairman was constituted to examine all matters in depth relating to hazardous waste and to give a report and recommendations at an early date. The fourteen Terms of Reference on which the High Powered Committee was required to give its report and recommendations were:

Whether and to what extent the hazardous wastes listed in Basel Convention have been banned by the Govt. and to examine which other hazardous wastes, other than listed in Basel Convention and Hazardous Wastes (Management and Handling) Rules, 1989, required banning.

To verify the present status of the units handling hazardous wastes imported for recycling or generating/recycling indigenous hazardous wastes on the basis of information provided by respective States/UTs and determine the status of implementation of Hazardous Wastes (Management and Handling) Rules, 1989 by various States/UTs and in the light of directions issued by the Supreme court.

What safeguards have been put in place to ensure that banned toxic/hazardous wastes are not allowed to be imported?

What are the changes required in the existing laws to regulate the functioning of units handling hazardous wastes and for protecting the people (including workers in the factory) from environmental hazards?

To assess the adequacy of the existing facilities for disposal of hazardous wastes in an environmentally sound manner and to make recommendations about the most suitable manner for disposal of hazardous wastes.

What is further required to be done to effectively prohibit, monitor and regulate the functioning of units handling hazardous wastes keeping in view the existing body of laws?

To make recommendations as to what should be the prerequisites for issuance of authorization/permission under Rule 5 and Rule 11 of the Hazardous Wastes (Management and Handling) Rules, 1989.

To identify the criteria for designation of areas for locating units handling hazardous wastes and waste disposal sites

To determine as to whether the authorization/permissions given by the State Boards for handling hazardous wastes are in accordance with Rule 5(4) and Rule 11 of hazardous waste Rules, 1989 and whether the decision of the State Pollution Control Boards (CPCBs) is based on any prescribed procedure or checklist.

To recommend a mechanism for publication for inventory at regular intervals giving area-wise information about the level and nature of hazardous wastes.

What should be the framework for reducing risks to environment and public health by stronger regulation and by promoting production methods and products which are ecologically friendly and thus reduce the production of toxics?

To consider any other related areas as the Committee may deem fit.

To examine the quantum and nature of hazardous waste stock lying at the docks/ports/Inland Container Depots(ICDs) and recommend a mechanism for its safe disposal or re-export to the original exporters

6.4 Compliances

Highlights of the order include certain compliances on the part of Ministry of Environment and Forests (MOEF) and other ministries of the Central Government, Central and State Pollution Control Boards and Pollution Control Committees. The highlights and compliances are summarized as under:

6.4.1 Ministry of Environment and Forests(MOEF)

6.5.1.1Inter-sectoral coordination

The MOEF is the focal point in the Government of India for all matters relating to the environment. The directions sought for by the petitioner to which MOEF has agreed shall be implemented in letter and spirit. The implementation wherever it is to be done by the MOEF, should be done forthwith and wherever it is required to be done by any other Ministry or Authority or Agency, the Nodal Ministry/MOEF shall ensure that it be so implemented.. As the Nodal Ministry, its first and foremost responsibility is to ensure coordination with all other Ministries that come into the picture. HPC discussions and studies show that there are major roles that have to be played by other Ministries as well.

For example:

All imported goods have to pass through Customs, which comes under the Ministry of Finance.

All matters relating to imports and exports are handled by the Ministry of Commerce under whom the Director General of Foreign Trade(DGFT) and Director General of Commercial Intelligence (DGCIS), both located in Calcutta, operate.

The need for employment generation, and consequently, matters relating to labour and industrial policy, industrial safety, occupations health hazards, compensation for disability/death are all matters dealt with by the Ministry of Labour.

A significant part of environmental pollution relates to water (both surface water and, particularly, groundwater); the Ministry of Water Resources is clearly involved.

Toxicological aspects of hazardous wastes like heavy metals, hormone disrupting chemicals and such other issues have to be dealt with by the Ministry of Health. Major research facility that comes under it is the Indian Council of Medical Research. Council of Scientific and Industrial Research (CSIR) and the Department of Biotechnology, on the other hand, comes under the Ministry of Science and Technology.

Ministry of Petroleum and Natural Gas is involved in respect of the oil sector while the Ministries of Railways, Defence and Surface Transport deal with matters relating to large scale use of battery systems and their disposal.

Ministry of Law is to be interacted on matters that relate to legislation, and extensively with the State Government in relation to implementation of laws, rules and regulations, and guidelines at grassroots level.

In case of any doubt or dispute, it would be the responsibility of MOEF to satisfy this Court. Further, the Ministry shall also develop a mechanism to ensure that wherever its directions are not implemented, necessary action shall be taken against those who are responsible for it. If any Inter-Ministerial consultation is required, the lead is to be taken by MOEF to see that such consultation takes place and effective measures are taken. The HPC believes that the principal role and responsibilities of the MOEF should be to inculcate the necessary concern and sense of urgency, and to ensure coordination amongst the various Ministries and State Governments on issues as they come up. Such coordination can be at the level of meetings taken by the Minister/Secretary who chairs Secretary-level inter-Departmental meetings.

6.4.1.2 Consideration for zero import of hazardous waste

The import of 29 items has been prohibited under Schedule-8 of the HW Rules as amended in May, 2003 while the Basel Convention has banned 76 items. The Ministry of Environment and Forests is required to examine the remaining items. It is implicit that if more items are banned, the corresponding Notification shall be issued by the Central Government under Section 11 of the Customs Act. Section 11 of the Customs Act, 1962 empowers the Central Government to prohibit either absolutely or subject to such conditions as may be specified in Notification the import and export of the goods if satisfied that it is necessary so to do for any of the purposes stated in sub-section (2). The Court directs that, in addition to 29 items, the MOEF will take into consideration what has been stated under heading 'A' (Imported Hazardous Waste which need to be included in the HWM Rules and ban of other Wastes) in the directions sought for by the petitioner on the basis of the recommendation of HPC. Further, the Ministry should also examine the question of banning used edible oil, cow dung, plastic scrap used PVC in any form, pet bottles etc. which, though not covered by Basel Convention, have hazardous impacts in terms of the HPC Report. According to the recommendations of HPC, these items also deserve to be banned. The Ministry shall also examine any other item which may have similar hazardous impact.

Another aspect that has been brought to the notice of the Court is the malpractice arising out of purported import of some permitted items. It appears that unscrupulous traders in the garb of importing used oil or furnace oil, in fact, import waste oil which is a banned item. They also Illegally import zinc wastes despite it being not permissible except in case where more than 65% of zinc can be recovered from the wastes. The Court is of the opinion that an enquiry should be conducted and appropriate action taken against concerned officer/officers of department responsible therein and, if necessary, a specific provision to that effect can be incorporated in Rules, wherever needed.

In regard to import of sludge oil under Marpol Convention the Court directed the Central Government to file an affidavit indicating in detail how the said oil is dealt with after import. It shall also be clarified in the affidavit whether such oil can, in the perception of the Central Government, be imported or it is only a technical import at the time of discharge of oil as suggested in the affidavit from MoEF dated 14th February, 2003.

6.4.1.3 Disposal of illegally imported wastes

It has been brought to the notice of the Court that 15 importers, whose names and addresses are known, illegally imported waste oil in 133 containers in the garb of lubricating oil. The HPC in its report (pp. 170-171) had noticed the presence of the consignment of this waste oil. On direction of the Court, the laboratory tests undertaken have shown the same as hazardous waste oil. By order dated 5th May, 1997, the Court directed that no import would be made or permitted by any authority or any person of any hazardous waste which is already banned under the Basel Convention or to be banned hereafter with effect from the date specified therein. The importers are directed to show cause why the consignment in question shall not be ordered to be re-exported or destroyed at their cost and why the amount spent on analysis in the laboratory (Rs.6.35 Lacs) be not recovered from them and why they should not be directed to make payment of compensation of Polluter Pays Principles and other action taken against them. The Ministry would be empowered to have assistance from Police/District Magistrate/Metropolitan Magistrate for affective service of notice on the importers

1. Awareness Creation

Another important role that the MOEF has to play is to create awareness in society and other stakeholders at large, and to ensure educational training programs. The latter should certainly cover those directly concerned with implementation programs, e.g. environmental scientist, officials etc.

6.4.1.5 Research and development initiatives

The MOEF also has a responsibility to ensure that research and development is conducted on scientific and technological aspects relating to this area. By and large, broad ranging and futuristic research has to be conducted with the support of the Central Government. It is unlikely that, in the present financial situation, any significant financial support will come from State Governments for this. The MOEF should also encourage industry and industrial associations to participate in research, particularly related to their specific areas of activity e.g. ETPs, CETPs, disposal facilities, clean and cleaner technologies, etc.

There can also be a cess levied on those industries dealing with hazardous material, which should be specifically earmarked for the promotion of research and development.

6.4.1.6 Sustainable development initiatives

The MOEF has to work closely with the Planning Commission in the area of sustainable development. The need for development programs to increase production, productivity and to create employment is well recognized. GDP growth, industrialization, energy production, exports are all part of this. However, this cannot be at the cost of present and the future in terms of quality of life for society as a whole. Industrial policy relating to what industries should be encouraged and permitted, the role of SMEs, issues relating to industrial estates (including their governance, facilities to be provided etc.), land use patterns, urban development and zoning and such other matters are of a general nature which call for over all national policy. These cannot be dealt with by any individual Ministry Department with concerns only for its limited area of responsibility. MOEF has the responsibility to put forward the environmental implications implicit in various policy options. The MOEF will be the focal point in the Government of India with regard to the international issues that arise in this area.

6.4.1.7 Testing Facility Creation

The MOEF must be encouraged to make use of the vast technical capabilities that exist in the country. This may be with CPCB, suitably strengthened and assigned necessary responsibilities. In addition, the State Pollution Control Boards must be equipped and staffed properly, as also laboratories coming under various scientific agencies in the country and in the private sector. The MOEF must ensure that adequate facilities are available at the gateway points in the country (e.g. Ports, ICDs, Customs areas) to make the first level measurements to aid decision-making; as also certified laboratories (whether these are in the public or the private sector) which can provide reports that are scientifically valid and credible. Increasingly, exports will have to be environmentally compliant suitably labeled and certified.

6.4.1.8 Location of Industrial Sites and Secured Landfills

The MoEF would consider the suggestion of HPC regarding development of National Policy for landfills sites. The suggestion is to the following effect:

In industrialized countries, the selection of sites for disposal facilities lies with the Government. In view of this, a national policy needs to be developed for locating such centralized/common TSDFs. The location of final disposal facilities should be based on the total quantity of hazardous waste generated in the individual State. For effective monitoring and an economically viable facility, it is important to locate a centralized facility within a distance of about 100 km. of the waste-generating units. Those States which generate less than 20,000 tons per year of hazardous waste may be permitted to have only temporary storage facilities and then transfer the waste to the final treatment and disposal facilities in the nearby State. It is not necessary and also not advisable to develop a facility in each and every district and/or State as land is a valuable natural resources.

6.4.1.9 National Policy Document on Hazardous Waste

MoEF is directed to either itself or through the CPCB or any other agency draft a policy document on hazardous waste generation and its handling within the country. While examining this aspect, the following recommendations of the HPC would be kept in view:

The policy document should emphasize a commitment to the recycling of wastes and propose incentives for encouraging and supporting recycling. Industries must be given a clear message that they must show concrete and tangible results as far as prevention and reduction of wastes are concerned. If they do not, they should be made to pay a waste generation tax. The policy document should enunciate a doctrine of partnership between SPCBs, entrepreneur and other stakeholders like the community, which will be involved in monitoring, preventing and reducing hazardous waste generation. The policy should review further growth of non-ferrous metallic waste, waste oil and used lead acid battery recycling in the SSI sector.

MoEF and Health Ministry shall examine and respond to the recommendations of HPC which read MoEF and Ministry of Health are required are to compile an extensive data regarding exposure and epidemiological studies (with special reference to endocrine disruptors). Directions may also be issued for centre of excellence for environmental health science and for existing institutes engaged in related activities. A network of R&D institutions, medical colleges and universities may also be created. MoEF should encourage the industries and their associations to participate in research activities concerning environmental health. These studies should be made public so that people could know about toxicity and its impact. A cess can be levied on the industries dealing with H.W., which should be specifically earmarked for promotion of R&D.

6.4.1.10 Implementation of Plastic Waste Recycling Rules, Battery Waste Recycling Rules, Draft Used Oil (Management and Handling) Rules.

MOEF is directed to ensure compliance of "Recycled Plastics, Plastics Manufacture and Usage Rules, 1999 and the "Batteries Management and Handling Rules, 2001". The Ministry shall issue directions to all Public Sector Institutions not to openly auction their hazardous wastes but only to those who are registered units having Environmentally Sound Technologies (EST).

MOEF has constituted a Standing Committee on hazardous waste to advise the Ministry on issues pertaining to hazardous waste and other related areas. The Terms of Reference of the said Committee are as follows:

a)Characterization of hazardous wastes:

Identification of hazardous waste and characterization of the constituents that would render such wastes hazardous.

b)Prohibition/restriction of hazardous wastes:-

Identification and listing of hazardous wastes of prohibition/restriction for exports/imports and handling of these wastes.

c)Environmentally sound technologies:-

Identification and list of environmentally sound technologies for reprocessing and recycling of wastes, treatment and disposal; and MOEF should consider making a provision for bank guarantee being given by importer while seeking permission to import used oil, furnace oil and zinc wastes to be released only on the imported consignment being found to be in conformity with the declared item of import.

6.4.2 Responsibilities of Ministries of Labour and Industry

The Court considered the suggestion of HPC under term of reference no. 4 relating to impact of hazardous waste on worker's health and directed the Ministry of Labour and Ministry of Industry to constitute a special committee to examine the matter and enumerate medical benefits which may be provided to the workers having regard to the occupational hazard as also keeping in view the question of health of the workers and the compensation which may have to be paid to them. The Court directed the Ministry of Labour and Ministry of Industry to constitute a special committee to examine the matter and enumerate medical benefits which may be provided to the workers having regard to the occupational hazard as also keeping in view the question of health of the workers and the compensation which may have to be paid to them. The Committee while examining the recommendations, shall also keep in view the judgment of this Court in Consumer Education and Research Centre Vs. Union of India (1995 (3) SCC 42).

6.4.3 Responsibilities of the Central Government

The Export and Import Policy (Exim Policy) issued from time to time, under the Foreign Trade (Development and Regulations) Act, 1992, inter alia, sets out the goods, import whereof is prohibited. We direct the Central Government that the said policy shall also correspond with the Hazardous Waste Rules, as amended from time to time, which means that if import of any item is prohibited under Hazardous Waste Rules, it shall be reflected in the prevalent Exim Policy.

For design and setting up of disposal facility as provided in Rule 8-A of HW (M&H) Rules, the criteria for Hazardous Waste Landfills published by CPCB in February, 2001 and the Manual for Design, Construction & Quality Control of Liners and Covers for Hazardous Waste Landfills published in December 2002 shall be followed and adhered to. 89 sites were identified out of which 30 were notified. Out of 30, 11 common landfills are ready and operational - one in Maharashtra, one in Andhra Pradesh and nine in Gujarat and that some of these landfills are in accordance with the Criteria and Manual aforesaid. The steps are being taken to expedite the completion of the remaining landfills. With this development in view, steps should be taken towards shifting of hazardous waste from wherever it is permissible to these landfills. The transport of hazardous waste would be in accordance with Rule 7 and the Guidelines issued by

Under Article 9 the HPC has recommended that in order to deter any trans boundary movement of hazardous wastes or other wastes, i.e. illegal traffic, the national/domestic legislation shall be enacted/amended appropriately to prevent and punish illegal traffic. The Government is directed to examine the aspect and file a report.

6.4.4 Responsibility of Central Pollution Control Board , SPCBs and PCCs

All SPCBs/PCCs are required to implement the directions that may be issued by the Ministry of Environment and Forests (MoEF).

The SPCBs are directed to produce a comprehensive report on illegal hazardous waste dump sites in their jurisdiction. Reports should be based on inspection, assessment of the size of the dump site, age, whether the dump site is passive or active and whether precautions have been taken to prevent damage to the environment. The SPCBs will and PCCs also take samples of the groundwater in the vicinity of the dump site at different point and prepare a report on contamination of the groundwater, if any, and if so, to what extent.

The SPCBs and PCCs are directed to draw up a plan with financial estimates for immediate measures that may be required to stop environmental damage. A full scale rehabilitation should also be prepared, together with detailed estimate of costs. All these reports will be sent to the CPCB.

The CPCB shall issue guidelines to be followed by all concerned including SPCBs and PCCs and the operators of disposal sites for the proper functioning and upkeep of the said sites.

SPCBs and PCCs are directed to close forthwith those units which are functioning without valid authorization issued under the HWM Rules. The authorization for any unit should not be issued or renewed until the occupier undertakes that they have a programme in place to reduce the volume or quantity and toxicity of hazardous wastes to the degree determined by them to be economically

practicable and that the proposed method of treatment, storage and disposal is the most practicable method currently available to them which minimizes the present and future threat to human health and environment.

Further, for effective implementation of the directions and to regulate the hazardous waste, it is necessary to strengthen the SPCBs and CPCB by providing them the requisite infrastructure and manpower so that they can issue the necessary guidelines to monitor the handling of hazardous wastes as suggested under Terms of Reference.

Particular care must be taken to prevent industries that use our Indian soil for processing of products and commodities of which production has been banned in other industrial countries. Units which propose to engage in this activity should not be permitted or licensed under any circumstances. The Rules should effectively prevent this. It is not enough to protect the country form the import of hazardous wastes; one should also look carefully at the import of those industries that will generate problematic hazardous wastes. The import of industries or product must be carefully screened in order to avoid dirty technologies and products, and the CPCB should do research on this so that the relocation of these industries from industrialized countries to India is effectively thwarted and technology transfer does not turn into hazardous transfer. The research done in this regard should be communicated by the CPCB to the SPCBs to form part of their decision-making process regarding absence of consents and authorizations. After research, if necessary, CPCB shall take up the matter with the MOEF for requisite regulatory measure.

The HPC has observed that incineration is the most important treatment method for the destruction of all high calorific and highly toxic wastes. High temperature incineration at 1200 degree Celsius mineralizes (breaks down into basis non-toxic components) all kinds of organic matter. Destruction efficiencies of effectively 99.99% of toxic compounds with no generation of persistent organic pollutants (as products of incomplete combustion) should be prima criteria for design of such disposal systems. It has further observed that in addition, while designing the disposal system, relevant operating parameters for example temperature, residence time and turbulence should be considered. On inspection it was bound by HPC that barring a few, most of the incinerators are mere combustion chambers or industrial boilers where the maximum temperature is around 500oC, which is much too low. Often they are not equipped with adequate air pollution control devices and all types of wastes, including non-chlorinated with chlorinated hydrocarbons, being burnt. There seems to be an urgent need to develop the design criteria for incinerators to safeguard the environments so as to have proper and efficient working of incinerators close to the place of generation of hazardous wastes. The design criteria is required to be set by the CPCB which is now ready in the form of a draft report.

Inventory

The Court directs that toxic inventory prepared by SPCBs regarding the generation of hazardous wastes, after its verification by CPCB shall be filed to this Court so that order for its conversion into National

Toxic Inventory can be passed. The inventorization is in progress and the information is provided in the Action Taken Reports (ATRs) submitted by the SPCBs and PCCs to the CPCB.

Dump sites

The Toxic inventory with regard to hazardous waste dump sites in different States should be prepared by SPCBs and PCCs and after verification by CPCB, shall be filed in this Court so that the orders can be passed on the same being treated as Authenticated National Inventory on hazardous waste dump site.

Steps before clearance

Before clearance of any hazardous wastes imported to India the Port and Customs authorities would ensure that the consignment in question corresponds with the details of authenticated copy of Form 7 sent by the country of export. CPCB, for a period of two year, would be empowered to monitor the import of hazardous waste, which means, it would be empowered to undertake random check from time to time as a safeguard.

Testing

The testing procedure and criteria evolved or which may be evolved by CPCB shall be followed by the concerned laboratories.

Directions to be issued regarding collection and transportation of used oil from different sources to be sold and recycled by registered refiners with requisite undertaking from refineries.

6.5 Public Participation and Third Party Audit

It has been recommended that public participation should be secured in the management of environment pollution and hazardous waste to maximum possible extent. Suggestions given in these regards are as under:

Selected local residents should be appointed as wardens for environmental surveillance, particularly to take note of illegal dumping of hazardous wastes.

Access to public records with the environment protection authorities should be freely allowed to the public, as the right to a healthy environment has been defined as part of the Right to Life under Article 21 of the Constitution.

Relevant important information should be displayed on notice boards and newspapers and communicated through radio, television and the Internet. The HPC would like to see all industries, involved in hazardous chemicals and the generating hazardous wastes display on-line date outside the factory gate, on quantity and nature of hazardous chemicals being used in the plant, as well as water and air emissions and solids wastes generated within the factory premises. If such date is not made available, the unit should be asked to show cause or even be asked to close down.

Informers and "whistle-blowers" within industry, who provide information, should be protected and strict confidentiality about them maintained. Third-party audit of hazardous wastes, where the audit team includes members of the community, should be made a routine practice.

6.6 Hazardous waste from ship breaking

Ship breaking activity grew into a full-fledged industry by 1979, when Govt. of India recognized it as a manufacturing industry. Now it has been recognized as a manufacturing process as per Central Excise and Sales Act, also. The ship braking activities are carried out at various coasts of the county; however, the main center lies on the West Coast at Alang, Gujarat. The geography of Alang makes it ideal for ship breaking. The beach is low and tides are as high as 10 meters. During low tide, the sea recedes by three km. The industry was set up in Alang in 1982, By 1990, over 100 ships started landing in Alang each year. In 1996-97, the industry scrapped a record 348 ships. The annual turnover of the industry stands at Rs 6,000 crore. The profit margins in the ship breaking industry are huge and big-time contractors make unbelievable profits.

On an average 200 ships per year are being cut at the Alang Ship Breaking Yard. The ship breaking industry is generating re-rollable steel scrap, directly used by the re-rolling industries at the down streams. At present, ship-breaking industry is producing around 2 million tones of re-rollable steel per annum. During the process of ship breaking, pollutants like oil, paint-chips, debris, rubber & plastics insulating materials, thermocole, glass wool, asbestos, etc. find their way to marine / terrestrial eco-system. Also some times the ships contain unidentified matters and toxic chemicals like paints / components, lead, heavy metals, poly-chlorinated byphenyls (PCB), asbestos, tin etc. Water pollutants, generated during ship breaking, result in change in water quality and marine eco-system especially in inter-tidal zone. The open burning of solid wastes including hazardous wastes, becomes a potential source of air pollution.

The accidental death rate reported at ship breaking yard is high. The reasons of death are gas leakage, explosions, inadequate safely measures during cutting, breaking and other operations.

The Court did not suggest discontinuing of ship breaking activity but noted that it deserves to be strictly and properly regulated. When the ship arrives at a port for breaking, the concerned authorities have to be vigilant about the hazardous waste which may be generated if appropriate timely action by various agencies, in particular, Maritime Board and the SPCB are not taken. The major ship breaking activity in India is at Alang in State of Gujarat and, therefore, Gujarat Maritime Board and Gujarat SPCB have to be alive to the consequences of the appropriate steps to be taken before the breaking activities start. According to the recommendation of HPC, the Inter Ministerial Committee comprising Ministry of Surface Transport, Ministry of Steel, Ministry of Labour and Ministry of Environment should be constituted with the involvement of Labour and Environment organizations and representatives of the ship breaking Industries

The Court has accepted the following recommendations of HPC:

Before a ship arrives at port, it should have proper consent from the concerned authority or the State Maritime Board, stating that it does not contain any hazardous waste or radioactive substances.

The ship should be properly decontaminated by the ship owner prior to the breaking. This should be ensured by the SPCBs.

Disposal of waste material, viz. oil, cotton, dead cargo of inorganic material like hydrated/solidified elements, thermocole pieces, glass wool, rubber, broken tiles, etc. should be done in a proper manner, utilizing technologies that meet the criteria of an effective destruction efficiently of 99.9 per cent, with no generation of persistent organic pollutants, and complete containment of all gaseous, liquid and solid residues for analysis and, if needed, reprocessing. Such disposed of material should be kept at a specified place earmarked for this purpose. Special care must be taken in the handling of asbestos wastes, and total quantities of such waste should be made known to the concerned authorities. The Gujarat Pollution Control Board should authorize appropriate final disposal of asbestos waste.

The ship breaking industries should be given authorization under Rule 5 of the H.W. Rules, 2003, only if they have provisions for disposal of the waste in environmentally sound manner. All authorization should be renewed only if an industry has facilities for disposal of waste in environmentally sound manner.

The State Maritime Board should insist that all quantities of waste oil, sludge and other similar mineral oils and paints chips are carefully removed from the ship and taken immediately to areas outside the beach, for safe disposal.

There should be immediate ban of burning of any material whether hazardous or non-hazardous on the beach.

The concerned State Pollution Control Board(s) be directed to close all units which are not authorized under the HW Rules.

That the plots where no activities are being currently conducted should not be allowed to commence any fresh ship breaking activity unless they have necessary authorization.

The Gujarat PCBs should ensure continuous monitoring of ambient air and noise level as per the standards fixed. The Gujarat PCBs be further directed to install proper equipment and infrastructure for analysis to enable it to conduct first level inspection of hazardous material, radio-active substances (wherever applicable).

The Gujarat SPCB will ensure compliance of the new Gujarat Maritime Board (Prevention of Fire & Accidents for Safety & Welfare of Workers and Protection of the Environment during Ship breaking Activities) Regulations, 2000, and should submit a compliance report to the Court.

The Notification issued by GMB in 2001 on Gas Free for Hot Work, should be made mandatory and no ship should be given a beaching permission unless this certificates is shown. Any explosion irrespective of the possession of certification should be dealt sternly and the license of the plot holder should be cancelled and Explosives inspector should be prosecuted accordingly for giving false certificate.

A complete inventory of hazardous waste on board of ship should be made mandatory for the ship owner. Breaking permission should not be granted without such an inventory. This inventory should also be submitted by the GMB to concerned SPCBs to ensure safe disposal of hazardous and toxics wastes.

Gujarat Maritime Board and Gujarat SPCB officers should visit sites at regular intervals so that the plot owners knows that these institutions are an Inter-Ministerial Committee comprising Ministry of Surface Transport, Ministry of Steel, Ministry of Labour and Ministry of Environment should be constituted with the involvement of labour and environment organizations and representatives of the ship breaking industry.

The SPCBs along with the State Maritime Board should prepare land fill sites and incinerators as per the CPCB guidelines and only after prior approval of the CPCB. This action should be taken in a time bound manner. The maximum time allowed should be one year.

At the international level, India should participate in international meetings on ship breaking at the level of the International Maritime Organisation and the Basel Convention's Technical Working Group with a clear mandate for the decontamination of ships of their hazardous substances such as asbestos, waste oil, gas and PCBs prior to exports to India for breaking. Participation should include from Central and State level.

That the above conditions also apply to other ship breaking activities in other Coastal States, if practiced.

6.7 Constitution of the Supreme Court Monitoring Committee

It appears from the HPC Report that about 80% of country's hazardous waste is generated in the State of Maharashtra, Gujarat, Tamil Nadu and Andhra Pradesh. This may also show good industrial growth in those States. In order to ensure that the generation of hazardous waste is minimum and it is properly handled in every State including the aforesaid States, in particular, it is necessary to appoint a Monitoring Committee to oversee the compliance of law, directions of this Court and Rules and Regulations.

The Court, therefore, constituted a Monitoring Committee comprising of the following members as also Dr. Claude Alvares, NGO and Dr. D.B. Boralkar, now the Member Secretary of the Maharashtra Pollution Control Board. This Committee shall oversee that the direction of this Court are implemented timely. It would also oversee that the aspects to which the Ministry has agreed are implemented in letter and spirit and without any laxity or delay in the matter. It would be open to the Monitoring Committee to co-opt a representative of the State Government or State Pollution Control Boards or any other person or authority as the Committee may deem fit and proper. The Monitoring Committee shall file quarterly reports in this Court.

6.0 Priorities in Hazardous Waste Management

Ranking of options in Hazardous Wastes Management follows the widely accepted hierarchical preference for waste management in general. Accordingly, waste avoidance and minimization ranks the highest followed by recycling and safe disposal of waste generated.

6.1 Waste Avoidance and Waste Minimization

Given the difficulties in handling of hazardous wastes and the serious adverse impacts that result from improper management of such wastes, waste avoidance and minimization gather added significance. Unlike other sectors of industrial activity, it is necessary to have a closer look at processes generating hazardous wastes rather than leave technological options entirely to the entrepreneur. Such an assessment of the avenues for waste avoidance/minimization would naturally be industry-specific and product-specific.

On priority, it would be necessary to identify industry sectors which continue to adopt out-dated and highly polluting technology generating significant quantities of hazardous wastes. For example the paper and pulp industry which continues with elemental chlorine based bleaching whereas there has been a major shift the world over to elemental chlorine-free bleaching. Similarly, the conversion of mercury cell based caustic soda manufacturing to membrane cell process would need to be expedited. Economic incentives, wherever needed for switch-over to cleaner production processes, would need to be provided to offset additional financial burden and make such switch-over a financially attractive option.

The entire chemical industry would need to be studied through industry specific assessments on cleaner technology options leading to waste avoidance / minimization and resource recovery. Within the chemical industry group, major segments such as pesticides and pesticide intermediates, dyes and dye intermediates as well as bulk drugs and intermediates would require special focus. In these industry categories, wherever laboratory scale demonstrations have been completed as in the case of H-acid manufacture wherein suitability of catalytic hydrogenation has been well established, pilot plants would need to be set up to enable speedier adoption by the industry. In cases wherein techno-economic feasibility of cleaner production process has been well established and already adopted by some units such as adoption of cyanide-free electroplating, a dialogue should be started forthwith with the concerned industry associations for switch-over within a specified time period.

In the petrochemicals, pesticides and dyes and dye intermediates sectors, product-wise opportunities available for recovery of resources such as solvents, other reagents and by-products as well as re-generation of spent catalysts have been well documented. This exercise needs to be followed up by setting up dedicated task forces under the guidance of concerned CSIR laboratories and such task forces

could serve as an inter-face between industry associations and CSIR laboratories to carry the work forward for actual application in field conditions.

6.2 Recycling of Hazardous Waste

Recycling of non-ferrous metallic wastes such as zinc dross, brass dross, used lead acid batteries, copper oxide mill scale and used lubricating oil offer attractive options for resource recovery in an environmentally sound and techno-economically feasible manner. Current gap between demand and supply of lead, zinc and copper as well as the projected widening of the gap due to rapid growth in demand arising from the automobiles sector etc. serve as added incentives for re-cycling. As compared to primary production of metals, re-cycling is energy efficient and environment friendly subject to a careful selection processing technology and disposal of wastes generated.

At present, there are about 200 recyclers of non-ferrous metallic wastes/waste oil who are registered under the HWM Rules. Registrations have been granted based on their possessing facilities for environmentally sound re-processing and suitable facilities for disposal of wastes generated. However, but for a few exceptions, almost the entire recycling takes place in the small scale sector. As such, there are serious limitations on technology upgradation which would be necessary to ensure that re-processing is done as per guidelines evolved by the Basel Convention.

In order to promote technology upgradation, it would be necessary to make a distinction between re-processors with State-of-the-art facilities which meet the Basel Convention guidelines and those that do not. The current import regime would need to be re-examined to give access to imports of non-ferrous metallic wastes to only State-of-the-art facilities from a prospective date. In fact, such Units could also be given preferential access to wastes generated within the country. Need for other economic incentives would also need to be considered to offset additional burden arising from enhanced capital investment and recurring expenditure on pollution control and waste disposal.

While the traditional approach to pollution control in India has been to stipulate industry-specific standards and leave the choice of technology to the entrepreneur, a break from convention was made in the case of used oil re-processing and technology upgradation was legally mandated from a prospective date. Such an approach would need to be examined for its usefulness and relevance in re-cycling of non-ferrous metallic wastes as well.

Despite the registration scheme for recyclers, the menace of recycling in the unorganised sector with all its attendant environmental and health hazards still continues. This underscores the importance of channelisation of wastes generated. While the battery Rules, 2000 mandate return of used lead acid batteries, compliance remains unsatisfactory. It would be necessary to look into the causes thereof and devise suitable economic incentives such as advance recycling tax which is suitably structured to provide adequate incentive for the battery users to return used batteries to authorize dealers. Simultaneously, an organised drive would be necessary to break the nexus between scrap dealers, backyard smelters and those engaged in battery re-conditioning.

At present, there are no re-processing facilities in the country to recover toxic metals such as mercury from thermometers, tube-lights. and cadmium from batteries, etc. Considering the potential for serious health impacts posed by co-disposal of such hazardous wastes with municipal solid wastes, development of a system for channelisation of such wastes and development of re-processing facilities deserve to be accorded high priority.

6.3 Safe disposal of Hazardous Waste Generated

The third and the last option is to dispose of the hazardous waste safely. Depending on the waste category, land disposal or incineration could be adopted. Design and operation of such facilities, either captive or common need to strictly adhere to the guidelines. Supervision of such facilities during construction stage is of paramount importance. Common facilities should invariably be equipped with laboratory facilities to verify waste categorisation.

6.4 Setting up of Common Facilities

At present, there are 3 integrated Hazardous Waste Management facilities in the States of Andhra Pradesh and Maharashtra in addition to 11 common landfill facilities available in Gujarat. States are currently at various stages of planning their common facilities. Common facilities including integrated facilities have to be planned following the polluter-pays principle although at the initial stages a certain level of assistance from the State Governments could significantly accelerate the process of setting up of these facilities and also ensure their viability in the initial years which is vital. Currently, several State Governments have made available land at concessional rates for setting up of these facilities which are part of the state's industrial infra-structure on the lines of Common Effluent Treatment Plants. For economic viability of common facilities, waste assurance is undoubtedly the single most important factor. Considering the urgency to set up common facilities and also the imperative to make them viable given the dire consequences to human health and environment the absence of such facilities could lead to, setting up of common facilities calls for scientific planning backed by sound economic rationale.

Transportation costs could account for a significant portion of total treatment costs particularly in the case of landfillable wastes.

An integrated waste management facility should be designed to handle at least 1 lakh tonne / annum of hazardous wastes; such a facility should comprise of a secured landfill, intractable waste stores, incinerator, reuse/ recycling facility, laboratory capable of comprehensive analysis, arrangement for transportation and handling of wastes including supporting infrastructure. Such a facility should be permitted one per State (until interstate movement of hazardous waste comes into place).

1. The integrated facility as indicated above should have a Zone of coverage of 200 kms radius from the facility.

2. This facility should be located close to the major waste generation area.

3. Beyond the Zone of coverage (where transport cost plays a major role), smaller facilities (satellite facility) comprising only of a secured landfill including waste stabilization / solidification facility, laboratory capable of Finger Printing Analysis, Mechanized Transportation and Handling of Wastes and a transfer station should be established, where feasible.

4. These facilities should be linked with the integrated facility of the State for comprehensive analysis of wastes, storage of intractable wastes, incineration and such other services.

5. These transfer stations cum landfill facilities should be atleast 300 kms from each other and the integrated facility.

6. All liability for these facilities shall also rest with the integrated waste management facility.

7. After the first integrated facility reaches satisfactory level of capacity utilization (50% of estimated waste) further integrated facilities can be planned.

8. New bio-medical waste treatment facilities, both common and individual, should not be allowed within forty kms. of an integrated facility since bio-medical wastes can also be handled at the integrated facilities.

Interstate transportation of Hazardous Wastes

Interstate movement of hazardous wastes would be required when (a) landfillable waste generated by a State is less than the pre-determined level of say 20,000 MTA (b) for a company with units located in several states and wishing to incinerate wastes at one facility and (c) for incineration purposes when incinerable waste generation in a State is not adequate to support 3000 MTA of incineration. Facilities for landfilling / incineration should be set-up within one year.

In some of the States like Delhi, Kerala, Himachal Pradesh, Chandigarh and North East States etc., efforts for development of hazardous waste disposal facilities are still in progress. There are difficulties in identifying sites as the quantity of waste generation is low and is not viable for disposal by landfilling or availability of ground water table close to the surface of the ground or high annual rainfall or high transportation cost. Therefore, it is felt that in case of Delhi, Kerala, Himachal Pradesh, Chandigarh and North Eastern States etc., combined facility with neighboring state including inter-state movement is required due to various factors such as land availability and the amount of waste generated suitable for landfilling / incineration.

Based on mutual consultations between the State Boards including the system of differential rates to be charged for wastes coming from other States, interstate movement of hazardous wastes for the interim period (say one year) may be allowed for the Units in States where common facilities are yet to be developed.

For proper tracking of HW disposal in an environmentally sound manner followed the manifest system, 5% of disposal charges may be made available to concerned SPCBs / PCCs where the wastes are proposed to be disposed by the occupier/operator of a facility satellite facility.

SR.No	Activity	Status	Agency
1	Proposed change in the HW Rules, 1989 as amended in 2003	Completed	MoEF
2	Review of list "A" Schedule VIII Items in Basel Convention other than 29 banned items already include in the HW Rules, 2003	Completed	MoEF
3	Review of waste materials like used edible oil, cow dung, plastic scrap, used PVC in any form, PET bottles etc. which are required to be banned.	Under progress	MoEF
4	Directions regarding compliance of Recycled Plastics, Manufacture and	Completed	MoEF

	Usage Rules, 1999 and the Batteries (Management and Handling) Rules, 2001		
5	Directions to be issued regarding collection and transportation of used oil from different sources to be sold and recycled by registered refiners with requisite undertaking from refineries.	Issued	MoEF/CPCB
6	Closure directions to the units operating without any authorisation or in violation of conditions of operations issued under HW Rules, 1989 as amended	Complied with	SPCBs/PCCs
7	Directions to SPCBs/PCCs bringing to their notice the latest cleaner technology and requiring the said Boards/Committees to ensure compliance thereof by concerned units within the fixed time frame	Under progress	CPCB
8	Preparation and issuance of check-list and ensuring its compliance by SPCBs/PCCs	Completed	
9	Transportation of HWs (Preparation of Guidelines)	Completed	
10	Amendment in the Rules incorporating the principles of Article 9 of the BASEL Convention-Affidavit to be filed	Completed	
11	Upgradation of Laboratories at Port/Docks/ICDs (Gateways)	Under progress	MoEF/Nodal Ministries
12	Uniform Testing Procedure to be followed by the labs	Under progress	CPCB
13	Direction regarding display of relevant information on HW by concerned units	Under progress	SPCBs/PCCs
14	Awareness Programme in Media regarding HWs		MoEF/CPCB
15	Preparation of State/UT Inventories Re. HW generation by SPCBs/PCCs	Under progress	SPCBs/PCCs
16	Random check-up of the inventories by CPCB	Under progress	CPCB
17	Submission of the State/UT Inventories regarding HW generation before this Hon'ble Court for preparation of National Inventory	Under progress	CPCB/SPCBs/PCCs
18	Preparation of States/UT Inventories regarding Waste Dump Sites and rehabilitation Plan	Under progress	SPCBs/PCCs
19	Cross check by the CPCB and evaluation of the rehabilitation Plan	Under progress	CPCB
20	Submission of the said Inventory and Rehabilitation Plan before this Hon'ble Court	Under progress	CPCB/SPCBs/PCCs
21	Preparation and publication of National Inventory of HW generation and HW Dump Sites	Under progress	MoEF/CPCB
22	Fixing time frame for implementation of Rehabilitation Plan by SPCBs/PCCs	Under consideration	SPCBs/PCCs
23	National policy for landfill sites	Under progress	MoEF/CPCB
24	Guidelines for proper functioning and upkeep of disposal sites	Completed	CPCB
25	Guidelines of HW Incinerators	Completed	MoEF/CPCB
26	Institutional Reforms MoEF/CPCB/ SPCBs/PCCs	Under progress	MoEF/Nodal Ministries
27	National Policy Document on HW	Under progress	MoEF/CPCB
28	CPCB to do research and take up the matter with MoEF for requisite regulatory measures in regard to import of dirty technologies in industries - step to be taken	Under progress	MoEF/CPCB
29	Various directions with regard to ship-breaking	Under progress	MoEF/State Maritime Boards/SPCBs

6.6 Use of Cement Kilns for HW incineration

Incineration of high calorific value hazardous wastes in cement kilns is a safe alternative to conventional disposal in dedicated waste incinerators. Sludge from petrochemical, oil refinery and paint industries as well as spent solvent from pesticide industries are particularly suitable.

In the cement kilns, the high flame temperature of around 20000C and high material temperature of around 14000C and large residence time of around 4-5 seconds ensure complete combustion of all organic compounds. Acid gases formed during combustion are neutralised by the alkaline raw material. The non-combustible residue including heavy metals gets incorporated into clinker in an irreversible manner.

The spread of cement industry in India across the States makes this option particularly attractive in the Indian context. That about 250 cement works in Europe utilize about 3 million tons of hazardous wastes indicates the potential that this option holds for India given that in India we have over 200 cement kilns and the incinerable hazardous wastes generated is only about 0.2 MTs. Trial runs need to be taken up under close supervision to study suitability of this option under Indian conditions in all major HW generating States. A CPCB study reveals the potential of using combustible and high calorific value hazardous waste as fuel in cement kilns. For example, sectors like pesticides, paints, oil refineries, pharmaceuticals generate high calorific value hazardous waste that can be used as fuel in cement industry. Similar potential lies in using waste oil and used tyres. This goes to show that waste of one sector can be used as raw material in another.

6.7 Illegal Dumpsites and remediation

In the absence of common facilities, illegal and clandestine dumping of Hazardous Waste has been reported in many States. Even after waste disposal facilities have become operational in some States, the problem persists since illegal dumping helps avoid costs of transportation and disposal. To prevent the problem from growing out of proportions, surveillance, especially during night hours, both by enforcement agencies as well as industry associations should be made effective.

Rehabilitation of dumpsites should be based on scientific assessment of contamination of soil and groundwater and projected future damage based on modelling. The strategy for intervention, whether the focus should be on excavation of waste at site to the nearest TSDF and measures to prevent further spread of contamination through containment measures would suffice or whether site remediation should be taken up and, if so, the approach therefore, would vary from site to site depending on nature of pollutants, future damage potential and remediation costs and benefits thereof. In any case, the 'Polluter Pays' Principle has to be basis for cost-sharing unless it becomes impossible to identify the culprits through finger printing of contaminants and tracing the wastes back to the producer.

In cases where it becomes impossible to track down the polluters, a dedicated fund needs to be created at the State level to which mandatory contributions from all producers of hazardous wastes could be prescribed.

For removal of HW wastes from premises of units to the nearest TSDF, the individual producers should also be levied a fine for indiscriminate disposal within premises in violation of conditions of authorisation for secured on-site storage for a temporary period.

The problem of hazardous wastes and chemicals lying in units which have been closed should also be tackled strictly based on the 'Polluter-Pays' Principle.

7.0 Custom & Laboratory Strengthening

Customs play an important role in regulating import of hazardous wastes into the country. Cases of illegal imports of hazardous wastes have clearly indicated the need to plug existing loopholes. Priority areas for action include training of customs staff engaged in inspection as well as sampling and also upgradation of customs labs.

Appraisers carrying out inspection of goods received and having discretion to pick up samples need to be trained to pick up representative samples to achieve the best results. In addition to sampling techniques, assessors should be made aware of current hazardous wastes regulations, documentation requirements etc. Equally important is the need to upgrade laboratory facilities at all major ports of entry. Difficulties faced recently by customs authorities in distinguishing between used oil and waste oil serves as a case in point to identify the gaps. Lack of laboratory facilities for analysis of trace organics such as PCBs could either result in holding up of supplies for long periods of time merely on grounds of suspicion or lead to illegal imports of waste oil under the garb of used oil. As a first step, a thorough assessment of laboratory facilities available at all the ports, in particular, facilities available both in terms of equipment and trained man-power and equipment for analysis of all important heavy metals and trace organics, should be taken up and a time-bound plan prepared for their up gradation. Till such time all the ports are upgraded both in terms of equipment and training of laboratory personnel,, it would be necessary to consider channelisation of all hazardous wastes through selected ports well equipped to handle them and for this purpose, ports may be categorised suitably. As an interim measure, outsourcing of laboratory related work to laboratories recognised under the EP Act in respect of all relevant parameters may be considered.

Synchronising Customs categorisation of wastes with amendments in the Hazardous Wastes Rules should be made automatic so that the customs lists need not be amended every time there is a change in the lists of various waste categories in the HW Rules. Incidentally, this would also help in eliminating the time gap between amendments in the HW Rules and the Customs waste lists which causes avoidable

confusion. Harmonisation of custom codes with the international system as amended from time to time should also be accorded high priority.

8.0 Disposal of date expired and banned pesticides

There are significant quantities of date expired pesticides lying in various States and concerned departments are looking for safe disposal. The options available are (i) to reprocess wherever possible by the industry who has supplied earlier; (ii) to appropriately incinerate either through dedicated incinerators of individual industries or through available with common integrated facilities. In order to deal with such hazardous wastes, interstate transportation should be permitted by the concerned State Governments and also disposal in a facility as per above said options available.

9.0 Conclusions

The industry driven economy of India's has resulted in hazardous waste problems, which are difficult to manage in an environmentally friendly manner. The non-enforcement of 'Polluter Pays' principle, continuation of import of hazardous wastes despite the ban, absence of proper infrastructure viz. centralized disposal facilities and lack of technical and financial resources have led to the unscientific disposal of hazardous wastes posing serious threat to human, animal and plant life. A High Power Committee (HPC) on hazardous waste management, constituted by the Hon'ble Supreme Court of India in 1997, made similar observation and conclude that the hazardous wastes situation in India is fairly grim. Thus, there is an urgent need for formulating proper hazardous waste management strategies, implementation of hazardous wastes management regulations and establishment of proper hazardous waste treatment and disposal facilities (HWTDF) for controlling the unscientific disposal of hazardous wastes This is now being done in accordance with the order of the Supreme Court which was issued on October 14, 2003 under the supervision of the Supreme Court Monitoring Committee.