

# **Hazardous Waste Management - Policy and Implementation: *The Indian Experience***

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## **Framework of Policy and Regulation in India**

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- **The 42<sup>nd</sup> amendment of India's Constitution (1976) underscored the importance of "green thinking".**
- **Article 48A**  
**"The state to protect and improve the environment and safeguard the forests and wild life in the country".**
- **Article 51A(g)**  
**"Fundamental duty of every citizen is to protect and improve the natural environment including forests, lakes, rivers, and wildlife and to have compassion for living creatures".**

# Acts & Regulations

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- **"Water Act" of 1974 and the subsequent amendments**
- **"Air Act" of 1981 and the subsequent amendments**
- **Ministry of Environment and Forests (MoEF). . . . . and the SDoEFs**
- **Central Pollution Control Board (CPCB) . . . . . and the SPCBs**
- **Minimal National Standards (*i.e.* MINAS) a certain kind of equity amongst the similar industries**
- **"Environment Protection Act", 1986**

# Regulations for Haz Wastes & Haz Chemicals

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- **Manufacture, Storage, and Import of Hazardous Chemicals Rules, November 1989**
- **Rules on Hazardous Micro-organisms / Genetically Engineered Organisms or Cells, December 1989**
- **Hazardous Waste Management and Handling Rules, December 1989**
- **18 categories of toxic, flammable, reactive, and corrosive wastes, in solid, sludge as well as fluid phases**
- ***For example: Waste Category No. 15 addressed pesticides and herbicides and their residues and intermediates (regulatory quantities: over 5 kg/yr cumulative).***
- **The rules provided so called "cradle to grave" guidelines for generators, transporters, operators of disposal facilities, and the state governments regarding monitoring**

# **Categorisation of Hazardous Wastes**

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**Frame Work # 1:**

**Use of Hazardous Substances for Categorisation**

- **Substances or combinations of substance intended for the purpose of defoliating plants or for the preventing destroying, repelling or mitigating of insects, fungi, weeds, rodents or predatory animals,**
- **Discarded useless or unwanted radioactive material, but excluding materials produced by a nuclear installation,**

- **Industrial manufacturing, trade or business residues if classified to be environmentally hazardous by the environmental quality commission after notices and public hearing, and**
- **Container and receptacles used in the transport, storage, use or application of substances in 1, 2, and 3.**

## **Frame Work # 2:**

### **Use of Source of Generation**

- **The source of generation is broadly classified sector wise into Commerce and Agriculture, Small Scale Industry, and Large Scale Industry.**
- **Each sector is then sub classified into the source and the hazardous waste generated from each source.**
- **The next two frame works namely the EPA framework and the Indian Approach framework have taken care of the drawbacks in this approach and gone in for an hybrid approach.**

### **Frame Work # 3:**

#### **Hybrid Approach of EPA for Categorisation**

- **Exhibits characteristics of ignitability, corrosivity, reactivity, and/or toxicity**
- **Is a non-specific source waste (generic waste from industrial processes)**
- **Is a specific source waste (from specific industries)**
- **Is a specific commercial chemical product or intermediate**
- **Is a mixture containing a listed hazardous waste**
- **Is a substance that is not excluded from regulation under the Resource Conservation and Recovery Act, Subtitle C.**

**As can be clearly seen the EPA uses a hybrid approach for the categorisation of hazardous wastes.**

**It not only categorises waste depending on its properties but also from the source of generation (both from specific industry as well as from different unit processes of various industries), specific listing of wastes, and specific products whose use could lead to hazardous wastes.**

## **Frame Work # 4:**

### **The Indian Approach of 'Listing the Categories'**

- **The Indian approach of 'Listing the Categories' is an hybrid approach and is a very powerful tool in the hands of the regulator.**
- **In the Indian Approach of 'Listing the Categories', candidate waste streams are reviewed by source and segregated into hazardous and non-hazardous categories. Those deemed to be hazardous are then so designated generically.**

## **Categorisation of Hazardous Wastes (continued)**

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- **Schedule appended to the “Hazardous Waste Management and Handling Rules (S.O. 594 (E) dated 28<sup>th</sup> July, 1989)” vide rules 3(i), 3(n), and 4 entitled “Categories of Hazardous Waste**
- **If the quantity is above the specified amount the waste is designated ‘hazardous’.**
- **Considering the Indian context, this approach is useful from a regulator point of view as it is easy and less time consuming exercise, cost effective, uses less resources, needs less man power and expertise.**

# **HWM&H Amendment Rules, 2000**

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**Clearly, something was not right and the HWM&H Rules of 1989 were not implemented for more or less 10 years!**

**On January 8, 1999, the MoEF invited objections from persons likely to be affected within a period of 60 days with regards to the intention of Govt to amend HW&M Rules of 1989.**

**Total 48 objections and responses were received by the committee chaired by Dr. Sivarama National Chemical Laboratory, Pune and were truly considered by the committee.**

**Subsequently, the HWM&H Amendment Rules were notified on January 6, 2000.**

# **Broader Definition of “Hazardous Waste”**

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**Schedule-1 lists 44 processes generating hazardous wastes along with a detailed sub-listing of the potential waste streams (totally 127).**

**Further, Schedule-2 lists 79 sub-classes of waste substances divided into five classes based on concentration limit of the pollutant (Classes A to E having limits of 50, 5000, 20000, 50000 mg/kg, and regardless of limit, respectively).**

**In addition to the above schedules, the term “hazardous waste” has also been defined in the context of import and export of waste substances as describe in rules 12, 13, and 14 of the HWM&H Amendment Rules of 2000.**

**Part-A of Schedule-3 lists importable and exportable wastes (List “A” & ”B”) and Part-B of the Schedule lists the hazardous characteristics.**

**It is important to note that, the amendment now permits import of waste substances (listed in Part-A of Schedule-3) for the purpose of reuse and recycle only when the waste does not have characteristics listed in Part-B of Schedule-3.**

**Clearly, some new matrixes will now be taken in the fold of HW regulation.**

**Disposable parts such as filter cartridges, filter cloths, air filters, ion exchange resins, molecular sieves, spent catalysts, etc are also categorically covered under new listing although the production of these matrixes may strictly be a periodic, need based, and episodic in nature.**

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**In the HWM&H Rules of 1989, there was a room for ambiguous interpretation of “Category 12: ETP sludges” because majority of chemical and manufacturing units have oil and grease, trace metals, toxic organics, and spent chemicals mixed into the process water; which precisely is the reason why they established ETP. Thus, sludges generated by ETP in many instances were included across the board in hazardous waste inventorisation.**




***What is the applicability of Part B of Schedule 3 for the wastes that are not to be “imported”?***

# **Responsibilities of Occupier and Operator of a Waste Management Facility**

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**Earlier the occupier was held responsible for handling of the wastes and (in the event of occupier being different from operator of waste management facility) the responsibility of occupier was limited to providing all the necessary and factual information to the operator.**

**In the context of new amendments, however, the occupier and operator are held responsible jointly as well as individually for lawful transportation, treatment, storage, and disposal of a given hazardous waste.**


** *What are the liabilities of the generator who contracts with a commercial TSDF (or a CTSDf) for the services of treatment, storage, and disposal?***

# Grant of Authorisation

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In rule 5, now SPCB is expected to process authorisation application for disposal of hazardous waste within 90 days. Also, the fee of Rs. 7,500/- has been stipulated and the authorisation period has been extended from two years to five years.


The newly introduced sub-rule (8) links renewal of authorisation granted under sub-rule (6) with the steps taken by occupier or operator of the facility for **REDUCTION** in the waste generated or recycle or reused.

 *It appears that preventive environmental management in the production plant is likely to be adopted by only those occupiers who operate in-house waste disposal facilities. However, sub-rule (8) does not provide a regulatory mechanism for encouraging generator of waste to go for cleaner production, waste minimisation, recycle, and reuse if the occupier gives the responsibilities of treatment and disposal to a commercial operator.*

# The Manifest System

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In rule 7, new sub rules (3 to 5) have been added to address issue of labelling and chain of custody protocol via a well articulated “manifest system”. The proposed modification appears to “complete the loop so as to keep generator as well as regulator completely informed about generation to disposal.

 *It appears that this excellent system can work meaningfully only when there exists sufficient laboratories to analyse the waste on one hand and all the role players (occupier, transporter and TSDF operator) are trained and clear about the objectives of the manifest system.*

# Identification of Disposal Sites

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One of the most important modifications to the old rules is related to placing the responsibility for identification of disposal sites on the shoulders of the occupier, industrial associations or proponent of Common Treatment, Storage, and Disposal Facility (CTSDF) as well as the State Government.

As per the HWM&H Rules of 1989, this responsibility was entirely assigned to the State Governments and their delays/inability has been argued as a major reason for lack of disposal infrastructure all over the country.

One other strength of the amended rule 8 happens to be the detailed protocol outline for notification of disposal sites. Figure 1 shows the steps for notification for disposal sites as describes in Rule 8, sub-rule (2 to7).

# **Some Sticky Issues !**

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-  ***What is preliminary EIA? It is not clear if they mean “Rapid EIA”.***
-  ***If state is going to be one of the role players even now in identification/selection of disposal site; what is the guarantee that this amendment will result in faster notification of sites?***
-  ***How would a project proponent for CTSDF and occupier desires to start a captive TSDF facility be treated?***
-  ***Do they existing state laws allow acquisition of land by private/government TSDF facilities? Projects like roads, dams, bridges, airports, railways area normally allowed to acquire the land for “larger public good”. What about waste disposal projects?***


# Designing and Setting-up of Disposal Facility

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Stepwise protocol for designing TSDF as per Rules 8A and 8B have been given in Figure 2.

Even the closure and post closure activity should now be detailed right at the design stage!

 ***Are there any states that have (or thinking of having) their own “TSDF design guidelines”?***

 ***What is the plan for capacity building in CPCB/SPCBs (to say checking and approval design submitted by consultant or operator or to say monitor during setting up or operation of facility)?***

# **Import, Export, and Trans-boundary Transport of HW**

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**Rule 11 of the HWM&H Rules, 1989 has been amended and now categorically states that “Import of hazardous waste from any country to India and export of hazardous waste from India to any country for dumping or disposal shall not be permitted”.**

**Rules 12, 13, and 14 are the new addition in the amendment which are included to streamline and systematise import of waste substances for the purpose of recycle and reuse. These rules also mention the responsibilities of the importer of wastes as well as the responsibility of exporting party/country.**

**Further, rule 15 has been added in the amendment to address the requirement under the Basel convention regarding illegal trans-boundary transport of hazardous waste.**

# **Illegal Traffic of HW**

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**Rule 15 has been newly introduced to address the movement of HW from or to India.**

**In case of illegal movement the provision is made to ship the waste back to the exporter or exporting country within 30 days or the waste shall be disposed off within 30 days from the date off-loading.**

# **Impossible to Get Reliable Statistics !!**

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**A variety of agencies and trade promotion councils have been interested in counting the generation rates of hazardous waste at state as well as national level in India for quite some time. All their efforts were at best sketchy because no reliable data were forthcoming from the SPCBs, CPCB or from the MoEF.**

## **The PIL in the SC of India**

**An international organization, Greenpeace, first drew attention to the import of hazardous wastes into India in violation of the Basel Convention.**

**Later, the *Research Foundation for Science, Technology and Natural Research Policy* filed its public interest petition alleging that such illegal imports of hazardous wastes were continuing.**

**It was only after the intervention of the Honorable Supreme Court (SC) of India that the High Powered Committee (HPC) was set up in late 1997.**

**Even the data submitted to the HPC underwent *metamorphosis* as follows!**

**The Secretary, MoEF, informed the Court on 5<sup>th</sup> May 1997 that the total quantum of hazardous waste generated in the country is about 0.7 million TPA.**

**In January, 2000, the HPC was informed that the total quantum of hazardous wastes generated was 9 million TPA**

**{see Table 1 published in Chandrasekharan [2000]}.**

**In February, 2000, the figure was brought down to 8 million TPA.**

**The HPC conducted a survey by sending questionnaires to all the SPCBs. Table-2 gives the state-wise status of number of units generating waste as well as quantity of waste generated in wastes types like recyclable, incinerable and disposable [HPC Report, volume II, Annexure 7, 2000]. This time the waste was 4.4 million TPA!!**

## **Statistics** *[Source: HPC Report, 2000]*

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**Out of 4.42 million tonnes of hazardous waste generated in the country every year, 1.69 million tonnes is recyclable, 0.19 million tonnes is incinerable and 2.53 million tonnes is destined for land disposal.**

**The latest position (as on March 2000) in respect of enforcement of the Rules is summarized below in Tables 3 and 4 [HPC Report, volume II, Annexure 7, 2000].**

**Of the 524 districts in 21 states for which data are available, 373 districts have units, which generate hazardous waste, and these districts have 13,011 units generating hazardous wastes.**

**Of the 13,011 units generating hazardous waste 11,138 units have been granted authorization. 478 units have been granted authorization for incineration, 9,186 for storage, 3,822 for land disposal and 2,325 for other disposal options.**

**In compliance of the Supreme Court order of 5<sup>th</sup> May, 1997, 374 units were closed and directions were issued to 86 by the respective States.**

**There are 116 incinerators in the country and 12-engineered land fills all of them in Gujarat. 89 sites have been identified in various states to set up disposal facilities of which 30 sites have been notified.**

**Till 1997, there was not a single Secured Landfill Facility available in the country to dispose off the hazardous waste. As on today, a very few centralised hazardous waste disposal facilities exist in India and most of them are in Gujarat State.**

**Andhra Pradesh, Maharashtra, Uttar Pradesh and Tamil Nadu are in the process of developing such centralised treatment and disposal facilities.**

**In some of the states, the process of identification and development of centralised TSDF has been delayed due to public protests and litigation.**

**At many places, the sites have been identified and notified by the *State Governments* but could not be developed due to lack of infrastructure facilities like the agency for development and paucity of funds.**

# **Assessment of Status of HWM in India**

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**The HPC Report [2000] has expressed their critical opinion on the present status of HWM in India in a rather dissatisfied and disheartened tone. Some of their salient conclusions are as follows:**

**Failure in implementation of HWM&H Rules, 1989 has made the Indian situation fairly grim!**

**No State Government appears to have understood the gravity of the situation relating to permanent and secured disposal sites for hazardous waste. Valuable time has been lost in the process. This has set the clock back considerably in this area.**

**Presently, in most states, work on the identification of waste-disposal sites is still in a preliminary stage. Clearly, the State Governments have failed in their duty to locate and identify hazardous waste-disposal sites as required under the Rules.**

**The majority of the authorizations granted for disposal of hazardous wastes by the SPCBs were for temporary storage of hazardous waste. In many cases, however, the temporary storages have become permanent!**

**Some states do not have approved centralized engineered landfill facility for disposal of HW, still they claim for nonexistence of illegal sites in their state (e.g. Madhya Pradesh and Karnataka).**

**Many State Governments have not taken up the development of disposal sites with any degree of seriousness (e.g. Delhi, Punjab, Uttar Pradesh, West Bengal, Tamil Nadu, Karnataka, Madhya Pradesh, Orissa and Rajasthan).**

**No time limits have been given either for locating or constructing landfills. The design of the few existing landfill facilities varies from State to State and consultant to consultant. This is because there are no standards provided in the legislation.**

**Few industrial units were enlightened enough to provide secured on-site facilities within the boundaries of their properties. As a result, illegal dumpsites are a source of continuing air and water pollution.**

**Several unauthorized units (e.g. lead reprocessing units) are still working, which do not have adequate facilities for processing of HW and must be closed immediately.**

**Statutory authorization disgruntled the public because of lack of response to public complaints.**

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**Lack of policy and vision at the highest level is a matter of serious concern!**

**The MoEF has made no concerted or consistent efforts—which necessarily had to be of a promotional, educational and coordinating nature—to ensure implementation of the HWM&H Rules, 1989.**

**They have apparently only passed the law and made no other efforts!**

## **Disclaimer**

*Please note that the opinions expressed in this manuscript are of the author and not of the IIT-Bombay or Indian Environmental Association (IEA) or National Solid Waste Association of India (NSWAI).*

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*The author takes full responsibility of mistakes and misinterpretation of the Indian Policies, Laws, the HWM&H Rules of 1989 as well as the HWM&H Amendment Rules of 2000 appearing in*

**Thank you!!**