Salient Features on Management of Wastes Included in the PWM ,SWM, & HWM Rules 2016

Dr. Anoop Chaturvedi, SSA

CPCB, Regional Directorate

Bhopal

Environmental Statues

1. Water (Prevention and Control of Pollution) Act, 1974
2. Water (Prevention and Control of Pollution) Cess Act, 1977
3. Air (Prevention and Control of Pollution) Act, 1981
4. **Environment (Protection) Act, 1986**
   - The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 replaced by Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008
   - The Coastal Regulation Zone Notification, 1991
   - The Chemical Accidents (Emergency, Planning, Preparedness, and Response) Rules, 1996
   - The Biomedical Waste Management Rules, 2016
   - Recycled Plastic manufacture and uses (Amendment) Rules, 2003
   - The Plastics waste Management Rules, 2016
   - The Solid Wastes Management Rules, 2016
   - The Hazardous & Other Waste Management Rules 2016
   - The Batteries (Management and Handling) Rules, 2001.
   - The Noise Pollution (Regulation and Control) (Amendment) Rules, 2000

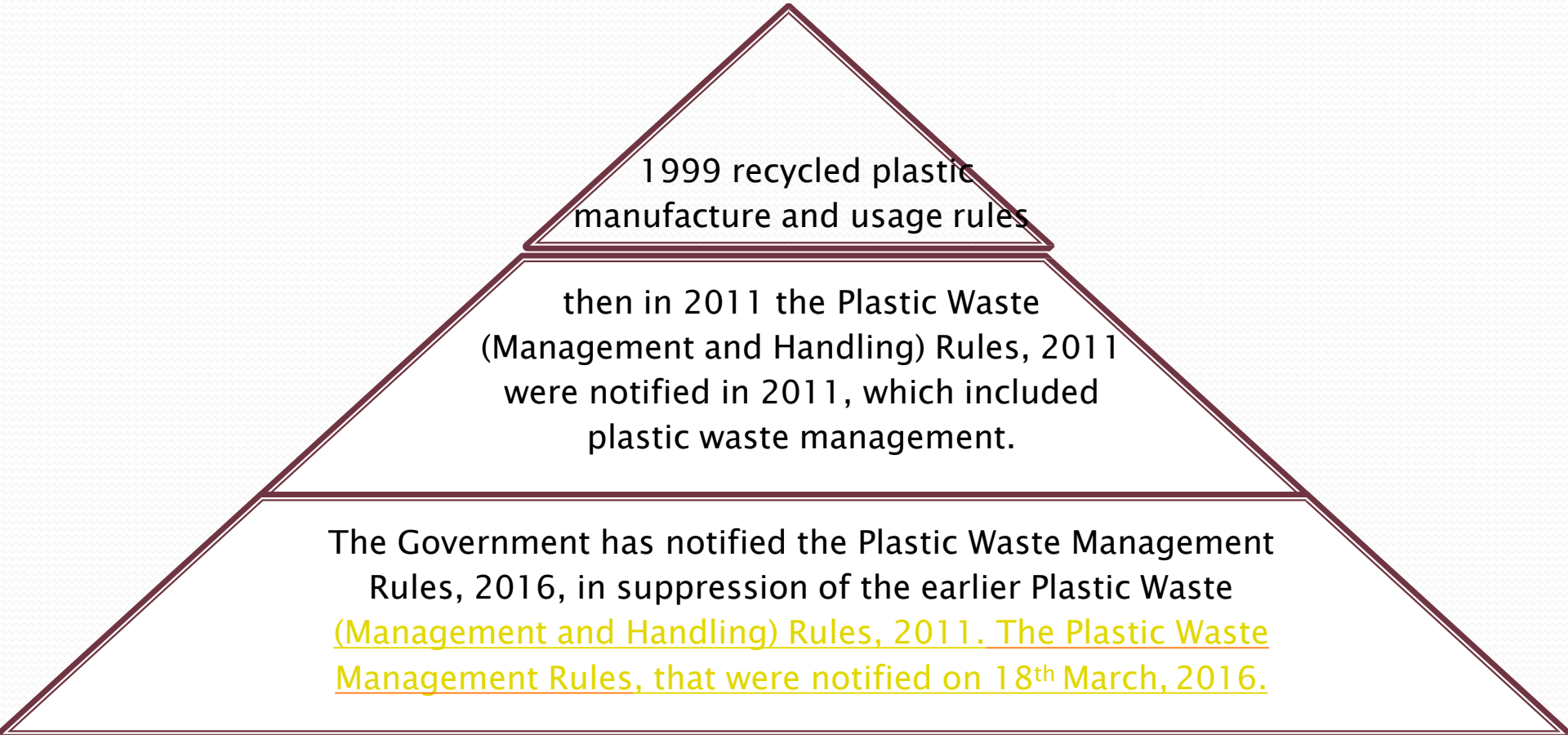
Functions of CPCB

- Advise the Central Government on any matter concerning the prevention and control of water and air pollution;
- Development of standards, Prepare manuals, codes and guidelines
- Coordinate the activities of the State Boards and resolve disputes among them;
- Provide technical assistance and guidance to the State Boards, carry out and sponsor investigation & research relating to problems of water & air pollution and for their prevention, control or abatement;
- Planing and organize trainings

Plastic Waste (Management and Handling) Rules, 2016

Introduction and Development of PWMR Rules:

The indiscriminate disposal of plastic has become a major threat to the environment. In particular, the plastic carry bags are the biggest contributors of littered waste and every year, millions of plastic bags end up in to the environment vis-a-vis soil, water bodies, water courses, etc.



Plastic Waste (management and handling)Rules,2016

Plastic

means material which contains as an essential ingredient a high polymer : polyethylene terephthalate, high density polyethylene, Vinyl, low density polyethylene ,polypropylene

Plastic waste

Discarded plastic

After intended use is over

Waste manage ment

the collection, storage, transportation reduction, re-use, recovery, recycling, composting disposal

PLASTIC WASTE MANAGEMNT RULES 2016- What's New ?

- Minimum thickness of Plastic carry bags increased from 40-50 Microns.
- Responsibility of local bodies and gram panchayat.
- Responsibility of Waste generator.
- Collect back system and extended producer's liability.
- Responsibility of retailers and streetvendors.
- Registration of shopkeepers and streetvendors.

Rule.2
APPLICATION OF PWMR,2016

(1)These rules shall apply to every

- Waste Generator
- Local body,
- Gram Panchayat,
- manufacturer,
- Importers and producer.

(2) The rule 4 shall not applyto

the **export oriented units** or units in **special economic zones**, notified by the Central Government, manufacturing their products against an order for export: Provide this exemption shall not apply to units engaged in packaging of gutkha, tobacco and pan masala and also to any surplus or rejects, left over products and the like.

Rule:03 DEFINITIONS

- **Brand owner**
- **Carry bags**
- **Extended producer's responsibility**
- **Institutional waste generator**
- **Multilayered packaging**
- **Plastic**
- **Prescribed authority**
- **Waste management .....**

Rule 4: Conditions

- Natural Shade
- Recycled Plastic not to be used for packaging of edibles.
- Thickness of plastic shall be not less than 50 Microns.
- Plastic sheet forming part of integral packaging shall be not less than 50 Microns.
- Only Registered Producer to be provided Raw material.
- Plastic Sachets not be used for packaging Gutka, Pan masala, Tobacco

Rule 5: Plastic waste management:

The plastic waste management by the urban local bodies shall be as under

1. Plastic waste → Recycle → Plastic waste recycler

2. Local bodies → Encourage use of non recyclable plastic → For road construction

3. Thermo set plastic → Processed and disposed → Guidelines issued by CPCB

4. Inert from recycling or processing → Disposed of → Compliance with solid waste managemnt rules,2000

Rule 6: Responsibility of local body

- Ensuring segregation, collection, storage, transportation, processing and disposal of plastic waste;
- Ensuring that no damage is caused to the environment during this process;
- Ensuring channelization of recyclable plastic waste fraction to recyclers;
- Ensuring processing and disposal on non-recyclable fraction of plastic waste in accordance with the guidelines issued by the CPCB;
- Creating awareness among all stakeholders about their responsibilities;
- Engaging civil societies or groups working with waste pickers;
- Ensuring that open burning of plastic waste does not take place.

Rule7. Responsibility of Gram Panchayat.-

(1) Every gram panchayat either on its own or by engaging an agency shall set up, operationalize and co-ordinate for waste management in the rural area under their control and for performing the associated functions, namely,-

(a) ensuring segregation, collection, storage, transportation, plastic waste and channelization of recyclable plastic waste fraction to recyclers having valid registration; ensuring that no damage is caused to the environment during this process;

(b) creating awareness among all stakeholders about their responsibilities; and

(c) ensuring that open burning of plastic waste does not take place.

Rule8. Responsibility of waste generator

1.Waste generator shall minimize generation of plastic waste and segregate Not litter plastic waste and handover segregated plastic waste – local bodies

2. All institutional waste generator shall segregate and store in accordance with municipal solid waste management rules

3.All waste generator shall pay user fee.

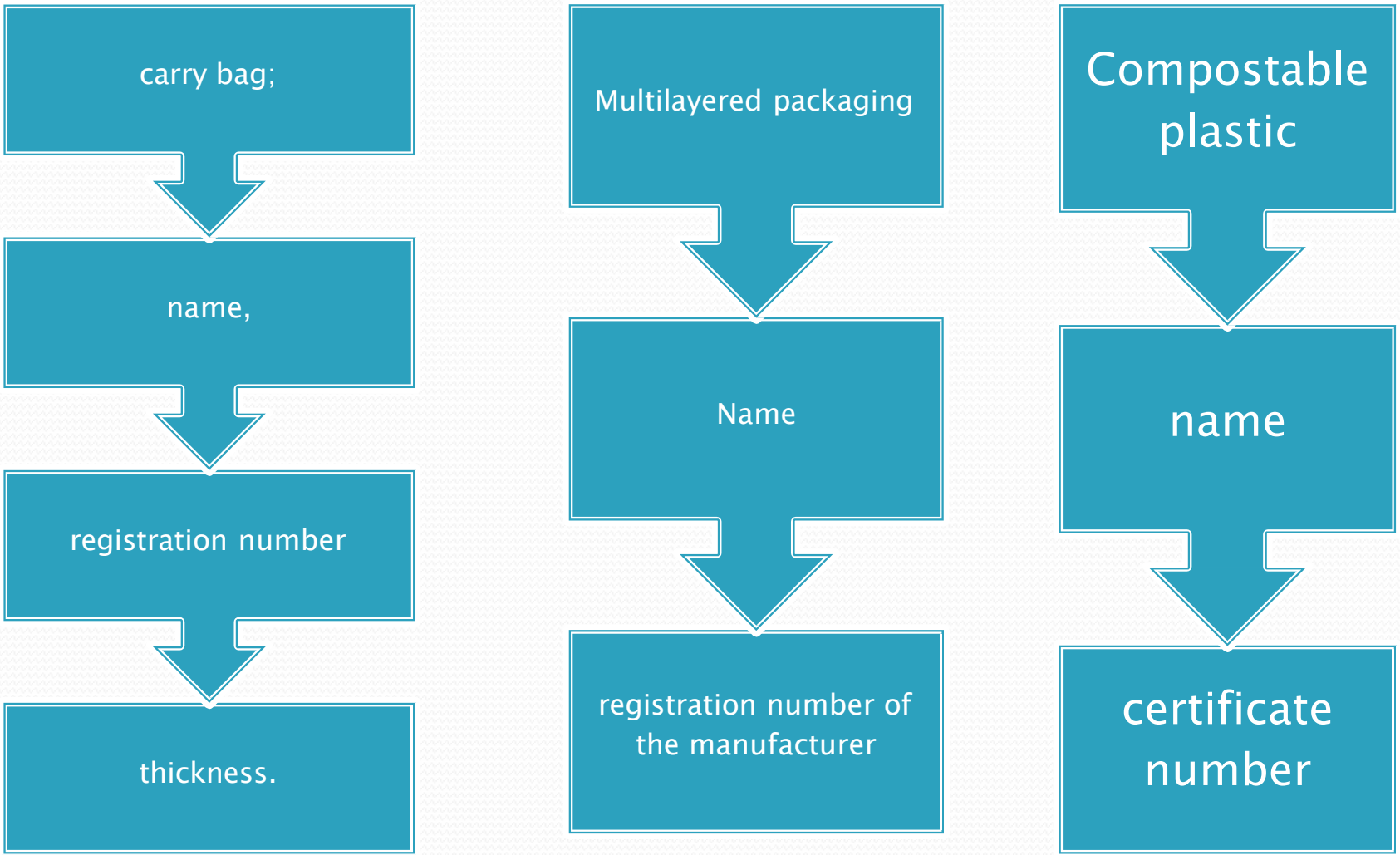
4.Every person responsible for organising an event in open space, which involves service of food stuff in plastic or multilayered packaging shall segregate and manage the waste generated during such event.

Rule 9. Responsibility of producers, Importers and Brand Owners

Producer	Within 6 months(from date of publication of rules)	Shall work out for waste collection system based on EPR
Producers , Importers and Brand owners	Responsible to collect back sachets or pouches	Plan of collection to be submitted to SPCB
Manufacturing and use of	Non recyclable multi-layered plastic	To be phased out in 2 years

Rule 11. Marking or labeling-

(1) Each plastic carry bag and multilayered packaging shall have the following information printed in English namely,-



Rule 12. Prescribed Authority

State Pollution control board and pollution control committee	Enforcement of provisions for registration,manufacturing of plastic products,processing and disposal	Union Territory
Secretary in-charge of uraban development	Enforcemnt of provisons relating to waste managemnt by waste generators	State and union territory
Concerned gram panchayat	Provisons relating to waste managemnt by waste generator	Rural area (state or Union)

Rule 13. Registration of producer, recyclers and manufacturer

(1) No person shall manufacture carry bags or recycle plastic bags or multi-layered packaging

unless he has obtained a REGISTRATION

From SPCB or pollution control committee

(2) Every producer shall,

For REGISTRATION Or RENEWAL of Registration

make an application to the SPCB or the Pollution Control Committee

(3) Every person recycling or processing waste or proposing to recycle or process plastic waste

for REGISTRATION or RENEWAL of registration for the recycling unit,

shall make an application to SPCB or the Pollution Control Committee.

Rule 14. Responsibility of retailers and street vendors-

Retailers or street vendors shall not sell or provide commodities to consumer in carry bags or plastic sheet or multi-layered packaging, which are not manufactured and labelled or marked, as per prescribed under these rules.

(2) Every retailers or street vendors selling or providing commodities in, plastic carry bags or multilayered packaging or plastic sheets or like or covers made of plastic sheets which are not manufactured or labelled or marked in accordance with these rules shall be liable to pay such fines as specified under the bye-laws of the local bodies.

Rule 15. Explicit pricing of carry bags

(1) The shopkeepers and street vendors willing to provide plastic carry bags for dispensing any commodity shall register with local body. The local body shall, within a period of **six months** shall make provisions for such registration on payment of a minimum fees of Rs. **48,000 i.e. Rs. 4000 p.m. as plastic waste management fees.**

(2) Only the registered shopkeepers or street vendors shall be eligible to provide plastic carry bags for dispensing the commodities.

(3) The local body shall utilize the amount paid by the customers for the carry bags exclusively for the sustainability of the waste management system within their jurisdictions.

Rule 16 : State Level Monitoring Committee

- The State government or the union Territory shall, for the purpose of effective monitoring of implementation of these rules,

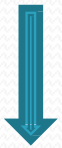
- The State Level Advisory Body shall meet at least once in Six Month and may invite experts, if it considers necessary.

Rule 17. Annual reports-

.

EVERY PERSON(engaged in recycling or processing)

Local body(under intimation to SPCB)



State pollution control board, pollution control committee

Central pollution control board

Central Government

Present management practices

- Recycling
- RDF
- Road construction
- Landfill

Solid Waste Management Rules 2016

Waste management hierarchy has been introduced as follows:

- Prevention
- Minimization
- Reuse
- Recycling
- Recovery, utilisation including co-processing
- Safe disposal

Salient Features of Regulations on Solid Waste Management

- Jurisdiction extended
- emphasises source segregation, reuse, recycle and recovery
- enable local bodies to collect 'User Fee' and levy 'Spot Fine',
- separate regime of disposal of diapers and sanitary napkins;
- Bulk generators to have composting
- promotion of city compost marketing;
- enable bringing policy on waste to energy;
- integration of Rag pickers, Kabadiwallas and Self Help Groups etc. in waste collection system;
- SEZ to earmark at least 5% of the total area of the plot or minimum 5 plots/ sheds for recovery and recycling facility.

Duties of Waste Generator

- Segregate waste into three separate streams namely bio-degrad able, non bio-degradable and domestic hazardous wastes in suit able bins and handover segregated wastes to authorized rag-pickers or waste collectors
- Generator will have to pay 'User Fee' to waste collector and for 'Spot Fine' for Littering and Non-segregation

Duties of Waste Generator

* No person shall organize an event or gathering of more than 100 persons at any unlicensed place without intimating the local authority, at least three working days in advance. Such person or the organizer of such event shall ensure segregation of waste at source and handing over of waste to waste collector or agency as specified by local authority.

* Bulk and institutional generators, market associations, event organizers and hotels and restaurants have been made directly responsible for segregation and sorting the waste and manage in partnership with local bodies

* The developers of Special Economic Zone, Industrial Estate, Industrial park to earmark at least 5% of the total area of the plot or minimum 5 plots/ sheds for recovery and recycling facility.

Collection and disposal of Sanitary Waste

- Shallwrap securely the used sanitary waste like diapers, sanitary pads etc., in the pouches provided by the manufacturers or brand owners of these products or in a suitable wrapping material and shall place the same in the bin meant for dry waste / non- bio-degradable waste

- The brand owners of sanitary items shall educate the masses and also provide wrapping material for disposal of their products.

* The manufacturers or Brand owners of disposable products such as tin, glass, plastics packaging etc. shall provide necessary financial assistance to local authorities for establishment of waste management system.

Duties of Ministry of Urban Development

- MoUD shall formulate National Policy and Strategy on Solid Waste Management including policy on Waste to Energy in consultation with stake holders
- Review the measures taken by the States and local bodies,
- Undertake training and capacity building of local bodies ;
- The national policy on SWM, will be guiding tool for the States/local authorities in SWM.
- Providing technical guidelines and project finance to States, UTs and local bodies on solid waste management to facilitate meeting timelines and standards.

Duties of Ministry of Fertlizers, Government of India

Shall provide market development assistance on city compost and ensure promotion of co-marketing of compost with chemical fertilizers in the ratio of 3 to bags: 6 to 7 bags by the fertilizer companies to the extent compost is made available for marketing to the companies.

- Duties of Ministry of Agriculture, Government of India.

The Ministry of Agriculture shall provide flexibility in Fertiliser Control Order for manufacturing and sale of compost , propagate utilisation of compost on farm land set up laboratories to test quality of compost produced by local authorities or their authorized agencies and issue

- suitable guidelines for maintaining the quality of compost and ratio of use of compost visa-a-vis chemical fertilizers while applying compost to farmland.

Duties of the Ministry of Power

Ministry of Power shall fix tariff or charges for the power generated from the Waste to Energy plants based on solid waste and ensure compulsory purchase of power generated from such Waste to Energy plants by DISCOMs

Ministry of New & renewable Energy

* The Ministry of New and Renewable Energy Sources shall facilitate infrastructure creation for Waste to Energy plants and provide appropriate subsidy or incentives for such Waste to Energy plants.
* Non recyclable waste having calorific value of 1500 K/cal/kg or more shall not be disposed of on landfills and shall only be utilized for generating energy either or through refuse
- derived fuel or by giving away as feed stock for preparing refuse derived fuel.

Duties of Secretary-Incharge,State Urban Development Department

* Shall prepare a state policy on solid waste management within a year

*Ensure identification and allocation of suitable land for setting up processing and disposal facilities for solid wastes within one year and incorporate them in the master plan

*Notify buffer zone for the solid waste processing and disposal facilities of more than 5 tons per day in consultation with the SPCB

*Start a scheme on registration of waste pickers and waste dealers

Duties of Urban Local Body

* Prepare a solid waste management plan as per State Policy within six months

*Arrange for door to door collection of segregated solid waste;

*Establish waste deposition centre/s for domestic hazardous waste and ensure safe storage and transportation of the domestic hazardous waste to the hazardous waste disposal facility or as may be directed by the state pollution control board/ committee

*Integrate rag pickers/informal waste collectors in solid waste

Duties of Urban Local Body

* All industrial units using fuel and located within 100 km from solid waste based RDF plant shall make arrangements within six months from the date of notification of these rules to replace at least 5 % of their fuel requirement by RDF so produced

Hon'ble NGT Direction- 28 points in Almitra.H.Patel case

* Every state & UT shall enforce SWM, 2016 without any further delay
* State Governments shall prepare action plan within four week and take steps for time bound implementation
* State will comply within six months w.e.f 1st January, 2017
* If the State or UT violates this provision, action may be taken as per E (P) act and are liable to pay environmental compensation
* All departments shall work in co-ordination

Present management practices

- Composting
- RDF
- Landfill

Hazardous and other wastes (Management and Trans boundary Movement) Rules, 2016

Background of Rule....

- Environment (Protection) Act, 1986
- Hazardous Wastes (Management and Handling) Rules, 1989
- Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008.
- Draft Hazardous and Other Wastes (Management and Transboundary Movement) Rules were published in July, 2015 inviting suggestions and objections. 473 suggestions/ objections were received from Government organisations, institutions and private individuals.
- **Hazardous and other wastes (Management and Transboundary Movement) Rules, 2016) – notified on 4th April, 2016**

Structure of Hazardous and Other Wastes Rules, 2016

- **Total 6 Chapters; 8 Schedules and 12 Forms;**

The Chapters includes information related to important definitions, responsibilities of various stakeholders, provision for Import & Export , Storage, Disposal and Transport etc.

The Schedules includes information related to processes generating, waste constituents, Characteristics, authorities and corresponding duties, documents for verification by Customs, commonly recyclable hazardous wastes, Specifications of Used Oil and waste oil etc.

The Forms includes information related to grant/renewal of authorization, maintaining records, Application for import or export, Application for recovery or co-processing etc.

- “The new Hazardous Waste Rules will ensure resource recovery and disposal of hazardous waste in environmentally sound manner.
- Rules have been made to distinguish between Hazardous Waste and Other wastes. Other wastes include:

  Waste tyre, paper waste, metal scrap, used electronic items, etc. and are recognized as a resource for recycling and reuse. These resources supplement the industrial processes and reduce the load on the virgin resource of the country.

The salient features of H and OW (M &TM) Rules, 2016 :-

- The ambit of the Rules has been expanded by including 'Other Waste'
- Waste Management hierarchy in the sequence of priority of prevention, minimization, reuse, recycling, recovery, co-processing; and safe disposal has been incorporated
- All the forms under the rules for permission, import/export, filing of annual returns, transportation, etc. have been revised significantly,
- The basic necessity of infrastructure to safeguard the health and environment from waste processing industry has been prescribed SOPs

salient features .....

- Co-processing as preferential mechanism over disposal for use of waste as supplementary resource, or for recovery of energy has been provided.
- The approval process for co-processing of hazardous waste to recover energy has been streamlined and put on emission norms basis rather than on trial basis.
- The process of import/export of waste under the Rules has been streamlined by simplifying the document-based procedure and by revising the list of waste regulated for import/export.
- The import of metal scrap, paper waste and various categories of electrical and electronic equipments for re-use purposehas been exempted from the need of obtaining Ministry's permission.

salient features .....

- Responsibilities of State Government for environmentally sound management of hazardous and other wastes have been introduced as follows:

  Toset up/ allot industrial space or sheds for recycling, pre-processing and other utilization of hazardous or other waste

  To register the workers involved in recycling, pre-processing and other utilization activities.

  To form groups of workers to facilitate setting up such facilities;

  To undertake industrial skill development activities and ensure safety and health of workers.

salient features .....

- State Government is authorized to prepare integrated plan for effective implementation of these provisions, and have to submit annual report to Ministry of Environment, Forest and Climate Change.

- In new Rules it is preferable to utilise such waste through recycling, or for resource recovery to avoid disposal through landfill or incineration.

Hazardous Waste Generation in States/UTs

- Gujarat (about 29%), Maharashtra (about 25%) and Andhra Pradesh (about 9%) are the top three HW generating States.
- Chhattisgarh (about 5%), Rajasthan, West Bengal and Tamil Nadu (about 4 %)

These seven States together, are generating about 75 % of country's total hazardous waste.

Major Amendments compared to earlier Rules

• Title of the Rules has been amended as Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

• Major Amendments made in following areas
– Authorization / Renewal of authorization (introduced new forms, compliance, verification report , Emergency Response Plans and undertaking for submitting bank guarantee)
– New Schedule-II for identification of HW
– Utilization of Hazardous waste includes Schedule IV wastes also.
– SoPs for recycling/utilization introduced
– Pass books applicable for all actual users
– Removal of Registration scheme
– Responsibilities of State Government
– Revised Import-Export provisions (Banned items 49 from 30; more clarity)
– Filing of Annual Reports by SPCBs & CPCB

Present management practice

- Co-incineration
- Co-processing
- Resource Recovery
- TSDF (Incineration or landfill)

Co-processing in Cement, TPPs and Iron & Steel Industries in Central Zone

- Most of the 17 category and red category of industries generates huge quantity of solid and Hazardous wastes

- Treatment given : SLF and incineration
  - Disposal in SLF/ low-lying areas is a temporary solution.
  - Incineration is not resource recovery system

- Treatment and Disposal of wastes becomes more expensive therefore co-incineration/ co-processing is the best option to resource recover from wastes.

Type of wastes to be co-processed

1. Mineral waste : Containing Ca, Al, Si, Fe etc,

- Used as secondary raw materials or
- As additives (slag, fly ash, synthetic gypsum etc),

2. Calorific waste: Used tyres, used oils, spent solvents, biomass, RDF, Paint sludge etc,

- Used as a substitute to fossil fuels,
- Reduces fuel cost
- Solves waste problem
- Reduces overall CO_2 emissions

Co-processing of waste materials will provides

- Energy,
- Materials recovery,
- Replacement of traditional raw materials,
- Reduces the exploitation of natural resources

Benefits of co-processing

- Avoid land disposal or incineration of wastes
- Avoid investment on developing TSDF
- Avoid future liability for wastes disposal and associated problems
- Gain Environmentally responsible image
- Act as a good steward of resources.

WASTE MATERIALS

Being used in cement kilns	Possibility to be Explored for following wastes in cement kilns
❖ Used tires	❖ Red mud
❖ Paint sludge	❖ Jarosite & Jarofix
❖ RDF & MSW (Plastic waste)	❖ Brine Sludge
❖ Oil sludge	❖ CETPs sludge
❖ Textile industry ETP Sludge	❖ SPL
❖ Agricultural residue and organic waste	❖ Dolochar
❖ Waste oils	❖ Wastes stored in captive SLF (20 nos.)
❖ Spent solvents.	
❖ Tar residue	
❖ ISF slag	
❖ Incinerable wastes from TSDF	
❖ Marble slurry	

- With the existing knowledge, co-processing of waste in Cement kiln initiated in India in 2006.
- Wastes like ETP sludge, Paint sludge, Refinery sludge, Tyre Chips, Plastic Waste, Tar Waste, Spent Solvent, Blended Liquid Waste are being co-processed in Cement Kiln
- Due to the heterogeneity of waste, pre-processing is required to produce a relatively uniform waste stream for co-processing in cement kilns. This waste stream should comply with the technical and administrative requirements of cement manufacture and guarantee that environmental standards are met

Co-processing in Cement Industries..

cement manufacture can consume significant quantities of wastes as fuel and non-fuel raw materials because :

- Maximum temperatures of approximately 2,000°
- Gas retention times of about 8 seconds
- Oxidising gas atmosphere in rotary kilns
- Uniform burnout conditions
- Sorption of gaseous components such as HF, HCl, and SO_2 on alkaline reactants;
- reduction of CO_2 emissions
- Destruction of organic pollutants because of high temperatures

Co-processing Iron & steel industry

Iron ore, coal/ coke, lime stone and dolomite are used as raw material in steel industries. Possibility of replacement of coal with hazardous waste in this process is less as compare to others because ash generation which further needs proper disposal. RDF, Tyre chips and biomass based fuels are the limited options to replace coal in sponge iron industries. Use of hazardous waste as AFR can be more justified in Cement plants as compare to steel industries.

Substitution of waste in place of raw materials in Sponge Iron Plant

Dolomite --- with Hydrated lime/ lime sludge

Coal --- with RDF, TBS, Tyre chips, Plastic and other waste which contain CV.

Iron ore --- wastes containing iron like jarosite, steel pickling plants ETP sludge etc

Issues :

- Kiln corrosion due to acidic gases,
- Neutral medium,
- Controlled conditions,
- APCDs/ emergency cap,
- Less temperature when compared with Cement kiln,

Co-processing in Thermal Power Plant:

The maximum temperature in the boiler or firing zone of thermal power plant is about 800°C to 950°C with retention time of 2 to 4 seconds. According to thermal power plant professional use of HW blended/ used with coal results formation of acidic gases which may damage the boiler tubes and corrode the inner-linings of the ESP/Bag house. Hence RDF, rice husk, mustard husk, soya husk and other similar CV wastes are only the limited options for replacing coal.

Thermal Power Plants

- AFBC and CFBC boilers
- Captive power plants
- High calorific value wastes
- Substitution of fuel(Coal, oil etc) by TBS, Selected HW, Char waste, bio-mass including agricultural residue, spent solvent etc

Issues:

- Change in feeding system
- Temperature 800 to 900 ^{o} in CFBC and FBC
- Grinding/Pulverization of waste if solids
- corrosion of Boiler tubes
- Less retention time
- APCDs
- Controlled conditions

The following issues to be considered for discussion

- Pre-mixing before co-processing
- Pre-processing plants at TSDF
- Co-processing of Jarosite, SPL, Red mud, Brine sludge, marble slurry
- co-processing of wastes lying at Captive SLFs & captive incinerators
- Creation of Waste bank
- Inventory of wastes and its characteristics

Field Experience Photographs

Hazardous Waste Storage facilities at M/s UltraTech Cement, Raipur [SPL]

Hazardous Waste Storage facilities at M/ ACC Cement, Jamul [Acid Tar sludge]

Jarofix & Jarosite Pond at M/s Hindustan Zinc Limited, Rajasthan

Brine sludge from caustic soda plants – M/s Shriram Fertilisers, Kota & M/s Grasim Industries, Nagda

Marble slurry storage at origin place

Marble slurry feeding system at Lakheri Cement Works

Plastic waste usually stored by rag-picker





Spent pot liner
HAZARDOUS
WASTE


CETP sludge


HAZARDOUS WASTE STORA
YARD
2009/08/19


ETP sludge
2009/11/02

Plastic waste

Jarosite

Textile ETP waste

Thank You