

Implementation Guidelines for Management of Healthcare Waste in Health Care Facilities

as per Bio Medical Waste Management Rules, 2016

“DRAFT DOCUMENT”

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PREFACE

FOREWORD

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EXECUTIVE SUMMARY

In India, management of regulatory framework, for protection of Environment is being regulated under Environment (Protection) Act 1986. Under this Act, Central Government provided regulatory framework for **environmentally sound** management of environment as well as **bio-medical Waste generated from health care facilities** for the first time under Bio Medical Waste (Management and Handling), Rules, 1998.

In order to implement these rules more effectively and to improve the collection, segregation, processing, treatment and disposal of these bio-medical wastes in an environmentally sound management thereby, reducing the bio- medical waste generation and its impact on the environment, the Central Government **revised the earlier rules and notified new rules** are called as **'Bio-Medical Waste Management Rules, 2016'** (for convenience hence forth it is referred as BMW Rules, 2016) **which came into force with effect from 28.03.2016.**

Bio-Medical Waste Management Rules,2016 are applicable to all persons who generate, collect, receive, store, transport, treat, dispose, or handle biomedical waste in any form including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories, blood banks, AYUSH hospitals, clinical establishments, research or educational institutions, health camps, medical or surgical camps, vaccination camps, blood donation camps, first aid rooms of schools, forensic laboratories and research labs.

"Bio Medical Waste" as defined by these rules means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps.

While developing these guidelines, functionality of Public Health Facilities, primarily District Hospitals, Community Health Centres, Primary Health Centres and other smaller health facilities has been kept in mind. **These guidelines help all the generators of bio-medical waste to ensure proper segregation, collection, intramural transporation, on-site pre-treatment, storage and final disposal of waste in compliance to the Bio-medical Waste Management Rules, 2016.**

Recommendations contained in these guidelines are expected to support the implementation of BMW Rules 2016. In case of any ambiguity, requirements given in the Rules take the precedence.

HOW TO REFER THESE GUIDELINES

These guidelines have been divided into five sections covering all the requirements as listed in the Bio Medical Waste Management Rules, 2016. Summary of each section has been provided at the start of each section which briefs about the content and intent of the particular section.

Section A: This particular section covers the technical components regarding management of the bio medical waste generated at the Healthcare Facilities (HCFs), such as its classification segregation, collection, transportation and storage, treatment and disposal by healthcare facilities. This section also covers the treatment and disposal methods of the bio-medical waste by the healthcare facilities located where Common Biomedical Waste Treatment Facility (CBWTF) are not available.

Section B: This section provides details of the activities, which are to be followed by health care workers for managing bio-medical waste generated during the out-reach activities within the HCFs.

Section C: This section covers the management requirements needed for implementation of Bio Medical Waste Management Rules, 2016 and provides guidance to the top management of HCFs on implementation of the BMWM Rules, 2016 in the HCF. This section details about the general roles and responsibilities of HCF to ensure that handling of the bio-medical waste is done in accordance with the BMWM Rules, 2016. This section also includes details of the record maintenance, occupational safety, training requirements of the staff, budgetary allocation for the BMW activities and system of monitoring and review of these activities.

Section D: This section provides a brief description of management of general waste in the health care facilities as per the relevant laws. This section also details additional requirements for managing general waste and other specific wastes in the Primary Health Centres (PHCs) and Sub-centres, where there is no facility of handing over the general waste to the local municipalities or corporations, urban local bodies, etc.

Section E: This section covers the annexures related to the framed guidelines. The annexures include reference specifications for colour coded waste collection bags and containers, templates of forms and formats required for reporting to State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) and other formats, which can be used by the HCF for various activities as listed under the BMWM Rules, 2016.

DEFINITIONS AS PER BMWM RULES, 2016

"Authorization" means permission granted by the prescribed authority for the generation, collection, reception, storage, transportation, treatment, processing, disposal or any other form of handling of bio-medical waste in accordance with these rules and guidelines issued by the Central Government or Central Pollution Control Board as the case may be

"Authorized person" means an occupier or operator authorized by the prescribed authority to generate, collect, receive, store, transport, treat, process, dispose or handle bio-medical waste in accordance with these rules and the guidelines issued by the Central Government or the Central Pollution Control Board, as the case may be

"Biological" means any preparation made from organisms or micro-organisms or product of metabolism and biochemical reactions intended for use in the diagnosis, immunization or the treatment of human beings or animals or in research activities pertaining thereto

"Bio-medical waste" means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps

"Bio-Medical Waste Treatment and Disposal Facility" means any facility wherein treatment, disposal of bio-medical waste or processes incidental to such treatment and disposal is carried out, and includes common bio-medical waste treatment facilities

"Handling" in relation to bio-medical waste includes the generation, sorting, segregation, collection, use, storage, packaging, loading, transportation, unloading, processing, treatment, destruction, conversion, or offering for sale, transfer, disposal of such waste

"Health care facility" means a place where diagnosis, treatment or immunization of human beings is provided irrespective of type and size of health treatment system, and research activity pertaining thereto. In pretext to these guidelines these health care facilities includes District Hospitals, Sub Divisional Hospitals, Community Health Centres, Primary Health Centres and Sub centres

"Management" includes all steps required to ensure that bio- medical waste is managed in such a manner as to protect health and environment against any adverse effects due to handling of such waste;

"Occupier" means a person having administrative control over the institution and the premises generating bio-medical waste, which includes a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank, health care facility and clinical establishment, irrespective of their system of medicine and by whatever name they are called;

"Operator of a common bio-medical waste treatment facility" means a person who owns or controls a Common Bio-medical Waste Treatment Facility (CBMWTF) for the collection,

reception, storage, transport, treatment, disposal or any other form of handling of bio-medical waste.

“Prescribed authority” mean the State Pollution Control Board in respect of State and Pollution Control Committee in respect of Union Territory.

“Point of Generation” means the location where wastes initially generate, accumulate and is under the control of the operator of the waste-generating process.

“Storage” means the holding of bio medical waste for a temporary period at the end of which the bio-medical waste is treated or disposed.

“Treatment” means any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological characteristics or composition of any hazardous waste

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SECTION A: CLASSIFICATION AND MANAGEMENT OF HEALTHCARE WASTE

Health Care Facilities (HCFs) are primarily responsible for management of the healthcare waste generated within the facilities, including activities undertaken by them in the community. The health care facilities, while generating the waste are responsible for segregation, collection, in-house transportation, pre-treatment of waste and storage of waste, before such waste is collected by Common Bio-medical Waste Treatment Facility (CBWTF) Operator. Thus, for proper management of the waste in the healthcare facilities the technical requirements of waste handling are needed to be understood and practiced by each category of the staff in accordance with the BMWM Rules, 2016..

This section of these guidelines covers the operational steps related to management of the biomedical waste (BMW) generated in the facility, which are necessary for ensuring that biomedical waste generated at the healthcare facility is handled in accordance with the BMWM Rules, 2016.

The section sequentially describes about the general classification of the waste in the health care facility, process of proper segregation, collection, transportation, and storage of the waste. The process & sub-processes for the pre-treatment, treatment and final disposal are also detailed in this section. This section also covers the guidelines for disposal of healthcare waste for the facilities which are not covered by Common Biomedical Waste Treatment Facility (CBMWTF).

A.1 CLASSIFICATION OF HEALTHCARE WASTE

A.1.1. GENERAL CLASSIFICATION OF HEALTH CARE WASTE

All the waste generated from the health care facility can be classified as:

- Bio Medical Waste
- General Waste
- Other Wastes

Bio Medical Waste

"**Bio-medical waste**" means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps. Bio Medical waste includes all the waste generated from the Health Care Facility which can have any adverse effect to the health of a person or to the environment in general if not disposed properly. All such waste which can adversely harm the environment or health of a person is considered as infectious and such waste has to be managed as per BMW Rules, 2016.

The quantity of such waste is around 10% to 15% of total waste generated from the Health Care Facility.

This waste consists of the materials which have been in contact with the patient's blood, secretions, infected parts, biological liquids such as chemicals, medical supplies, medicines, lab discharge, sharps metallic and glassware, plastics etc.

General Waste

General waste consists of all the waste other than bio-medical waste and which has not been in contact with any hazardous or infectious, chemical or biological secretions and does not include any waste sharps. This waste consists of mainly the papers, cardboards, food, textile, general discharge, C&D wastes, horticulture wastes, etc. These general wastes are further classified as dry wastes and wet wastes and should be collected separately.

This quantity of such waste is around 85 % to 90% of total waste generated from the facility.

Such waste is required to be handled as per Solid Waste Management Rules, 2016 and C&D Waste Management Rules, 2016 as applicable.

Other Wastes

Other wastes consists of used electronic wastes, used batteries, and radio-active wastes which are not covered under biomedical wastes but have to be disposed off from time to time as and when such wastes are generated as per the provisions laid down under E-Waste (Management) Rules, 2016, Batteries (Management & Handling) Rules , 2001 and amendments made thereof, and Rules/guidelines under Atomic Energy Act, 1962 respectively.

Percentage-wise classification of waste generated from the Health Care Facility is given in Figure A 1. Examples of wastes generated in Health Care Facility is given in Table A 1.

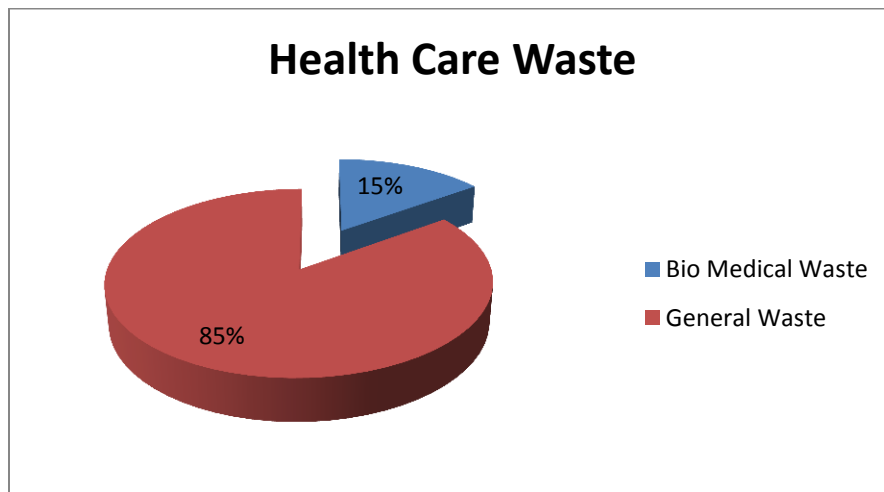


Figure A1. Percentage-wise classification of waste generated from the Health Care Facility

Source: Safe Management Waste from Health Care Activities, 2nd Edition, WHO

TABLE A1. EXAMPLES OF HEALTHCARE WASTE

HEALTH CARE WASTE	
BIO-MEDICAL WASTE	GENERAL WASTE
<ul style="list-style-type: none"> • Human and animal <u>a</u>natomical Waste like body parts, tissues, organs etc. • Soiled waste such as items contaminated with blood and body fluids like Dressings cotton, swabs etc. • Expired or Discarded Medicines • Chemical Waste such as Laboratory Chemicals used in production of biologicals, , X-ray film developing liquid, discarded Formalin, liquid from laboratories and floor washings, cleaning, house-keeping and disinfecting activities . • Discarded linen, mattresses, beddings contaminated with blood or body fluid. • Microbiology, Biotechnology and other clinical laboratory waste such as Blood bags, Laboratory cultures, stocks or specimens of micro- organisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures. • Waste Recyclables such as wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes) and vaccutainers with their needles cut) and gloves Blood Bags, Attenuated Vaccines, Lab Cultures etc. • Waste sharps including Metals such as Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps • Glassware including medicine vials and ampoules as well as metal body implants 	<ul style="list-style-type: none"> • News paper, paper and card boxes • Plastic water bottles • Aluminium cans of soft drinks • Covering of different materials • Food Containers • Compostable general waste
	OTHER WASTE
	<ul style="list-style-type: none"> • E-Waste • Used Batteries • Radioactive Wastes

A.1.2 CLASSIFICATION OF BIO_MEDICAL WASTE AS PER BIO MEDICAL WASTE MANAGEMENT RULES, 2016

Bio Medical Waste Management Rules, 2016 categorises the bio=medicalwaste generated from the health care facility into four categories based on the segregation pathway and colour code. Various types of bio medical waste is further assigned to each one of the categories, as detailed below:--

1. Yellow Category
2. Red Category
3. White Category
4. Blue Category

These categories are further divided as per the type of waste under each category as follows:

CATEGORY	TYPE OF WASTE
YELLOW	Human Anatomical Waste
	Animal Anatomical Waste
	Soiled Waste
	Discarded or Expired Medicine
	Chemical Waste
	Chemical Liquid Waste
	Discarded linen, mattresses, beddings contaminated with blood or body fluid.
	Microbiology, Biotechnology and other clinical laboratory waste (Pre-treated)
RED	Contaminated Waste (Recyclable)
WHITE	Waste Sharps including metals
BLUE	Glassware
	Metallic Body Implants

CATEGORIZATION & CLASSIFICATION OF WASTE AS PER BMW RULES, 2016 AND OTHER APPLICABLE RULES

A.2 STEPS OF BIO MEDICAL WASTE MANAGEMENT

The management of bio-medical waste can overall be summarized in these seven simple steps given in Figure A2.:

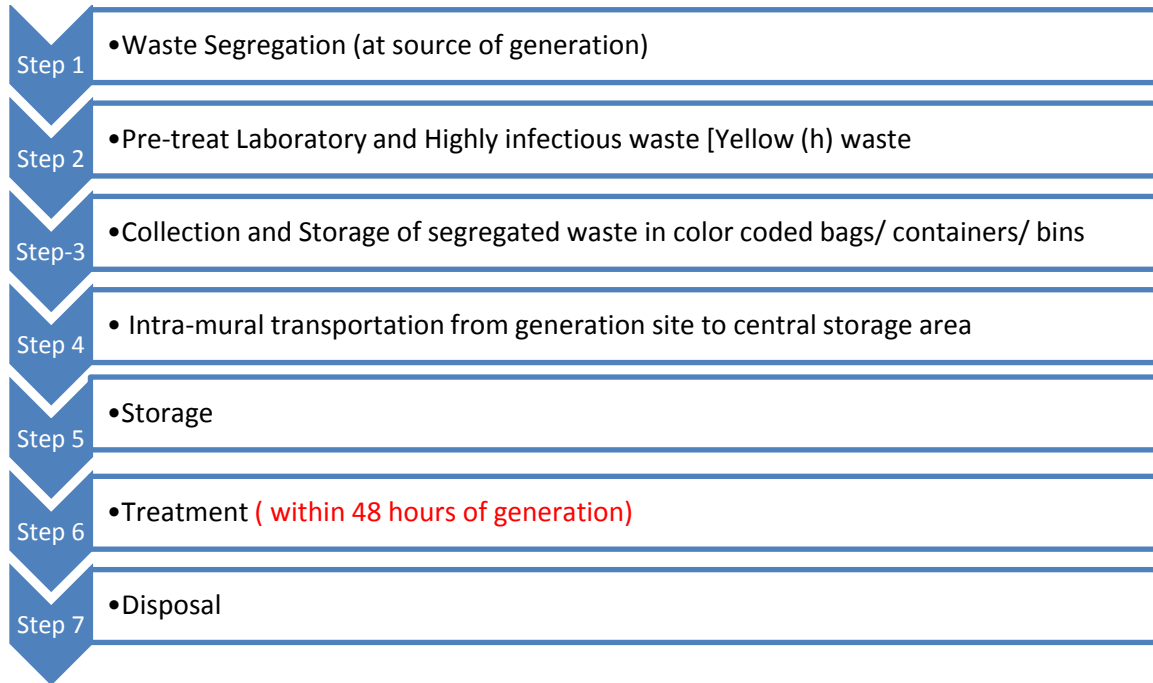


Figure A.2 Steps of Bio-medical Waste Management

First five steps (Segregation, Collection, pre-treatment Intramural Transportation and Storage) is the exclusive responsibility of Health Care Facility. While Treatment and Disposal is primarily responsibility of CBWTF operator except for lab and highly infectious waste, which is required to be pre-treated by the HCF. Following are the responsibility of HCF for management and handling of bio-medical waste:

1. Biomedical Waste should be segregated at the point of generation by the person who is generating the waste in designated colour coded bin/ container
2. Biomedical Waste & General Waste shall not be mixed. Biomedical Waste & General Waste shall not be mixed. Storage time of waste should be as less as possible so that waste storage, transportation and disposal is done within 48 hours.
3. .
4. Chlorinated plastic bags for collection of biomedical waste should not be used by the HCF. All efforts shall be made to minimize the chlorinated plastics in biomedical waste .
5. No secondary handling or pelfirage of waste shall be done at healthcare facility. If CBWTF facility is available at a distance of 75 km from the HCF, bio-medical waste should be treated and disposed only through such CBWTF operator..
6. Only Laboratory and Highly infectious waste shall be pre-treated onsite before sending for final treatment or disposal through a CBWTF Operator.

7. All bags or containers containing segregated bio-medical waste shall be labelled (including bar code) before such waste goes for final disposal through a CBWTF.

Responsibility of various category of staff in regards to BMW Management is given in the Table A3.

Table A.3 RESPONSIBILITY OF VARIOUS CATEGORY OF STAFF IN REGARDS TO BMW MANAGEMENT

S. No.	BMW Management Activity	Functional Responsibility	Overall Responsibility
1.	Segregation at source	Doctors, Nurses, Paramedical staff, Technicians and Support staff (all employees involved in generation and segregation of BMW)	MS/ CMO/ SMO/ MO I/c
2.	Collection	Housekeeping staff	Housekeeping Incharge
3.	Transportation to Interim Storage Area	Housekeeping staff	Housekeeping Incharge
4.	Transport to Central Storage Area	Housekeeping Staff	Housekeeping Incharge
5.	Storage and Handover to CBMWTF	Housekeeping Staff	Housekeeping Incharge
6.	Disposal (by deep burial pits where no acces to the CBWTF)	Housekeeping staff	Housekeeping Incharge
7.	Updating of Bio Medical Waste Register	Designated Housekeeping Staff	Chairperson BMW Committee
8.	Submission of Reports to SPCB/PCC/CPCB	Chairperson BMW Management Committee and Administrative Head i.e. MS/ SMO/CMO	MS/ CMO/ SMO/ MO I/c
9.	Authorization from SPCB/ PCC	Chairperson BMW Management Committee and Administrative Head i.e. MS/ SMO/CMO/ MO I/c	MS/ CMO/ SMO/ MO I/c
10	Updating and Display of Reports on Website	Chairperson BMW Management Committee and Administrative Head i.e. MS/ SMO/CMO/ MO I/c	MS/ CMO/ SMO/ MO I/c
11	Monitoring of Activities of BMW Management	Nodal Person of BMW Committee or Person Responsible for Monitoring (PHC & Sub centre)	Chairperson BMW Committee/ MS/ CMO/ SMO/ MO I/c

A.4 BIO MEDICAL WASTE SEGREGATION


Bi- medical waste generated from a healthcare facility is required to be segregated at the point of generation as per the colour coding stipulated under Schedule I of BMWM Rules, 2016





Activities to ensure that proper waste segregation is carried out:

- Waste must be segregated at the **point of generation** of source and not in later stages. As defined earlier too, “**Point of Generation**” means the location where wastes initially generate, accumulate and is under the control of doctor / nursing staff etc. who is providing treatment to the patient and in the process generating bio-medical waste.
- Posters / placards for bio-medical waste segregation should be installed at the point of generation.
- Adequate number of colour coded bins / containers or bags should be available at the point of generation of bio-medical waste.
- Provide Personnel Protective Equipment to the bio-medical waste handling staff.

A.4.1 Color Coding and Type of Container/ Bags to be used for Waste Segregation & Collection

As per Schedule I of the Bio Medical Waste Management Rules, 2016 following color coding and type of container/bags is needed to be used by the HCFs for segregation and collection of generated Bio Medical Waste from the facility.

S. No.	Category	Type of waste	Color & Type of Container
1.	Yellow Category	<ul style="list-style-type: none"> • Human Anatomical Waste • Animal Anatomical Waste • Soiled Waste • Discarded or Expired Medicine • Microbiology, Biotechnology and other clinical laboratory waste • Chemical Waste • Chemical Liquid Waste 	<p>Yellow colored Non Chlorinated Plastic Bags (having thickness equal to more than 50 μ) or containers</p>  <p>Note</p> <ul style="list-style-type: none"> (i) Chemical liquid waste such as spent hypo of X-Ray should be stored in yellow container and sold to recycler authorised by SPCB/PCC. (ii) Infected secretions, aspirated body fluids etc from laboratory should be disinfected before mixing with other wastewater from hospital. (iii) Liquid chemical wastes should be pre-treated/neutralised before mixing with other wastewater from hospital.
2.	Red Category	Contaminated Waste (Recyclable)	Red Coloured Non Chlorinated Plastic Bags ((having thickness equal to more

			than 50 µ) and Containers
			
3.	White Category	Waste Sharps including metals	White Coloured translucent, puncture proof, leak proof, Temper Proof containers 
4.	Blue Category	<ul style="list-style-type: none"> Glassware Metallic Implants Body	Cardboard boxes with blue colored marking or blue colored puncture proof, temper proof containers  

NOTE: As per BMW Rules, 2016, every occupier shall phase out use of non-chlorinated plastic bags within two years i.e. by 27.03.2018 and from 28.03.2018 onwards, the chlorinated plastic bags shall not be used for storing and transporting of bio-medical waste and the occupier or operator of a common bio-medical waste treatment facility shall not dispose of such plastics by incineration and the bags used for storing and transporting biomedical waste shall be in compliance with the Bureau of Indian Standards. Till the Standards are published, the carry bags shall be as per the Plastic Waste Management Rules, 2016.

Please refer to Annexure E.1 Specifications for Plastic bags and containers to be used for waste segregation and collection

A.4.2 Essentials for proper waste segregation

To ensure that there is proper BMW segregation at the point of generation HCF has to ensure following:

- Display work instructions like posters for waste segregation at the point of generation
- Provide proper sized and adequate number of color coded bins, bags and containers at the point of generation as per the expected
- Provide PPEs to waste handlers for waste segregation and collection.

A.5 BIO MEDICAL WASTE COLLECTION

A.5.1 Time of Collection

- Bio-medical waste should be collected on daily basis from each ward of the hospital at a fixed interval of time. There can be multiple collections from wards during the day.
- HCF should ensure collection, transportation, treatment and disposal of bio-medical waste within 48 hours.
- Collection times should be fixed and appropriate to the quantity of waste produced in each area of the health-care facility.
- General waste should not be collected at the same time or in the same trolley in which bio-medical waste is collected.
- Collection should be daily for most wastes, with collection timed to match the pattern of waste generation during the day. For example, in An IPD ward where the morning routine begins with the changing of dressings, infectious waste could be collected mid-morning to prevent soiled bandages remaining in the area for longer than necessary.
- General waste collection, must be done immediately after the visiting hours of the HCFs, as visitors coming to facility generate a lot of general waste and in order to avoid accumulation of such general waste in the HCF. The collection timings must enable the HCF to minimize or nullify the use of interim storage of waste in the departments.
- Bio-medical waste collected by the staff, should be provided with PPEs.

A.5.2 Packaging

- Bio-medical waste bags and sharps containers should be filled to no more than three quarters full. Once this level is reached, they should be sealed ready for collection.
- Plastic bags should never be stapled but may be tied or sealed with a plastic tag or tie.
- Replacement bags or containers should be available at each waste-collection location so that full ones can immediately be replaced.
- Colour coded waste bags and containers should be printed with the bio-hazard symbol, labelled with details such as date, type of waste, waste quantity, senders name and receivers details as well as bar coded label to allow them to be tracked till final disposal.
- Ensure that Bar coded stickers are pasted on each bag as per the guidelines issued by CPCB

A.5.3 Labeling

All the bags/ containers/ bins used for collection and storage of bio-medical waste, must be labelled with the warning Symbol of Bio Hazard or Cytotoxic Hazard as the case may be as per the type of waste in accordance with the BMWM Rules, 2016.



Bio-Hazard Label



Cyto-Toxic Label

~~In case of non-implementation of bar coding, a In addition to the bar coded label, all the bags and containers to be transported to CBWTF must also be labeled with following details:~~

- Date of Generation
- Type of waste category
- Waste Quantity in kg
- Name and Address of the hospital
- Contact Person Name and Phone Number
- Contact Details in case of any Emergency
- Receivers contact details i.e Name, Address and Contact Details

Please Refer to Annexure E.2: Label for Bio Medical Waste Containers & Bags

Please refer to Annexure E.3: Label for Transporting of Bio Medical Waste and Containers

A.5.4 Interim Storage

- Interim storage of bio medical waste is discouraged in the wards / different departments of HCF.
- If waste is needed to be stored on interim basis in the departments it must be stored in the dirty utility/sections.
- No waste should be stored in patient care area and procedures areas such as Operation Theatre. All infectious waste should be immediately removed from such areas.
- In absence of dirty utilities/ sections such BMW must be stored in designated place away from patient and visitor traffic or low traffic area.

A.6 IN HOUSE TRANSPORTATION OF BIO MEDICAL WASTE

A.6.1 Transportation Trolleys & Carts

In house transportation of Bio Medical Waste from site of waste generation/ interim storage to central waste collection center, within the premises of the hospital must be done in closed trolleys / containers only preferably fitted with wheels for easy manoeuvrability. Such trolleys or carts are designated for the purpose of Bio Medical Waste Collection ONLY. Patient trolleys must not be used for waste transportation.

Size of such waste transport trolleys should be as per the volume of waste generated from the HCFs..

Examples of Waste Collection Trolleys for BMW Transportation:



Waste Collection Cart



Waste Transport Trolley for a particular category of waste

A.6.2 Route of intramural transportation of bio-medical waste

Bio-Medical Waste Generated from different wards or laboratories in the Health care facilities must be transported in the covered trolleys/carts through a route which has low traffic flow of patients and visitors.

Route of transportation preferably be planned in such a way that:

- Transportation does not occur through high risk areas
- Supplies and waste are transported through separate routes.
- Waste is not transported through areas having high traffic of patients and visitors
- Central Waste collection area can be easily accessed through this route
- Safe transportation of waste is undertaken to avoid spillage and scattering of waste

A.7 STORAGE OF WASTE

A.7.1 CENTRAL WASTE COLLECTION AREA (KERB STATION)

Each Healthcare facility should ensure that there is a designated waste collection center situated within its premises for storage of bio-medical waste, till the waste is transported for treatment and disposal to CBMWTF. Such center is manned and is under lock and key under the responsibility of a designated person. During construction it is to be ensured that the center is kept ventilated through the use of exhaust fan or by providing guarded space for proper ventilation.

A.7.2 SUGGESTED GUIDELINES FOR CONSTRUCTION OF CENTRAL WASTE COLLECTION AREA

- The location of central waste collection station must be away from the public/ visitors access.
- The space allocation for this station must be as per the quantity of waste generated from the hospital.
- The planned space must be sufficient so as to store at least two days generation of waste.
- The planned space must also include space provisions for storage of waste collection trolleys.
- Such center must be roofed and manned and is under lock and key under the responsibility of designated person.
- The entrance of this center must be accessible through a concrete ramp for easy transportation of waste collection trolleys.
- Flooring should be of tiles or any other glazed material with slope so as to ease the cleaning of the area.
- During construction it is to be ensured that the center is kept ventilated through the use of exhaust fan or by use of wire meshes for ventilation.
- It is to be ensured by the health care facility that such central storage station is safety inspected for potential fire hazard and based on such inspection preventive measure has to be taken by the health care facility like installation of fire extinguisher, smoke detector etc.
- There should also be provision for water supply adjacent to central waste storage area for cleaning and washing of this station and the containers. The drainage from the storage and washing area should be routed to the Effluent Treatment Plant.
- Sign boards indicating relevant details such as contact person and the telephone number should be provided.
- The entrance of this station must be labeled with "ENTRY FOR AUTHORIZED PERSONAL ONLY" and Logo of Bio Medical Waste Hazard.
- It is to be ensured that no general waste is stored in the central waste collection area.

Other Considerations for Central Waste Collection Area (KERB Station)

- To ensure there is no pilferage of recyclables, it is to be ensured that central storage area is under lock & key, guarded by a designated person.
- Healthcare facilities need to maintain the record of waste generated and handed over to the authorized recyclers.

- To ensure protection from the animals, it is to be ensured by the health care facility that there is no stray animal in the health care facility premises and health care facility has installed cattle traps at the entrance of the health care facility.
- To ensure protection against the pests it is to be ensured by the HCFs that it has engagement of the pest control agency for taking the pest control measures in the central storage area on regular basis.

A.6.3 CENTRAL STORAGE FOR HCFs HAVING CAPTIVE TREATMENT AND DISPOSAL SYSTEM

For the health care facilities which are having captive or its own BWTF for treatment and disposal through incinerators, autoclaves/microvaes, shredders etc. within its premises must ensure that waste generated from the HCF is stored in this central waste collection area till it is transported to reception area of captive BMWTF within the premises.

For HCFs having its own treatment and disposal facility through use of deep burial pits i.e. Primary Health Centers (PHCs) which doesn't fall under coverage area of any CBWTF, interim Storage area used for daily waste collection will serve as Central Waste Collection Area. The collected waste is needed to be store in this place before it is disposed of by the deep burial pits as per the specifications given under the BMWM Rules, 2016.

A.8 HANDING OVER THE BIO-MEDICAL WASTE TO CBWTF

A.8.1 MINIMUM REQUIREMENTS

Following Steps are needed to be undertaken by Health Care Facility while handing over the bio medical waste to CBWTF:

- All the BMW waste should be collected in the colour coded bags/ bins/ containers and should not be mixed with the general waste generated by the health care facility.
- All the bags or containers containing bio- medical waste, to be sent out of the premises must also be labeled as per BMWM Rules and also with the unique bar code.
 - Collect or receive a receipt generated from bar-code scanning system.
- The HCFs must ensure that there is no secondary handling of the waste i.e. the waste is handed over to the CBWTF directly from HCFs' central waste collection center.
-

NOTE: As per the BMW Rules 2016, Bar code and global positioning system shall be added by the Occupier and common bio-medical waste treatment facility in one year time of publication of these rules.

As per the guidelines of CPCB, each bag should be labelled with barcode for identification of waste and ensure that the details of weight and time of collection are scanned into waste tracking server and receive a receipt generated by scanning system provided by the operator of CBMWTF. Each HCF should obtain user access to waste management server operated by CBMWTFs. There should be agreement between the CBMWTF and HCF on operation of bar code based waste management system. .

Till the time the bar coded system is not implemented, all the bags/ containers used for collection and storage of BMW, must be labeled as described earlier in these guidelines and as per **Annexure no.E.3**

It is the responsibility of the health care facility to ensure that any untreated anatomical waste; soiled waste shall not be stored in the health care facility's waste collection area beyond a period 48 Hours.

If the waste collection agency or CBMWTF does not collect the waste within agreed time, which must not exceed beyond 48 hrs, it is the responsibility of the health care facility to immediately notify to the prescribing authority about any such lapse.

A.8.2 RECORD KEEPING

Each healthcare facility need to maintain and update a day wise, category wise record of Bio Medical Waste generated from the facility.

Category wise quantity of waste generated from the facility must be recorded in Bio Medical Waste Register being maintained at central waste collection center under the supervision and authority of one designated person.

A weighing balance as per the specifications given in cpcb guidelines for bar code system needs to be kept in central waste collection center or with a designated person responsible for handing over the waste to CBWTF, for weighing the quantity of Bio Medical Waste.

Weighing of waste would not be necessary after implementation of bar-code based waste management system by CBWTF operator. However, in such case, the record of the receipts provided by CBWTF operator from bar-code scanning cum weighing system should be maintained.

Note: Each healthcare facility including the facilities having captive treatment and disposal facility also needs to maintain and update the quantity of waste generated from the facility in the Bio Medical Waste Register on daily basis

Following records need to be maintained (to be kept atleast for five years) relating to:

- **Bio-medical Waste Generation (Ward-wise as well as Centralized)- for compilation of AR**
- **Pre-treatment of Lab., Microbiology, Blood Bags and the Blood samples.**
- **Wastes treated and disposed through recyclers approved by SPCB/PCC (as applicable).**
- **Daily Waste disposed through CBWTF**
- **Accidents and remedial measures taken**

- Immunisation of Health Care Workers
- Trainings organised to the HC Staff
- Health status of the workers (Induction and once in a year)
- Minutes of the meetings of the Committee c constituted by the HCF
- annual report submitted by June 30th of every year (By the HCFs) for the preceding Calendar year to SPCB/PCC

Please Refer to Annexure E.5: Format for Bio Medical Waste Register / Record

1. **A.8.3 UPDATING OF INFORMATION IN WEBSITE** Every healthcare facility as prescribed under BMWM Rules, 2016 shall develop a separate page/web link in its website for displaying the information pertaining to their hospital. The following information should be uploaded and updated :Contact Address and details of the Healthcare Facility
2. **No. of beds**
3. **Details of**
Authorisation under BMWM Rules, 2016;
Consent under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981
4. **Total quantity of bio-medical waste generation (in kg/day)**
5. **Mode of disposal of bio-medical waste (through CBWTF or through captive treatment facility)**
6. **Name and address of the CBWTF through which waste is disposed off (as applicable)**
7. **In case, HCF is having captive treatment facility,**
 - a. **bio-medical waste treated (in kg/day)**
 - b. **Details of treatment equipment**
Nos, capacity of each treatment equipment (in kg/day)
 - c. **Operating parameters of the treatment equipment as per BMWM Rules, 2016**
8. **Record of bio-medical waste generation (category wise)**
9. **No. of trainings conducted on Bio-medical Waste Management in the current year**
10. **Stats of immunization of Health Care Workers involved in handling of BMW**

A.9 TREATMENT AND DISPOSAL OF BIO MEDICAL WASTE

As per BMWM Rules, 2016 the treatment and disposal of BMW generated from the HCF must be carried out in accordance with Schedule I, and in compliance with the standards provided in Schedule II of BMWM Rules, 2016.

It is also emphasized in the rules that no healthcare facility shall establish on site treatment and disposal facility for BMW, if a service of CBWTF is available within 75 kilometer of travelling distance of the facility thus all the public healthcare facilities within reach of 75 kilometer of CBWTF needs to dispose of the BMW through such CBWTF only and are not allowed to establish its own treatment and disposal facility. For the public health care facilities especially in rural areas where there is no CBWTF within range of 75 kilometer, the disposal of BMW can still be made through a CBWTF who is willing to provide treatment services and authorized by the

concerned SPCB/PCC to operate in an area beyond 75Km radial distance. In case of no reach to any CBWTF, the BMW generated from HCFs should be disposed in captive treatment and disposal facility or by deep burial pit as authorised by the respective SPCB/and as specified in these guidelines

The collection, treatment, processing and disposal options for both the categories of healthcare facilities; having linkage with CBWTF or not having linkage with CBWTF, are detailed here as per Schedule I of BMW Rules. 2016

A 10.1 ACTION TO BE TAKEN BY HCF FOR TREATMENT AND DISPOSAL OF DIFFERENT CATEGORY AND TYPE OF WASTE

YELLOW CATEGORY

TYPE OF WASTE

- a. **HUMAN ANATOMICAL WASTE:** Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time).Placenta, Body Tissue , Extracted Tooth

Type of bag and container: Collect the waste in yellow colored non chlorinated plastic bag and store in yellow colored container

Treatment and Disposal:

For HCF having linkage with CBWTF

No treatment of waste is required to be carried out at the health care facility other than waste which requires pre-treatment as prescribed under the BMWM Rules, 2016. Waste should be stored in central storage point and must handed over to CBWTF. It is mandatory for each health care facility that dead Fetus waste should be handed over to CBWTF in yellow bag with a copy of the official Medical Termination of Pregnancy (MTP) certificate from the Obstetrician or the Medical Superintendent/ SMO/ CMO of the HCF

For HCF without linkage to CBWTF

Disposal of the waste in the deep burial pit should not be practiced unless the hospitals is located in remote isolated place. Copy of official MTP certificate from the MO I/C for fetus below the vitality period must be kept with the HCF. Use of deep burial pit should be as authorised by the respective SPCB/PCC.

This waste should be disposed through twin chambered compact incinerator with 2 seconds retention time in secondary combustion chamber and air pollution control devices as specified in CPCB guidelines for design of Incinerators.

- b. **SOILED WASTE:** Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs

Type of bag and container: Collect the waste in yellow colored non chlorinated plastic bag and store in yellow colored container

Treatment and Disposal:

For HCF having linkage with CBWTF

No treatment of waste is required to be carried out at the health care facility. Waste must be handed over to CBMWTF

For HCF having own treatment and Disposal facility

Soiled waste should be disposed through twin chambered compact incinerator with 2 seconds retention time in secondary combustion chamber and air pollution control devices as specified in CPCB guidelines for design of Incinerators.

Soiled waste can also be disposed in captive deep burial pits only in case of the hospitals located in remote isolated place. Use of deep burial pit should be as authorised by SPCB/PCC.

- c. **EXPIRED AND DISCARDED MEDICINE:** Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc

Type of bag and container: Collect all the expired and discarded medicines except for cytotoxic drugs waste in a separate yellow colored non chlorinated plastic bag (different form being used for human anatomical waste) and store in yellow colored container.

All the cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc must be collected in separate yellow colored non chlorinated plastic bag labeled as cytotoxic hazard.

Treatment and Disposal:

For HCF having linkage with CBWTF

No treatment of waste is required to be carried out at the health care facility. As per BMW Rules, 2016 all the expired and discarded medicines including cytotoxic drugs expired `cytotoxic drugs are either returned back to the manufacturer or are handed over to the CBMWTF to be disposed of through incineration.

For healthcare facilities where there no established system for returning the drugs to the manufacturer it is recommended that the expired and discarded medicines are handed over only to CBWTF for disposing of through incineration.

For HCF having own treatment and Disposal facility

Expired and discarded medicines are required to be sent back to manufacturer or can be disposed through nearest common biomedical Waste or Hazardous waste incinerators with prior intimation to SPCBs./PCCs.

This waste can also be disposed through twin chambered compact incinerator with 2 seconds retention time in secondary combustion chamber, which can withstand a temperature of 1200°C and equipped with air pollution control devices as specified in CPCB guidelines for design of Incinerators.

- d. **CHEMICAL LIQUID WASTE:** Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, discarded Formalin, infected secretions, aspirated body fluids, liquid from laboratories and floor washings, cleaning, house-keeping and disinfecting activities, silver X Ray developing liquid etc. etc.

Type of bag and container: Yellow colour container or yellow labelled container may be used for sale of X-ray hypo.

Treatment and Disposal: As per the BMW Rules 2016, the chemical liquid waste of the hospital must be collected through a separate drainage system leading to a Effluent Treatment Plant (ETP). Silver X ray film developing fluid must be given or sold to the authorized recyclers for resource recovery. Hospitals with large standalone labs shall install ETP for separate collection and disinfection of infectious waste from laboratory prior to mixing the same with rest of the wastewater from hospital for further treatment. For middle and small healthcare facilities ***having no system of separate ETP the liquid waste is needed to be onsite chemically disinfected with chlorine solution in a tank before mixing the same with other wastewater.***

- e. **Discarded Linen , Mattresses, beddings contaminated with Blood and body fluids**

Type of bag and container: Collect the waste in yellow colored non chlorinated plastic bag and store in yellow colored container

Treatment and Disposal:

For HCF having linkage with CBWTF

Disinfect the waste linen with non-chlorinated chemical disinfection and hand over to the CBWTF operator for final disposal by incineration. . The waste mattresses should be cut into pieces and disinfected with non-chlorinated chemicals and can be handed over for incineration or can be disposed as General waste in dry bins in cities having RDF or waste to Energy Plants.

The used mattresses shall not be sold or auctioned. However, the reusable linen and bed sheets can be sold or auctioned only after washing and disinfection.

For HCF having own treatment and Disposal facility

The waste mattresses should be cut into pieces and disinfected with non-chlorinated chemicals and can be incinerated in captive incinerator or can be disposed as General waste in dry bins in cities having RDF or waste to Energy Plants.

f. **MICROBIOLOGY, BIOTECHNOLOGY AND OTHER CLINICAL LABORATORY WASTE:**

Microbiology, Biotechnology and other clinical laboratory waste: blood bags, Laboratory cultures, stocks or specimen of micro-organisms, live or attenuated vaccines, human cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures

Type of bag and container: Collect the waste in yellow colored non chlorinated plastic bag and store in yellow colored container

Treatment and Disposal:

For HCF having linkage with CBWTF

All the microbiological waste, blood bags, live attenuated vaccines, cultures, dishes and other highly infectious waste is needed to be pre-treated by disinfection up to Log 4 microbial kill before handing over the waste to CBWTF operator. Pre-treatment should be done by autoclave / microwave / hydroclave.

Disinfection can also be adopted as pre-treatment method by using non-chlorinated chemical disinfectants like calcium oxide, phenolic compounds etc. which can achieve efficacy of log 4 reduction.

The pre-treated waste bags should be handed over to CBWTF operator on daily basis.

For HCF having own treatment and Disposal facility

Pre-treated waste should be disposed off by a HCF having captive treatment facilities. i.e., incineration in twin chambered compact incinerator with 2 seconds retention time in secondary combustion chamber and air pollution control devices as specified in CPCB guidelines for design of Incinerators.

Pre-treated waste can be disposed in captive deep burial pits in case of the hospitals located in remote isolated place. Use of deep burial pit should be as authorised by SPCB/PCC.

RED CATEGORY

TYPE OF WASTE

CONTAMINATED WASTE RECYCLABLE: Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, chlorinated blood bags, syringes (without needles and fixed needle syringes) and vaccutainers with their needles cut) and gloves.

Type of bag and container: Collect the waste in red colored non chlorinated plastic bag and store in red colored container

Treatment and Disposal:

For HCF having linkage with CBWTF

Waste generated from disposable items such as tubing, drains ,oxygen mask, bottles intravenous tubes and sets, catheters, urine bags, thick plastic splash proof gowns and gloves are nicked and this waste is finally put in red colored non chlorinated plastic bags and containers. Syringes after removing cutting the needles should also be put in this category. No onsite treatment of such waste is required. Plastic vials (PVC) with positive controls/ vaccines are to be autoclaved and put in red bags. All such waste is needed to be sent to CBWTF for final treatment and disposal

For HCF having own treatment and Disposal facility

All the recyclable waste generated from the HCF must be sterilised using autoclaving/microwaving / hydro-calving with log 6 microbial reduction or chemically disinfected with chlorine solution or any alternative chemical treatment for disinfection by log 4 microbial kill before final disposal. Disinfected waste can be handed over to the authorized waste handlers or informal waste pickers after chemical disinfection. Recyclable waste must never be disposed of as along with general waste in dry stream and same is required to be disposed of only through registered recyclers or waste to energy plants or for oil recovery.

WHITE CATEGORY

TYPE OF WASTE

WASTE SHARPS INCLUDING METALS: Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts. This includes used, discarded and contaminated metal sharps.

Type of bag and container: Collect the waste in white translucent, puncture proof, leak proof, tamper proof container.

Treatment and Disposal:

For HCF having linkage with CBWTF

After collection in Puncture proof , leak proof, tamper proof container handover the waste to CBWTF without any alteration or onsite treatment.

For HCF having own treatment and Disposal facility

Dispose of the sharp after chemical disinfection and dispose in captive concrete waste sharp pit. Alternatively treat by Autoclaving or Dry Heat Sterilization followed by shredding or mutilation or encapsulation in metal container; combination of shredding cum autoclaving prior to disposal in sharp pit and send to iron foundries.

BLUE CATEGORY

TYPE OF WASTE

- a. **GLASSWARE** : Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes

Type of bag and container: Cardboard boxes with blue colored marking

Treatment and Disposal:

For HCFs having linkage with CBWTF

Dispose of the waste by handing over to CBWTF without any onsite treatment.

Glass vials with positive controls are needed to be autoclaved and then are discarded in cardboard box before handing over to CBWTF.

For HCFs having own treatment and Disposal facility

Dispose of in sharp pits.

- b. **METALLIC BODY IMPLANTS** : Implants used for orthopedic surgeries

Type of bag and container: Cardboard boxes with blue colored marking

Treatment and Disposal: Dispose of the waste by handing over to CBWTF or if having its own treatment and disposal facilities. In case of no access to CBWTF, used glass bottles should be disinfected and washed with detergent and can be sold to recyclers. Broken glass should be disinfected and disposed in sharps pit.

IMPORTANT CONSIDERATIONS

- The treatment of BMW must meet the standards for treatment of bio medical waste as specified in **Schedule II of BMW Rules, 2016**.
- The autoclave used for sterilization of the blood bags, microbiology waste must be dedicated for treatment of bio-medical waste only.
- HCF must follow the standards for autoclaving of biomedical waste as listed in **Schedule II of BMW Rules, 2016**
- For the HCFs which has not yet established the Effluent Treatment Facility, should install suitable treatment plant for treatment of wastewater generated from the healthcare facility and the treated water should conform to the standards of liquid waste as listed in **Schedule II of BMW Rules, 2016**

Chemical disinfection is to be performed by Hypochlorite Solution or equivalent disinfectant like aldehydes, lime, ammonium salts, phenolic compounds etc. (refer: WHO guidelines for Infection Control in Healthcare Facilities). Chemical disinfection performed must meet the standard of chemical disinfection as listed in **Schedule II of BMW Rules, 2016**.

Please Refer to Annexure E.10: Preparation of Hypochlorite Solution

A.10.2 TREATMENT AND DISPOSAL FACILITY FOR HCF NOT HAVING LINKAGE WITH CBWTF

For the Health Care Facilities located where no CBWTF is available at a distance of 75 km and also not within the feasible coverage area of any nearby CBWTF, the treatment and disposal of BMW can be carried out in secured deep burial pits and sharp pits as per the authorization of SPCBs/PCCs. Else all such health care facilities should install captive incinerators and other treatment facilities as required under BMW Rules, 2016.

A.10.2.1 Standards for Deep Burial

- A pit or trench should be dug about two meters deep. It should be half filled with waste, and then covered with lime within 50 cm of the surface, before filling the rest of the pit with soil.
- It must be ensured that animals do not have any access to burial sites. Covers of galvanized iron or wire meshes may be used.
- On each occasion, when wastes are added to the pit, a layer of 10 cm of soil shall be added to cover the wastes.
- Burial must be performed under close and dedicated supervision.
- The deep burial site should be relatively impermeable and no shallow well should be close to the site.
- The pits should be distant from habitation, and located so as to ensure that no contamination occurs to surface water or ground water. The area should not be prone to flooding or erosion.
- The location of the deep burial site shall be authorized by the prescribed authority i.e CPCB/SPCB or District Pollution Control Board Office.
- The institution shall maintain a record of all pits used for deep burial.

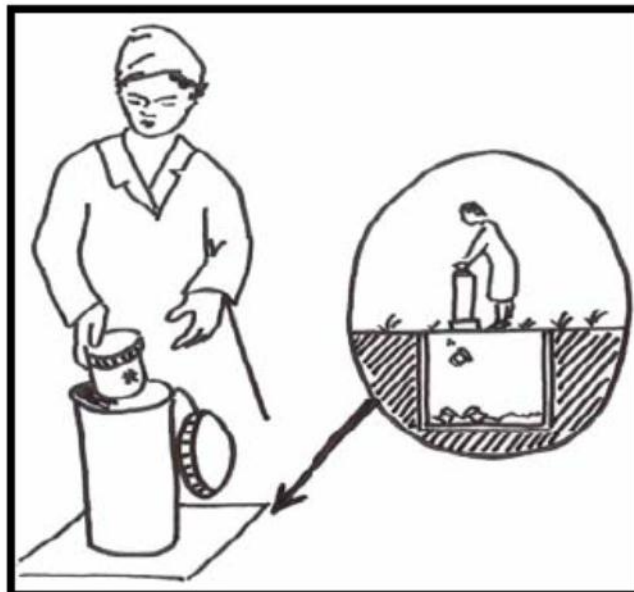
- The ground water table level should be a minimum of six meters below the lower level of deep burial pit.

The design of the deep burial pit should be as given below:

Design of the deep burial pits

A.10.2.2 Suggested Standard for disposal of Sharp wastes.

- A sharp pit must be constructed within the hospital premise to dispose of the sharp waste generated from the facility.
- Sharp pit must be a 1mtx1mtx1mt concrete lined protected pit with a cemented lid.
- Disposal of the sharp containers need to be done by discarding the containers in entirety into the sharp pits.
- Encapsulation of the waste sharp for prevention of reuse may be done with use of binding material like cement or clay. The filled needle containers can be placed in the sharp pits up to 3/4th of the capacity of the pit. An immobilizing material such as cement or clay is added to the pit. Once dry, the sharp pit is sealed. Another sharp pit is created for further use.

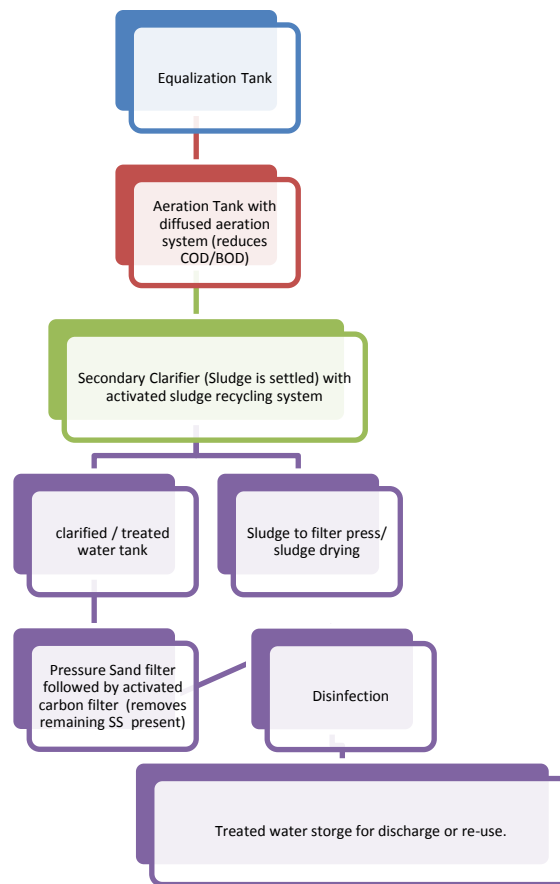


[Please Refer to Annexure F.11: Bio Medical Waste Management Chart for Healthcare Facility](#)

A.11 Effluent Treatment Plant

Effluent Treatment Plant should be provided in every HCF to treat the wastewater generated from the hospital in order to comply with the effluent standards prescribed under the BMWM Rules, 2016. Sources of wastewater generation from the hospital are wards, laboratories, used disinfectants, floor washing, washing of patients area, hand

washing, laundry, discharge of accidental spillage, fire fighting, bathroom/toilet etc. Typical flow chart for the Effluent Treatment Plant is given below:



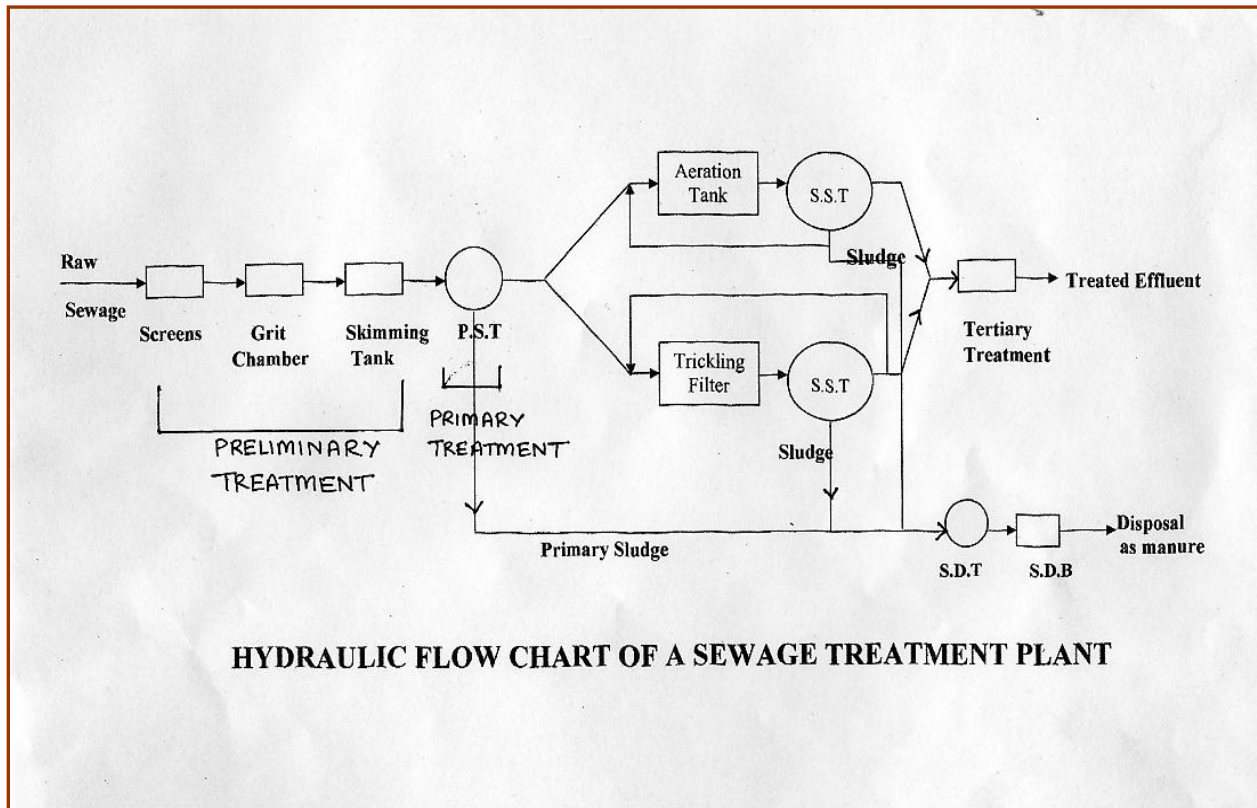
The wastewater is treated in the ETP having three level of treatment; Primary, secondary and tertiary.

Primary Treatment comprise of : Equalisation, Chemical Dosing/Flash and Slow Mixing

Secondary Treatment comprise of : Aeration tank or Activated Sludge Process, Secondary Settling Tank

Tertiary Treatment comprise of : Pressure Filtration, Activated Carbon Filtration, Chlorination, Disposal to drain/sewer

Hydraulic Flow Chart of Sewage Treatment Plant {Replace this flow diagram with modified flow sheet}



Options for reuse of treated wastewater:

Wastewater generated from the HCF is treated in the ETP and shall be disposed into drain / sewer or could be reused in the following:

1. Flushing
2. Horticulture
3. Scrubber

B. BIO MEDICAL WASTE MANAGEMENT FOR OUTREACH ACTIVITIES

In public health care facilities, each HCF is performing some outreach activities by providing services to the population outside the premises of HCF. Some of such activities like Immunization programmes and home delivery services generate bio medical waste and are needed to be handled in order to avoid any harm to environment and human health.

This section provides the details of the activities needed to be carried out by the health care workers during such activities so as to ensure that handling of the BMW generated from these activities are done as per the BMW Rules, 2016. This section details about the responsibility for management of BMW during such activities, steps of BMW management for outreach activities and collection, treatment and disposal methods of BMW generated during such outreach activities.

B.1 RESPONSIBILITY

The occupier of the health care facility is totally responsible for ensuring that waste generated during the outreach activities is properly segregated, collected, treated and disposed of as per BMW Rules, 2016.

The ANM or HCW responsible for carrying out such outreach activities is totally responsible for handling the bio medical waste generated during the outreach activities as per BMW Rules, 2016.

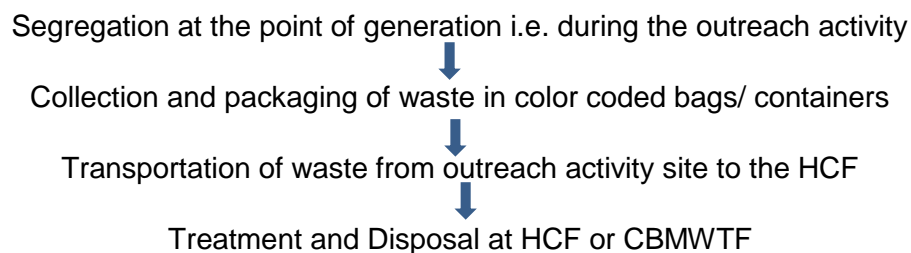
B.2 OUT REACH ACTIVITIES

In public health system each Health Care Facility provides some kind outreach services to the population like:



- Home delivery by SBA
- Ante Natal Care
- Point of care diagnosis
- Immunization
- Family Planning activities



In some of these activities the bio medical waste is generated which is needed to be segregated, collected at the site of generation only and has to be transported back to HCF for treatment and disposal.

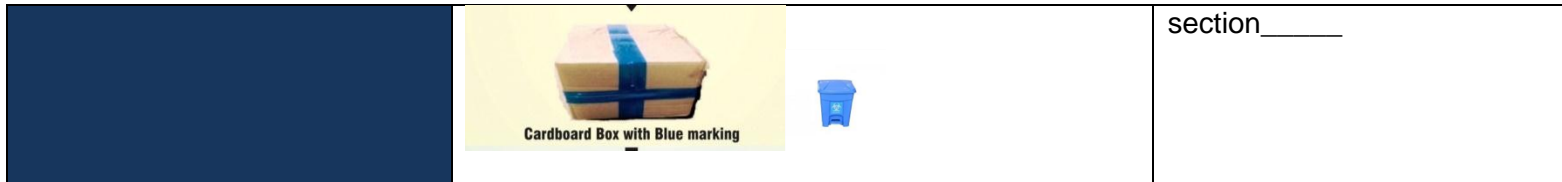
B.3 STEPS FOR BIO MEDICAL WASTE MANAGEMENT FOR OUT REACH ACTIVITIES



B.4 WASTE COLLECTION, TREATMENT AND DISPOSAL OPTION FOR OUTREACH ACTIVITIES

Category & Type of Waste	Action to be Taken at the Outreach Station	Final Disposal
<p>Yellow Category Anatomical Waste, placenta body tissues, cottons, Items contaminated with blood like swabs, dressing, cotton.</p>	<p>Collect the waste in Yellow color plastic bag and transport the same to the HCF for final treatment and disposal</p> 	<p>Handover to CBMWTF.</p> <p>In case of no linkage with CBMWTF, carry the waste to captive facility of hospital for necessary treatment and disposal.</p>
<p>Attenuated Vaccines</p>	<p>Collect in separate container yellow colored small container at the outreach station and transport back to HCF</p> 	<p>Dispose of by handing to CBMWTF or in sharp pit after treatment</p>
<p>Discarded Medicine</p>	<p>Collect in separate Yellow Colored Bag with Cytotoxic Symbol and transport it back to HCF</p>	<p>Handover the waste to CBWTF operator for final disposal by incineration at</p>

		<p><1200°C.</p> <p>For the healthcare facilities having no linkage with CBMWTF, the expired and discarded medicines should be sent back to manufacturer for disposal by incineration at <1200°C</p>
<p>Red Category Tubings, Bottles, Syringes, Gloves,</p>	<p>Collect the waste in separate red colored waste collection bag and transport it back to HCF</p> 	<p>Handover the waste to near by CBMWTF for treatment by sterilization and final disposal by authorised recycler.</p> <p>In case of no linkage with CBMWTF, carry the waste to captive facility of hospital for necessary treatment and disposal.</p>
<p>White Category Needles , Scalpel, blades, Syringes with fixed needles</p>	<p>White Colored puncture proof, leak proof, Temper Proof containers and transport it back to HCF</p> 	<p>Handover the waste to CBMWTF or treat and dispose the waste as per the treatment option given in BMWM Rules</p>
<p>Blue Category Broken glass, Ampoules, Medicine vials</p>	<p>Cardboard boxes with blue colored marking or blue colored puncture proof, temper proof containers</p>	<p>Handover the waste to CBMWTF or bring it back to hospital, for treatment and dispose the waste as per the treatment option given in</p>



Note: As per Rule 7 of the BMWM Rules, 2016, Any person including an occupier or operator of a common bio medical waste treatment facility, intending to use new technologies for treatment of bio medical waste other than those listed in Schedule I shall request the Central Government for laying down the standards or operating parameters. On receipt of a request referred to in sub-rule (5), the Central Government may determine the standards and operating parameters for new technology which may be published in Gazette by the Central Government.

B.5 BIO-MEDICAL WASTE MANAGEMENT BY OCCASSIONAL WASTE GENERATORS

Occasional bio-medical waste generator like first aid rooms at school, colleges, research laboratories at institutions, blood banks, health camps etc are also required to dispose the bio-medical waste generated waste as per the provisions of BMWM Rules, 2016. Occasional generators are also required to obtain authorisation (one time) from the prescribed authority under BMWM Rules, 2016. Following are the guidelines for the occasional bio-medical waste generators:

1. Obtain one time authorisation under BMWM Rules, 2016 from the prescribed authority;
2. Obtain agreement with the CBWTF operator for final treatment and disposal of bio-medical waste;
3. Inform the prescribed authority and CBWTF operator as and when bio-medical waste is generated;
4. Segregate the bio-medical waste as per the colour coded categories stipulated under BMWM Rules, 2016;
5. Pre-treat the microbiology, biotechnology and other clinical laboratory waste with non-chlorinated chemical disinfection method;
6. Ascertain that the bio-medical waste is collected by the CBWTF operator within the stipulated time period;
7. Maintain the record pertains to quantum of category wise bio-medical waste generated and treated.

B.6 GUIDELINES FOR UTILISATION OF BIO-MEDICAL WASTE FOR CONDUCTING RESEARCH

Bio-medical waste like body fluids, placenta etc is utilized by the proponents who are involved in production of drugs, reagent chemicals, markers, etc. The same may require transportation of bio-medical waste from one place/State to other. Following guidelines are required to be followed for utilization of bio-medical waste :

- 1. If any proponent want to utilize the bio-medical waste, the proponent should obtain authorisation under BMW Rules, 2016 from the concerned prescribed authority.**
- 2. If interstate transportation of bio-medical waste is required, then the proponent and the HCF both requires to obtain the authorisation from the concerned Prescribed Authority.**
- 3. In authorisation, the list of hospitals from where the bio-medical waste is collected should be mentioned.**
- 4. Quantity of bio-medical waste needs to be processed or collected by the HCF should also be mentioned in the authorisation.**
- 5. Prior information should be given to the Prescribed authority as and when the bio-medical waste needs to be collected from the hospital.**
- 6. The waste should be transported in Dedicated vehicles provided for the collection or transportation of bio-medical waste by the proponent.**
- 7. In case of transport of body fluids in small specilaised containers, and transport by courier, the same should be carried out after submitting completed details on handling, packaging, labelling, safety fact sheets, etc and taking prior authorization for the same.**
- 8. Concerned Authority shall examine the proposal for interstate transportation of bio-medical waste for utilization, and ensure that the residual waste after utilization is disposed after pre-treatment and sent to CBMWTF for final disposal.**

SECTION C: MANAGEMENT REQUIREMENTS

This section clearly defines all the requirements of management of the healthcare facilities in order to successfully implement the requirements of Bio Medical Waste Management Rules, 2016. This section is totally applicable to the Top Management of the Health Care Facilities which includes the In charge of the Health Care Facility, which may be Medical Superintendent (MS), SMO/CMO/PMO/MO I/c, depending upon the type of health care facility.

This section covers the overall roles and responsibilities of the healthcare facilities in relation to the biomedical waste management, the method of approval for authorization or renewal of the authorization from the prescribed authorities, the system of monitoring and review of the activities related to Bio Medical Waste Management, the training requirements, the records to be maintained by the HCFs, the reporting requirements of the Bio Medical Waste Management Rules, that includes both the annual reporting and accident reporting, the liability of the occupier and occupational safety of the employee of the health care facility.

This section also details about the budget allocation for BMW Management Activities and also on the activities needed to be undertaken for monitoring and review of these activities to ensure proper implementation.

C.1 GENERAL ROLES AND RESPONSIBILITY OF HEALTH CARE FACILITY

Each healthcare facility has to perform certain roles and responsibility in order to successfully implement the Bio Medical Waste Management Rules, 2016 (BMWM Rules, 2016). A brief summary of overall roles and responsibilities of the healthcare facility which are to be fulfilled as per BMWM Rules, 2016 is detailed in these guidelines. This section also highlights the designation of the person responsible for overall implementation of BMWM Rules, 2016 in the health care facilities, as per the structure of public health care system of India.

C.1.1 ROLE OF HEALTH CARE FACILITY

Each health care facility plays a major role of handling of waste through waste segregation, collection, its pre-treatment and storage activities. It is imperative for HCFs to follow the Bio Medical Waste Management Rules, 2016, so that these activities can be performed in an accurate manner and thus ensuring protection of environment and human health from any adverse effect, which may occur due to the waste generated from the healthcare facilities,

As per the BMWM Rules, 2016, the liability for implementing these rules lies with the person having administrative control over the healthcare facility. This person in BMWM Rules is termed as an “**Occupier**” and defined as “a person having administrative control over the institution and the premises generating bio-medical waste, which includes a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank, health care facility and clinical establishment, irrespective of their system of medicine and by whatever name they are called.”

In the context of public health systems in India, the role of an Occupier will be performed by designated Medical Superintendent (MS)/Chief Medical Officer (CMO)/Senior Medical Officer (SMO)/ Principal Medical Officer (PMO) of the District Hospital, Sub Divisional Hospital and Community Health Center (CHC).

In case of Primary Health Centre (PHC) and Sub Center, the duties of occupier is to be performed by designated Medical Officer In charge (MO I/C) of the PHC.

The CMO/ SMO/ MS/Medical Officer In charge of the HCFs is totally responsible and liable for implementing, monitoring and review of activities related to Bio Medical Waste Management in its premises for which it is authorized to perform.

C.1.2 RESPONSIBILITY OF THE HEALTHCARE FACILITY

It is the overall responsibility of the In charge of the HCF to take all necessary steps to ensure that bio-medical waste is handled without any adverse effect to human health and the environment and in accordance with the BMWM Rules, 2016.

He/she has to ensure that the BMW generated from the Health Care Facility is properly segregated, handled, stored, packaged, transported and disposed of, as per these guidelines to ensure successful implementation of BMWM Rules, 2016

Overall Roles and Responsibility of Health Care Facility

Over all roles and responsibility of the Health Care Facility is given in the following figure.C1.



As per the BMW Management Rules, 2016 the responsibility of the HCFs is:

- To ensure that all the legal requirements related to the Bio Medical Waste Management are complied with and are regularly updated
- To ensure that annual reports and accidents reports are submitted to SPCB in a timely manner.
- To ensure that bio-medical waste is handled without any adverse effect to human health and the environment.
- To make a provision within the premises for a safe, ventilated and secured location for storage of segregated biomedical waste
- To ensure that there shall be no secondary handling, pilferage of recyclables or inadvertent scattering or spillage by animals
- To ensure that bio-medical waste from central waste collection storage or premises shall be directly transported to the common bio-medical waste treatment facility for the appropriate treatment and disposal
- To ensure pre-treatment of all the laboratory waste, microbiological waste, blood samples and blood bags before handling to over to CBMWTF for final disposal
- To phase out use of chlorinated plastic bags, gloves and blood bags within two years from the date of notification of Bio-Medical Waste Management Rules, 2016
- To ensure that the solid waste other than BMW is disposed of as per relevant rules and laws and there is no mixing of BMW and solid waste

- To establish a Bar- Code System for bags or containers containing bio-medical waste to be sent out of the premises or place for any purpose within one year from the date of the notification of Bio-Medical Waste Management Rules, 2016.
- To ensure all the staffs of HCFs are provided regular training on BMW handling both at the time of induction and on annual basis as well
- To ensure occupational safety of all the employees through annual health checkups, immunization and provisions of appropriate and adequate PPEs
- To ensure that BMW Register is maintained and is updated on day to day basis
- To ensure that monthly and annual records of the waste generated from the facility is uploaded on its own website as well as on State Pollution Control Website(SPCB)
- To immediately inform the SPCB in case of any lapse by waste collection agency or CBMWTF in collection of waste from the HCF.
- To ensure that all the activities of BMW management are monitored and reviewed
- To ensure that the committee formed for monitoring and review of BMW management is functioning properly
- To ensure that all the records related to BMW Management are maintained by HCF.
- To ensure that all the requirements related to establishment of a treatment facility within its premises are fully complied with

All the listed responsibilities are detailed in these guidelines, laying down all the steps which are needed to be undertaken by health care facility in order to fulfill these responsibilities

C .2 AUTHORIZATION

C.2.1 RESPONSIBILITY

"authorization" means permission granted by the prescribed authority for the generation, collection, reception, storage, transportation, treatment, processing, disposal or any other form of handling of bio-medical waste in accordance with these rules and guidelines issued by the Central Government or Central Pollution Control Board (CPCB) as the case may be;

As per BMW Rules, 2016, Every occupier or operator handling bio-medical waste, irrespective of the quantity is required to obtain authorisation from the prescribed authority i.e. State Pollution Control Board and Pollution Control Committee, as the case may be, for grant of authorisation and the prescribed authority shall grant the provisional authorisation with validity of such authorisation (for bedded health care facility), synchronised with the validity of the consents.

The overall responsibility of having valid authorizations and consents under various acts lies with the In-charge of the health care facility.

C.2.2 AUTHORIZATION UNDER BIO MEDICAL WASTE MANAGEMENT RULES, 2016

Procedure for Authorization

In charge of the health care facility needs to apply to the respective State Pollution Control Board (SPCB) in respect of States or Pollution Control Committees (PCC) in respect of Union Territories for fresh or renewal of authorization, for the activities being carried out in handling of Bio Medical Waste Management by the health care facility.

Application

Application must be submitted to the respective SPCB/PCC for fresh or renewal of authorization in prescribed format as per Form II as prescribed under Bio Medical Waste Management Rules, 2016

Information requirements of Application

- Particulars of Health Care Facility: Name, Address, Contact Details etc.
- Validity of Consents under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981
- Detail of HCF: Number of beds, Average number of patient treated per month
- Category wise Quantity of Waste Generated or disposed by the health care facility
- Detail of any treatment facility available in the premises of health care facility

Please refer to Annexure F.8: Application form for Authorization or Renewal of Authorization

Grant of Authorization

Upon verification and ensuring the HCF is having requisite facilities, the authorization is granted by the respective State Pollution Control Board (SPCB)/Pollution Control Committee (PCC) in a prescribed form, with unique number of authorization and date of issue.

Validity of Authorization

(a) For bedded Healthcare Facilities

The validity of this authorization is synchronized with the validity of:

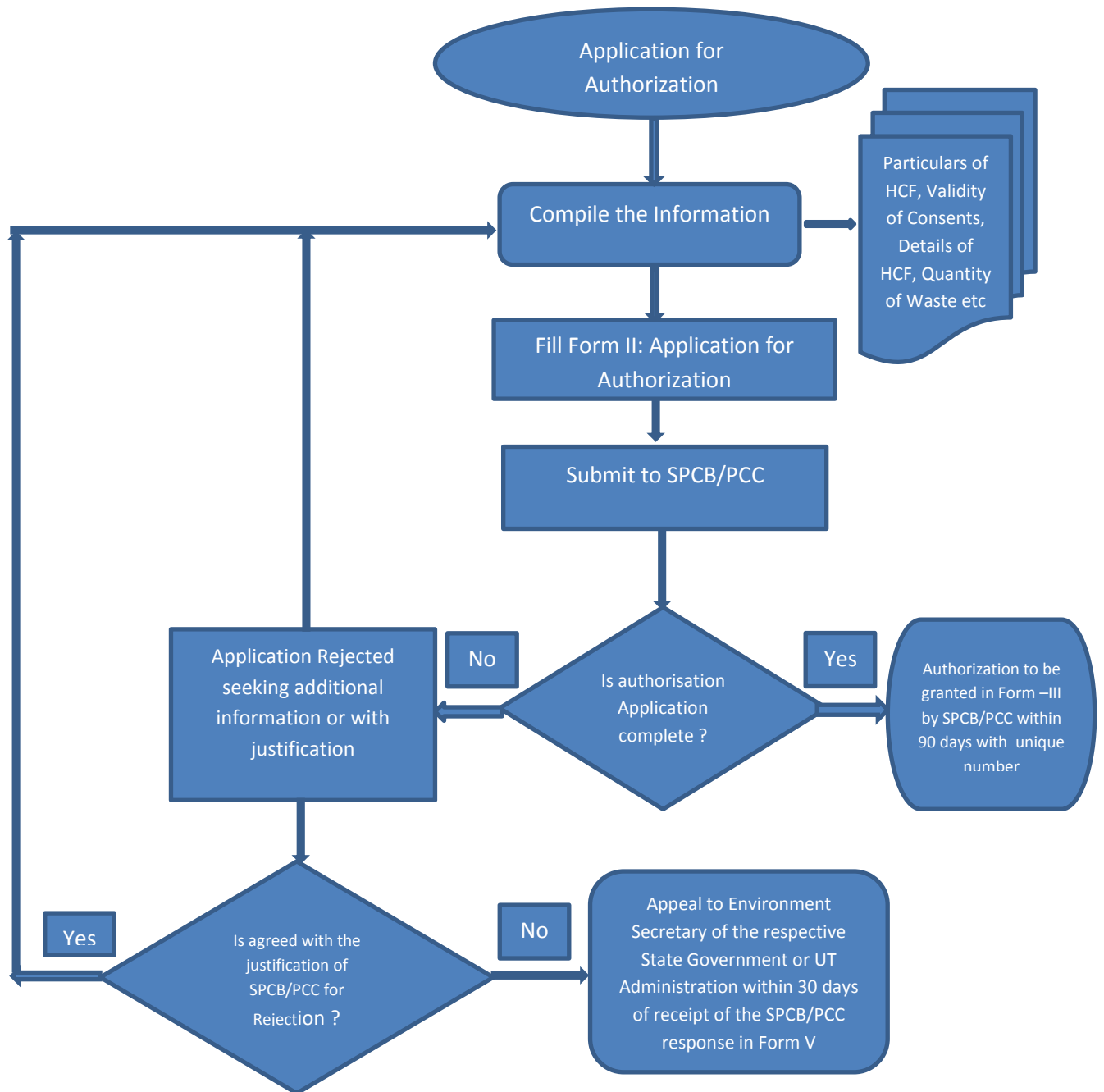
1. Consent under Air (Prevention and Control of Pollution) Act, 1981:
2. Consent under the Water (Prevention and Control of Pollution) Act, 1974

(b) For non-bedded Healthcare Facilities

The authorization for non-bedded healthcare facilities is for one time only. HCFs need to apply for a Fresh Authorization if there is any change or any variance in relation to the activities for which authorization is earlier granted by the respective SPCB/PCC.

Flow chart for obtaining of authroisation is given in Figure C1.

FIGURE C1. FLOW CHART OF PROCEDURE OF AUTHORISATION UNDER BMW RULES, 2016



C.2.3 APPROVAL FOR DEEP BURIAL PITS (FOR HCFs NOT UNDER AGREEMENT WITH CBWTF)

Each HCF which is treating and disposing of the BMW through deep burial pits, need to have an approval from the respective prescribed authority i.e. SPCB/PCC office for establishment of deep burial pits and records of such pits needs to maintained.

Disposal by deep burial is permitted only in rural or remote areas where there is no access to common bio-medical waste treatment facility. This will be carried out with prior approval from the prescribed authority and as per the Standards specified in Schedule-III. The deep burial facility shall be located as per the provisions and guidelines issued by Central Pollution Control Board from time to time.

C.2.4 AGREEMENT WITH COMMON BIO MEDICAL WASTE TREATMENT FACILITY (CBWTF)

Each health care facility which is situated within reach of 75 kilometers of CBWTF needs to have a valid agreement with CBWTF for treatment and disposal of Bio Medical Waste generated from the HCF.

It has to be ensured by the HCF, that the CBWTF operator collects the waste within a specified time, which must not exceed beyond a period **48 hours**.

Agreement must also specify the responsibilities of in agreement parties, terms on supply of non-chlorinated bags and payment conditions.

C.3 REPORTING TO STATE POLLUTION CONTROL BOARD OR POLLUTION CONTROL COMMITTEE

C.3.1 ANNUAL REPORTING

As per the Bio Medical Waste Management Rules, 2016, the healthcare facility is required to submit the Annual Report to the SPCB/PCC on or before 30th June every year, for the period from January to December of the preceding calendar year.

The annual report should be filled in the prescribed format as per the Form IV prescribed under BMW Management Rules, 2016.

The annual report contains details of following:

- Particulars of Occupier/ HCF
- Quantity of waste generated in kg/annum
- Details of storage, treatment, transportation, processing and disposal facility
- Details of training conducted on Bio Medical Waste Management
- Details of accident Occurred
- Details Emission and Effluent testing

Annual Report submitted to the State Pollution Control Board or Pollution Control Committee must also be enclosed with following details:

- Training imparted to the Health Care Workers involved in handling of bio-medical waste
- Minutes of Meeting of BMW Management Committee
- Details of Accident Occurred during one year, along with the remedial steps taken
Records of testing of Emission of DG Sets
- Records of Effluent generated and its characteristics from health care facility
- Records of pre-treatment Of specified waste categories
Record of recyclable waste handed over to the authorized recycler in kg/annum (where captive treatment facility is allowed by the SPCB/PCC)
- Records of health status of the Health Care Workers involved in handling of bio-medical waste
- Records of immunisation of Health Care Workers involved in handling of bio-medical waste

Each healthcare facility must also ensure that the annual report submitted to the concerned SPCB/PCC is also published in its own website

Please refer to Annexure E.7: FORM IV: Annual Report

C.3.2 ACCIDENT REPORTING

Any accident occur during the handling of Bio Medical Waste in the healthcare facility is having potential to either harm the environment or safety of the human health must be recorded by the HCF.

As per the Bio Medical Waste Management Rules, 2016, the accidents are classified into two categories: **Major and Minor**

Major Accidents

Major accidents includes but not limited to following:

- Toppling of the truck carrying bio-medical waste
- Accidental release of bio-medical waste in any water body
- Fire Hazard
- Blasts
- Flooding or Erosion of the deep burial pit etc

It is **mandatory** under BMW Rules 2016, for healthcare facilities to report each/any **major** accidents, to the respective State Pollution Control Board/Pollution Control Committee, occurred during the handling of BMW along with the records of remedial actions taken including corrective and preventive actions

The Accident Report is needed to be forwarded in written to the respective SPCB/PCC within **24hrs of accident.**

The reporting should be done on the prescribed **Form 1** given in BMW Rules 2016.

Minor Accidents

Minor accidents includes but not limited to following

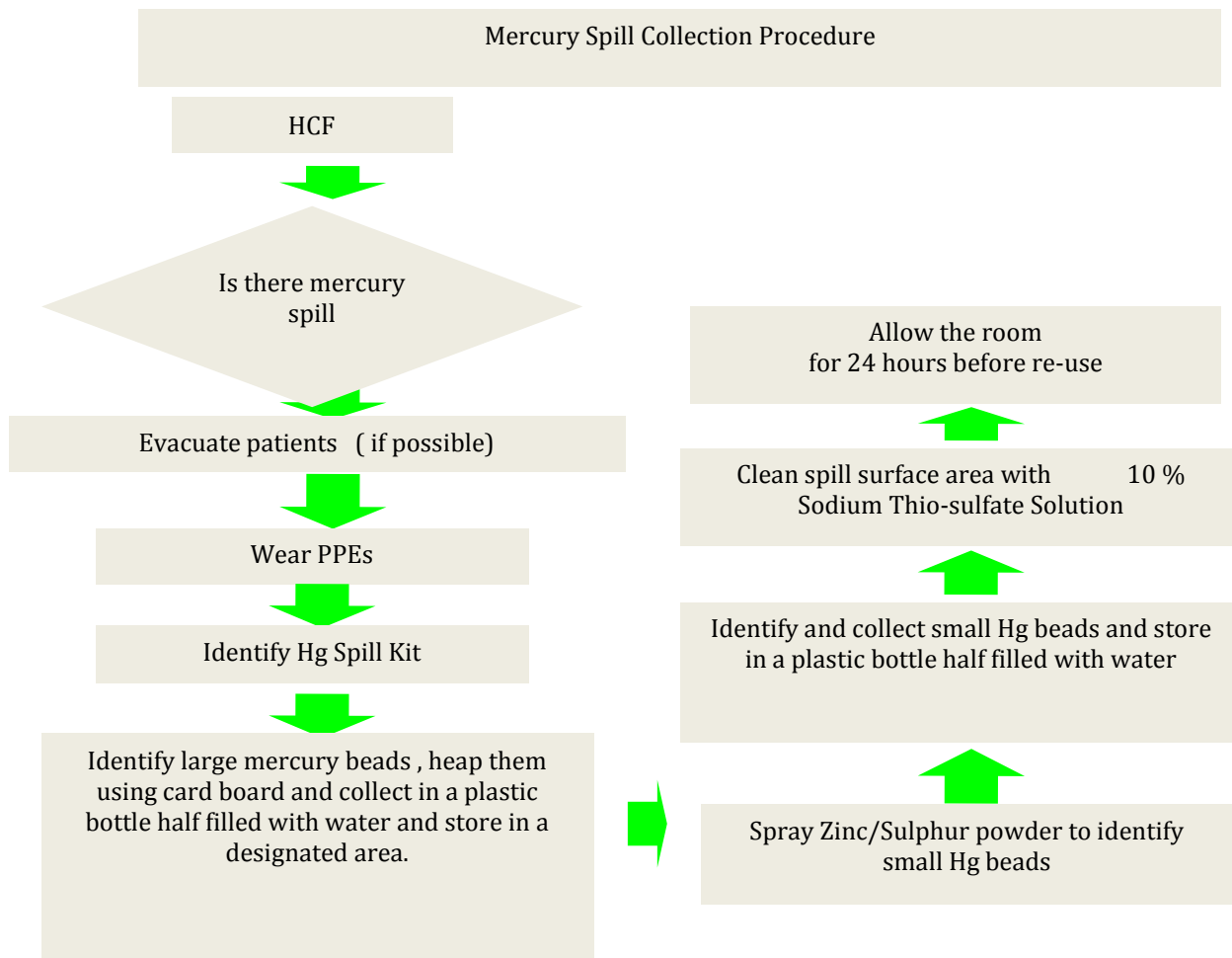
- Needle stick injuries,
- Splash exposure or
- Spillage etc.

Such minor accidents need not to be immediately reported to the State Pollution Control Board/Pollution Control Committee but is required to be recorded by the health care facility and appropriate remedial actions must be taken by health care facility.

Healthcare facility also needs to submit the details of total number of accidents occurred both major and minor, along with the number of persons affected, remedial actions taken and number of fatalities, along with the annual report (for the preceding calendar year) to be submitted to SPCB/PCC, on or before 30th June of every year.

Spill Management Procedures:

Mercury Spill Collection Procedure:



Blood Sample Spill collection procedure (To be included)

Please refer to Annexure E.8: Form I: Accident Reporting Form

C.3.3 OTHER REPORTING REQUIREMENTS

Besides annual reporting and accident reporting each healthcare facility needs to report to the respective SPCB/PCC in event of following:

- If the waste collection agency or CBWTF does not collect the waste within 48 hours of generation, it is the responsibility of the HCF to immediately notify to the respective State Pollution Control Board/Pollution Control Committee about any such lapse.
- It is also mandatory to report to the respective State Pollution Control Board/Pollution Control Committee, the reason of storing the waste in the facility for a period beyond 48 hours and also the remedial actions taken by the HCFs to ensure that the waste does not adversely affect human health and the environment.

C.4 RECORD MAINTENANCE

As per Bio Medical Waste Management Rules, 2016 it is mandatory for every authorized person to maintain records related to the generation, collection, reception, storage, transportation, treatment, disposal or any other form of handling of bio-medical waste.

C.4.1 LIST OF RECORDS

1. Authorization from SPCB/PCC under BMW Rules, 2016
2. Annual Report submitted to SPCB/PCC
3. Accident Report Submitted to SPCB/PCC including "NIL" report.
4. Bio Medical Waste Register
5. Training Records on BMW Management including both Induction and in service training records.
6. Annual Health check-up record of all employees
7. Immunisation Record of all employee
8. Minutes of meeting of Bio Medical Waste Management committee
9. Details of accident occurred including preventive and corrective actions taken by the HCFs in relation to such accidents.
10. Records of testing of Effluent generated from health care facility
11. Record of recyclable waste handed over to the authorized recycler in kg/annum (in case of HCF having captive treatment facility as per the format given at??).

C.4.2 RECORD RETENTION PERIOD

All the records related to the handling of BMW by healthcare facilities needs to be retained for a period of five years.

C.5 OCCUPATIONAL SAFETY

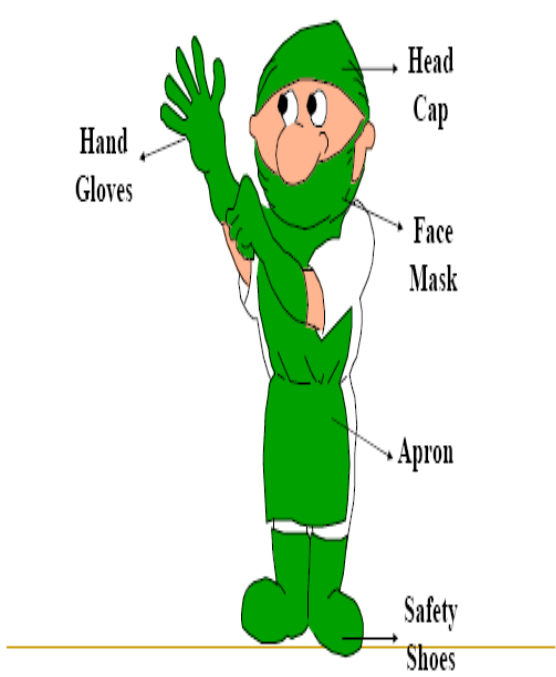
It is the responsibility of the in charge of the healthcare facility to ensure the occupational safety of the healthcare workers and other staff involved in handling of Bio medical waste in the healthcare facility.

As per Bio Medical Waste Management Rules, 2016 occupational safety of the staff is to be ensured in following methods:

- Providing adequate and appropriate Personal Protective Equipment (PPE) to the staff handling Bio Medical Waste
- Conducting health check-up of all the employees at the time of induction and also at least once in a year.
- Ensuring that all the staff of the health care facility involved in handling of BMW is immunized atleast against the Hepatitis B and Tetanus.
- Taking remedial steps in accordance to any accident occurred, leading to any harm to the employee, during the handling of Bio medical waste

C.5.1 PERSONAL PROTECTIVE EQUIPMENT

Health care facilities must ensure that all the staff involved in the handling of Bio Medical waste is provided with Personal Protective Equipment (PPE) for their safety.

<p style="text-align: center;">PPE : PERSONAL PROTECTIVE EQUIPMENT</p> 	<p>Personal Protective Equipment (PPE) includes:</p> <ul style="list-style-type: none">• Heavy Duty Gloves (Workman's Gloves)• Gum Boots or safety shoes for waste collectors• Face mask• Head Cap• Splash Proof Gowns or aprons etc.• Disposal gloves for waste handlers <p>Use of PPE while handling of Bio Medical Waste must be encouraged and must be monitored regularly to ensure occupational safety of staff.</p>
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C.5.2 EMPLOYEE HEALTH CHECK UP

As per Bio Medical Waste Management Rules, 2016, every HCF must ensure that a comprehensive health check-up of each employee and other staff involved in BMW handling is carried out at the time of induction and also as a mandatory procedure to be followed for each year for every employee.

Comprehensive Health Check-up includes following but not limited to:

- Present Complaints (If any), with duration
- Vaccination History (especially with respect to Hepatitis B and Tetanus Toxoid)
- Past Medical History
- Past Surgical History
- General Physical Examination
- Dental Examination
- Systemic Examination including Cardiovascular System, Respiratory System, Central Nervous System, Gastrointestinal System, Uro Genital System, Gynae and Obstet.(in case of females), Musco-skeleton System , EYE and ENT.
- Lab Investigations including: Hb, TLC, DLC, RBS, Blood Urea, S. Creatinine, Urine, Stool etc.
- Radiological Investigations : Chest X ray, USG(If needed), CT or MRI (if needed)
- Inference with Diagnosis

Health Check-up records of all the employees are needed to be maintained in the personal record of each employee for proving compliance

Please refer to Annexure E.9: Suggested Format for Employee Health Check up Record

C.5.3 IMMUNIZATION

- All the staff involved in handling of Bio Medical Waste in the health care facility must be immunized against the communicable diseases especially against Hepatitis B and Tetanus.
- Evaluation of immunization status of the staff must be included in the annual health check-up.
- Hospital needs to maintain the immunization records of all the staff with dates of immunization and due date of first dose, Second Dose and Booster Dose.

C.6 TRAINING OF HEALTHCARE WORKERS

As per Bio Medical Waste Management Rules, 2016, it is mandatory for all the employee of the healthcare facility to be trained on handling of biomedical waste management and handling.

C.6.1 TRAINING NEED ANALYSIS

It is mandatory for each health care worker inducted to the HCF to undergo the training on Bio Medical Waste Management at the time of induction.

Though as per BMW Rules, 2016 an annual training for the entire healthcare staff of HCF on Bio Medical Waste Management is a mandatory requirement, it is suggested that the committee / person designated for monitor or review of the activities of BMW management does the Training need analysis of the staff based on following parameters:

- Theoretical Knowledge
- Demonstration of methods of handling of bio-medical waste
- Practical Implementation

If any scope of improvement is observed by the committee or designated person, training must be provided to the relevant section of staff or staff.

C.6.2 TRAINING SCHEDULE

As per the BMW Rules, 2016 the minimum requirements for health care facilities is to conduct the training on BMW activities at least annually for all the staff of the facility and also whenever a new staff is inducted into Health Care Facility.

It is preferable for each health care facility to create a training calendar for imparting the training on Bio Medical Waste Management Handling and training must be provided as per the formed training plan.

C.6.3 TRAINERS

- As per the BMW Rules, 2016 it is the responsibility of the SPCB/PCC and CBMWTF to impart training on BMW Management in the health care facilities.
- SIHFW may take the responsibility to provide induction training to the newly recruited healthcare staff
- For In house trainings trainers can be arranged from SPCB/PCC or CBMTF or already trained employee of the healthcare worker can take up the role of trainer.

C.6.4 TRAINING MATERIAL

It is a requirement of BMW Rules, 2016 to have a standard training module for imparting the training in the healthcare facilities. For this purpose, these guidelines can be used as training material for imparting the training or any other relevant material published by approved authorities like SPCB/PCC, State Guidelines can be used as training material.

C.6.5 TRAINING RECORDS

Health care facilities need to ensure that all the training records pertaining to the Bio Medical Waste Management including the induction training records and in service training, for all the staff is needed to be kept for proving compliance.

Attendance records of each training needs to maintained and signed by the trainees with name and designation.

HCFs need to maintain, compile and provide details of trainings provided for BMW handling to State Pollution Control Board (SPCB)/Pollution Control Committee (PCC). These details have to be submitted along with the annual report to the prescribed authority i.e. SPCB//PCC, on or before 30th June of every year.

The training details include:

- Total Number of trainings conducted along with the date of imparting the training
- Total number of participant of each training
- Attendance Record
- Total Number of staff trained on BMW Handling
- Total number of staff trained on BMW handling at the time of Induction
- Total number of staff, not undergone any sought of training on BMW Handling.

C.6.6 TRAINING EFFECTIVENESS

Effectiveness of the training can be evaluated by observing the same parameters as listed in training need analysis of the staff or through a test mock/verbal or written, to be conducted after training

C.7 BUDGET ALLOCATION FOR BIO MEDICAL WASTE MANAGEMENT

As per Schedule –III of the BMWM Rules, 2016, State Government of Health or Union Territory Government or Administration are required to allocate adequate funds to Government health care facilities for bio-medical waste management

HCFs may have a dedicated budget for BMWM as a part of annual budget of the health care facilities. Such budget must include both recurring and non-recurring costs expected to be incurred by HCFs, related to Bio Medical Waste Management.

States may include this budget for the Bio Medical Waste Management in the yearly PIP for approval and funding from the Central Government of India.

The various budget heads under which the grant is awarded from the center can be:

- Training Heads
- Resources needed for BMW
- RFP for contracting with CBMWTF

Such budget must include action plan for:

- Logistics: Bins, bags, puncture proof containers, PPE, trolleys, needle cutters and chemicals
- Outsourcing: Waste Collection and Personnel
- Training
- IEC/Patient Education: Posters, Pamphlets

C.8 MONITORING AND REVIEW

Each healthcare facility must ensure that there is a system of monitoring and review of the activities related to the handling of Bio Medical Waste Management.

Bio Medical Waste Management Rules, 2016 stipulates that the system to be adopted for monitoring and review of the activities at all the levels of implementation. The monitoring and review is required to be done through following instruments:

1. State Level: State Monitoring cum Technical Advisory Committee (SMTAC)
2. District Level: District Monitoring cum Technical Advisory Committee (DMTAC)
3. HCFs having 30 beds or more: Quality Team/ Infection Control Committee/ Bio Medical Waste Management Committee
4. HCFs having less than 30 beds: Designated Bio Medical Waste Supervisor

C.8.1 MONITORING AND REVIEW AT HCFs HAVING 30 BEDS OR MORE

BMWM Rules 2016 stipulates that monitoring and review of the activities related to handling of bio medical waste, must be performed by an existing committee or by framing a new committee for this purpose, at the healthcare facility only.

Quality Team (QT), framed under National Quality Assurance standards, responsible for implementation of quality assurance can perform the overall role of monitoring and review the activities of BMW handling.

It is suggested that HCF must frame new committee at the facility level for monitoring of the BMW activities, which is to be termed as Bio Medical Waste Management Committee.

The suggested composition of such committee is as follows:

- SMO/ CMO/ Medical Superintendent (Chairperson)
- District Quality Consultant/ District BMW Officer(Invitee Members)
- Quality Manager
- Hospital Infection Control Nurse/ Officer
- Nursing In charge
- Medical Officer (Surgery)
- Medical Officer (Emergency)
- Medical Officer (Gynae & Obs)
- Microbiologist/ Pathologist
- OT Nurse / Technician/ Assistant
- Lab Technician
- Blood Bank/ Storage Unit Technician
- Housekeeping In charge
- Pharmacist

The responsibility of this committee are to:

- Improve and streamline the bio medical waste (BMW) management Systems for proper implementation of Bio-Medical Waste Management Rules 2016.
- Formulate and ensure implementation of the responsibilities of the various categories of the staff involved in the generation, collection, transportation, treatment and disposal of wastes.
- Monitor biomedical waste handling practices in the organization.
- Ensure periodic training of all categories of staff involved in generating and transporting waste.
- Maintenance of all the records related to BMW handling as per BMWM Rules 2016.
- Ensuring submission of reports to prescribing authority like Accident Reporting & Annual Reporting to SPCB/PCC within the stipulated due dates.
- Update and maintain the valid authorization from SPCB/PCC
- Have a valid agreement with Common Bio Medical Waste Treatment Facility (CBWTF).
- Take appropriate remedial actions in event of any accident occurrence

Meeting Schedule

It is to be ensured by the HCFs that the committee framed for monitoring of activities of bio medical waste handling in the facility must meet:

- At least once in six months or
- When needed.
- Committee must meet in event of any accident reported.

Agenda and Meeting Records

It is to be ensured that committee meetings are held in accordance with a predefined agenda for the meeting.

The Agenda of meeting, proceedings/ minutes of meeting along with the planned actions with the responsibility delegated for implementation should be recorded and records are to be kept with BMW Committee for proving compliance.

All the minutes of meeting of this committee is to be forwarded along with the Annual Report to the prescribing authority i.e. SPCB/PCC. The meeting records for the period from January to December of the preceding year are to be submitted along with Annual Report on or before 30th June of every year.

C.8.2 MONITORING AND REVIEW AT HCFs HAVING LESS THAN 30 BEDS

The healthcare establishments having less than 30 beds must designate a qualified person for monitoring and review the activities of Bio Medical Waste Management in the facility.

The designated staff, for monitoring of the activities of BMW will perform the same functions as described for the committee framed

****Note: For monitoring at the sub center level it is advised that the person designated for monitoring at the PHC is also responsible for monitoring at the sub center level***

The person designated will be overall responsible for implementation of BMW Rules, 2016 under direct supervision of Medical Officer I/c of the PHC

Will also be responsible for collating the information required for submission of the annual report and will also be responsible for maintaining the records of BMW Trainings, Quantity of waste generated , number of accidents occurred in handling of BMW both major and minor, remedial actions taken by HCFs in event of such accidents etc.

INDICATORS FOR MONITORING OF ACTIVITIES OF BMW MANAGEMENT AT VARIOUS LEVELS

The officials for monitoring and review for the activities of BMW management at various levels i.e. State, District and Facility level, needs to monitor the performance related to the BMW management at all the levels. For this purpose a monthly indicator monitoring tool is already developed. The state and district level instruments needs to compile the data received from the facility level and take appropriate actions for any lapse in the BMW activity and for the improvement of the BMW handling in the state.

Please refer to the Annexure E.12 “Indicators for monitoring of BMW Activities in the State”

C.9 LIABILITY OF HEALTH CARE FACILITY

As per BMW Rules, 2016, the administrative head i.e. **Occupier**, of the HCF generating waste is liable for any harm that may occur to the environment or people due to improper handling of the BMW generated from the facility.

The occupier shall be liable for action under section 5 and section 15 of Environment (Protection) Act, 1986, in case of any violation.

To avoid any legal implications the HCF must meet all the responsibilities as listed in these guidelines as well as BMW Rules, 2016.

LEGAL ACTIONS THAT CAN BE TAKEN AGAINST HCFS

For violation of the provisions; 'Directions' under **Section 5** of 'The Environment (P) Act, 1986' as follows:

- Closure, prohibition or regulation of any operation or process
- Stoppage or regulation of the electricity or water supply
- Closure of the HCFs

For Violation of the Provisions; Liable for punishment under **Section 15** of 'The Environment (P) Act, 1986' which includes:

- Imprisonment up to five years or fine up to one lakh rupees or both
- In case of violation continues: additional fine which may extend to five thousand rupees for every day
- If the contravention continues beyond a period of one year after the first date of contravention, the offender shall be punishable with imprisonment for term which may extend to seven years.

C.10 REQUIREMENTS FOR ESTABLISHMENT OF CBWTF WITHIN THE PREMISES OF HCFS

As per Bio Medical Waste Management Rules, 2016, in cases where service of the common bio-medical waste treatment facility is not available within 75 KMs, the Occupiers shall set up requisite biomedical waste treatment equipment like incinerator, autoclave or microwave, shredder within the premises of the facility, provided that it has valid authorization from State Pollution Control Board/PCC, prior to commencement of its operation.

If a Health Care facility wants to establish an onsite treatment facility within the premises of the facility; in addition to the requirements of Occupier, such facilities must also meet the requirements of "Operator", as prescribed under **Section 5 of BMW Rules, 2016**

SECTION D. RELATED REQUIREMENTS

This section provides a brief description about the management of general waste in the healthcare facilities as per the relevant laws. This section also details about the additional requirements for management of general waste in the primary health centres and sub centres, where there is no facility of handing over the general waste to the local municipalities or corporations, urban local bodies and gram panchayats

D.1 MANAGEMENT OF GENERAL WASTE

As per Bio Medical Waste Management Rules 2016 the general waste generated from the healthcare facility must be

Disposed of in accordance with the provisions of Solid Waste Management Rules, 2016

- Not to give treated bio-medical waste with municipal solid waste

D.1.1 GENERAL REQUIREMENTS FOR HCFS

Health care facilities must ensure that the general solid waste generated from the facility is segregated and collected in a separate bins filled in with non-chlorinated bags and shall not be mixed up with the BMW generated in the facility.

- Two separate bins should be provided at each place for dry waste (blue colour bin) and wet waste (green colour bin)
- Segregated wastes should be handed over to the Local Municipalities or Corporations, Urban Local Bodies and Gram Panchayats as per the Municipal Solid Waste (Management and Handling) Rules, 2016 or as amended from time to time.
- The wet waste should preferably be used in on site compost plant to produce organic compost.
 - Used sanitary waste like diapers, sanitary pads etc. generated from hospitals should preferably be wrapped in the pouches provided by the manufacturers or brand owners of these products or in a suitable wrapping material and disposed along with soiled waste yellow category waste for incineration.
 - , ;
 - To store horticulture waste and garden waste generated from his premises separately in his own premises and dispose of as per the directions of the local body from time to time.
 - No waste generator shall throw, burn or burry the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.
 - All waste generators shall pay such user fee for solid waste management, as specified in the bye-laws of the local bodies.
 - No person shall organize an event or gathering of more than one hundred persons at any unlicensed place without intimating the local body, at least three working days in advance and such person or the organizer of such event shall ensure segregation of waste at source and

- Handing over of segregated waste to authorized waste collector or agency as specified by the local body
-

Such waste **must not be** stored in the central waste storage area meant for Bio Medical Waste generated for the facility, but is stored separately, till it is handed over to the local municipalities or corporations or Gram Panchayats

Any BMW generated should not be mixed with the general waste and should not be handed over to the Municipality.

For this purpose health care facilities has to ensure that all the staff of HCF segregates the waste at the generation site only and general waste is collected and stored in a separate non chlorinated bag

D.1.2 ADDITIONAL REQUIREMENT FOR PHC AND SUB CENTERS

For Primary Health Centers and Sub Centers these are the additional considerations which

- General waste generated from the facility must be transported to Solid Waste dumping sites through an identified waste collector
- In absence of waste collection facility the organic waste like food, paper, cardboard, land clippings etc can be disposed of in the secured composting pit.
- Inorganic wastes like plastic water bottles, aluminum cans etc should be handed over to the identified and authorized recyclers or informal waste handlers.

Construction of compost Pit

- A two-tank system for garden and general waste is recommended.
- A small tank of 1m x 1m x 1m is made above ground under may be a shade.
- The tank may be divided into two equal halves units vertically by a wall containing vents.
- Twigs wigs and small branches are put on the floor.
- The waste is deposited over this layer and spread in the tanks.
- After a layer of 15 to 20 cm dry/green leaves is formed, a thin layer of soil is used to cover it.
- Water is sprinkled over it. This process of alternate layers of waste and mud is followed till the tank is about $\frac{3}{4}$ full following which the other tank is used.
- The contents of the first tank are to be left alone for about two months and the contents can then be used as manure.

Vermi Composting

In this method, few species of Earth-worms (*Eudrilus eugeniae* or *Eisenia foetida* and *Perionyx excavates*) are added to the compost. These help to break the waste and the added excreta of the worms makes the compost very rich in nutrients.

- To make a compost pit, a covered / selected site is selected.

- Preferably the pit should be lined with granite or brick to prevent nitrite pollution of the subsoil water.
- Each time when organic matter is added to the pit, it should be covered with a layer of dried leaves or a thin layer of soil which allows air to enter the pit.
- Usually after 6 to 8 weeks the rich pure organic matter is ready to be used.

D2 MANAGEMENT OF OTHER WASTES

D2.1 MANAGEMENT OF USED BATTERIES

As per the provisions under Batteries (Management & Handling) Rules, 2001, used lead acid batteries generated from health care facilities (HCFs) should be sold/auctioned/sent only to the authorised dealers, designated collection centres or authorised recyclers or any any authorised agency. In no case the used batteries be handed over to an unauthorised person. Hospital having purchased more than 100 batteries should maintain records of number of batteries purchased, and number of used batteries sent to registered recyclers/authorised dealers/designated collection centres/any other agency as per Form-VIII of Batteries Rules, 2001 and the returnns sha;; be filed halfy yearly i.e. by 30th June and 31st December of every year to the concerned State Pollution COntrol board. D2.2 MANAGEMENT OF E-WASTES

As per provisions under E-Waste (Management) Rules, 2016, every generators of end of life electrical and electronic equipment (EEE) listed under Schedule-I are required to ensure that such E-Waste is sent to an authorized E-Waste dismantling or recycling facility or an authorised collection centre of the producers or through designated take back service providers of a producers. E-waste can also be auctioned only to the authorised E-Waste recyclers/dismantlers. Recods of E-Waste transfer/sale should be maintained records in Form -2 for verification of the SPCBs/PCCs and Annual returns as per Form-3 of E-Waste (Management) Rules, 2016 should be submitted to SPCBs/PCCs by June 30th of every year.

E-Waste generated from hospital equipment not listed in Scheduel-I should also be sold/transferred to only the Authorized E-Waste Recyclers/dismantlers.

D2.3 MANAGEMENT OF RADIOACTIVE WASTES

The Atomic Energy Regulatory Board (AERB) has been mandated by the Central Government, as the Competent Authority as per Atomic Energy (safe Disposal of Radioactive Wastes) Rules, 1987 notified under the Atomic Energy Act 1962. It exercises regulatory control over nuclear installations and the use of radioactive substances and radiation generating plants outside such installations.

AERB also empowered to perform the functions as stipulated under sections 10(1) (powers of entry) and 11(1) (powers to take samples) of Environmental (Protection) Act, 1986 and Rule 12 (agency to which information on excess discharge of pollutants to be given) of the Environmental (Protection) Amendment Rules, 1987 with respect to radioactive substances.

As per provisions of Atomic Energy (safe Disposal of Radioactive Wastes) Rules, 1987, no person shall dispose of radioactive waste (a) unless he has obtained an authorisation from the

competent authority under these rules; (b) in any manner other than in accordance with the terms and conditions specified in the authorisation issued under these rules; (c) in any location different from those specified in the authorisation; and (d) in quantities exceeding those specified in the authorisation.

Health Care Facilities generating radionuclides waste from treatment of Cancer patients and end-of-life equipment containing radio radionuclides shall obtain authorisation from AERB for its disposal. As per the policy of AERB, radionuclides wastes are required to be re-exported back to the manufacturer. It was recommended that such generators shall ensure arrangement with manufacturer at the time of purchase of such equipment. Waste disposal facilities of AERB are regulated by Waste Disposal Agency (Division) of AERB.

SECTION E: ANNEXURES

This section provides all the reference material for successful implementation of BMWM Rules .in the health care facilities.

It details about the specifications of waste collection containers and bags, standards for disinfections and pre-treatment, standards for incinerations etc as per BMWM Rules, 2016

This section also provides relevant label, forms and formats needed for approval or reporting to SPCB, as per the BMWM Rules 2016.

This section also provides suggested forms and formats which can be used by the healthcare facilities for successful implementation, monitoring and review of the activities related to Bio Medical Waste Management.

SPECIFICATIONS FOR PLASTIC BAGS & CONTAINERS

PLASTIC BAGS

- HCFs must ensure that the chlorinated plastic bags used for waste collection, must be phased out. Such chlorinated bags must be replaced with use of Non chlorinated bags which are as per the BIS standards or as per the Plastic Waste Management Rules, 2016
- As per the Plastic Waste Management Rules, 2016, each plastic bags must have labeling and marking as follows:
 - Name and Registration Number of Manufacturer and thickness of the bag
 - Name and registration Number of Manufacturer in case of multilayered packing
 - Type of material
- Each Plastic Bags must bear a label of "Recycled" as per its compositions
- Each carry bag made from compostable plastics shall bear a label **“COMPOSTABLE”** and shall conform to the Indian Standard: IS or ISO 17088:2008 titled as Specifications for “Compostable Plastics”.
- Each Non chlorinated plastic bags must be at least of 50 micron width

CONTAINERS

- For containers being used for collection of sharps and glassware the containers must meet the requirements as listed by World Health Organization(WHO) in “PQS Performance Specifications : Safety Box for disposal of waste sharps”
Source: Document number: WHO/PQS/E10/SB01.1

LABELS FOR BIO MEDICAL WASTE CONTAINERS AND BAGS

Label for Bio Medical Waste including sharps



Label for Cytotoxic Waste

CYTOTOXIC HAZARD SYMBOL



HANDLE WITH CARE

LABEL FOR TRANSPORTING OF BIO MEDICAL WASTE AND CONTAINERS

DayMonth

Year

Date of generation

Waste category Number

Waste quantity.....

Sender's Name and Address

Phone Number

Fax Number.....

Contact Person

In case of emergency please contact :

Name and Address :

Phone No.

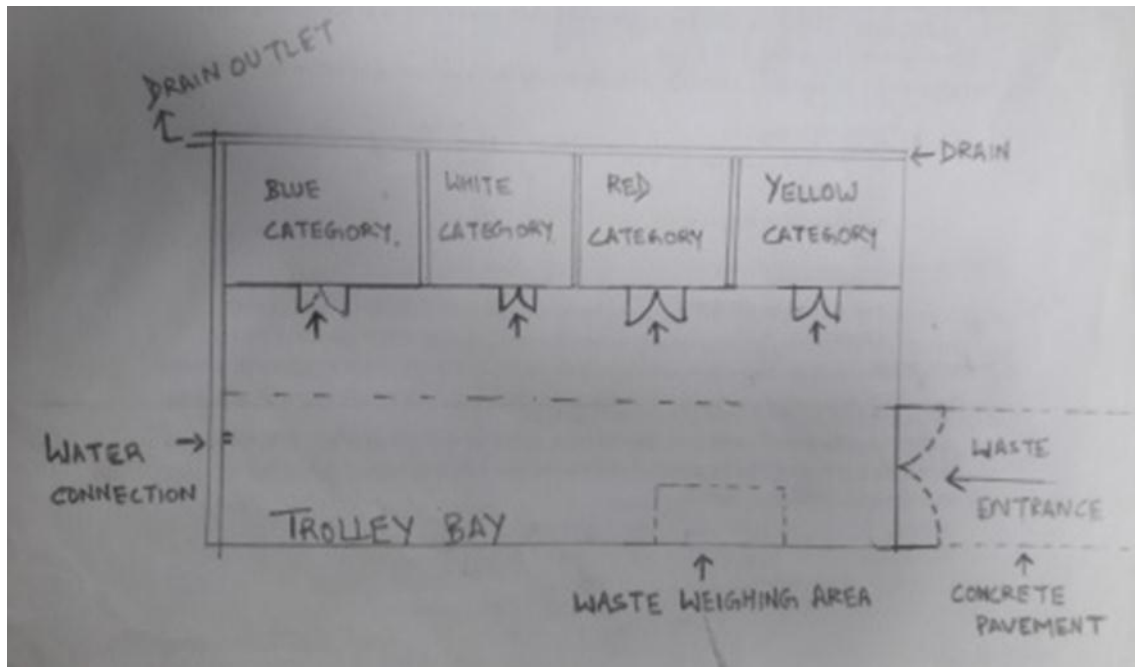
Receiver's Name and Address:

Phone Number

Fax Number

Contact Person

SUGGESTED LAYOUT OF CENTRAL WASTE STORAGE AREA



FORMAT FOR BIO MEDICAL WASTE REGISTER/RECORD

NAME & ADDRESS OF HEALTH CARE FACILITY

BIO MEDICAL WASTE REGISTER/ RECORD FORMAT

S.NO.	Date of Generation	Quantity of BMW Generated (in KG) Colour Coding and Category					Date of collection by Waste Collection Agency	Time (in AM/ PM)	Name & Signature of Waste Collector	Name & Signature of HCF Staff
		Yellow (1)	Red (2)	White (3)	Blue (4)	Total				
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										
13.										
14.										
15.										

FORM II

APPLICATION FOR AUTHORIZATION OR RENEWAL OF AUTHORIZATION

(To be submitted by occupier of health care facility or common bio-medical waste treatment facility)

To

The Prescribed Authority

(Name of the State or UT Administration)

Address:

1. Particulars of Applicant:

- (i) Name of the Applicant:
(In block letters & in full)
- (ii) Name of the health care facility (HCF) or common bio-medical waste treatment facility (CBWTF)
- (iii) Address for correspondence:
- (iv) Tele No., Fax No.:
- (v) Email:
- (vi) Website Address:

2. Activity for which authorization is sought:

Activity	Please tick
Generation, segregation	
Collection,	
Storage	
Packaging	
Reception	
Transportation	

Treatment or processing or conversion	
Recycling	
Disposal or destruction	
Offering for sale, transfer	
Any other form of handling	

3. Application for fresh or renewal of authorization (please tick whatever is applicable):

- (i) Applied for CTO/CTE Yes/No
- (ii) In case of renewal previous authorization number and date:

- (iii) Status of Consents:
 - a) Under the Water (Prevention and Control of Pollution) Act, 1974

 - b) Under the Air (Prevention and Control of Pollution) Act, 1981

4. (i) Address of the health care facility (HCF) or common bio-medical waste treatment facility (CBWTF):

- (ii) GPS coordinates of health care facility (HCF) or common bio-medical waste treatment facility (CBWTF):

5. Details of health care facility (HCF) or common bio-medical waste treatment facility (CBWTF):

- I. Number of beds of HCF:
- II. Number of patients treated per month by HCF:
- III. Number healthcare facilities covered by CBMWTF: _____
- IV. No of beds covered by CBMWTF: _____
- V. Installed treatment and disposal capacity of CBMWTF: _____ Kg per day
- VI. Quantity of biomedical waste treated or disposed by CBMWTF: _____ Kg/ day
- VII. Area or distance covered by CBMWTF: _____
(Please attach map a map with GPS locations of CBMWTF and area of coverage)
- VIII. Quantity of Biomedical waste handled, treated or disposed:

Category	Type of Waste	Quantity Generated or	Method of Treatment and Disposal(Refer
----------	---------------	-----------------------	--

		collected, kg/day	Schedule-I)
1	2	3	4
YELLOW	a) Human Anatomical Waste		
	b) Animal Anatomical Waste		
	c) Soiled Waste		
	d) Expired or Discarded Medicines		
	e) Chemical Solid Waste		
	f) Chemical Liquid Waste		
	g) Discarded linen, mattresses, beddings contaminated with blood or body fluid		
	h) Microbiology, Biotechnology and other clinical laboratory waste		
RED	Contaminated Waste (Recyclable)		
WHITE	Waste sharps including Metals:		
BLUE	Glassware		
	Metallic Body Implants		

6. Brief description of arrangements for handling of biomedical waste (attach details):

i. Mode of transportation (if any) of bio-medical waste:

ii. Details of treatment equipment (please give details such as the number, type & capacity of each unit)

Treatment Equipment	Number of Units	Capacity of each unit
Incinerators		
Plasma Pyrolysis		
Autoclaves		
Microwave		
Hydroclave		
Shredder		
Needle tip cutter or destroyer		
Sharps encapsulation or concrete pit		
Deep burial pits		
Any other treatment equipment		

7. Contingency plan of common bio-medical waste treatment facility (CBWTF)(attach documents):
8. Details of directions or notices or legal actions if any during the period of earlier authorization
9. Declaration

I do hereby declare that the statements made and information given above are true to the best of my knowledge and belief and that I have not concealed any information.

I do also hereby undertake to provide any further information sought by the SPCB in relation to these rules and to fulfill any conditions stipulated by the SPCB

Date:

Signature of the Applicant

Place:

Designation of Applicant

FORM IV: ANNUAL REPORT

S. NO.	Particulars		
1.	Particulars of Occupier		
	I. Name of Authorized Person (Occupier or Operator)		
	II. Name of HCF or CBMWTF :		
	III. Address for Correspondence :		
	IV. Address of Facility		
	V. Tel. No, Fax. No :		
	VI. E-mail ID :		
	VII. URL of Website		
	VIII. GPS coordinates of HCF or CBMWTF		
	IX. Ownership of HCF or CBMWTF	(State Government or Private or Semi Govt. or any other)	
	X. Status of Authorization under the Bio-Medical Waste (Management and Handling) Rules	Authorization Number Valid Up to :	
	XI. Status of Consents under Water Act and Air Act	Valid Up to :	
2.	Type of Health Care Facility		
	I. Bedded Hospital:	No. of Beds:	
	II. Non-bedded health care facility (Clinic or Blood Bank or Clinical Laboratory or Research Institute or Veterinary Hospital or any other)		
	III. License number and its date of Expiry		
3.	Details of CBMWTF		
	I. Number healthcare facilities covered by CBMWTF		
	II. No of beds covered by CBMWTF :		
	III. Installed treatment and disposal capacity of CBMWTFkg/day	
	IV. Quantity of biomedical waste treated or disposed by CBMWTFkg/day	
4.	Quantity of waste generated or	Category	Quantity(kg/anumn)

	disposed in Kg per annum (on monthly average basis)	Yellow			
		Red			
		Blue			
		White			
		General Solid Waste			
5.	Details of the Storage, treatment, transportation, processing and Disposal Facility				
	I. Details of On Site Storage	Size:			
		Capacity:			
		Provision for Onsite Storage (Cold Storage or any other provisions):			
	II. Details of Onsite Disposal Facility	Type of Treatment Equipment	No. of Units	Capacity kg/day	Quantity Treated or Disposed kg/annum
		Incinerators			
		Plasma Pyrolysis			
		Autoclaves			
		Microwave			
		Hydroclave			
		Shredder			
		Needle tip cutter or destroyer			
		Sharps encapsulation or concrete pit			
		Deep Burial Pits			
Chemical Disinfection					
Any other equipment used for treatment					
III. Quantity of recyclable wastes sold to authorized recyclers after treatment in kg per annum.	Red Category (like plastic, glass etc.)				

	IV. No of vehicles used for collection and transportation of biomedical waste			
	V. Details of incineration ash and ETP sludge generated and disposed during the treatment of wastes in Kg per annum		Quantity generated	Where disposed
		Incineration		
		Ash		
		ETP Sludge		
	VI. Name of the Common Bio-Medical Waste Treatment Facility Operator through which wastes are disposed of			
	VII. List of member HCF not handed over bio-medical waste			
6.	Do you have bio-medical waste management committee? If yes, attach minutes of the meetings held during the reporting period			
7.	Details of Training conducted on BMW			
	I. Number of trainings conducted on			
	II. BMW Management			
	III. number of personnel trained			
	IV. number of personnel trained at the time of induction			
	V. number of personnel not undergone any training so far			
	VI. Whether standard manual for training is available?			
	VII. Any other Information			
8.	Details of Accident Occurred			
	I. Number of Accidents occurred			
	II. Number of the persons affected			
	III. Remedial Action taken (Please attach details if any)			
	IV. Any fatality occurred, details			
9.	Are you meeting the standards of air Pollution from the incinerator? How many times in last year			

	could not meet the standards?	
	Details of Continuous online emission monitoring systems installed	
10.	Liquid waste generated and treatment methods in place. How many times you have not met the standards in a year?	
11.	Is the disinfection method or sterilization meeting the log 4 standards? How many times you have not met the standards in a year?	
12.	Any other relevant information	(Air Pollution Control Devices attached with the Incinerator)

Certified that above report is for the period from

.....
.....
.....

Name and Signature of Head of Institution

Date:

Place

FORM 1: ACCIDENT REPORTING FORM

BIO MEDICAL WASTE MANAGEMENT RULES, 2016

1. Date and time of Accident:
2. Type of Accident:
3. Sequence of events leading to accident:
4. Has the authority being informed immediately:
5. The type of waste involved in accident:
6. Assessment of the effects of the accidents on human health and the environment:
.....
7. Emergency measures taken:
8. Steps taken to alleviate the effects of accidents:
9. Steps taken to prevent the recurrence of such an accident:
10. Does your facility has an Emergency Control Policy? If yes give details:
.....

Date.....

Signature.....

Place.....

Designation.....

FORMAT FOR EMPLOYEE HEALTH CHECK UP

Designation:.....Date:

Name: Father's name.....

Age.....years, Sex.....; Married/ Not Married. Blood group.....Rh.....

Address.....
.....

Phone No....., E-Mail:.....

Present complaints with duration (if any):

- 1.
- 2.
- 3.
- 4.
- 5.

Vaccination history (Especially w.r.t Hepatitis-B and Tetanus):

Whether vaccination ever received in past? Yes/ No

Name of Vaccine	First dose	Second Dose	Third Dose	Booster	Booster	Booster	Booster
Hepatitis-B							
Tetanus Toxoid							

Past medical history (if any):

Hypertension	Yes	No	Since When	Diabetes	Yes	No	Since When
Asthma	Yes	No	Since When	Arthritis	Yes	No	Since When
Tuberculosis	Yes	No	Since When	Allergies	Yes	No	Since When
Cancer	Yes	No	Since When	Others	Yes	No	Since When

Surgical history (if any):

GENERAL PHYSICAL EXAMINATION:

General appearance.....

Cyanosis Jaundice..... Clubbing.....

Pulse..... BP.....

Odema feet..... Oral hygiene

Height.....cm, Weight.....kg,

DENTAL EXAMINATION:

SYSTEMIC EXAMINATION:

Cardiovascular System

Respiratory System

Central Nervous System

Gastrointestinal System

Urogenital System

Gynae. & Obstet (*In case of Females*)

Gravida	Para	Abortions

Musculoskeletal System

ENT

Eye

INVESTIGATIONS

Lab Tests:

Hb	TLC	DLC				RBS	BI. Urea	S. Creatinine
		P	L	M	E			

Urine:

Stool:

ECG:

Others

Radiological examination

X- Ray Chest PA view:

USG (If Required)

CT scan/MRI (If required)

Others:

Inference with Diagnosis, if any

Advice / Recommendations/ Intervention done

Name and signature of doctor

PREPARATION OF 1% SODIUM HYPOCHLORITE SOLUTION





PREPARATION OF CHLORINE SOLUTION USING CONCENTRATED SOLUTION

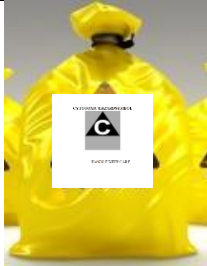

Concentration of commercially available hypochlorite solution	Required Chlorine concentration	To Prepare 1000 ml	
		Solution in ml	Add water in ml
5 %	2 %	400	600
	1 %	200	800
	0.5 %	100	900
10 %	0.5 %	50	950
	1 %	100	900
	2 %	200	800



PREPARATION OF CHLORINE SOLUTION USING BLEACH POWDER SOLUTION





Strength of Stable Bleaching Powder (SBP)	Volume of Water	Desired Concentration	Bleaching powder in grams per litre
20 %	1 Litre	0.5%	20
		1%	50
		2%	100
		5%	250
		10%	500
25 %	1 Litre	0.5%	20
		1%	40
		2%	80
		5%	200
		10%	400
30 %	1 Litre	0.5%	17
		1%	33
		2%	67
		5%	167
		10%	333




BIO MEDICAL WASTE MANAGEMENT CHART FOR HEALTH CARE FACILITIES

Category	Type of Waste	Example of Waste	Treatment at HCF	Type of Bag	Type of Container	Action to be taken by HCF	
						In agreement with CBMWTF	Not having agreement with CBMWTF
Yellow	Human Anatomical Waste	Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time).Placenta, Body Tissue , Extracted Tooth, Body Parts	None			Waste must be handed over to CBMWTF. It is mandatory for each health care facility that dead Fetus waste should be handed over to CBMWTF in yellow bag with a copy of the official Medical Termination of Pregnancy certificate from the Obstetrician or the Medical Superintendent/ SMO/ CMO of the HCF	Dispose of the waste in the deep burial pit. Copy of official MTP certificate from the MO I/C for fetus below the vitality period must be kept with the HCF
	Soiled Waste	Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components	None			The collected waste is needed to be handed over to the CBMWTF for final disposal	Waste must be disposed of in the deep burial pits

Category	Type of Waste	Example of Waste	Treatment at HCF	Type of Bag	Type of Container	Action to be taken by HCF	
						In agreement with CBMWTF	Not having agreement with CBMWTF
	Expired or Discarded Medicines	Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc.	None			all the expired and discarded medicines including cytotoxic drugs expired `cytotoxic drugs are either returned back to the manufacturer or are handed over to the CBMWTF to be disposed of through incineration	Expired and discarded medicines are required to be sent back to manufacturer or can be crushed and dispose of secure land fill
	Chemical Liquid Waste	Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, Silver X-ray film developing liquid, discarded Formalin, infected secretions, aspirated body fluids, liquid from laboratories and floor	For facilities having no facility of ETP: Pre Treatment with Chemical Disinfection, Use of 1 % Hypochlorite Solution with a minimum contact time of 30 minutes	None	None	The chemical liquid waste of the hospital must be collected through a separate system leading to the effluent treatment plant (ETP). Silver X ray film developing fluid must be given to authorized recyclers for resource recovery Healthcare	The liquid waste generated from the facility must be drained of in the general drainage system after chemical disinfection

Category	Type of Waste	Example of Waste	Treatment at HCF	Type of Bag	Type of Container	Action to be taken by HCF	
						In agreement with CBMWTF	Not having agreement with CBMWTF
		washings, cleaning, house-keeping and disinfecting activities etc.				<i>facilities having no system of ETP the chemical liquid waste is needed to be chemically disinfected with chlorine solution before mixing the same with other waste water.</i>	
	Discarded linen, mattresses, beddings contaminated with blood or body fluid.		Pretreatment with use of 1 % Hypochlorite Solution for a minimum contact time of 30 min or though non chlorinated solution like 5 % Lysol, Lime etc.			Discarded Linen after treatment must be sent to the CBMWTF for final disposal or can be handed over to authorized recyclers	Dispose of the same in the deep burial pits or handover to authorized recyclers after disinfection

Category	Type of Waste	Example of Waste	Treatment at HCF	Type of Bag	Type of Container	Action to be taken by HCF	
						In agreement with CBMWTF	Not having agreement with CBMWTF
	Microbiology, Biotechnology and other clinical laboratory waste	Blood bags, Laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.	Pre Treatment with use of Autoclave dedicated for this purpose only. For PHC and Subcente where there is no dedicated autoclave for this purpose all the waste must first be chemically disinfected			Such waste is handed over to the CBMWTF only	Must be disposed of in the sharp pits after chemical disinfection
RED	Contaminated waste (Recyclable)	(a) Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes) and vaccutainers with their needles cut) and gloves.	Must be nicked. And for HCF not having linkage with CBMWTF chemical disinfection is carried out before final disposal			Has to be handed over to the CBMWTF	Can be handed over to the authorized waste handlers or informal waste pickers after chemical disinfection Must never be disposed

Category	Type of Waste	Example of Waste	Treatment at HCF	Type of Bag	Type of Container	Action to be taken by HCF	
						In agreement with CBMWTF	Not having agreement with CBMWTF
							of in the land fills
3. White Translucent	Waste Sharps including metals	Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps	In case of non-availability of temper proof, puncture proof and leak proof container, disinfect the sharp through chemical disinfection.	None		Handover the container to CBMWTF	Dispose of the waste in the sharp pits after chemical disinfection
Blue Glassware	Glassware	Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes	Pretreatment with use of 1 % Hypochlorite Solution for a minimum contact time of 30 min	 Cardboard Box with Blue marking		Handover to CBMWTF	Dispose of the same in the sharp pits
	Metallic Body Implants	Implants used for orthopedic surgery					

INDICATORS FOR MONITORING OF BMW ACTIVITIES IN THE STATE**INDICATORS FOR STATE LEVEL MONITORING****1. Percentage of Health care facilities having valid authorization from SPCB:**

Number of Facilities having valid authorization / Total Number of HCFs in State X100

2. Percentage of Health care facilities under agreement with CBMWTF:

Number of HCFs having agreement with CBMWTF/ Total Number of HCFs in State X 100

3. Category wise waste generated per bed

S.no.	Category of Waste	Total Quantity of Waste (a)	Total Number of Beds in State (b)	Waste Generated/ Bed (a/b)
1.	Yellow			
2.	Red			
3.	Blue			

4. Total number of facilities granted authorization by SPCB / Total Number of facilities applied for authorization**5. Total Number of Accidents Reported while BMW Handling****6. Total Number of Trainings conducted for BMW****INDICATORS AT DISTRICT LEVEL**

Same as mentioned above for State Level Monitoring.

INDICATORS AT FACILITY LEVEL

Facility Level Monthly Indicator Sheet

- **Name of Healthcare Facility:**
- **Address of Healthcare Facility:**
- **Type of Healthcare Facility** (Private/ Public):
- **Number of Bed:** _____ **Number of OPD:** _____ **Number of IPD:** _____
- **Status of Authorization from Pollution control Board** (Please tick one)

- Valid Authorization
- Applied For
- Under Renewal

- **Method of Disposal** (Please tick one):

- CBMWTF
- Deep Burial

- **Category Wise Waste Generated**

S.no.	Category of Waste	Waste in kg
1.	Yellow	
2.	Red	
3.	Blue	

- **Total number of accidents reported**
- **Number of days in a month when CBMWTF does not collected waste within stipulated time of 48 hrs from HCFs**
- **Total number of incidences when CBMWTF fails to collect the waste within define time frame of 48 hrs**
- **Total number of trainings done for BMW management**
- **Percentage of employees immunized:**

Total Number of Employees Immunized/ Total Number of Employees in HCF X 100

- **Total Number of trainings conducted for BMW Management**
- **Number of sharp injury cases reported among hospital worker and waste handlers.**

ABBREVIATIONS

HCF: *Health Care Facility*

BMW: *Bio Medical Waste*

CBWTF: *Common Bio Medical Waste Treatment Facility*

NHSRC: *National Health System Resource Centre*

AYUSH: *Ayurveda Yoga Unani, Sidha and Homoeopathy*

CPCB: *Central Pollution Control Board*

SPCB: *State Pollution Control Board*

MS: *Medical Superintendent*

CMO: *Chief Medical Officer*

SMO: *Senior Medical Officer*

PMO: *Principal Medical Officer*

CHC: *Community Health Centre*

PHC: *Primary Health Centre*

MO I/C: *Medical Officer In charge*

PPE: *Personal Protective Equipment*

IEC: *Information Education and Communication*

ETP: *Effluent Treatment Plant*

SMTAC: *State Monitoring cum Technical Advisory Committee*

DMTAC: *District Monitoring cum Technical Advisory Committee*

DQT: *District Quality Team*

ANM: *Auxiliary Nurse Midwife*

HCW: *Health Care Worker*

WHO: *World Health Organization*

- Bio Medical Waste Management Rules, 2016
- Plastic Waste Management Rules, 2016
- Water (Prevention and Control of Pollution Act), 1974
- Air (Prevention and Control of Pollution) Act, 1981
- Solid Waste Management Rules, 2016
- Guidelines for Disposal of Bio Medical Waste generated during Universal Immunization Program (UIP): CPCB
- Safe Management of Waste from Health Care Activities 2nd Edition: WHO
- Management of Solid Health Care Waste at Primary Health Center: A Decision Making Guide: WHO
- IMEP guidelines : MOHFW India
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