

MINOR RESEARCH PROJECT

ON

**“Implementation of The Biomedical Waste
(Management and Handling) Rules 1998
by Hospitals in Satara City”**

SUBMITTED BY

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TO

UGC

2015

CERTIFICATE

This is to certify that a copy of the final report of Minor Research Project entitled **“Implementation of The Biomedical Waste (Management and Handling) Rules 1998 by Hospitals in Satara City”** by Dr. Sujata Sanjay Pawar, Ismailsaheb Mulla Law College, Satara has been kept in the library of the college and an executive summary of the report has been posted on the website of the College.

Dr. Sujata Pawar

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Management and disposal of biomedical waste is the subject of great importance, touching many issues concerning human safety and environmental hazards. It was a fascinating experience to study the research topic “Implementation of The Biomedical Waste (Management and Handling) Rules 1998 by Hospitals in Satara City.” I have made sincere efforts in highlighting the significance of “proper and safe disposal of biomedical waste” as a pre requisite of enjoyment of our rights related to health and environment.

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Glossary

BMW	Bio-Medical Waste
BMW Rules	Biomedical Waste (Management and Handling) Rule, 1998 (as amended to date)
CBMWTDF	Common Bio Medical Waste Treatment and Disposal Facility
CPCB	Central Pollution Control Board
CO	Carbon Monoxide
CO₂	Carbon Dioxide
DG	Diesel Generator
EC	Environmental Clearance
ETP	Effluent Treatment Plant (ETP)
EPA	Environment (Protection) Act, 1986 (as amended to date)
Facility	(Hazardous Waste)
GPS	Global Positioning System
HCE	Health Care Establishments
HCFs	Health Care Facilities
HCl	Hydrochloric Acid
HW (M, H & TM) Rules	Hazardous Waste (Management, Handling & Transboundary
KM	Kilometer
KW	Kilowatt Movement) Rules
MHz	Mega Hertz
MoEF	Ministry of Environment & Forests
MSPCB	Maharashtra State Pollution Control Board
NO_x	Oxides of Nitrogen
O₂,	Oxygen
PCC	Pollution Control Committee
PLC	Programmable logical control
RO	Regional Office/ Officer of MPCB
SPCB	State Pollution Control Board
TSDF	Treatment Storage and Disposal
TOC	Total Organic Carbon
VOCs	Volatile Organic Compounds

CHAPTER ONE

INTRODUCTION

CHAPTER ONE

INTRODUCTION

India's economic growth has increased the demand for better health care and medical facility. The growth of hospitals and private clinics are surely a good sign of better health care facilities however this has also increased the concerned of generation of bio medical waste and its safe disposal. The Government in order to resolve this issue had notified Bio-medical Waste (Management and handling) Rules, 1998 under the Environment (Protection) Act, 1986.¹ These rules apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio medical waste in any form.²

Bio-medical waste has been defined as any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological and including categories mentioned in Schedule I³ The increasing health care facility is a sign of growth of medical development in the country however it is also raises concern of safe disposal of bio medical waste. The rules framed for the safe disposal of bio medical waste imposes liability of safe disposal of bio medical waste to the occupier.⁴ The occupier includes a hospital, nursing home, clinic dispensary, veterinary institution, animal house, pathological laboratory, blood bank by whatever name called, means a person who has control over that institution and or its premises.⁴

It shall be the duty of every occupier of an institution generating bio-medical waste which includes a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank by whatever name called to take all steps to ensure that such waste is handled without any adverse effect to human health and the environment.⁵

The rules prescribed under Bio-Medical Waste (Management and Handling) Rules, 1998 provides that all bio-medical waste shall be treated and disposed in accordance with Schedule 1⁶

and according to standard prescribed in Schedule V. ⁷ The task of segregation, packaging, transportation and storage are importance steps for safe and proper disposal. The Act provides that it shall not be mixed with other wastes and shall be segregated into containers or bags at the point of generation. ⁸ The transportation of bio-medical waste to waste treatment facility shall be done only through vehicle authorized for this purpose by the competent authority and untreated waste shall not be kept beyond a period of 48 hours. ⁹

Health Care Waste is defined as the total waste stream from a healthcare establishment, research facilities, laboratories, and emergency relief donations. Health care waste includes several different waste streams, some of which require more stringent care and disposal:

1. **Communal Waste** is all solid waste not including infectious, chemical, or radioactive waste. This waste stream can include items such as packaging materials and office supplies. Generally, this stream can be disposed of in a communal landfill or other such arrangement. Segregation of materials which are able to be reused or recycled will greatly reduce the impact burden of this waste stream.

2. **Special Waste** consists of several different subcategories:

·**Infectious:** Discarded materials from health-care activities on humans or animals which have the potential of transmitting infectious agents to humans. These include discarded materials or equipment from the diagnosis, treatment and prevention of disease, assessment of health status or identification purposes, that have been in contact with blood and its derivatives, tissues, tissue fluids or excreta, or wastes from infection isolation wards. Such wastes shall include, but are not limited to, cultures and stocks; tissues; dressings, swabs or other items soaked with blood; syringe needles; scalpels; diapers; blood bags. Incontinence material from nursing homes, home treatment or from specialized health-care establishments which do not routinely treat infectious diseases (e.g. psychiatric clinics) is an exception to this definition and are is not considered as infectious health-care waste. Sharps, whether contaminated or not, should be considered as a subgroup of infectious health-care waste. Includes: Syringe needles, scalpels, infusion sets, knives, blades, broken glass.

·**Anatomic:** consists of recognizable body parts.

•**Pharmaceutical:** Consisting of/or containing pharmaceuticals, including: expired, no longer needed; containers and/or packaging, items contaminated by or containing pharmaceuticals (bottles, boxes).

•**Genotoxic:** Consisting of, or containing substances with genotoxic properties, including cytotoxic and antineoplastic drugs; genotoxic chemicals.

•**Chemical:** Consisting of, or containing chemical substances, including: laboratory chemicals; film developer; disinfectants expired or no longer needed; solvents, cleaning agents and others.

•**Heavy Metals:** Consisting of both materials and equipment with heavy metals and derivatives, including: batteries, thermometers, manometers.

•**Pressurized containers:** Consisting of full or empty containers with pressurized liquids, gas, or powdered materials, including gas containers and aerosol cans.

•**Radioactive materials:** Includes: unused liquids from radiotherapy or laboratory research; contaminated glassware, packages or absorbent paper; urine and excreta from patients treated or tested with unsealed radionuclides; sealed sources.¹⁰

SALIENT FEATURES OF BIO-MEDICAL WASTE (MANAGEMENT AND HANDLING) RULES 1998

a) It is Published by Govt. of India, under Section 6 & 25 of Environmental Protection Act 1986 on 20/7/98 and appeared in official gazette of India on 27/7/98.

b) It deals with the generation/handling/treatment/disposal of Bio Medical Waste.

c) These rules apply to all persons who generate, collect, receive, store, transport, treat, dispose or handle bio-medical waste in any form.

d) Rule 4 specify duty of occupier (generator) to take all steps to ensure that such waste is handled without any adverse effect to human health and the environment.

- e) Rule 5 and 6 specifies waste management procedures.
- f) Section 7 is about prescribed authority that shall implement these rules. The Pollution Control Board of the state has been declared as prescribed authority by the State Govt.
- g) These rules apply to all persons who generate, collect, receive, store, transport, treat, dispose or handle bio-medical Waste in any form. Every occupier of an institution generating, collecting, receiving, storing, transporting, treating disposal and for handling Bio-medical waste in any other manner, except such occupier of clinics, dispensaries, pathological laboratories, blood banks providing treatment/service to less Than 1000 patients per month and also the operators of Biomedical waste facility are covered under these rules.
- h) Form 1 is fixed for application of authorization. Government to prescribed necessary fee.
- i) An advisory Committee as required under rule 9 has to be constituted.
- j) As per these rules, this shall be the duty of every occupier {as defined in rule 3(8)} of an institution generating bio-medical waste which includes a hospital, nursing home, clinic dispensary, veterinary institution, animal house, pathological laboratory blood bank by what ever name called to take all steps to ensure that such waste is handled without any adverse effect to human health and the environment¹¹

SOURCES OF HEALTH CARE WASTE

- Government/private hospitals
- Nursing homes
- Physician/dentist office or clinic
- Dispensaries
- Primary health care centers
- Medical research and training centers
- animal./slaughter houses
- labs/research organizations
- Vaccinating centers
- Bio tech institutions/production units

TABLE 1.1

SIGNIFICANCE OF THE STUDY

According to World health organization report “waste from health care activities” the 20% o the total amount of waste generated from health care activities is infectious, toxic or radioactive. Further this waste contains potentially harmful microorganisms which can cause infectious disease to patients, health care workers and to general public. ¹² The world health organization estimates that in the year 2000 21 million hepatitis B virus infections, two millions hepatitis C virus infection and 26000 HIV infections worldwide have caused due to the use of contaminated syringes. The reason for this alarming statistics is non proper disposal and of needles and syringes worldwide.

In India the quantum of waste generated in India is estimated to be around 1-2 kg per bed per day in a hospital and 600 gm per day per bed in a general practioner’s clinic.¹³ The number health care establishment in Maharashtra has increased in the past few years and similarly the quantum of waste generation have also increased.

It is now well established that proper disposal of biomedical waste is of paramount importance because of its infectious and hazardous characteristics. Improper disposal can result in the following:

- Organic portion ferments and attracts fly breeding
- Injuries from sharps to all categories of health care personnel and waste handlers
- Increase risk of infections to medical, nursing and other hospital staff
- Injuries from sharps to health workers and waste handlers
- Poor infection control can lead to nosocomial infections in patients particularly HIV, Hepatitis B & C

- Increase in risk associated with hazardous chemicals and drugs being handled by persons handling wastes
- Poor waste management encourages unscrupulous persons to recycle disposables and disposed drugs for repacking and reselling
- Development of resistant strains of microorganisms¹⁴

<p>WHAT IT IS</p> <p>Biomedical waste is any solid or liquid waste including its container and any intermediate product. These are highly infectious and generated during the diagnosis, treatment or immunisation of human beings or animals. It can also be generated during research or production or testing.</p> <p>It consists of human anatomical waste, microbiology and biotechnology waste, discarded medicines and cytotoxic drugs, soiled waste, solid waste, liquid waste, incineration ash and chemical waste. It includes blood, organs, syringes, tissues, bandages and blades</p>		<p>VIOLATORS</p> <p>9 govt hospitals violate biomedical waste norms</p> <p>70 tonnes of waste generated in Delhi every day</p> <p>50 % waste in Delhi goes untreated every day</p> <p>1,350 kg waste generated from AIIMS each day</p> <p>1,125 kg generated at Safdarjung Hospital each day</p> <p>675 kg waste generated from RML hospital every day</p> <p>394.65 kg generated from SK Hospital each day</p> <p>157.5 kg waste from KS Children's Hospital daily</p>
<p>THE HAZARDS OF BIOMEDICAL WASTE</p> <p><i>HAZARDS caused by biomedical wastes are breeding of flies and insects, fire, proliferation of rodents, air, water and land pollution, transmission of infections such as Hepatitis B, cholera, HIV, plague, diphtheria, tuberculosis and other microbes, mechanical injury, re-circulation of waste, nuclear waste hazards and carcinogenic effects.</i></p>		

A newspaper report on the Hazards of Biomedical waste¹⁵

TABLE 1.2

OBJECTIVES

- 1) To evaluate legal provisions about disposal and management of bio medical waste.
- 2) To review and analysis literature, data and secondary data with regard bio medical waste management and practice in Satara city.
- 3) To evaluate the implementation of legal rules and regulation in Satara City by health care establishment especially related to Bio-Medical Waste (Management and Handling) Rules, 1998.
- 4) To assess the current situation in the city of Satara city with regard to bio waste generation, management and disposal of bio- medical waste.
- 5) To carry out survey of health care establishments in Satara city to assess the existing practices of collection, segregation, storage, transportation and disposal of bio medical waste.
- 6) To monitor common bio medical waste treatment and disposal facility located at Jakat Wadi, Satara for disposal of bio medical waste generated by Satara city and nearby locations.
- 7) To identify and study areas requiring consideration in the implementation of bio medical facility in Satara city.
- 8) To propose suggestion for the improvement in the implementation of bio medical rules in satara city.
- 9) To arrive at the concluding remark.

HYPOTHESES

The following hypotheses were formulated and to ascertain the issues in the biomedical disposal system.

H1 The practices of biomedical waste management and disposal in Satara are not in line with the rules enacted by the Government and amended from time to time.

H2 The awareness of biomedical wastes rules is lacking amongst Health Care Establishments.

H3 Common biomedical disposal facility provides a vital role in Bio Medical Waste Management.

METHODOLOGY

Since the study involves interdisciplinary issues, doctrinal as well as non doctrinal methods of study will be undertaken.

UNIVERSE OF STUDY: The present study will be conducted in Satara city. Hence it is limited to all health care establishments within the boundaries of Satara Municipal Council. Satara Municipal Corporation has divided the area of Satara city into 39 wards (parabhat) for governance and representation.

As of 2011 India census, Satara had a population of 120,079; males constituted 52% of the population and females 48%. Satara has an average literacy rate of 80%, higher than the national average of 74%: male literacy is 84%, and female literacy is 76%. In Satara, 10% of the population is under 6 years of age. Marathi is the native and widely spoken languages. English, Kannada, Gujarati are also spoken. Like other large cities Satara city is divided into three parts urban area, Suburban areas, Industrial area.

Suburban areas include SadarBazaar, Shahupuri, Shahunagar, Karanje, Godoli,Kodoli, Krishnanagar, Sangamnagar, Saidapur, Sangam mahuli, Kshetra mahuli, Vadhe, Kondave, Khed, Jakatwadi. Out of these only sadar bazaar is under municipal boundaries rest all are out of municipal boundaries. This area having major population is still out of municipal boundaries and under proposal to take under municipal boundaries. The large number of health care establishment is located in sadar bazaar area which has a Government Civil hospital.

SAMPLE AND SAMPLING: Health care establishment especially hospitals in Satara City would be selected randomly by applying simple random sampling method. This will constitute the sample for present study. Hence the total sample size of the study would be around 40%

METHODS OF DATA COLLECTION: Questioner, Interview and observation techniques will be used for collection of data. A questioner sheet shall a given to selected hospitals. Few in depth case studies will be conducted to collect detailed information about implementation of legal norms and difficulties if any in their compliance.

A) Interview method with the person most knowledgeable about biomedical waste management in hospitals facility.

b) On-site observations of biomedical waste management and handling practices at major hospital and health care provider facility

c) Review of available reports/manuals on biomedical waste management.

d) Review of available and existing biomedical waste management laws and legislation

e) Observation of biomedical waste treatment and disposal sites at satara

TOOLS OF DATA COLLECTION: For accomplishing the above objectives both primary and secondary data will be collected through primary and secondary sources of data collection. Primary data will be collected, by administering an interview schedule directly with the respondents. Secondary sources of data collection will be reports published by state and central government, municipal reports, books, journals and periodicals.

ANALYSIS OF DATA: The collected will be analysed by using SPSS window based version. The intellectual reasoning will be provided where ever necessary.

REPORT WRITING: Final report will be written for recommendations and suggestions.



FIGURE NO.1

SCHEME OF THE STUDY

Chapter 1. Introduction chapter covers the meaning of bio medical waste, significance of the study, objectives, Research Methodology, Hypothesis of the study.

Chapter 2. Treatment and disposal of bio medical waste, category of bio medical waste and photos of site visit by the principal investigator is provided in this chapter.

Chapter 3. This Chapter includes details on segregation, packaging, transportation, storage of bio medical waste, color coding and label details, photos of specially designed transport vehicle for transporting bio medical waste

Chapter 4. In these chapter details of Common bio-medical waste treatment facility plants requirement, Site plan layout, photos of premises of CBMDF, interview of the supervisor of the plant has been covered.

Chapter 5. In this chapter Bio-medical Waste (Management and Handling) Rules, 1998 which was amended by Bio-medical waste (Management and Handling) Rules, 2012 is covered.

Chapter 6. In this chapter International convention on environment protection is covered.

Chapter 7. Judicial trend on waste management and environment is covered in this chapter

Chapter 8. In this chapter covers bio medical law worldwide.

Chapter 9. This chapter is dedicated to result of the study and its analysis with the help of graphs.

Chapter 10. This includes finding, suggestions and conclusion drawn on the study conducted on the basis of information gathered and analysis made on the subject matter.

END NOTES

1. By rules 6, 8 and 25 of the Environment (Protection) Act, 1986 published in the Gazette vide S.O. 746 (E) dated 16 October, 1997
2. Rule 1, application clause
3. Rule 3 (5) Bio-Medical Waste (Management and Handling) Rules, 1998
4. Rule 4 Bio-Medical Waste (Management and Handling) Rules, 1998, It shall be the duty of every occupier of an institution generating bio-medical waste which includes a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank by whatever name called to take all steps to ensure that such waste is handled without any adverse effect to human health and environment.
5. Rule 3 (8) Bio-Medical Waste (Management and Handling) Rules, 1998
6. Rule 5 Bio-Medical Waste (Management and Handling) Rules, 1998
7. *ibid*
8. Rule 6 (1) and (2), Bio-Medical Waste (Management and Handling) Rules, 1998
9. Rule 6 (4) and (5), Bio-Medical Waste (Management and Handling) Rules, 1998
- 10 http://www.who.int/water_sanitation_health/medicalwaste/itoxiv.pdf, Safe management of wastes from health-care activities, World Health Organization, Geneva, 1999
11. http://www.mppcb.nic.in/bio-medical_waste.htm
12. <http://www.who.int/mediacentre/factsheets/fs253/en/>
13. <http://www.medwasteind.org/random.asp>
14. *ibid*
15. <http://www.dailymail.co.uk/indiahome/indianews/article-2376914/Delhis-hazardous-hospitals-Green-Tribunal-finds-clinics-including-AIIMS-flouting-waste-disposal-regulations.html>

Chapter Two

TREATMENT AND DISPOSAL

CHAPTER TWO

TREATMENT AND DISPOSAL

The Bio-Medical Waste (Management and Handling) Rules, 1998 provides for treatment and disposal of bio medical¹ in accordance in accordance with Schedule I² and in compliance with the standards prescribed in Schedule V.³ Every occupier is required to set up required bio medical waste treatment facilities like incinerator, autoclave, microwave system for the treatment of waste or ensure mandatory treatment of waste at a common waste treatment facility. The occupier has to either install treatment facilities or send bio medical waste to common waste treatment facility.⁴ In Satara city bio medical waste is disposed at common bio medical waste treatment facility operated by Nature in Need.

The Central Pollution Control Board⁵ (CPCB) has prescribed guidelines⁶ for Common Bio-Medical Waste Treatment Facilities as well as for design and construction of Incinerators⁷ However, Health being a state subject, it is the responsibility of the concerned State Government to take necessary steps to monitor the disposal of biomedical wastes through the State Pollution Control Boards⁸ (SPCBs) and Pollution Control Committees (PCCs) in the Union Territories, as per the provisions made under the Bio-medical Waste (Management & Handling) Rules, 1998. The State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) are the prescribed authorities to grant authorization for the BMW Management. They are empowered to ensure the compliance of provisions of this Rules.⁹

As per the National Guidelines for Hospital Waste Management¹⁰, the Head of the hospital shall form a waste Management Committee under his Chairmanship. The Waste Management Committee shall meet regularly to review the performance of the waste disposal. This Committee is responsible for making hospital specific action plan for

hospital waste management and for its supervision, monitoring implementation and looking after the safety of the bio-medical waste handlers.



Principal Investigator Dr. Sujata S.Pawar within the premises of Nature in Need, Common Bio medical Waste Treatment Facility, Satara



Principal investigator Dr. Sujata S. Pawar monitoring the functioning of machinery within Nature in Need, Common Bio medical Waste Treatment Facility, Satara



Bio medical waste disposal process at progress in Nature in Need, Common Bio medical Waste Treatment Facility Satara ,

CATEGORIES OF BIOMEDICAL WASTE SCHEDULE – I

WASTE CATEGORY	TYPE OF WASTE	TREATMENT AND DISPOSAL OPTION
Category No. 1	Human Anatomical Waste (Human tissues, organs, body parts)	Incineration@ / deep burial*
Category No. 2	Animal-Waste (Animal tissues, organs, body parts, carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals and colleges, discharge from hospitals, animal houses)	Incineration@ / deep burial*
Category No. 3	Microbiology & Biotechnology Waste (Wastes from laboratory cultures, stocks or specimen of live micro organisms or attenuated vaccines, human and animal cell cultures used in research and infectious agents from research and industrial laboratories, wastes from production of biologicals, toxins and devices used for transfer of cultures)	Local autoclaving/ microwaving / incineration@
Category No. 4	Waste Sharps (Needles, syringes, scalpels, blades, glass, etc. that may cause puncture and cuts. This includes both used and unused sharps)	Disinfecting (chemical treatment@@ / autoclaving / microwaving and mutilation / shredding##
Category No. 5	Discarded Medicine and Cytotoxic drugs (Wastes comprising of outdated, contaminated and discarded medicines)	Incineration@ / destruction and drugs disposal in secured landfills
Category No. 6	Soiled Waste (Items contaminated with body	Incineration@ /

	fluids including cotton, dressings, soiled plaster casts, lines, bedding and other materials contaminated with blood.)	autoclaving / microwaving
Category No. 7	Solid Waste (Waste generated from disposable items other than the waste sharps such as tubing, catheters, intravenous sets, etc.)	Disinfecting by chemical treatment@@ / autoclaving / microwaving and mutilation / shredding##
Category No. 8	Liquid Waste (Waste generated from the laboratory and washing, cleaning, house keeping and disinfecting activities)	Disinfecting by chemical treatment@@ and discharge into drains
Category No. 9	Incineration Ash (Ash from incineration of any biomedical waste)	Disposal in municipal landfill
Category No.10	Chemical Waste (Chemicals used in production of biologicals, chemicals used in disinfecting, as insecticides, etc.)	Chemical treatment @@ and discharge into drains for liquids and secured landfill for solids.

TABEL 1.3

@@ Chemical treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent. It must be ensured that chemical treatment ensures disinfection.

** Mutilations / Shredding must be such as to prevent unauthorized reuse.

@ There will be no chemical pre-treatment before incineration. Chlorinated plastics shall not be incinerated.

* Deep burial shall be an option available only in towns with population less than five lakh and in rural areas.

END NOTES

1. Rule 5(1) “Bio-medical waste shall be treated and disposed of in accordance with Schedule I, and in compliance with the standards prescribed in Schedule V.”
2. Provides for categories of bio-medical waste
3. Provides for standards for treatment and disposal of bio-medical wastes
4. Rule 5 (2) *“Every occupier, where required, shall set up in accordance with the time-schedule in Schedule VI, requisite bio-medical waste treatment facilities like incinerator, autoclave, microwave system for the treatment of waste, or, ensure requisite treatment of waste at a common waste treatment facility or any other waste treatment facility.”*
5. The Central Pollution Control Board (CPCB), statutory organization, was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974. Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981. <http://cpcb.nic.in/Introduction.php>
6. www.cpcb.nic.in/wast/.../Rev_Draft_Gdlines_CBWTFs_26022014.pdf
7. Seventh Schedule, Constitution of India, List II, Public health and sanitation; hospitals and dispensaries.
8. www.cpcb.nic.in/wast/.../DesignandconstructionofBMWincinerator.pdf
9. Rule 7(1) *“The Government of every State and Union Territory shall establish a prescribed authority with such members as may be specified for granting authorisation and implementing these rules. If the prescribed authority comprises of more than one member, a chairperson for the authority shall be designated.”*
10. National Guidelines on Hospital Waste Management, 2002: It was issued by the Ministry of Health & Family Welfare, Govt. of India. These guidelines include safety measures, waste management, training and related administrative functions in hospitals and its environment.

CHAPTER THREE

SEGREGATION, PACKAGING, TRANSPORTATION AND STORAGE

CHAPTER THREE

SEGREGATION, PACKAGING, TRANSPORTATION AND STORAGE

The bio-medical waste is segregated into container/ bags according to rules provided under rule 6 of the bio-medical rules.¹ It provides following rules which have to be followed at the point of generation and in its storage, transportation, treatment and disposal.

(1) The Bio-medical waste shall not be mixed with other wastes. It shall not be mixed with municipal waste and shall be kept from other types of waste.²

(2) Bio-medical waste shall be segregated into containers/bags at the point of generation in accordance with Schedule II prior to its storage, transportation, treatment and disposal. The containers shall be labeled according to Schedule III.³ The segregation of bio-medical waste is important element in the collection of bio-medical waste.

(3) If a container is transported from the premises where bio-medical waste is generated to any waste treatment facility outside the premises, it shall contain information as per Schedule IV along with the label prescribed in Schedule III.⁴

(4) The untreated biomedical waste shall be transported only in such vehicle as may be authorized for the purpose by the competent authority as specified by the government.⁵

(5) No untreated bio-medical waste shall be kept stored beyond a period of 48 hours.⁶

The rules provides that if for any reason it becomes necessary to store the waste beyond such period, the authorized person must take permission of the prescribed authority and take measures to ensure that the waste does not adversely affect human health and the environment.⁷



Training Camp regarding Management of Bio-medical waste Organized for Hospital Staff at Civil Hospital, Satara



The poster on the wall near Bio-medical waste container displaying color code of bio medical waste containers/bags



at Government Civil Hospital at Satara

Nature in Need supplies Different color coded bags to be used for bio medical waste storage and segregation

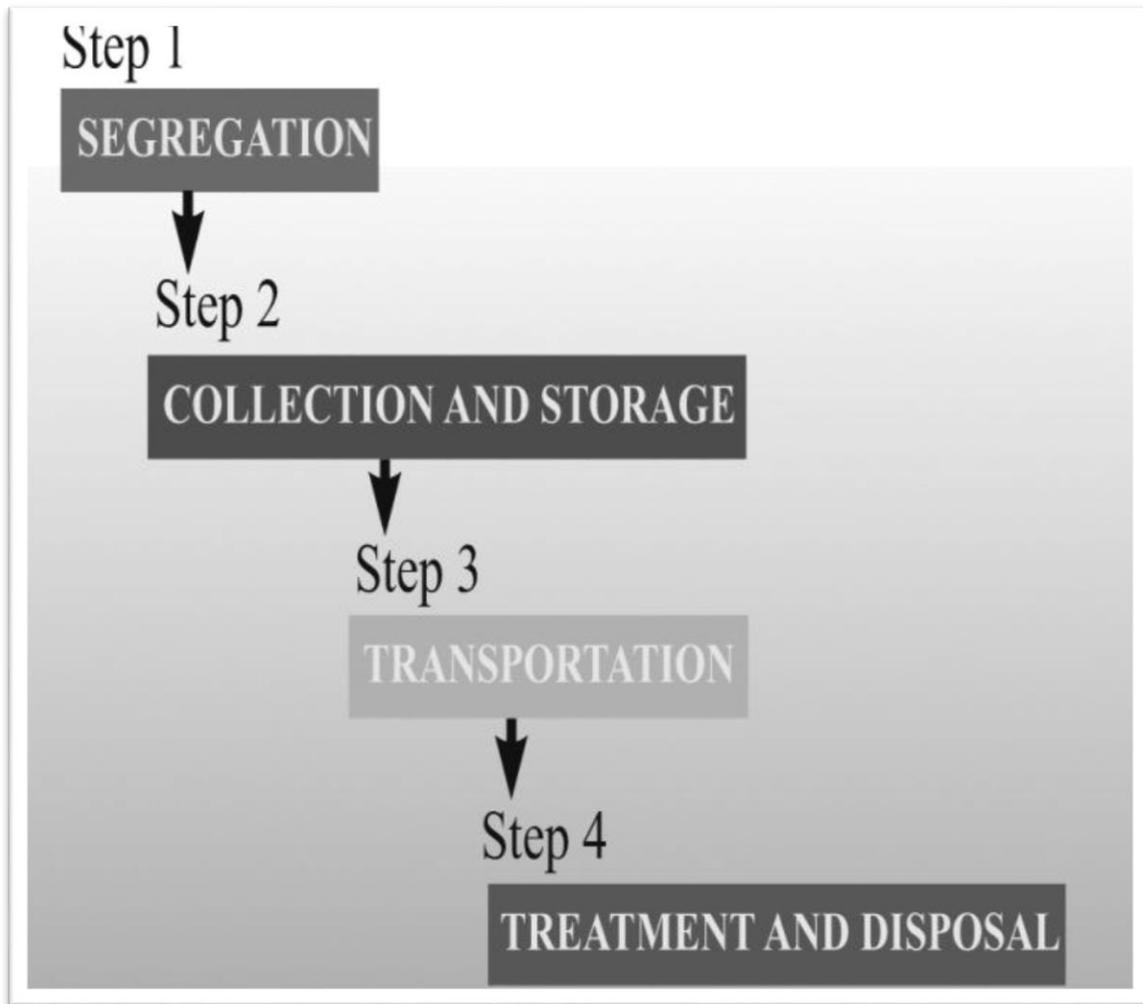


Diagram showing the process of bio medical waste management from segregation to final treatment and disposal

TABLE 1.4

The rule 6 prescribes labeling of container according schedule III. The bio-medical waste shall be shall be labeled according to Schedule III and if a container is transported from the premises where bio-medical waste is generated to any waste treatment facility outside the premises, the container shall also carry information prescribed in Schedule IV. The container labeled shall be wash proof and prominently visible. It shall have the date, name, address, phone of the sender and receiver.

SCHEDULE II

Colour coding	Type of container	Waste categories
Yellow	Plastic bags	Human anatomical waste, animal waste, microbiological waste, soiled waste,
Red	Disinfected container plastic bags Plastic bags/ puncture	Microbiological, soiled, solid waste (e.g. waste IV tubes catheters, etc.)
Blue/white	Plastic bags/ puncture proof containers	Discarded medicines, incineration ash, chemical waste
Black	Plastic bags/ puncture proof containers	Discarded medicines, incineration ash, chemical waste

TABLE 1.5

SCHEDULE III



TABLE 1.6

SCHEDULE IV

LABEL FOR TRANSPORT OF BIO-MEDICAL WASTE CONTAINERS/BAGS

Day Month	
Year	
Date of generation	
Waste category No	
Waste class	
Waste description	
Sender's Name & Address	Receiver's Name & Address
Phone No	Phone No
Telex No	Telex No
Fax No	Fax No
Contact Person	Contact Person
In case of emergency please contact	
Name & Address :	
Phone No.	
Note :	

TABLE 1.7



Specially designed vehicles for transportation of bio medical waste in Satara City

END NOTES

1. Segregation, packaging, transportation and storage
2. Rule 6(1)
3. Rule 6(2)
4. Rule 6(3)
5. Rule 6(4)
6. Rule 6(5)
7. *ibid*

CHAPTER FOUR

Common Bio-medical Waste Treatment Facility (CBWTF)

CHAPTER FOUR

COMMON BIO-MEDICAL WASTE TREATMENT FACILITY (CBWTF)

The rule 5 of the Bio-Medical Waste (Management and Handling) Rules, 1998 provides treatment and disposal of bio medical waste in accordance with schedule I and with compliance of standards given in schedule V. It provides that every occupier shall set up in accordance with the time-schedule given under Schedule VI, bio-medical waste treatment facilities like incinerator, autoclave, microwave system for the treatment of waste, or, ensure requisite treatment of waste at a Common Bio-medical Waste Treatment Facility (CBWTF).

The Bio-Medical Waste (Management and Handling) Rules, 1998 state that every Health care establishment has to set up requisite biomedical waste treatment facilities like incinerator, autoclave, microwave system for the treatment of waste, or should ensure requisite treatment of waste at a common waste treatment facility or any other waste treatment facility. Installation of individual treatment facilities by every healthcare unit requires comparatively high capital investment and thus is not a viable option. In addition, it requires separate human power and infrastructure for proper operation and maintenance of treatment systems. The concept of Common Biomedical Waste Treatment Facility (CBWTF) not only addresses such problems but also prevents proliferation of treatment facilities in a city, which themselves can be a source of hazard and infection if not maintained well. To help in setting up new CBWTFs, monitoring and evaluation of existing ones, Central Pollution Control Board (CPCB) has brought out Guidelines for BMW Treatment Facilities.

The following are important guidelines for common bio medical treatment facilities issued by Central pollution control board.

LOCATION OF CBWTF

The CBWTF shall be located as near to the area of operation in order to avoid travel distance in waste collection and enhancing operational flexibility however a CBWTF shall be located at a place reasonably far away from residential and sensitive area so that it has minimal impact on these areas

LAND REQUIREMENT:

Sufficient land shall be allocated for CBWTF to provide all requisite systems which include space for storage, waste treatment facilities, ETP, vehicle washing and parking space. It is felt that a CBWTF will require minimum of 1 acre land area. So, preferably, a CBWTF be set up on a plot size of not less than one acre

COVERAGE AREA OF CBWTF

Suggested coverage area of development of a CBWTF is as follows:

- (i) Only one CBWTF may be allowed to cater up to 10,000 beds at the approved rate by the Prescribed Authority.
- (ii) A CBWTF shall not be allowed to cater healthcare units situated beyond a radius of 150 km. However, in an area where 10,000 beds are not available within a radius of 150 KM, existing CBWTF in the locality may be allowed to cater the healthcare units situated outside the said 150 KM.

TREATMENT EQUIPMENT

The Common Bio-medical Waste Treatment Facility (CBWTF) following **treatment facilities:**

Incineration: It is a controlled combustion process where waste is completely oxidized and harmful microorganisms present in it are destroyed/denatured under high temperature. The guidelines for “Design & Construction of Bio-medical Waste Incinerators” is prepared by CPCB are being followed for selecting/installing a better bio-medical waste incinerator.

The specific requirements regarding norms of combustion efficiency and emission level have been defined in BMW rules 1998.

Suitably designed pollution control devices should be installed.

Incinerator should be certified from pollution control board.

The chlorinated plastic bags should not be incinerated.

Waste to be incinerated shall not be chemically treated with any chlorinated disinfectants.

The functioning of the incinerator and the number of cycles operated per day should be documented in a log book. Regular monitoring of the process should be done as per CPCB norms.

The ash produced by incinerator should be sent for secure land filling and should also be periodically checked for toxic metals.

Autoclaving: Autoclaving is a low-heat thermal process where steam is brought into direct contact with waste in a controlled manner and for sufficient duration to disinfect the wastes. For ease and safety in operation, the system should be horizontal type and exclusively designed for the treatment of bio-medical waste. For optimum results pre-vacuum based system is preferred against the gravity type system. It shall have tamper proof control panel with efficient display and recording devices for critical parameters such as time, pressure, date and batch number etc. Typically, autoclaves are used for the sterilization of reusable medical equipment. They allow for the treatment of only limited quantities of waste and are therefore commonly used only for highly infectious waste, such as microbial cultures or sharps.

Shredder: Shredding is a process by which waste are reshaped or cut into smaller pieces so as to make the wastes unrecognizable. It helps in prevention of reuse of bio-medical waste and also acts as identifier that the waste has been disinfected and is safe to dispose off.

In **microwaving**, microbial inactivation occurs as a result of the thermal effect of electromagnetic radiation spectrum lying between the frequencies 300 and 300,000 MHz.

Microwave heating is an inter-molecular heating process. The heating occurs inside the waste material in the presence of steam.

Chemical disinfection: Though chemical disinfection as stipulated under the BMW Rules is also an option for treatment of certain categories of bio-medical waste but looking at the volume of waste to be disinfected at the CBWTF and the pollution load associated with the use of disinfectants, the use of chemical disinfection for treatment of bio-medical waste at CBWTF is not recommended.

COLLECTION AND TRANSPORTATION OF BIO-MEDICAL WASTES

Collection of bio-medical waste: Generator of the bio-medical waste is responsible for providing segregated waste in accordance with the provisions of the Bio-medical Waste (Management & Handling) Rules, 1988, to the CBWTF operator. The CBWTF operator shall not accept the non-segregated waste and such incident shall be reported to the Prescribed Authority once in a quarter. Temporary storage at healthcare unit shall be designated. The coloured bags handed over by the healthcare units shall be collected in similar coloured containers with cover. Each bag shall be labeled as per Schedule III & IV of the Bio-medical Waste (Management & Handling) Rules, so that at any time, the healthcare units can be traced back that are not segregating the bio-medical wastes as per the Rules. The coloured containers should be strong enough to withstand any possible damage that may occur during loading, transportation or unloading of such containers. These containers shall also be labeled as per the Schedule III of the Rules. Sharps shall be collected in puncture resistant container. The person responsible for collection of bio-

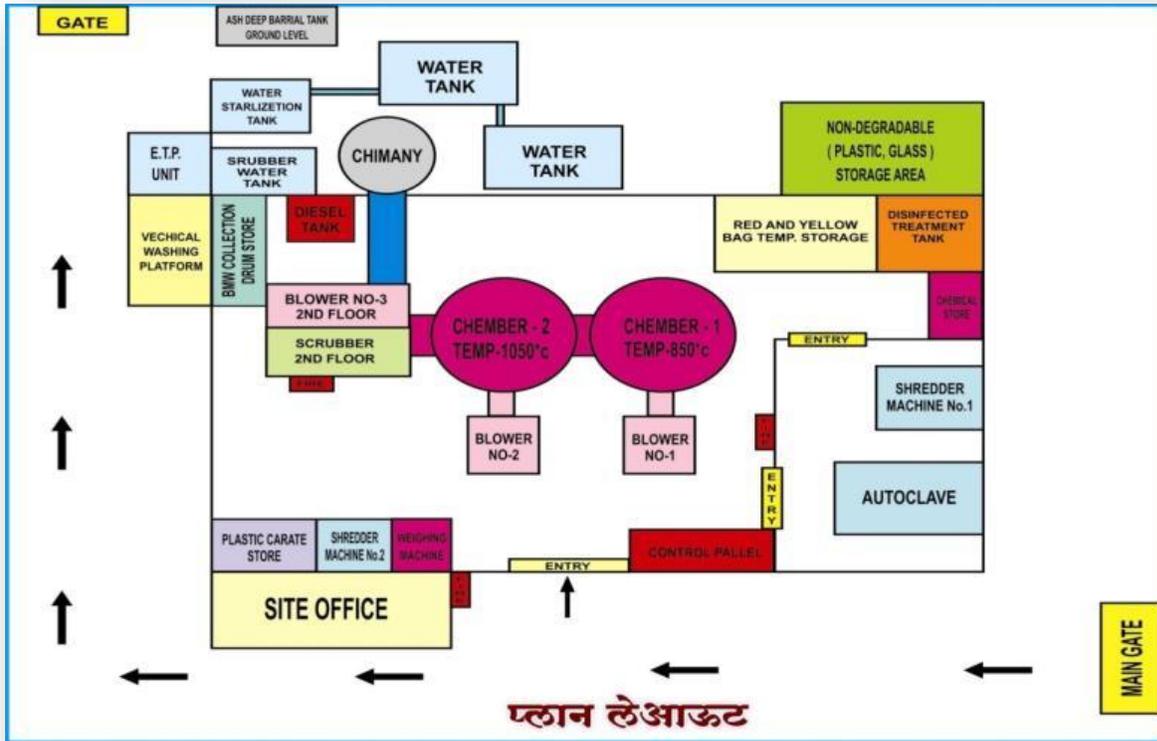
medical wastes shall also carry a register with him to maintain the records such as name of the healthcare unit, the type and quantity of waste received, time at which collected from the member HCF, signature of the authorised person from the healthcare unit etc. Bar coding system may be adopted to identify and maintaining records.

COST TO BE CHARGED BY THE CBWTF OPERATOR FROM THE HEALTHCARE UNITS

Cost to be charged from the healthcare units plays an important role in sustaining the project. The cost shall be so worked out that neither it becomes a monopoly of the CBWTF operator nor the interest of the CBWTF operator is overlooked. It is recommended that cost to be charged from the healthcare units shall be worked out in consultation with the concerned State Pollution Control Board (SPCB)/Pollution Control Committee (PCC) and the local Medical Association, keeping in view the following options:

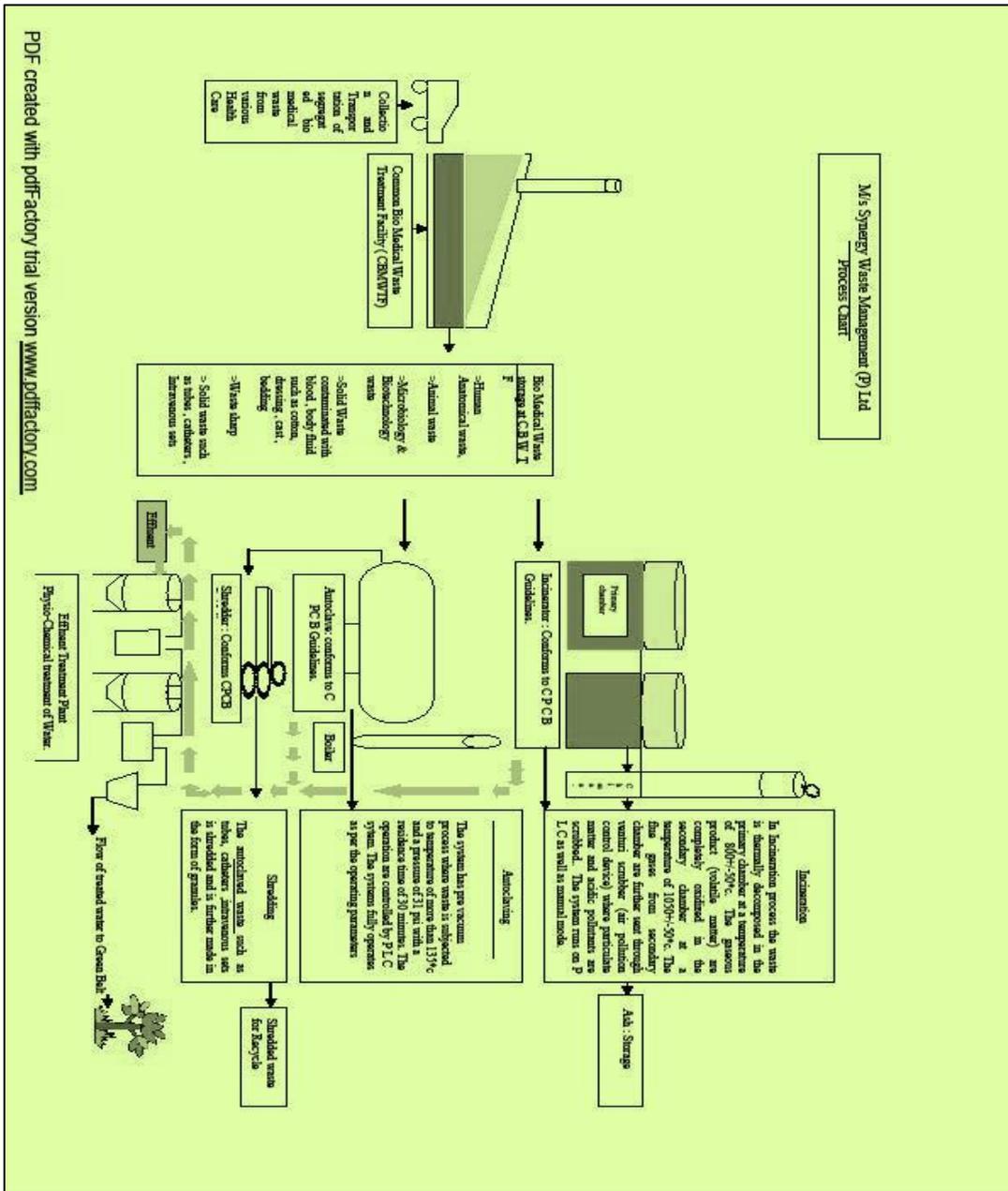
- (i) Fixed charges in case of the nursing homes/clinics/Sample Collection Centres/Dental Centres;
- (ii) Fixed charges per bed basis to the low bed strength hospitals (upto 30 beds)
- (iii) Charges based on the weight basis;
- (iv) Charges to the hospitals having 30 or more beds

The above guidelines are certain important guidelines issued by Central Pollution Control Board. It contains few excerpts from the revised guidelines issued by central pollution control board.



Plan layout of Nature in Need, Satara

FIGURE NO.2



PDF created with pdf-factory trial version www.pdf-factory.com

FIGURE NO.3

Courtesy: <http://www.synergyworld.co.in/images/pdf/PROCESS%20CHART.pdf>



The first photo shows specially designed vehicles used for transporting bio medical waste parked within the premises of Nature in Need. The second photo shows the premises of the plant covered by green belt as per Central pollution board guidelines and norms.

INTERVIEW QUESTIONNAIRE

Interview questionnaire prepared for Common Bio Medical Waste treatment Facility
“Implementation of Biomedical Waste (Management and Handling) Rules 1998 By Hospitals in Satara City”

Minor Research Project by Dr. Sujata Pawar I/C Principal, Ismailsaheb Mulla Law College, Satara.

Questioner

Instructions: - * Please tick mark the answer/Write in place provided.

* You may tick mark more than one answer if appropriate.

* This information will be kept confidential and will be used only for the academic and research purposes.

1. Name & Address of the common Bio Medical Waste Treatment Facility

Nature in Need, BMWT services

2. Name of operator of a Bio Medical Waste Facility

Appaso Balvant jadhav

3. First grant of authorization from Pollution Control Board

2007

4. Date of latest renewal

15th may 2014

5. Was the authorization suspended anytime?

YES NO If Yes ,During _____

6. Is the annual report sent before 31stJan. every year to Pollution control Board?

YES NO

7. Is the record related to handling of Bio Medical Waste kept in a register?

YES NO

8. Did any accident during transportation or handling of Bio Medical waste occurred in past?

YES NO

9. If yes was the accident reported to Pollution Control Board in Form III?

YES NO

10. What kind of Bio Medical Waste Handling is done by you?

- a) Collection / Reception
- b) Storage
- c) Transport
- d) Treatment
- e) Disposal

11. What kind of vehicles are used for transportation of Bio Medical Waste?

Pack body vehicles _____ Total Nos. six

12. What kind of containers /bags is used for transportation of Bio Medical Waste?

Single Container Separate Container As per Color Code

13. Are the container/bags labeled with (Wash proof & Promptly Visible) details given in Sc.III & Sc.IV?

YES NO

14. Do containers have Biohazards or Cytotoxic? YES NO

15. Is there any chance of unauthorized reuse or resale of discarded items by any one during handling of Bio Medical Waste by you?

YES NO Don't Know

16. What kind of staff is employed for the work? Give designation/category and No. of employees?

Trained staff, supervisor, machine operator, watch man, other laborer

Total Nine

17. What care is taken to prevent accident/improper handling of Bio Medical Waste?

As per central pollution board norms and guidelines

18. Do you provide safety measures to worker against operational health hazards?

YES NO

19. Is vehicle transporting Bio Medical Waste covered and secured

YES NO

20. Is interior of container smooth without sharp edges which can be easily washed and disinfected?

YES NO

21. What standards for waste autoclaving are followed by you?

a) Temperature

b) Pressure

c) Autoclave residence time

22. How is recording of operational parameters maintained?

As per central pollution board norms and guidelines

23. What Standards are followed by you for Microwaving?

Not Applicable

24. What Standards are followed by you for deep burial?

Not Applicable

25. Give brief description of method of treatment & disposal by you?

Disinfection, autoclaving, shredding, incineration.

26. State the category & quantity of waste (category wise) handled per month by you?

Human Anatomical waste	- 1040 kg
Sharps waste	- 740 kg
Discarded medicine	- 90 kg
Solid waste	- 10,400 kg
Solid waste II	- 690 kg

All figures are in an average.

27. What are difficulties faced by you in implementing the Bio Medical Waste rules?

State pollution control board should take strict action against health care establishment for the implantation of bio medical waste rules.

28. What are your suggestions/comments with regard to prevention minimization & control of Bio Medical Waste hazards to human health & environmental?

Pollution control board should issue notices on regular basis to health care establishment if they are not following BMW rules and penalty should be imposed on Health care establishment.

CHAPTER FIVE

**BIO-MEDICAL WASTE (MANAGEMENT
AND HANDLING) RULES, 2011**

CHAPTER FIVE

BIO-MEDICAL WASTE (MANAGEMENT AND HANDLING) RULES, 2011

Bio-medical Waste (Management and Handling) Rules, 1998 was amended by Bio-medical waste (Management and Handling) Rules, 2011¹

The Ministry of Environment & Forests have gazetted and initiated the public notification process of its draft Bio-Medical Waste (Management and Handling) Rules, 2011. These rules have described 7 the duties and responsibilities of occupier and operator in detail, besides the procedures for certification, authorization, monitoring etc. The changes made in the 2011 Rules which are relevant to this report are as follows;

- A) It has been stipulated that every occupier of the healthcare facility shall set up therequired biomedical waste treatment equipment's prior to commencement of its operation or make necessary arrangements through an authorized common bio medical waste treatment facility.
- b) In the earlier rules, occupiers of an institution, which provided service to less than 1000 patients per month, need not take authorization from the prescribed authority.
- c) Under the new rules, every occupier, irrespective of the number of patients served or the quantum of bio medical waste generated is required to obtain authorization.
- d) Under existing rules, there was an overlap with regard to color coding and segregation of waste. Now, the color codes have been clearly specified to avoid confusion and overlapping.
- e) The number of categories of waste has been reduced from ten to eight. Color coding for non-infectious waste has also been prescribed.

- f) Duties and responsibilities of the occupier including occupational safety and training requirements have been delineated in detail.
- e) Similarly, duties and responsibilities of the operator of the waste treatment facility are also provided in detail.
- h) Use of chlorinated plastic bags for segregation of waste by the occupier and incineration of the same by the operator is prohibited under the revised rules.

BMW RULES 2011 VS. 1998

2011	1998
Every occupier generating BMW, irrespective of the quantum of wastes comes under the BMW Rules and requires to obtain authorisation	Occupiers with more than 1000 beds required to obtain authorisation
Duties of the operator listed	Operator duties absent
Categories of Biomedical Waste reduced to Eight	Biomedical waste divided in ten categories
Treatment and disposal of BMW made mandatory for all the HCEs	Rules restricted to HCEs with more than 1000 beds
A format for annual report appended with the Rules	No format for Annual Report
Form VI i.e. the report of the operator on HCEs not handing over the BMW added to the Rules	Form VI absent

TABLE 1.8

COLOUR CODING AND TYPE OF CONTAINER FOR DISPOSAL OF BMW

Colour Coding	Type of container to be used	Waste Category Number
Yellow	Non Chlorinated plastic bags	Category 1,2,5,6
Red	Non Chlorinated plastic bags/puncture proof container for sharps	Category 3,4,7
Blue	Non Chlorinated plastic bags container	Category 8
Black	Non Chlorinated plastic bags	Municipal Waste

TABLE 1.9

END NOTES

1. <http://www.moef.nic.in/downloads/public-information/salient-features-draft-bmwmh.pdf>

CHAPTER SIX

INTERNATIONAL CONVENTION ON ENVIRONMENT PROTECTION

CHAPTER SIX

INTERNATIONAL CONVENTION ON ENVIRONMENT PROTECTION

United Nations Conference on the Human Environment

The first United Nations Conference on the Human Environment¹ (UNCHE) was held in Stockholm, Sweden from June 5 to June 16, 1972. This was the first United Nations conference on the environment as well as the first major international gathering focused on human activities in relationship to the environment, and it laid the foundation for environmental action at an international level. The conference acknowledged that the goal of reducing human impact on the environment would require extensive international cooperation, as many of the problems affecting the environment are global in nature. Following this conference, the United Nations Environmental Programme² (UNEP) was launched in order to encourage United Nations agencies to integrate environmental measures into their programs.

It proclaimed that “Man is both creature and molder of his environment, which gives him physical sustenance and affords him the opportunity for intellectual, moral, social and spiritual growth. In the long and tortuous evolution of the human race on this planet a stage has been reached when, through the rapid acceleration of science and technology, man has acquired the power to transform his environment in countless ways and on an unprecedented scale. Both aspects of man's environment, the natural and the man-made, are essential to his well-being and to the enjoyment of basic human rights the right to life its³

The conference produced the “Framework for Environmental Action,” an action plan containing 109 specific recommendations related to human settlements, natural-resource management, and pollution, educational and social aspects of the environment, development, and international organizations.

United Nations Conference on Environment and Development

United Nations Conference on Environment and Development or the The Earth Summit in Rio de Janeiro was an important UN conference⁴ The conference addressed the urgent problems of environmental protection and socio-economic development. The assembled leaders signed the Convention on Climate Change and the Convention on Biological Diversity, endorsed the Rio Declaration and the Forest Principles, and adopted Agenda 21, a 300 page plan for achieving sustainable development in the 21st century. The Summit's message — that nothing less than a transformation of our attitudes and behavior would bring about the necessary changes. Governments recognized the need to redirect international and national plans and policies to ensure that all economic decisions fully took into account any environmental impact. And the message has produced results, making eco-efficiency a guiding principle for business and governments alike. Patterns of production — particularly the production of toxic components, such as lead in gasoline, or poisonous waste are being scrutinized in a systematic manner by the UN and Governments alike Alternative sources of energy are being sought to replace the use of fossil fuels which are linked to global climate change. New reliance on public transportation systems is being emphasized in order to reduce vehicle emissions, congestion in cities and the health problems caused by polluted air and smog. There is much greater awareness of and concern over the growing scarcity of water.

Principle 15 states

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation⁵

Earth Summit 2002

The World Summit on Sustainable Development⁶, or Earth Summit 2002 took place in Johannesburg, South Africa, from 26 August to 4 September 2002. It was convened to discuss sustainable development by the United Nations. It gathered a number of leaders from business and non-governmental organizations, 10 years after the first Earth Summit in Rio de Janeiro.

The Johannesburg Declaration was the main outcome of the Summit; however, there were several other international agreements. It laid out the Johannesburg Plan of Implementation as an action plan.

The United Nations Conference on Sustainable Development

The United Nations Conference on Sustainable Development⁷ (UNCSD), also known as Earth Summit 2012 was the third international conference on sustainable development aimed at reconciling the economic and environmental goals of the global community. Hosted by Brazil in Rio de Janeiro from 13 to 22 June 2012, Rio+20 was a 20-year follow-up to the 1992 Earth Summit / United Nations Conference on Environment and Development (UNCED) held in the same city, and the 10th anniversary of the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg.

The ten day mega-summit, which culminated in a three-day high-level UN conference, was organized by the United Nations Department of Economic and Social Affairs and included participation from 192 UN member states — including 57 Heads of State and 31 Heads of Government, private sector companies, NGOs and other groups. The decision to hold the conference was made by UN General Assembly Resolution A/RES/64/236 on 24 December 2009. It was intended to be a high-level conference, including heads of state and government or other representatives and resulting in a focused political document designed to shape global environmental policy.

In 1992, the first conference of its kind, the United Nations Conference on Environment and Development (UNCED), commonly referred to as the Rio Conference or Earth Summit, succeeded in raising public awareness of the need to integrate environment and development. The conference drew 109 heads of state to Rio de Janeiro, Brazil, to address what were dubbed urgent problems of environmental protection and socio-economic development. The Earth Summit influenced subsequent UN conferences, including Rio+20 and set the global green agenda. “The World Conference on Human Rights, for example, focused on the right of people to a healthy environment and the right to development; controversial demands that had met with resistance from some Member States until the Earth Summit.”⁸

Major outcomes of the conference include the Climate Change Convention—a climate-change agreement that led to the Kyoto Protocol, Agenda 21, and a Convention on Biological Diversity. It also created new international institutions, among them the Commission on Sustainable Development, tasked with the follow-up to the Rio Conference, the United Nations Framework Convention on Climate Change (UNFCCC) and led to the reform of the Global Environment Facility.

Ten years later, Earth Summit 2002 informally nicknamed Rio+10 was held in Johannesburg, South Africa with the goal of again bringing together leaders from government, business and NGOs to agree on a range of measures toward similar goals. At Rio+10, sustainable development was recognized as an overarching goal for institutions at the national, regional and international levels. There, the need to enhance the integration of sustainable development in the activities of all relevant United Nations agencies, programs and funds was highlighted. The discussion also encompassed the role of institutions in stepping up efforts to bridge the gap between the international financial institutions and the multilateral development banks and the rest of the UN system⁹

Major outcomes of that conference include the Johannesburg Declaration and almost 300 international partnership initiatives meant to help achieve the Millennium Development Goals.

The conference had three objectives:

Securing renewed political commitment for sustainable development

Assessing the progress and implementation gaps in meeting previous commitments.

Addressing new and emerging challenges.

International treaties, Conventions, Conferences and Protocols resulted in regulatory legislation to protect the environment in several countries for framing policies to protect and improve environment, preventing pollution, punishing environmental crimes, and for compensating the persons affected by breach of protective provisions. There are, however, some international

agreements and regulatory principles, which form the basis for healthcare waste management rules at the national level:

1. The international community recognized sustainable development as the overarching paradigm for improving quality of life in 1992, at UNCED. Although sustainable development is susceptible to somewhat different definitions, the most commonly accepted and cited definition is that of the Brundtland Commission on Environment and Development, which stated in its 1987 Report, *Our Common Future*¹⁰ that sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”¹¹ The parameters of sustainable development are clarified in Agenda 21 and the Rio Declaration, both adopted at UNCED, and in subsequent international regional and national instruments.

Principle 4 of the Rio Declaration states¹²

“In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.”

Principle 25 states¹³ that *“Peace, development and environmental protection are interdependent and indivisible.”*

2. One of the core principles of sustainable development is the "Polluter Pays" Principle. This recognizes that the polluter should pay for any environmental damage created, and that the burden of proof in demonstrating that a particular technology, practice or product is safe should lie with the developer, not the general public. The first mention of the Principle at the international level is to be found in the 1972 Recommendation by the OECD Council on Guiding Principles concerning International Economic Aspects of Environmental Policies¹⁴ where it stated that: *"The principle to be used for allocating costs of pollution prevention and control measures to encourage rational use of scarce environmental resources and to avoid distortions in international trade and investment is the so-called Polluter-Pays Principle."*

*"This principle means that the polluter should bear the expenses of carrying out the above-mentioned measures decided by public authorities to ensure that the environment is in an acceptable state"*¹⁵

3. The precautionary principle is often seen as an integral principle of sustainable development that is development that meets the needs of the present without compromising the abilities of future generations to meet their needs. By safeguarding against serious and, particularly, irreversible harm to the natural resource base that might jeopardize the capacity of future generations to provide for their own needs, it builds on ethical notions of intra- and inter-generational equity. The Precautionary Principle was incorporated into the 1992 Rio Declaration on Environment and Development, stating that,

"Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation".¹⁶

4. Principle 21 of the Stockholm Declaration recognizes the sovereign right of each state upon its natural resources, emphasizing that it is limited by the responsibility for transboundary harm. 1972 Stockholm Declaration Principle 21¹⁷

"States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction."

Stockholm Principle 21/Rio Principle 2 contain two elements which cannot be separated without fundamentally changing their sense and effect: the sovereign right of states to exploit their own natural resources, and the responsibility, or obligation, not to cause damage to the environment of other states or areas beyond the limits of national jurisdiction. It is a well-established practice

that, within the limits stipulated by international law, every state has the right to manage and utilize natural resources within its jurisdiction and to formulate and pursue its own environmental and developmental policies. However, one of the limits imposed by international law on that right is that states have an obligation to protect their environment and prevent damage to neighboring environments.

India is signatory to international conventions and treaty and has adopted various rules to deal with different types of waste. Bio-medical waste has been dealt under Bio-Medical Wastes (Management and Handling) Rules, 1998. The following are legislation along with the kind of waste management.

a) The Hazardous Wastes (Management, Handling and Tran boundary Movement) Rules, 2008.¹⁸

(b) waste-water and exhaust gases as covered under the provisions of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974)¹⁹ and the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981)²⁰

(c) Wastes arising out of the operation from ships beyond five kilometers of the relevant baseline as covered under the provisions of the Merchant Shipping Act, 1958 (44 of 1958)²¹ and the rules made thereunder.

(d) Radio-active wastes as covered under the provisions of the Atomic Energy Act, 1962 (33 of 1962)²² and the rules made thereunder.

(e) Bio-medical wastes covered under the Bio-Medical Wastes (Management and Handling) Rules, 1998²³ made under the Act; and

(f) Wastes covered under the Municipal Solid Wastes (Management and Handling) Rules, 2000²⁴ made under the Act;

END NOTES

1. Stockholm from 5 to 16 June 1972
2. UNEP, established in 1972, is the voice for the environment within the United Nations system.
3. <http://www.unep.org/Documents.Multilingual/Default.asp?documentid=97&articleid=1503>
4. United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, 3-14 June 1992
5. www.unep.org/Documents.Multilingual/Default.asp?DocumentID=78&ArticleID=1163
6. <http://www.earthsummit2002.org/>
7. <http://www.un.org/en/sustainablefuture/about.shtml>
8. http://en.wikipedia.org/wiki/United_Nations_Conference_on_Sustainable_Development
9. ibid
10. <http://www.un-documents.net/our-common-future.pdf>
11. <http://www.un-documents.net/ocf-02.htm>
12. <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>
13. ibid.
14. <http://www.oecd.org/trade/envtrade/39918312.pdf>
15. ibid.
16. <http://www.gdrc.org/u-gov/precaution-7.html>
17. <http://www.unep.org/Documents.Multilingual/Default.asp?documentid=97&articleid=1503>
18. <http://mpcb.gov.in/hazardous/pdf/HWRulesFinalNoti240908.pdf>

19. [www.cpcb.nic.in/upload/NewItems/\(1\)%20Wateract1974%20.doc](http://www.cpcb.nic.in/upload/NewItems/(1)%20Wateract1974%20.doc)
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22. dae.nic.in/?q=node/153
23. envfor.nic.in/legis/hsm/biomed.html
24. www.moef.nic.in/legis/hsm/mswmhr.html

CHAPTER SEVEN

JUDICIAL TREND ON WASTE MANAGEMENT AND ENVIRONMENT

CHAPTER SEVEN

JUDICIAL TREND ON WASTE MANAGEMENT AND ENVIRONMENT

The Constitution (Forty Second Amendment) Act 1976¹ explicitly incorporated environmental protection and improvement as part of State policy through the insertion of Article 48A.² Article 51A (g)³ imposed a similar responsibility on every citizen “to protect and improve the natural environment including forests, lakes, rivers, and wildlife and to have compassion for all living creatures.”

Article 48A provides for protection and improvement of environment and safeguarding of forests and wild life.-

“The State shall endeavor to protect and improve the environment and to safeguard the forests and wild life of the country”

Article 21⁴ of the Constitution of India, which guarantees 'right to life', Protection of life and personal liberty states “No person shall be deprived of his life or personal liberty except according to procedure established by law” and it safe and healthy environment is a part of article 21. **Rural Litigation and Entitlement Kendra v. State of U.P.**⁵ was one of the earliest cases where the Supreme Court dealt with issues relating to environment and ecological balance.

The Supreme Court in the **Charan Lal Sahu**.⁶ Similarly, in **Subash Kumar**,⁷ the Court observed that ‘right to life guaranteed by article 21 includes the right of enjoyment of pollution-free water and air for full enjoyment of life.’ Through this case, the Court recognized the right to a wholesome environment as part of the fundamental right to life. This case also indicated that the municipalities and a large number of other concerned governmental agencies could no longer rest content with unimplemented measures for the abatement and prevention of pollution. They may be compelled to take positive measures to improve the environment.

In *M.C. Mehta Vs. Union of India*⁸ and others a Three Judges Bench of Supreme Court held that Article 39(e), 47 and 48-A by themselves and collectively cast a duty on the State to secure the health of the people, improve public health and protect and improve the environment.

“Articles 39 (e), 47 and 48A by themselves and collectively cast a duty on the State to secure the health of the people, improve public health and protect and improve the environment. It was by reason of the lack of effort on the part of the enforcement agencies, notwithstanding adequate laws being in place, that this Court has been concerned with the state of air pollution in the capital of this country. Lack of concern or effort on the part of various governmental agencies had resulted in spiralling pollution levels”

In **M.C. Mehta v Union of India (UOI) and Ors.** the Apex Court noticing that there has been accelerated degradation of environment, reiterated that the right to live is a fundamental right under Article 21 of the Constitution and it includes the right of enjoyment of pollution free air for the enjoyment of life. It was further observed that the most vital necessities such as air, water and soil having regard to the right of life under Article 21, cannot be permitted to be misused and polluted so as to reduce the quality of life of others

The judgement delivered by Justice V.R. Krishna Iyer in **Ratlam Municipality Case**⁹ in 1980 has viewed the concept of public nuisance in an environmental sense. In this case, the Supreme Court dismissed the argument of Ratlam Municipality that it could not perform the statutory duties due to financial inability. The Court ordered the Municipality to provide the basic civic facilities to the public without making lame excuses. This Judgement became an eye opener for the public-spirited individuals and encouraged them to file litigations to solve local environmental issues. This reformed the whole system and a number of cases have been filed before different courts seeking remedies against environmental pollution.

“Public nuisance, because of pollutants being discharged by big factories to the detriment of the poorer sections, is a challenge to the social justice component of the rule of law. Likewise, the grievous failure of local authorities to provide the basic amenity of public conveniences drives the miserable slum-dwellers to ease in the streets, on the sly for a time, and openly thereafter, because under ature's pressure, bashfulness becomes a luxury and dignity a difficult art. A

responsible municipal council constituted for the precise purpose of preserving public health and providing better finances cannot run away from its principal duty by pleading financial inability. Decency and dignity are non-negotiable facets of human rights and are a first charge on local self-governing bodies. Similarly, providing drainage systems- not pompous and attractive, but in working condition and sufficient to meet the needs of the people- cannot be evaded if the municipality is to justify its existence. A bare study of the statutory provisions makes this position clear.”

In **Vellore Citizens Welfare Forum case**¹⁰, the Supreme Court was approached by the petitioner to issue directions against the tannery pollution caused by the discharge of untreated effluents in Vellore area in Tamilnadu. The untreated effluents affected the agricultural lands, groundwater and health of the local people. The Court delivered a landmark judgment in this case and directed the tanneries to set up effluent treatment plants. The tanneries, which failed to establish effluent treatment plants, were closed in the interest of the public.

In a landmark judgment on medical waste management, the Supreme Court in connection with safe disposal of hospital waste ordered that,

- (a) All hospitals with 50 beds and above should install either their own incinerator or an equally effective alternative method before 30th November 1996.
- (b) The incinerator or the alternative method should be installed with a necessary pollution control mechanism conforming to the standard laid down by Central Pollution Control Board (CPCB).
- (c) Hazardous medical waste should be segregated as source and disinfected before final disposal.

In this background in persuasion to the directive of The Court, the Ministry of Environment and Forests, Government of India notified the Bio-Medical Waste (management and Handling) Rule on 27th July 1998; under the provision of Environment Protection Act 1986. Accordingly all the hospitals in the public and private sector are now bound to follow these rules to evade legal

action. It regulated the disposal of biomedical wastes and lays down the procedures for collection treatment and disposal and standards to be complied with. These rules apply to all persons, who generate, collect, receive store, transport, and treat or handle biomedical wastes in any form. Biomedical wastes mean any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities etc.¹¹

END NOTES

1. <http://indiacode.nic.in/coiweb/amend/amend42.htm>
2. <http://www.constitution.org/cons/india/p04048a.html>
3. <http://www.constitution.org/cons/india/p4a51a.html>
4. <http://www.constitution.org/cons/india/p03021.html>
5. 1985 AIR 652, 1985 SCR (3) 169
6. Charan Lal Sahu v. Union of India AIR 1990 SC 1480.
7. Subhash Kumar v. State of Bihar, AIR 1991 SC 420.
8. 2002 (2) SCR 963
9. 1980 AIR 1622, 1981 SCR (1) 97
10. AIR 1996 SC 2715, (1996) 5 SCC 647
11. AIR 1996 SC 2969, (1996) 2 SCC 594, [1996] 3 SCR 80

CHAPTER EIGHT

BIO-MEDICAL WASTE LAW WORLDWIDE

CHAPTER EIGHT

BIO-MEDICAL WASTE LAW WORLDWIDE

UNITED KINGDOM

In the UK there are specific legislation to deal with hazardous clinical waste.

All clinical waste handling and disposal procedures comply with the following regulations:

The Environmental Protection Act 1990 (including the Duty of Care Regulations)¹

The Controlled Waste Regulations 2012²

The Hazardous Waste Directive 2011³

The Carriage of Dangerous Goods Regulations⁴

The main legislation governing clinical waste disposal is The Environmental Protection Act 1990. This stipulates that all producers of waste have a Duty of Care to ensure the correct and proper management of waste is performed and states that it is unlawful to deposit, recover or dispose of controlled clinical waste without a waste management licence, or in a way that causes pollution of the environment or harm to human health.

Section 34(1) imposes a duty on *"any person who imports, produces, carries, keeps, treats or disposes of controlled waste or, as a broker, has control of such waste, to take all such measures applicable to him in that capacity as are reasonable in the circumstances"*

The statutory duty of care applies to everyone in the waste management chain. It requires producers and others who are involved in the management of the waste to prevent its escape, and to take all reasonable measures to ensure that the waste is dealt with appropriately from the point

of production to the point of final disposal. This is enforced through the “polluter pays” principle, making producers of waste responsible for its management and disposal.

The department of health had issued Health Technical Memorandum (HTM) 07-01 guidelines for those involved in the management and disposal of healthcare waste. It provides guidance on the secure and legally compliant management of clinical waste.

Clinical waste is defined as:

a. “. . . any waste which consists wholly or partly of human or animal tissue, blood or other body fluids, excretions, drugs or other pharmaceutical products, swabs or dressings, syringes, needles or other sharp instruments, being waste which unless rendered safe may prove hazardous to any person coming into contact with it; and b. any other waste arising from medical, nursing, dental, veterinary, pharmaceutical or similar practice, investigation, treatment, care, teaching or research, or the collection of blood for transfusion, being waste which may cause infection to any person coming into contact with it.”

Clinical waste can be divided into three broad groups of materials:

- a. any healthcare waste which poses a risk of infection
- b. certain healthcare wastes which pose a chemical hazard
- c. medicines and medicinally-contaminated waste containing a pharmaceutically-active agent

UNITED STATES OF AMERICA

The Medical Waste Tracking Act (MWTa) of 1988.⁵ The Medical Waste tracking Act of 1988 defines medical waste as *"any solid waste that is generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals."*

The Medical Waste Tracking Act (MWTa) was enacted in 1988. The Act amended the Solid Waste Disposal Act. It defined medical waste and established which medical wastes would be subject to program regulations. The MWTa required management standards for segregation, packaging, labeling and marking, and storage of the medical waste. The Act also established

record keeping requirements and penalties that could be imposed for mismanagement. The MWTA required the EPA to examine various treatment technologies such as incinerators and autoclaves, microwave units and various chemical and mechanical systems for their ability to reduce the disease causing potential of medical waste.

The features of the legislation are following,

- a) Defined medical waste and established which medical wastes would be subject to program regulations.
- b) Established a cradle-to-grave tracking system utilizing a generator initiated tracking form.
- c) Required management standards for segregation, packaging, labeling and marking, and storage of the medical waste.
- d) Established record keeping requirements and penalties that could be imposed for mismanagement.

In addition to on-site treatment or pickup by a biomedical waste disposal firm for off-site treatment, a mail-back disposal option exists in the United States. In mail-back biomedical waste disposal, the waste is shipped through the U.S. postal service instead of transport by private hauler.

Medical waste disposal is primarily regulated at the state level. However certain medical waste is disposed according to federal law. The health care facilities, including, but are not limited to hospitals, physician's offices, dental practices and veterinary hospitals etc. Many of these waste streams are regulated at the state and local level while others are governed by federal regulations. States develop regulations for office and municipal type waste, whereas the federal government develops regulations for hazardous waste such as mercury or radioactive wastes. State regulations generally cover potentially infectious medical waste, sometimes referred to as regulated medical waste.

CANADA

In Canada extensive guidelines exist for the management of certain types of waste for e.g., the Canadian Council of Ministers of the Environment (CCME) has *Guidelines for the Management of Biomedical Waste in Canada*.⁶ Biomedical waste can be defined as waste generated in human and animal health care facilities, medical or veterinary research and training facilities, clinical testing or research laboratories, as well as vaccine production facilities. Most Canadian jurisdictions have prepared or are preparing guidelines or regulations for the management of biomedical waste. The treatment procedures used at each facility are subject to the standards in place for that province or territory. CCME has also developed Canada-wide guidelines for defining, handling, treating, and disposing of biomedical waste: the Guidelines for the Management of Biomedical Waste in Canada. The intent of these guidelines is to promote uniform practices and set minimum standards for managing biomedical waste in Canada.

It defines biomedical Waste defines as

a) Human Anatomical Waste This consists of human tissues, organs, and body parts, but does not include teeth, hair, and nails.

b) Animal Waste This consists of all animal tissues, organs, body parts, carcasses, bedding, fluid blood and blood products, items saturated or dripping with blood, body fluids contaminated with blood, and body fluids removed for diagnosis or removed during surgery, treatment or autopsy, unless a trained person has certified that the waste does not contain the viruses and agents listed in Risk Group 4 (see table 1). This excludes teeth, hair, nails, hooves, and feathers.

c) Microbiology Laboratory Waste

This consists of Laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human or animal cell cultures used in research, and laboratory material that has come into contact with any of these.

d) Human Blood and Body Fluid waste This consists of human fluid blood and blood products, items saturated or dripping with blood, body fluids contaminated with blood, and body fluids removed for diagnosis during surgery, treatment or autopsy. This does not include urine or feces.

e) Waste Sharps

Waste sharps are clinical and laboratory materials consisting of needles, syringes, blades, or laboratory glass capable of causing punctures or cuts.

f) Cytotoxic Waste

The term is commonly used to refer to pharmaceuticals used in treating cancer, e.g., antineoplastics or chemotherapy agents

SOUTH AUSTRALIA

Environment Protection (Waste to Resources) Policy 2010 under the Environment Protection Act 1993⁷ provides waste management including bio medical waste. It states that the objective of this policy is to achieve sustainable waste management by applying the waste management hierarchy consistently with the principles of ecologically sustainable development.

The medical waste means waste consisting of—

(a) medical sharps; or

(b) human tissue, bone, organ, body part or foetus; or

(c) a vessel, bag or tube containing a liquid body substance; or

(d) an animal carcass discarded in the course of veterinary research or medical practice or research; or

(e) a specimen or culture discarded in the course of medical, dental or veterinary practice or research and any material that has come into contact with such a specimen or culture; or

(f) any other article or matter that is discarded in the course of medical, dental or veterinary practice or research and that poses a significant risk to the health of a person who comes into contact with it;

Further the Environment Protection (Waste to Resources) Policy 2010 under division 2—Medical waste, 16 - *Collection and transport of medical waste provides that*

(1) Medical waste produced in the course of a prescribed activity must, as soon as is reasonably practicable after its production, be placed in a prescribed container and—

(a) Collected for disposal by—

(i) a licensed waste transporter authorised to collect and transport medical waste; or

(ii) a council; or

(b) Transported by a person employed or engaged in the business producing the waste directly to—

(i) a licensed depot at which medical waste may be received pursuant to the licence; or

(ii) a hospital.

HONG KONG

The Waste Disposal (Amendment) Ordinance 2006⁸ enacted on 7 April 2006 to implement the Clinical Waste Control Scheme, through waste disposal (clinical waste) (general) regulation. The main feature of the legislature are following

(a) Requiring clinical waste producers to properly manage their clinical waste by segregating those waste from other municipal solid waste and consigning the clinical waste to licensed waste collectors for disposal;

(b) Establishing a statutory licensing requirement for clinical waste collectors;

(c) promulgating to the parties concerned two sets of Code of Practice (“CoP”) to provide guidance on the handling and management of clinical waste;

(d) Setting up a trip ticket system to track clinical waste from source to disposal facility;

(e) Designating the Chemical Waste Treatment Centre (“CWTC”) as the Government facility to treat clinical waste; and

(f) levying a charge on the clinical waste to be disposed of at the CWTC.

This Regulation provides for the control and regulation of the disposal and delivery of clinical waste. Some important feature of the regulation are following,

2. Section 1 provides for the commencement of the Regulation.
3. Section 2 sets out the definitions necessary for the interpretation of the Regulation.
4. Sections 3 and 4 impose a duty to dispose of clinical waste properly and provide for the means by which clinical waste may be properly disposed of.
5. Section 5 requires a licensed waste collector to deliver the clinical waste that the licensed waste collector has collected to a reception point (as defined in section 2) within 24 hours or, where the Director of Environmental Protection (“the Director”) by a direction requires the licensed waste collector to deliver any clinical waste collected by the licensed waste collector to a specified reception point within a specified period, to deliver the clinical waste to that reception point within that period.
6. Section 6 empowers the Director to require removal of clinical waste.
7. Section 7 requires a person handling clinical waste to take precautions to prevent danger to public health or safety, pollution to the environment and nuisance to the neighbouring area.
8. Section 8 provides for the circumstances under which a waste disposal licence may be granted.
9. Section 9 provides for the authorization for using land or premises used for certain purposes (such as a dental, medical, nursing or veterinary practice) as a collection point.
10. Section 10 provides for the Director’s power to authorize a person to collect or remove clinical waste without a waste collection licence. That section also provides for the Director’s power to authorize a person to use specified land or premises for the disposal of clinical waste without a waste disposal licence.

END NOTES

1. <http://www.legislation.gov.uk/ukpga/1990/43/contents>
2. http://www.legislation.gov.uk/uksi/2012/811/pdfs/uksi_20120811_en.pdf
3. <https://www.gov.uk/waste-legislation-and-regulations>
4. <http://www.hse.gov.uk/cdg/>
5. <http://www.epa.gov/osw/nonhaz/industrial/medical/tracking.htm>
6. http://www.ccme.ca/files/Resources/waste/pn_1060_e.pdf
7. <http://www.legislation.sa.gov.au/LZ/C/POL/ENVIRONMENT%20PROTECTION%20%28WASTE%20TO%20RESOURCES%29%20POLICY%202010/CURRENT/2010.-.UN.PDF>
8. http://www.epd.gov.hk/epd/clinicalwaste/nonflash/english/downloads/files/wd_a_ordinance_2006_gazetted_e.pdf

CHAPTER NINE

RESULTS AND ANALYSIS

CHAPTER NINE

RESULTS AND ANALYSIS

Based on the review of literature and conceptual framework the following hypothesis were formulated and analyzed in the background of data collected.

The following hypotheses were formulated to ascertain the issues in the biomedical disposal system.

H1 The practices of biomedical waste management and disposal in Satara are not in line with the rules enacted by the Government and amended from time to time.

H2 The awareness of biomedical wastes rules is lacking amongst Health Care Establishments.

H3 Common biomedical disposal facility provides a vital role in Bio Medical Waste Management.

As part of data collection, responses were taken from doctors and supervisor of common biomedical waste disposal facility. The questions asked and responses collected are presented in the form of following graphs.

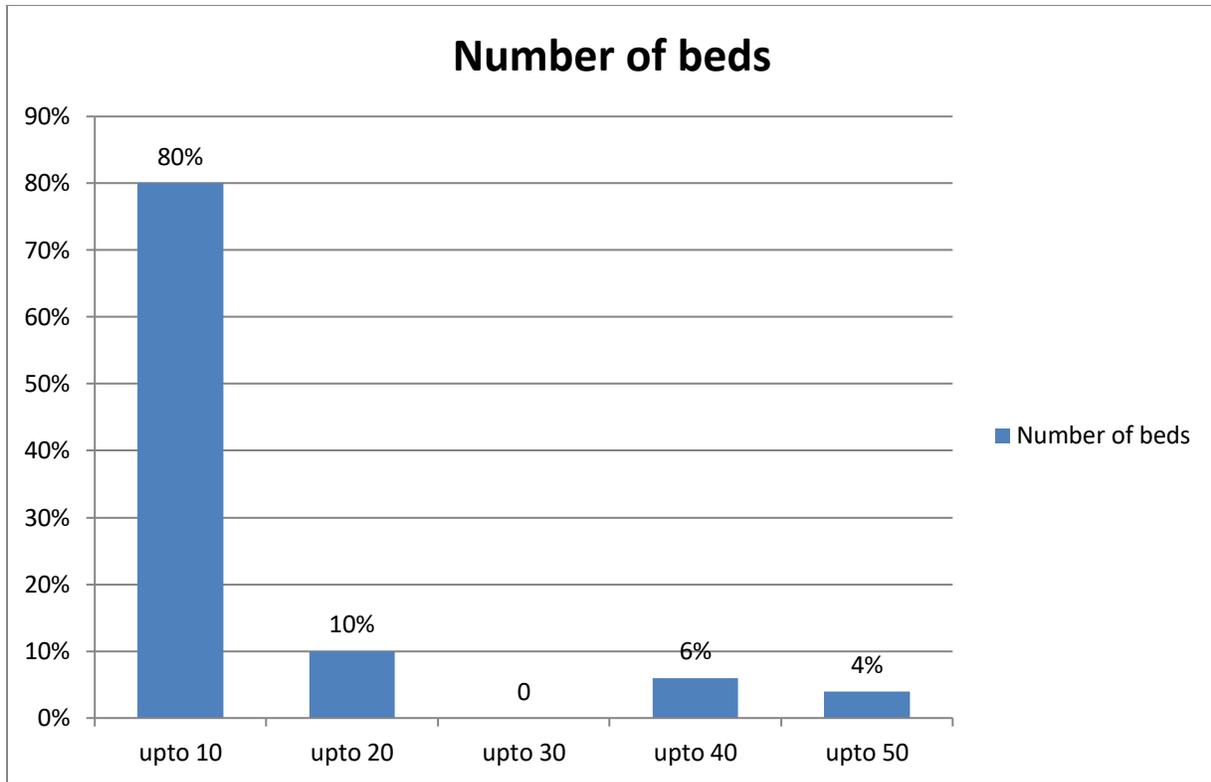


TABLE 2.0

Health Care Establishments are the major generators of the biomedical medical waste. The Health Care Establishments are classified into two categories: Bedded HCEs i.e. Hospitals/ Nursing Homes with Bed Facility and Non-bedded HCEs. The above charts shows that major HCE in the Satara city are small establishment in terms of number of beds. The 80% of HCE have bed capacity up to ten.

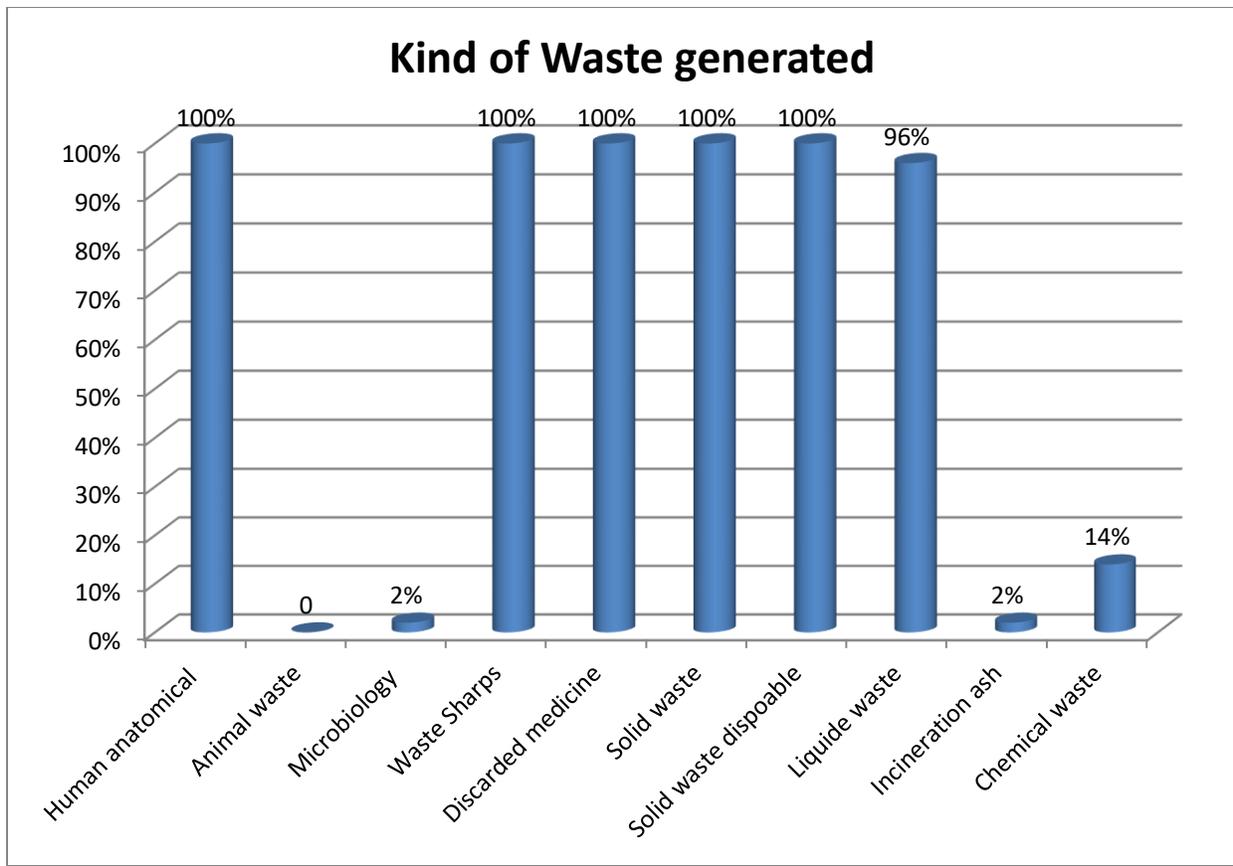


TABLE 2.1

The health care establishment generates different types of biomedical wastes. The heavily generated biomedical wastes are human anatomical, waste sharps, discarded medicine, solid waste items like contaminated with blood, solid waste like disposable items like tubing, liquid waste. In the study animal waste was nill and generation of microbiological waste/biotechnology waste and incineration waste was least in terms of generation of waste.

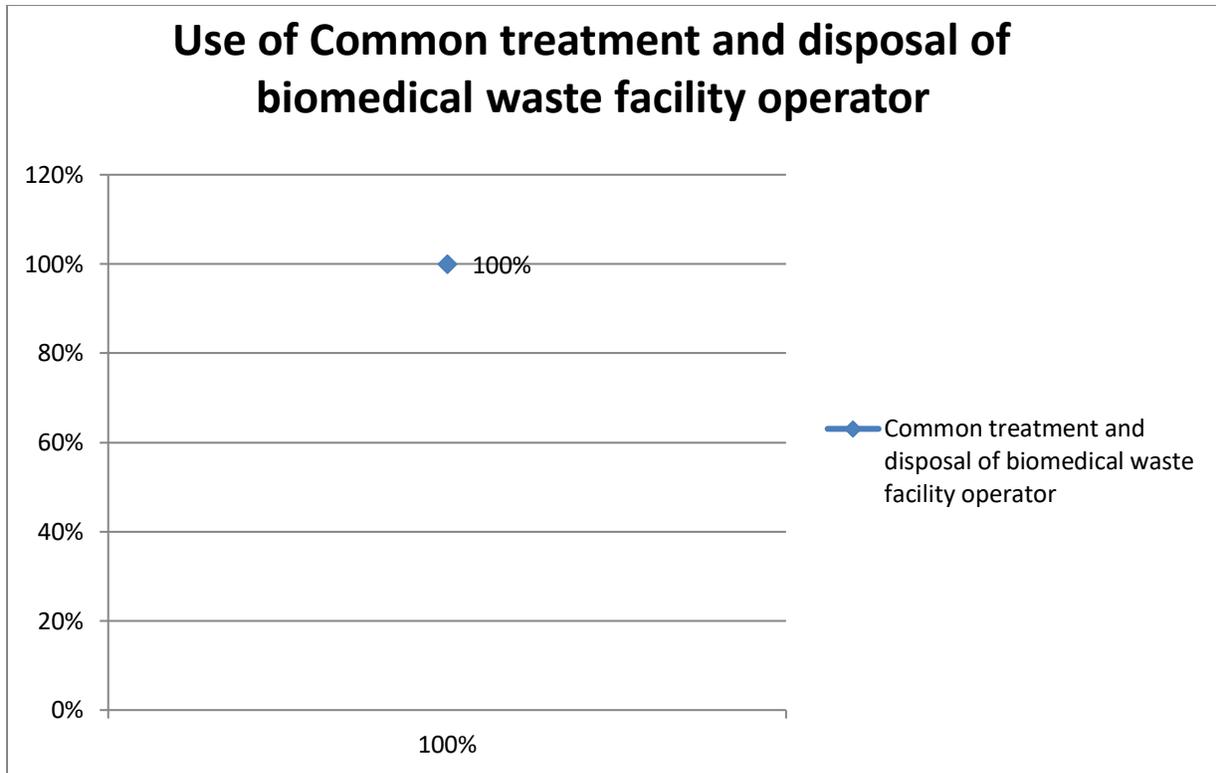


TABLE 2.2

The study showed that 100% of HCE are using common treatment and disposal of biomedical waste facility operator service for disposal of biomedical waste. The use of Common treatment plant provides specialized services to HCE who have to pay to the operators according the quantum of waste generated.

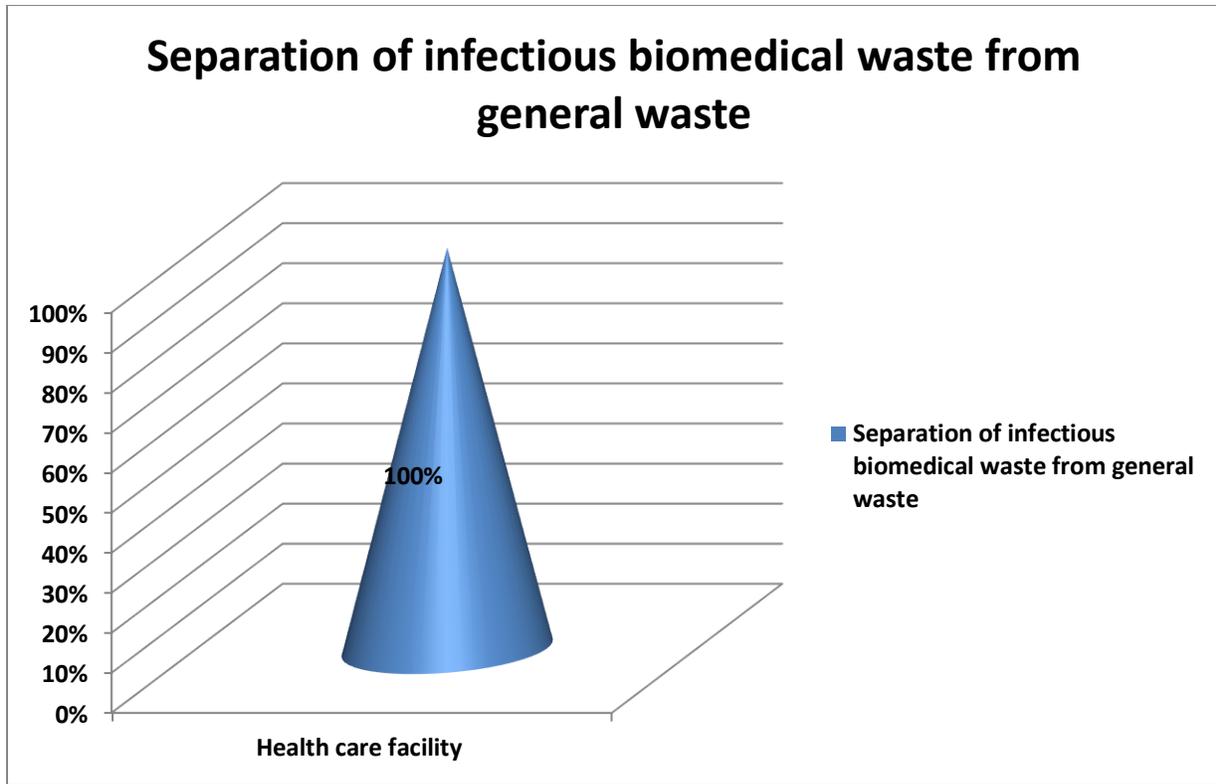


TABLE 2.3

In the study it showed that all the HCE separates infectious biomedical wastes from general waste. This is commendable and it shows the awareness of contagious disease and proper management of biomedical waste. The bio-medical waste is segregated into container/ bags according to rules provided under rule 6 of the Bio-medical Waste (Management and handing) Rules, 1998 and are not mixed with other wastes. It is not being mixed with municipal waste and is kept separated from other types of waste.

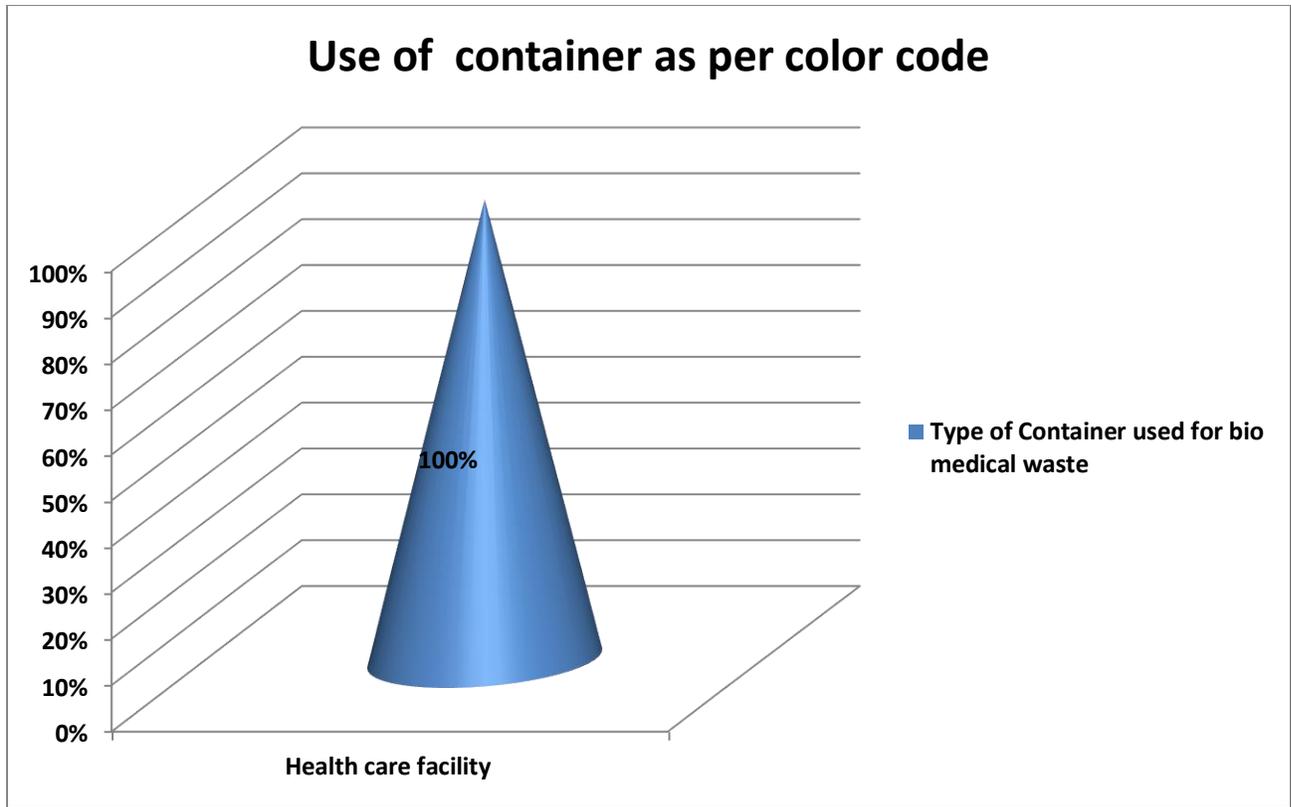


TABLE 2.4

The bio-medical waste is segregated into container/ bags according to rules provided under rule 6 of the bio-medical rules. Bio-medical waste is segregated into containers/bags at the point of generation in accordance with Schedule II prior to its storage, transportation, treatment and disposal. The segregation of bio-medical waste is important element in the collection of bio-medical waste. The study showed that all health care establishments followed this rule stringently and biomedical waste is stored as per color code.

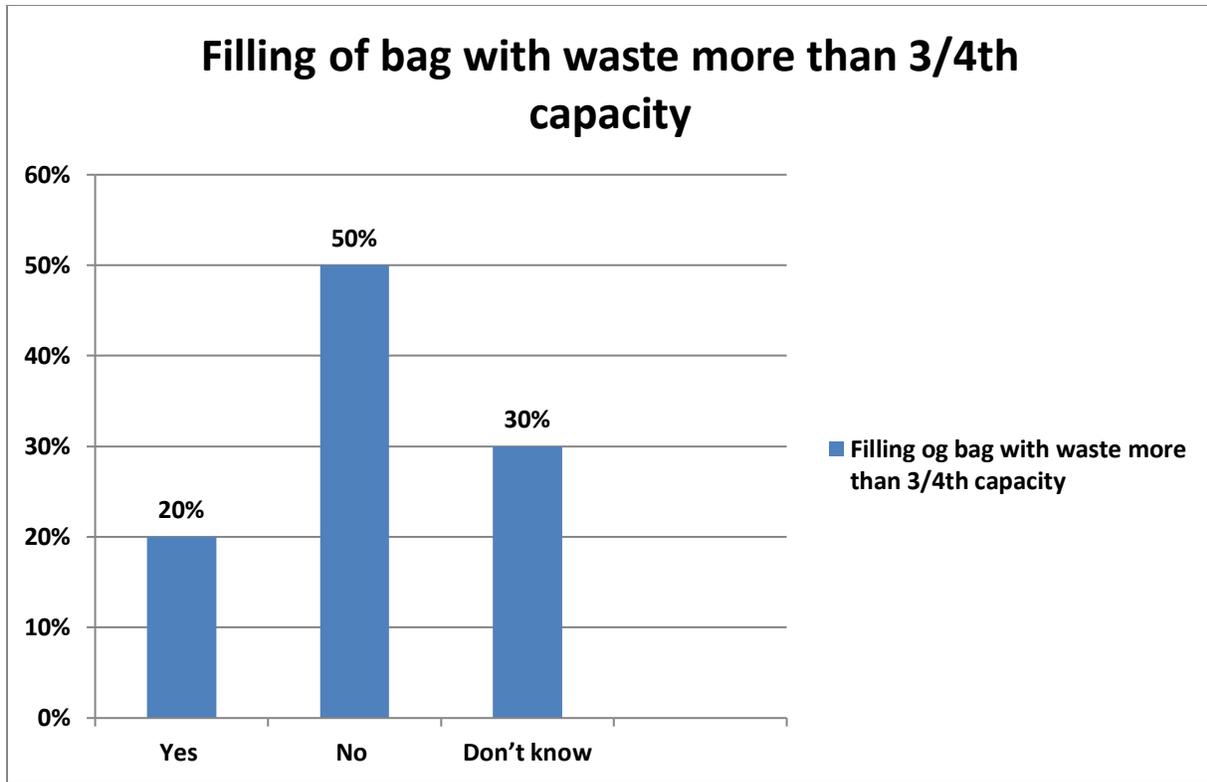


TABLE 2.5

It is general practices that waste bags/container are filled fully thereby causing spillage. In response to the question that whether bag/container are filled with waste for more than 3/4th capacity, 50% responded in no, 20% in yes and a 30% said responded that they are not aware of this issue. It is worth noting here that in the questionnaire a question was asked about the removable of biomedical waste for final disposal outside the hospital campus/clinic and majority stated that ward boy/nurse are responsible for final disposal. Hence it can be presumed here that many health care establishments have strong policy for final disposal and other issues related to it like filling of waste etc.

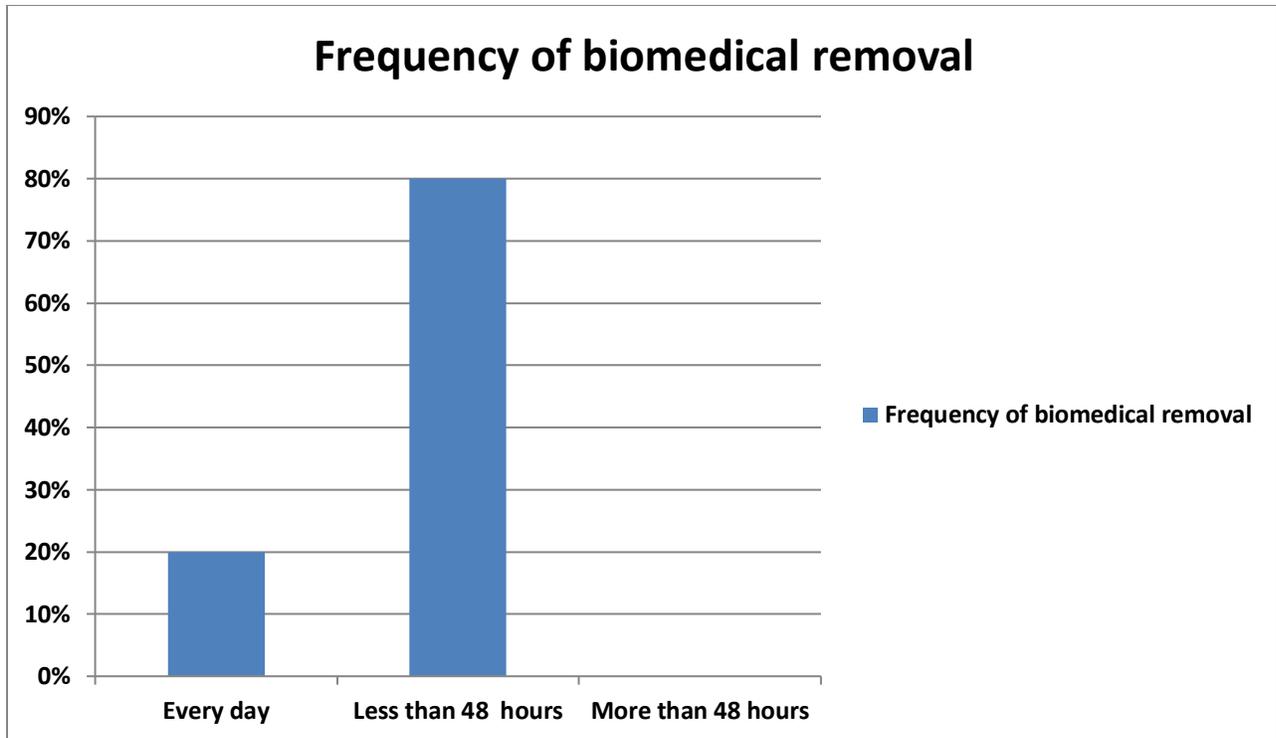


TABLE 2.6

The bio-medical waste is segregated into container/ bags according to rules provided under rule 6 of the bio-medical rules. It provides that no untreated bio-medical waste shall be kept stored beyond a period of 48 hours. If for any reason it becomes necessary to store the waste beyond such period, the authorized person must take permission of the prescribed authority and have to take measures to ensure that the waste does not adversely affect human health and the environment. The study showed that 20% of Health care establishment are sending their waste on the same day and 80% are sending within the 48hrs. Hence it shows that prescribed rules are followed with regard to removal of biomedical waste.

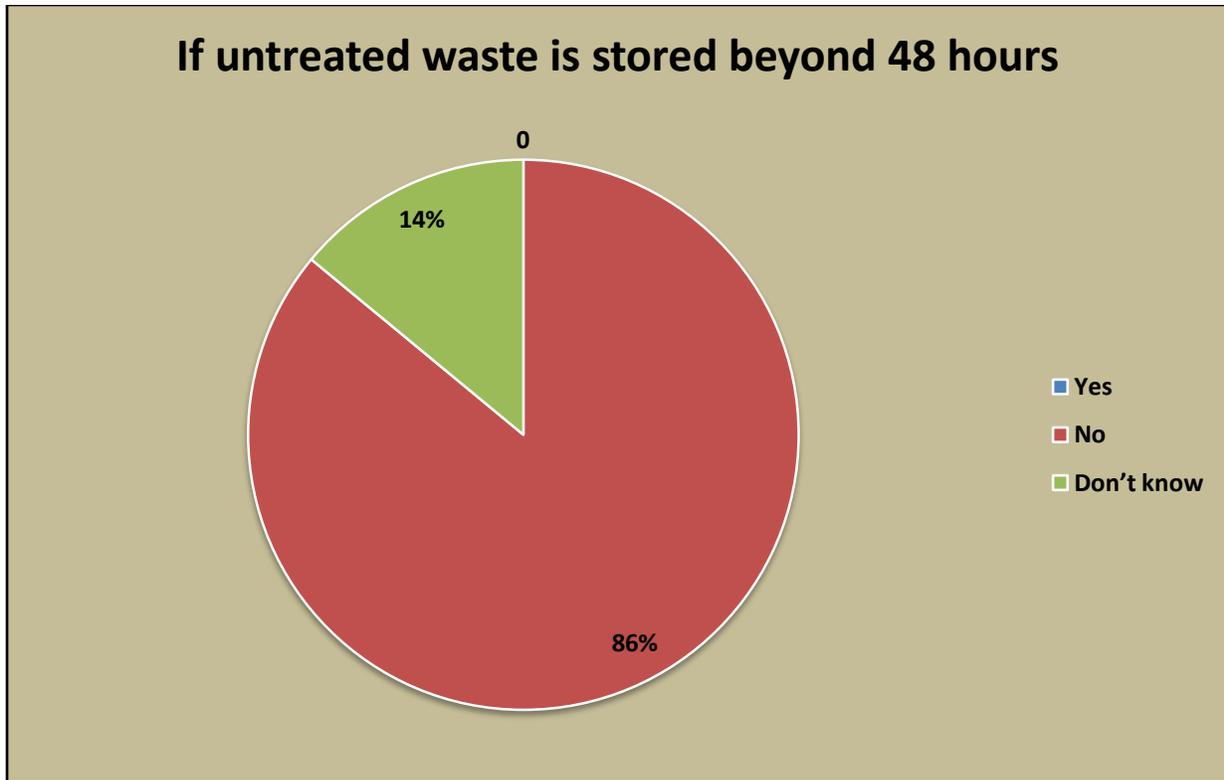


TABLE 2.7

No untreated bio-medical waste shall be kept stored beyond a period of 48 hours. If for any reason it becomes necessary to store the waste beyond such period, the authorized person must take permission of the prescribed authority and have to take measures to ensure that the waste does not adversely affect human health and the environment. The health care establishment was asked whether they seek permission from prescribed authority if in case the untreated waste is stored beyond 48hrs, 86% responded in negative and 14% responded that it is not applicable to them. When researcher enquired and discussed this issue with different health care establishment they accepted that in general untreated waste is not stored beyond 48hrs, however in rare occasion if it does happen, they don't seek permission. It shows that many health care establishments don't have clear guidelines regarding this issue. 14% responded that this condition is applicable to them as they have never faced such issue in the past.

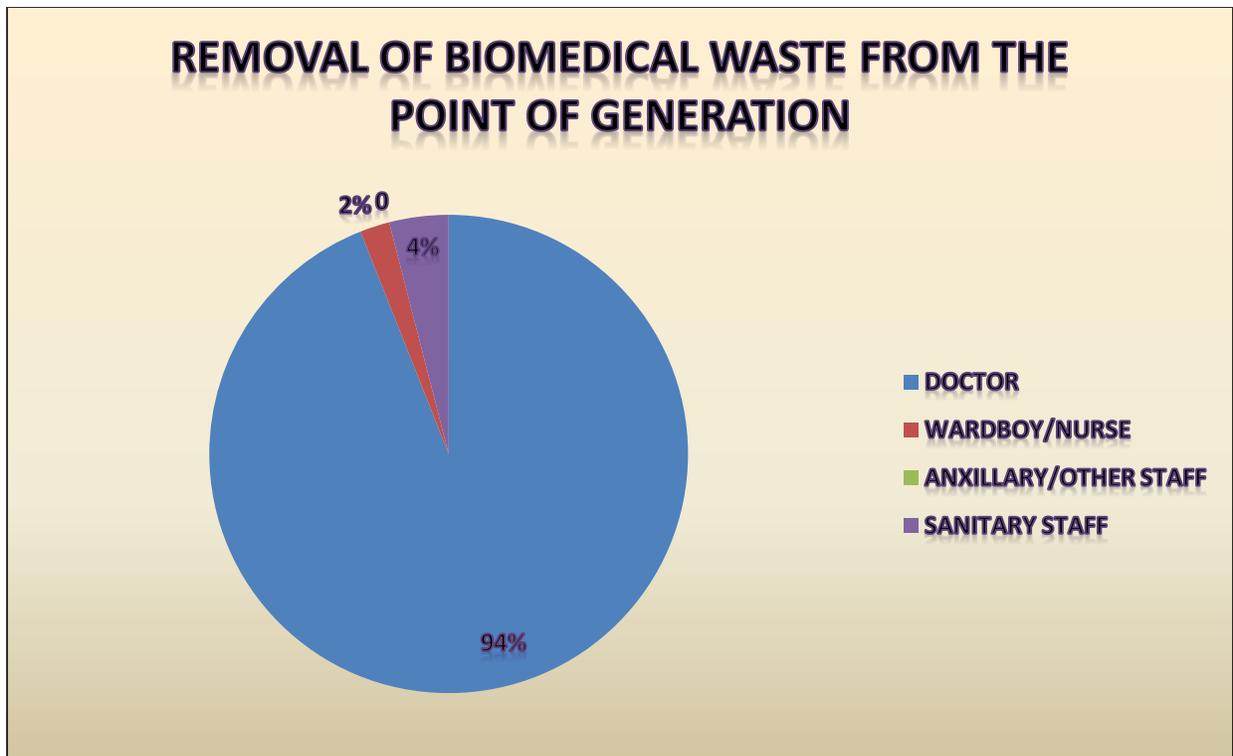


TABLE 2.8

The rule 4 of the Bio-medical Waste (Management and handing) Rules, 1998, imposes duty of every occupier of an institution generating bio-medical waste like a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank etc to take all steps to ensure that such waste is handled without any adverse effect to human health and the environment. It was found in 94% of the health care establishment, doctors were themselves responsible of biomedical waste from point of generation for intermediate storage, 4% responded their sanitary staff and 2% responded that their ward boy/nurse are responsible for such practice. The practice of doctors themselves removing biomedical waste is appreciable and shows that many health care establishments have clear policy with regard to removal of biomedical waste.

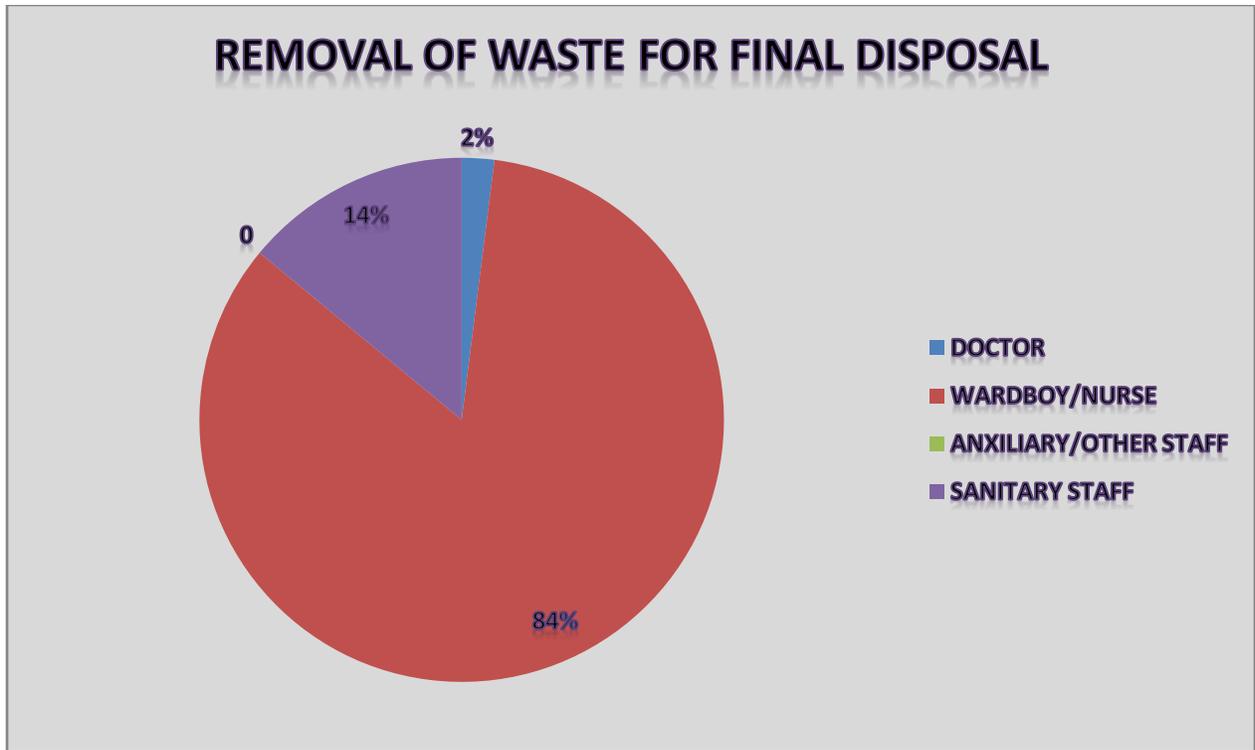


TABLE 2.9

The removal of biomedical waste for final disposal outside the hospital campus/clinic were mainly through ward boy/nurse as 84% responded that in their establishment ward boy/nurse are responsible for final disposal. The 14% stated that their sanitary do the task of final disposal and surprisingly 2% declared their doctors are removing biomedical waste for final disposal.

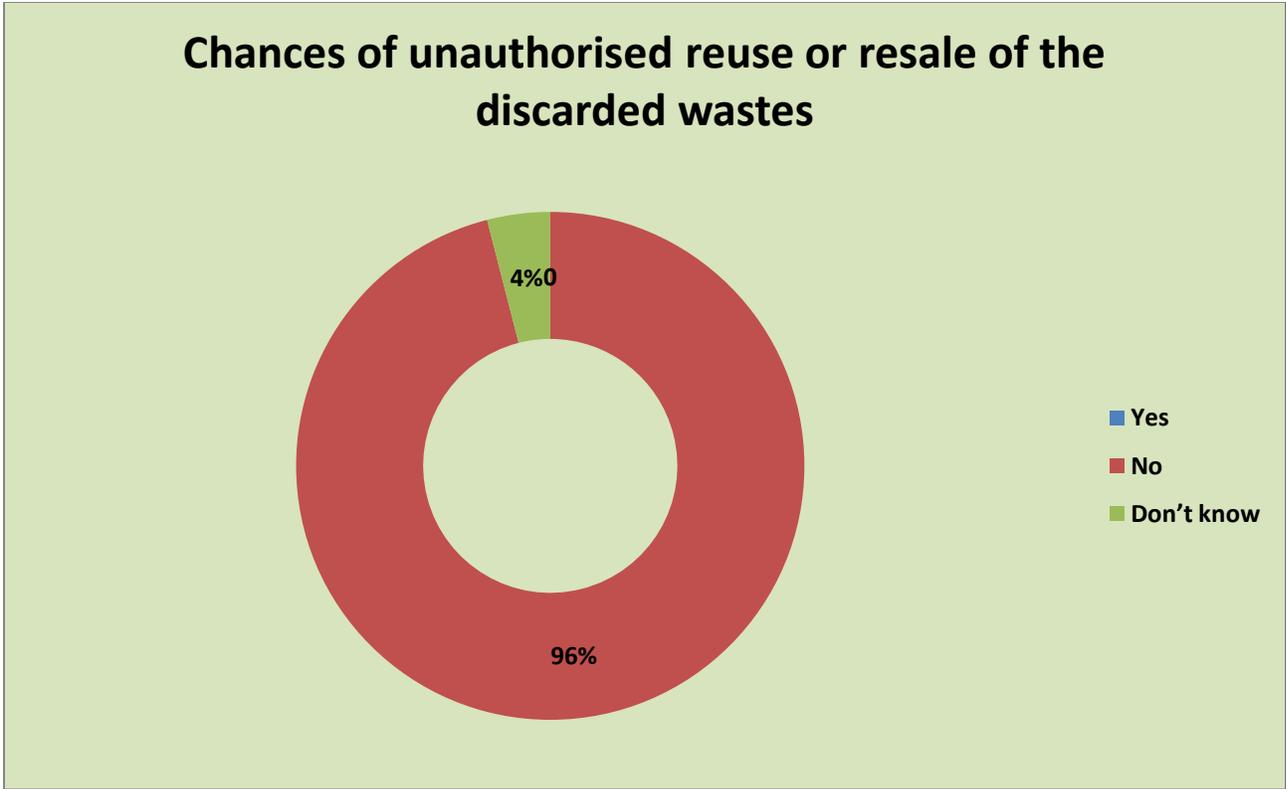


TABLE 3.0

It is an important to take steps to prevent unauthorized use of discarded items or resale of discarded items. The discarded item usually carries contagious disease or infection which can spread disease to uninfected person. 96% health care responded that there is no chance of unauthorized use or resale of the discarded items by anyone within or outside the premises. However 4% responded were not sure whether discarded items can reused or resold.

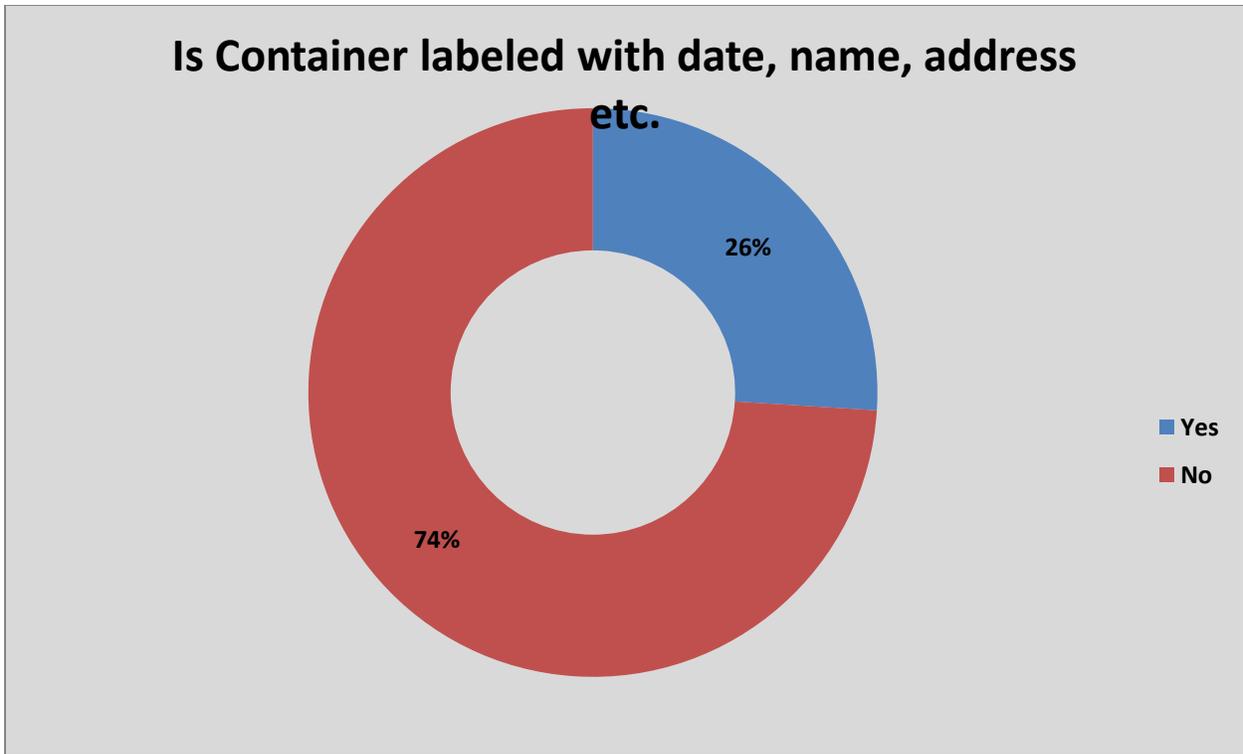


TABLE 3.1

The rule 6 prescribes labeling of container according schedule III. It provides biomedical waste container/bags should have non-washable label displaying clearly the date, name, address, phone of the sender and receiver. Only 26% responded in positive and 74% responded in negative showing that this norm is clearly flouted by many health care establishments.

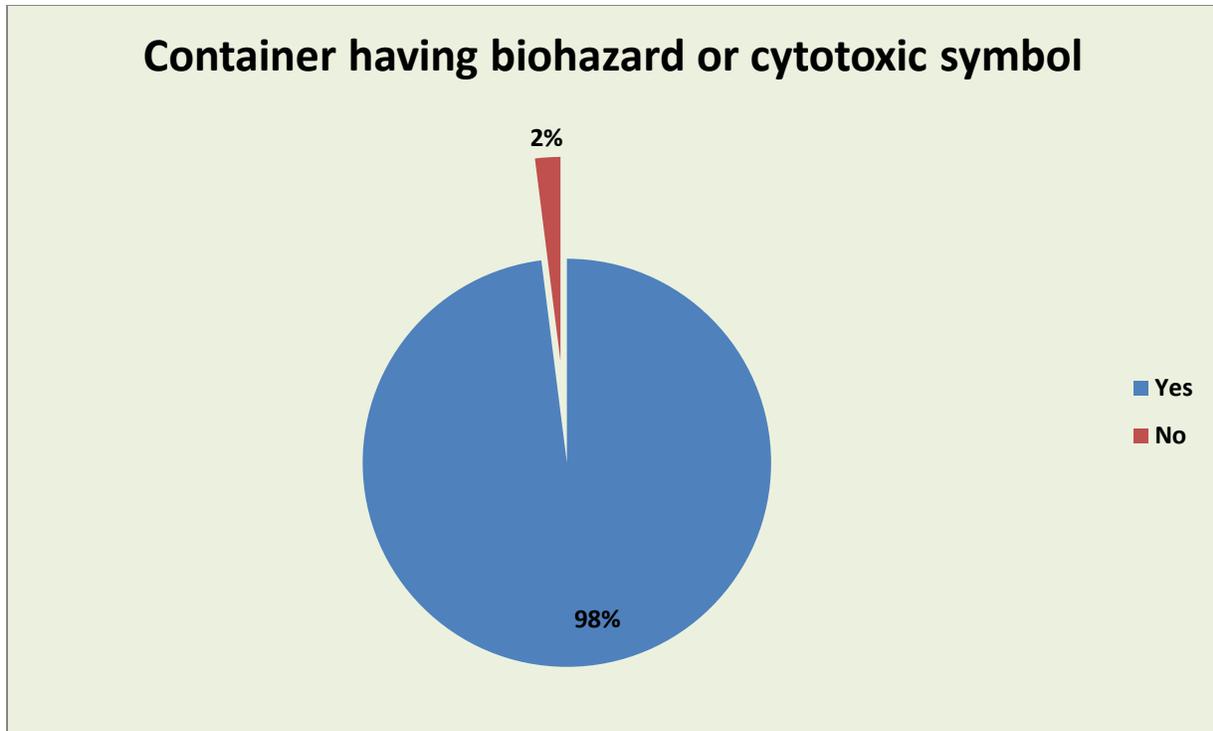


TABLE 3.2

The schedule III of the rule provides for symbol or label for biomedical waste container/bags. It provides biomedical waste container/bags should have non-washable label and visibly display the biohazards or Cytotoxic symbol on it. 98% responded that their container/bags display such symbol. However 2% said that their container/bags have no such symbol which is violating rules of biomedical rules.

Whether puncture proof plastic bag is used

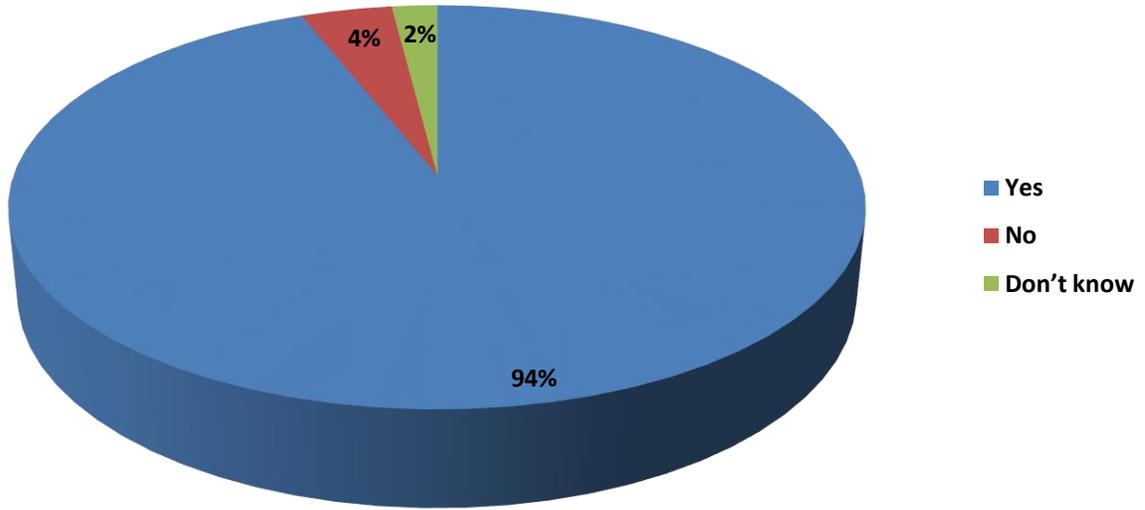


TABLE 3.3

Schedule II provides for use of puncture proof bag for certain category of biomedical waste. 94% responded that they are using puncture proof bag for collection of sharps etc. However 4% said they are not using puncture proof bag and 2% said they don't know regarding this issue.

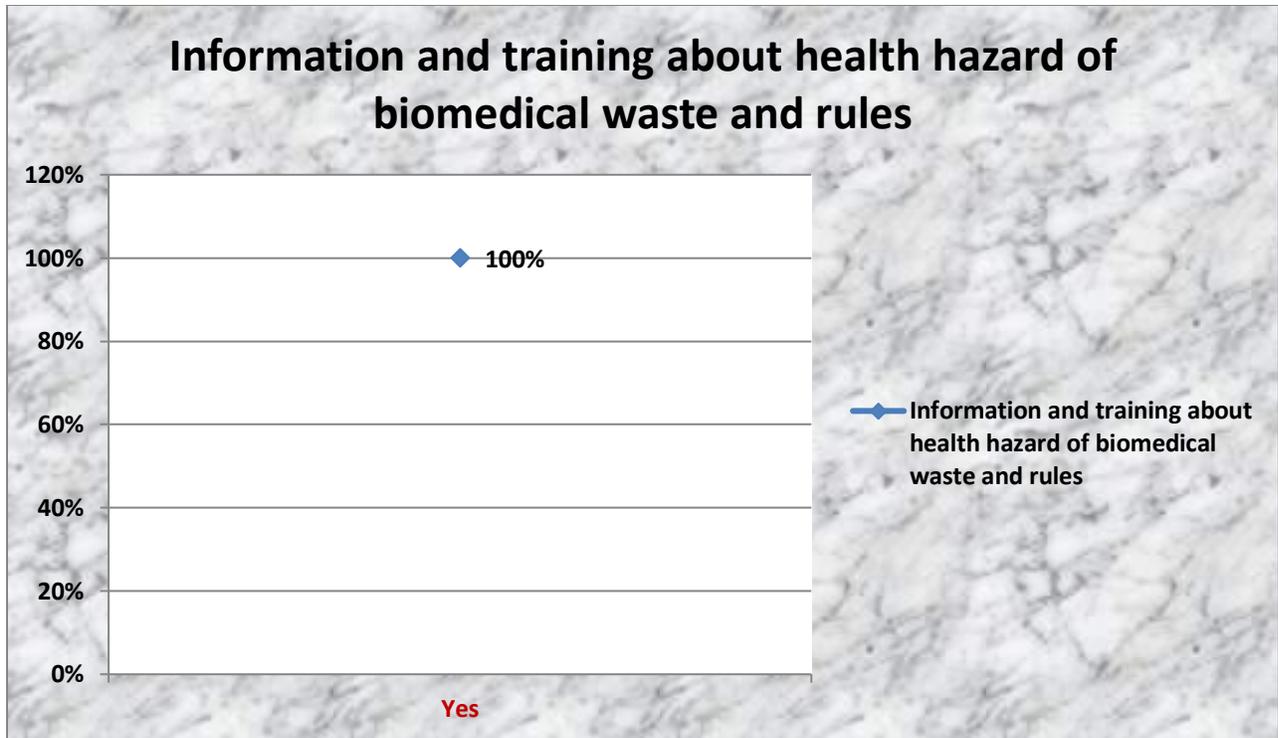


TABLE 3.4

Information and training about health hazards of biomedical waste and concerned rules to staff that are responsible for handling the biomedical waste is important for safe handling of biomedical waste. 100% responded in positive.

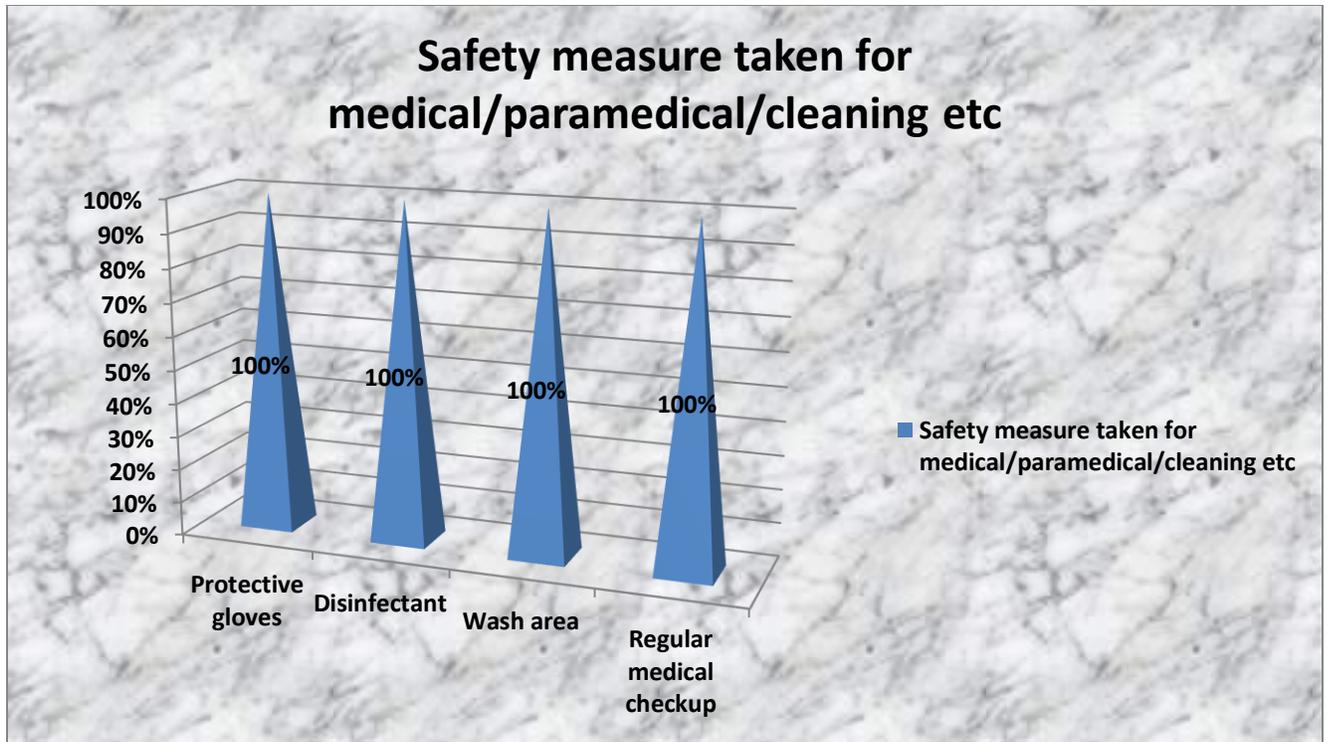


TABLE 3.5

It is rightly said that precaution is better than cure. A question was asked on the safety measures which are taken for medical/paramedical staff who deal with biomedical waste. The 100% health care establishment answered that they do they provide take safety measure like protective gloves, disinfectant and provide regular medical checkup etc.

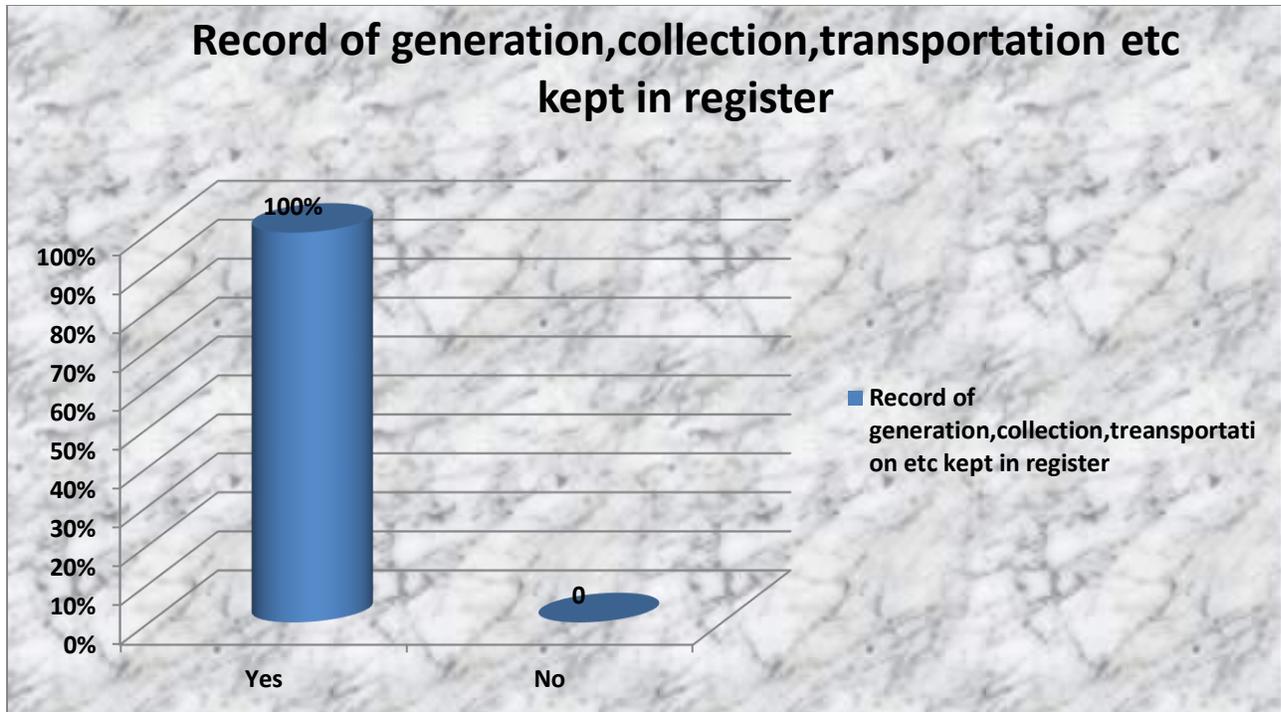


TABLE 3.6

Every authorized person shall maintain records related to the generation, collection, reception, storage, transportation, treatment, disposal or any form of handling of bio-medical waste in accordance with the rules and any guidelines issued. There were 100% positive responses. It was also found out during visit and discussion that health care establishments were maintaining registers with regard to biomedical waste generation date, quantum of waste etc.

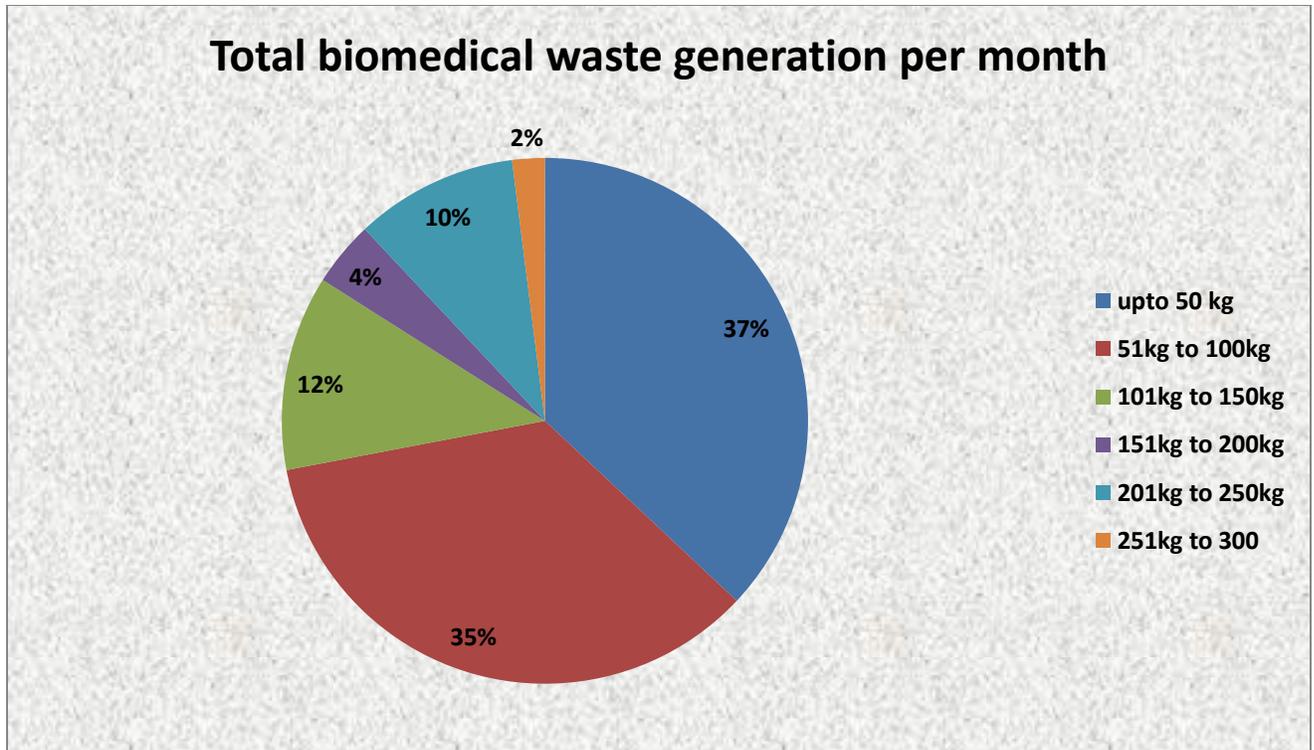


TABLE 3.7

A question was asked in the questionnaire regarding the generation of biomedical waste per month by health care establishments. It was found that 37% of the health care establishment is generating approximately biomedical waste up to 50 kg per month and 35% up to 100 kg per month. 12% of health care establishment were generating waste above 100 kg but less than 150 kg per month, 4% above 150 kg per month but less than 200 kg, 10% above 200 kg per month but less than 250 kg per month and 2% of health care establishment are generating waste above 250 kg but less than 300 kg per month.

CHAPTER TEN

FINDING, SUGGESTIONS AND CONCLUSION

CHAPTER TEN

FINDING, SUGGESTIONS AND CONCLUSION

The following hypothesis were formulated and tested to check the authenticity of the data collected.

HYPOTHESES

H1 The practices of biomedical waste disposal in Satara are not in line with the rules enacted by the Government and amended from time to time.

H2 The awareness of biomedical wastes rules is lacking amongst Health Care Establishments in Satara.

H3 Common biomedical disposal facilities play a vital role in Bio Medical Waste Management.

FINDING

On the basis of primary data, secondary data, interactions with the health care establishment and on site visit of common bio medical waste treatment facility have resulted in the revelation of following findings.

- 1) The health care establishments in Satara city are aware of importance of proper handling and disposal of bio medical waste.
- 2) The majority of health care establishments are following the Bio-medical Waste (Management and handing) Rules, 1998

- 3) The study has showed that 100% of HCE are using common biomedical waste treatment operator's services for disposal of biomedical waste.
- 4) The role of common bio medical waste treatment facility is very important in safe and prompt disposal of bio medical waste as per rules prescribed in this regard. CBMWTDF Nature in Need has Incinerator, shredder, Autoclaving machine, sterilization tank, Disinfectant Tank etc. and is substantially following the guidelines prescribed by Central Pollution Control board and Maharashtra Pollution Control Board from time to time regarding collection, transportation and disposal of bio medical waste. (See Annexures A to Q)
- 5) It creditable to note that all health care establishments have adopted proper safety measures like protective gloves, disinfectant and provide regular medical checkup etc. for medical/paramedical staffs who usually deal with biomedical waste.
- 6) It worth noting that major health care establishments make it certain that discarded items are neither reused nor resold.
- 7) Health care establishment are providing regular information and training about health hazards of biomedical waste and concerned rules to staff responsible for handling the biomedical waste.
- 8) However, norms were flouted regarding labels. Most of the health care establishments are failing to tag bio medical waste bag/container with date, name, address, phone of the sender and receiver etc. which is mandatory according to rules.
- 9) It has been observed that in most of the health care establishments, doctors are personally responsible for bio medical management.
- 10) It has been observed that use of puncture proof bag for certain category of biomedical waste like sharps is mandatory however still few health care establishment are not using it thereby contravening the rules.
- 11) It has been observed that, health care establishments are taking training and awareness bio medical waste issues and rules among its staff member.

12) From the site visit and supervision of Nature in Need and inspection of record and on discussion with health care establishments in Satara city, it can be stated that Common Bio-medical Waste Treatment Facility (CBWTF) NATURE IN NEED plays an essential role in the safe Collection, Transportation, Treatment and disposal of the bio medical wastes.

SUGGESTIONS

- 1) The Bio medical wastes must be segregated at the point of generation from non bio medical wastes properly according to Bio-medical Waste (Management and handling) Rules, 1998. This is an important step to prevent contamination.
- 2) Currently health care establishments are not monitored by Government on the issue of bio medical waste. There should be visits by authorities to check the segregation and storage of waste. This will raise the seriousness on the issue.
- 3) Currently health care establishments don't have policies with regard to bio medical management. There has to be proper policy based guidelines issued by appropriate authority.
- 4) It should be ensured that waste bags are filled up to only three fourth capacities and tied securely.
- 5) Health care establishments must have awareness and training programs for its entire staff.
- 6) It has come to notice that most of the health care establishments lack separate rooms for storage of bio medical waste. The health care establishment should store bio medical waste in a separate room.
- 7) The waste must be stored in leak proof and puncture proof bags/containers.
- 8) The bags/containers must be properly sealed with date, name of health care establishment.

9) The health care establishment must not store waste beyond 48 hrs and if necessary seek permission from prescribed authority. However as far as possible it should be storage beyond 48 hrs must be avoided by making special arrangement with disposal agency.

10) The government should institute awards for safe hospital waste management.

CONCLUSION

The growing population has necessitated the need of health care establishments. In India the health sector is dominated by private sector. The better health care facility offered by this sector has also raised the need for better management of clinical waste or bio medical waste. The waste generated by health care establishment includes a wide range of material like used needles and syringes to soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceuticals, medical devices and radioactive materials etc.

Biomedical waste management a major issue and concern not only to hospitals, nursing home authorities but also to the environmental and law enforcement agencies, and public in general. The greatest risk of biomedical waste is from the infectious and sharp components of the waste because to health care workers handling waste and can contract HIV or AIDS, Hepatitis B and C. These waste poses risk to uninfected population if it comes in contact with it. Thus it essential that the bio medical waste is properly handled, segregated and is properly disposed off.

The Government of India took a major step by enacting The Bio-Medical Waste (Management and Handling) Rules, 1998. under Section 6 and 25 of Environmental Protection Act 1986, The rule deals with the generation/handling/treatment/disposal of Bio Medical Waste. India is among very few countries which have specific bio medical waste law in practice. The state government plays an important role in the implementation of bio medical rules as health is a subject matter under state list.

The health care establishment plays an important role in the bio waste management as they are generator of bio medical waste and are responsible in collecting segregating, storing and disposing it. The concept of Biosafety is fundamentally a preventive concept is an important concept in this matter. It includes taking steps and measures to prevent infection to all medical, nursing and paramedical workers as well as by patients, attendants, ancillary staff and administrators in a hospital. The concept also includes taking measure to damage to environment and uninfected pollution.

A Common Bio-medical Waste Treatment Facility (CBWTF) is an important and cost effective way to treat and dispose bio medical waste. The installation of individual treatment facilities by small healthcare units requires comparatively high capital investment. Apart from it requires separate manpower and infrastructure development for proper operation and maintenance of treatment systems. The Common Bio-medical Waste Treatment Facility (CBWTF) is an answer to these important problems. The Central Pollution Control Board (CPCB) has prescribed guidelines for Common Bio-Medical Waste Treatment Facilities as well as for design and construction of Incinerators. The State Government takes necessary steps to monitor the disposal of biomedical wastes through the State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) in the Union Territories, as per the provisions made under the Bio-medical Waste (Management & Handling) Rules, 1998.

The need for proper bio medical waste management has gain important in recent years with the growth private health care sector in India. Technology is playing a major role in bringing quality in healthcare, be it better nursing communication systems, patient monitoring devices or telemedicine to provide low cost diagnosis to remote patients, etc. The concept of medical tourism, where hospitals of specialized nature will sooner or later come to light needs special attention. In this scenario a separate and autonomous department of Government with penal powers is need of the time to deal with bio medical waste management in India.

In Maharashtra, Maharashtra Pollution Control Board (MPCB) enforces these Rules by

- Authorization of HCEs for generation and handling of BMW
- Authorization of CBMWTFs for collection, treatment and disposal of BMW
- Periodic inspection and audit of the "system" to ensure compliance to the law.

- Taking action on non-compliance.
- Carrying out inventorization of BMW to report the status
- Undertaking awareness programs at HCEs

In order to know whether all relevant legal provisions are being followed by the HCEs in Satara, and to find out the difficulties and problems in implementing these rules The researcher has undertaken this Minor Research Project on this topic, which is approved by Shivaji University and UGC and is funded by UGC.

The present study is conducted in Satara city. Hence it is limited to all health care establishments within the boundaries of Satara Municipal Council. Satara Municipal Corporation has divided the area of Satara city into 39 wards (parabhog) for governance and representation. Health care establishment, especially hospitals in Satara City, were selected randomly by applying simple random sampling method. Questioner, Interview and observation techniques have been used for collection of data. A questioner sheet was given to selected hospitals. Few in depth case studies have been conducted to collect detailed information about implementation of legal norms and difficulties if any in their compliance.

In Satara, Association of Hospital Owners (AHO) along with CBMWTDFs, namely, NATURE IN NEED and Indian Medical Association (IMA) have arranged for simple, feasible, and environment friendly solutions for BMW management at different hospital routes for every type of bio medical waste as per the BMW (management and Handling) Rules 1998 as amended in 2011.

Former President of AHO, Dr Sandip Shrotri and President of AHO, Dr Amita Mahajani and the authority of CBMWTDF operator Shri A. B. Jadhav and Sagar Jadhav have developed the coherent scheme for bio medical waste management in Satara City , where the bio medical waste is collected by employees of Nature in Need and is transported to and disposed off at the CBMWTDF centre at Songoan near Satara City as per the legal provisions and rules. CBMWTDF, Nature in Need, Satara has Incinerator, shredder, Autoclaving machine, sterilization tank, Disinfectant Tank etc. and is substantially following the guidelines prescribed

by Central Pollution Control board and Maharashtra Pollution Control Board from time to time regarding collection, transportation and disposal of bio medical waste. (See Annexures A to Q)

Waste audits has been made mandatory for renewal of Consent to Operate. This has ensured increase in credibility of CBMWTDFNature in Need and better Health, Safety and Environment compliance from employees from HSEs in Satara city. The majority of health care establishments in Satara city are following of Bio-medical Waste (Management and handing) Rules, 1998



Principal investigator Dr. Sujata S. Pawar discussing the concerns of bio medical waste handling, treatment and disposal with District Civil Surgeon Dr Suresh Jagdale and other doctors at Government Civil Hospital, Satara

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ANNEXURE A

LIST OF HEALTH-CARE ESTABLISHMENTS IN SATARA CITY

Sr.no	Name of Hospitals	Address	Bed Capacity
1	Pratibha hospital	Opp. Z. P. Satara	36
2	Aryangla hospital	Shukrawar peth, Satara	40
3	Sanjeevani hospital	Sadarbazar, Satara	105
4	Pawar hospital	Sadarbazar, Satara	10
5	Kamakshi hospital	Sadarbazar, Satara	8
6	Howale hospital	Sadarbazar, Satara	15
7	Karpe hospital	Radikha road, Satara	10
8	Suyog hospital	Sadarbazar, Satara	40
9	Shinde hospital	Mangalwar peth Satara	5
10	Magalmurthi hospital	Sadarbazar, Satara	5
11	Nav jeevan hospital	Somwar peth, Satara	7
12	Thoke hospital	Sadarbazar, Satara	5

13	Wagholikar Charitable Trust	Malhar peth, Satara	5
14	Sarvate Eye clinic and laser centre	Sadarbazar, Satara	7
15	Shubhamkaroti hospital	Sangamnagar, Satara	5
16	Kadam children's hospital	Radikha road, Satara	6
17	Dhanwantari hospital	Malhar peth, Satara	5
18	Gajanan Clinic	Guruwar peth, Satara	5
19	Chintamani nursing home	Shaniwar peth, Satara	13
20	Urmila maternity home	Old RTO, Satara	4
22	Girija hospital	Malhar peth, Satara	11
23	Symbiosis research centre	Sadarbazar, Satara	11
24	Varunjikar hospital	Sadarbazar, Satara	10
25	Askhay Clinic	Deshmukh colony, Satara	10
26	Siddhanath Hospital	Shukrawar peth, Satara	10
27	Agate hospital	Somwar peth, Satara	10
28	Ashwini hospital	Sadarbazar, Satara	11
29	Bhawgan hospital	Sadarbazar, Satara	10

30	Duttakasi hospital	Shaniwar peth, Satara	11
31	Dr Pol orthopedic hospital	Sadar Bazar, Satara	10
32	Laxmi nursing home	Sadar Bazar Satara	15
33	Joshi hospital	Sadarbazar, Satara	10
34	Yashwant neuro and trauma centre	Sadar Bazar , Satara	12
35	LimayeHospital	Sadarbazar, Satara	25
36	Bokil hospital	Yadavgopal peth, Satara	8
37	Kamala hospital	Sadarbazar, Satara	10
38	Ghadge hospital	Sadarbazar, Satara	11
39	Renuka nursing home	Guruwar peth, Satara	5
40	Crity care centre	Z P , Satara	14
41	Yashshri hospital	Radikha road, Satara	11
42	Phadke hospital	Parasnis colony, Satara	15
43	Sukhada hospital	Shaniwar peth, Satara	15

44	Niramaya hospital	Sadarbazar, , Satara	11
45	Patil ortho and accident hospital	Sadarbazar, Satara	14
46	Nandedeep hospital and research centre	Radikha road, Satara	10
47	Meenakshee Hospital	Sadarbazar, Satara	11
48	Jeevanjyot hospital	Shaniwarpeth, Satara	11
49	Hirwe hospital	Radikha road, Satara	11
50	Suryaprabha hospital	Radikha road, Satara	11
51	Phadke nursing home	Mangalwar peth, Satara	5
52	Sheetal Maternity Home	Mangalwar peth, Satara	8
53	Mane Hospital	Visavanaka , Satara	5
55	Dr Bokil eye hospital	Powai naka, Satara	7
56	Radhika nursing home	Sadarbazar, Satara	20
57	Life scan diagnostic centre	Sadarbazar, Satara	10
58	Shivam hospital	Shaniwar peth, Satara	5

59	Shiddivinayak hospital	Market yard, Satara	30
60	Shrinath clinic	Karneje peth, Satara	10
61	Omkar nursing home	Mangalwar peth, Satara	5
62	Sawai vaidya hospital	Yadavgopal peth , Satara	5
63	Kuchekar hospital	Sadar Bazar, Satara	10
64	Shreekrupa hospital	Budhavar peth, Satara	5
65	Jeevandhara hospital	Satara	7
66	Smarath hospital	Yado Gopal Peth, Satara	3
67	Maher nursing home	Raviwar peth, Satara	5
68	Manav vikas sanstha	Ganeshnagar Satara	10
69	Ashok Pawar memorial hospital	Radhika road, Satara	10
70	Tawade memorial hospital	Near S T Stand, Satara	5
71	Bhoslae eye hospital	Satara	10
72	Amruta nursing home	Powai Naka, Satara	20
73	Kanse hospital	Satara	10
74	Surgical and maternity hospital	Satara	5

75	Vivekananda eye hospital	Sadarbazar, Satara	25
76	Chaitanya seva hospital	Sukarwar peth , Satara	10
77	Kandalgaonkar eye hospital	Sadarbazar, Satara	13
78	Varad hospital	Mangalwar peth, Satara	8
79	Prajakta hospital	Raviwar peth, Satara	5
80	Gaikwad hospital	Mahalwar peth, Satara	10
81	Lavand hospital	Sadarbazar, Satara	12
82	Suyash clinic	Vyankatpura , Satara	10
83	Shri Ram nursing home	Somawar peth , Satara	4
84	Prabhu krupa hospital	Kesarkarpeth, Satara	5
85	Subhamkar clinic	Sadarbazar, Satara	3
86	Saikrupa Hospital	Sadarbazar, Satara	10
87	Ashriwad hospital and ICU	New Radihikaroad, Satara	15
88	Dhristi eye hospital	Deshmukh colony, Satara	10
89	Barge eye hospital	Pantacha,got, , Satara	5
90	Mahadwar orthopedic centre	Satara	5
91	Kil bil childrens hospital	Saikrupa, camp , Satara	3
92	Usha clinic and hospital	Bapuji salunke nagar, Satara	10

93	Pendharkar hospital	Parasnis colony, Satara	7
94	Yash eye clinic	Somwar peth, Satara	9
95	Kiritiratan hospital	Uttekarnagar, Satara	5
96	Dravid hospital	Sadarbazar, Satara	10
97	Kanishka hospital	Deshmukh colony, Satara	10
98	Jeevandeep health institute	Sadarbazar, Satara	5
99	Satara camp lions eye hospital	New radihika road ,Satara	10
100	Maher nursing home	Sadarbazar, Satara	10
101	Satara hospital and research centre	Kalayani estate, Satara	10
102	Muktangan	Pokainaka, Satara	10
103	Patil eye clinic	Shaniwar,peth, Satara	10
104	Suryodaya clinic	Visawa naka, Satara	10
105	Babar clinic	Pantacha got, Satara	10
106	Sanjeevan heath centre	Sadar Bazar, Satara	10
107	Khairmode ENT hospital	Raviwar peth, Satara	10
108	Sanjeevan hospital	Satara nagarpalika, Satara	15

109	Chirau children's institute hospital	New Radhika road, Satara	10
110	Maitra hospital	Bhurke colony, Satara	10
111	Mahadwar orthopedic centre	Remand home, camp, Satara	10
112	Kandalgaonkar eye clinic	Yadavgopal peth, Satara	10
113	Jeevanskashi hospital	Sadarbazar, Satara	10
114	Saptatara hospital	Raviwar peth, Satara	5

Source: As per record available from Krantisinh Nana Patil Government Civil Hospital, Satara.

ANNXURE B

QUESTIONNAIRE II

Questionnaire prepared for doctors and health care establishment

“Implementation of Biomedical Waste (Management and Handling) Rules 1998 By Hospitals in Satara City”

Minor Research Project by Dr. Sujata Pawar I/C Principal, Ismailsaheb Mulla Law College, Satara.

Questioner

Instructions: - * Please tick mark the answer/Write in place provided.

* You may tick mark more than one answer if appropriate.

* This information will be kept confidential and will be used only for the academic and research purposes.

1) **Name of the Hospital/Clinic** _____

2) **Number of beds** _____

3) **Name of the Doctor** :- _____

4) **Kind of waste generated and approximate quantity per day**

a) **Human Anatomical Waste(Human tissues,Organs,Body Part**

YES NO

b) **Animal Waste** YES NO

c) **Microbiology & Biotechnology waste** YES NO

d) **Waste Sharps (Needles,Syringes,etc.)** YES NO

- e) Discarded Medicins & Cytotoxin Druges YES NO
- f) Solid Waste YES NO
 (Items Contaminated with blood &
 Body fluids including cotton Dressings,etc.)
- g) Solid Waste YES NO
 (Disposable items like tubings, catheters IV Sets, etc.)
- h) Liquid Waste YES NO
- i) Incineration Ash YES NO
- j) Chemical Waste (Chemical used in disinfections etc.)
 YES NO

Total Biomedical Waste generated per month _____Kg.

5) Method of disposal of Biomedical Waste by the hospital/clinic

- a) Disinfection and sterilization YES NO
- b) Distruction/Shredding YES NO
- c) Chemical treatment YES NO
- d) Microwaving YES NO
- e) Autoclaving YES NO
- f) Incineration YES NO
- g) Deepburial YES NO
- h) Disposal in secured landfill YES NO
- i) Use of common Bio Medical Waste
 Treatment & Disposal facility YES NO

**6) Name & Address of common treatment & disposal of Biomedical Waste Facility
 Operator**

7) Is authorization from Pollution Control Board taken?

YES NO

8) State the date of latest renewal from Common Biomedical Waste Treatment and Disposal Facility _____

9) Is infectious Biomedical Waste separated from General Waste?

YES NO

10) What container is used?

Single Container Different Container As Per Colour Code

11) At what point the biomedical waste is segregated as per colour code

a) At generation of waste

b) Storage

c) Transportation

d) Treatment & Disposal

12) Is the bag / container filled with waste for more than 3/4th capacity? YES

NO

13) How frequently the biomedical waste is removed?

Everyday Less than 48 Hrs. More than 48 Hrs.

14) If untreated waste is stored beyond 48 hours is the permission obtained from authority?

YES NO Not Applicable

15) Where is the waste stored before it is removed from hospital/clinic?

16) Who removes the biomedical waste?

a) From point of generation for intermediate storage.

- i. Doctor
- ii. Wardboy / Nurse
- iii. Anxiliary /other staff
- iv. Sanitary Staff

b) For final disposal outside the hospital campus/clinic.

- I. Doctor
- II. Wardboy/ Nurse
- III. Anxiliary /other staff
- IV. Sanitary Staff/Guard

17) Is there any chance of unauthorized reuse or resale of the discarded items by anyone within or outside the premises?

YES NO Don't Know

18) Is the container labeled (wash proof & prominently visible) according to Sec. IV of the rules with date, name, address, phone of the sender & receiver?

YES NO

19) Is the information about labeling and colour coding of the container displayed at prominent place near container?

YES NO

20) Is waste collection timing & duty charts displayed / informed to waste collectors / supervisors?

YES NO

21) Dose the container has Biohazards or Cytotoxic Symbol on it?

YES NO

22) Whether Puncture proof plastic bag is used for collection of sharps etc?

YES NO

23) Is there any policy about measures to be taken during accident/emergency regarding biomedical waste?

YES NO

24) What is the cost involved / charges paid for biomedical waste disposal Rs. _____/month.

25) Is the information and training about health hazards of biomedical waste and concerned rules given to the staff responsible for handling the same?

YES NO

26) What safety measures are taken for medical/ para medical/cleaning & transportation staff?

a) Protactive gloves, aprons, masks etc. YES NO

b) Provision of disinfectant, soap etc. YES NO

c) Provision of wash area YES NO

d) Regular medical checkup YES NO

27) Is the record of generation, collection, transportation and disposal of biomedical waste kept in the register?

YES NO

28) Is the annual report sent to pollution control board before 31 Jan. every year?
YES NO

29) What are the difficulties faced in implementing the biomedical waste rules?

30) What are your suggestions/comments with regard to prevention/minimization & control of biomedical waste hazards to human health & environment?

Signature and Name of Doctor giving information

Name _____

Signature

Seal

Observations

ANNEXURE C

INTERVIEW QUESTIONNAIRE

Interview questionnaire prepared for Common Bio Medical Waste treatment Facility

“Implementation of Biomedical Waste (Management and Handling) Rules 1998 By Hospitals in Satara City”

Minor Research Project by Dr. Sujata Pawar I/C Principal, Ismailsaheb Mulla Law College, Satara.

Questioner

Instructions: - * Please tick mark the answer/Write in place provided.

* You may tick mark more than one answer if appropriate.

* This information will be kept confidential and will be used only for the academic and research purposes.

14. Name & Address of the common Bio Medical Waste Treatment Facility

15. Name of operator of a Bio Medical Waste Facility

16. First grant of authorization from Pollution Control Board

17. Date of latest renewal

18. Was the authorization suspended anytime?
YES NO If Yes ,During _____

19. Is the annual report sent before 31stJan. every year to Pollution control Board?
YES NO

20. Is the record related to handling of Bio Medical Waste kept in a register?
YES NO

21. Did any accident during transportation or handling of Bio Medical waste occurred in past?
YES NO

22. If Yes was the accident reported to Pollution Control Board in Form III?
YES NO

23. What kind of Bio Medical Waste Handling is done by you?

- a) Collection / Reception
- b) Storage
- c) Transport
- d) Treatment
- e) Disposal

24. what kind of vehicles are used for transportation of Bio Medical Waste?
_____ Total Nos.

25. What kind of containers /bags are used for transportation of Bio Medical Waste?

Single Container Separate Container As per Colour Code

26. Are the container/bags labeled with (Washproof & Promently Visible) details givan in Sc.III & Sc.IV?

YES NO

Do containers have Biohazards or Cytotoxic? YES NO

Is there any chance of unauthorized reuse or resale of discarded items by any one during handling of Bio Medical Waste by you?

YES NO Don't'Know

27. What kind of staff is employeed for the work?Give designation/category and No. of employees?

28. What care is taken to prevent accident/improper handling of Bio Medical Waste?

29. Do you provide safety measures to worker against operational health hazards?

YES NO

30. Is vehicle transporting Bio Medical Waste covered and secured

YES NO

31. Is interior of container smooth without sharp edges which can be easily washed and disinfected?

YES NO

32. What standards for waste autoclaving are followed by you?

a) Temperature

b) Pressure

c) Autoclave residence time

33. How is recording of operational parameters maintained?

34. What Standards are followed by you for Microwaving?

35. What Standards are followed by you for deep burial?

36. Give brief description of method of treatment & disposal by you?

37. State the category & quantity of waste (category wise) handled per month by you?

38. What are difficulties faced by you in implementing the Bio Medical Waste rules?

39. What are your suggestions/comments with regard to prevention minimization & control of Bio Medical Waste hazards to human health & environmental?

ANNXURE D

THE BIO-MEDICAL WASTE (MANAGEMENT AND HANDLING) RULES, 1998

MINISTRY OF ENVIRONMENT & FORESTS

NOTIFICATION

New Delhi, 20th July , 1998

¹**S.O.630(E)**. - Whereas a notification in exercise of the powers conferred by Sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986) was published in the Gazette vide S.O. 746(E), dated 16 October, 1997 inviting objections from the public within 60 days from the date of the publication of the said notification on the Bio-Medical Waste (Management and Handling) Rules, 1998 and whereas all objections received were duly considered ;

Now, therefore, in exercise of the powers conferred by Section 6, 8 and 25 of the Environment (Protection) Act, 1986 the Central Government hereby notifies the rules for the management and handling of bio-medical waste.

1. SHORT TITLE AND COMMENCEMENT

- (1) These rules may be called the Bio-Medical Waste (Management and Handling) Rules, 1998.
- (2) They shall come into force on the date of their publication in the official Gazette.

2. APPLICATION

These rules apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form.

3. DEFINITIONS In these rules unless the context otherwise requires:

1. "**Act**" means the Environment (Protection) Act, 1986 (29 of 1986);
2. "**Animal House**" means a place where animals are reared/kept for experiments or testing purposes;

¹ As published in Gazette of India, Extraordinary Part II Section 3- Sub section (ii), vide notification S.O.630(E), dated 20.7.1998.

3. **"Authorisation"** means permission granted by the prescribed authority for the generation, collection, reception, storage, transportation, treatment, disposal and/or any other form of handling of bio-medical waste in accordance with these rules and any guidelines issued by the Central Government.
4. **"Authorised person"** means an occupier or operator authorised by the prescribed authority to generate, collect, receive, store, transport, treat, dispose and / or handle bio-medical waste in accordance with these rules and any guidelines issued by the Central Government.
5. **"Bio-medical waste"** means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals, and including categories mentioned in Schedule I;
6. **"Biologicals"** means any preparation made from organisms or micro-organisms or product of metabolism and biochemical reactions intended for use in the diagnosis, immunisation or the treatment of human beings or animals or in research activities pertaining thereto;
7. **"Bio-medical waste treatment facility"** means any facility wherein treatment disposal of bio-medical waste or processes incidental to such treatment or disposal is carried out ²[and includes common treatment facilities.]

³[(7a) **'Form'** means Form appended to these rules;]

8. **"Occupier"** in relation to any institution generating bio-medical waste, which includes a hospital, nursing home, clinic dispensary, veterinary institution, animal house, pathological laboratory, blood bank by whatever name called, means a person who has control over that institution and/or its premises;
9. **"Operator of a bio-medical waste facility"** means a person who owns or controls or operates a facility for the collection, reception, storage, transport, treatment, disposal or any other form of handling of bio-medical waste;

² Added by rule 2(i) of the Bio-Medical Waste (M & H)(Second Amendment) Rules, 2000 notified vide notification No. S.O.545(E), dated 2.6.2000 and came into force w.e.f.2.6.2000.

³ Inserted by Rule 2(ii) of the Bio-Medical Waste (M&H) (Second Amendment) rules, 2000 notified vide Notification No.S.O.545(E), dated 2.6.2000 and came into force w.e.f. 2.6.2000.

10. "**Schedule**" means schedule appended to these rules;

4. DUTY OF OCCUPIER

It shall be the duty of every occupier of an institution generating bio-medical waste which includes a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank by whatever name called to take all steps to ensure that such waste is handled without any adverse effect to human health and the environment.

5. TREATMENT AND DISPOSAL

- (1) Bio-medical waste shall be treated and disposed of in accordance with Schedule I, and in compliance with the standards prescribed in Schedule V.
- (2) Every occupier, where required, shall set up in accordance with the time-schedule in Schedule VI, requisite bio-medical waste treatment facilities like incinerator, autoclave, microwave system for the treatment of waste, or, ensure requisite treatment of waste at a common waste treatment facility or any other waste treatment facility.

6. SEGREGATION, PACKAGING, TRANSPORTATION AND STORAGE

- (1) Bio-medical waste shall not be mixed with other wastes.
- (2) Bio-medical waste shall be segregated into containers/bags at the point of generation in accordance with Schedule II prior to its storage, transportation, treatment and disposal. The containers shall be labeled according to Schedule III.
- (3) If a container is transported from the premises where bio-medical waste is generated to any waste treatment facility outside the premises, the container shall, apart from the label prescribed in Schedule III, also carry information prescribed in Schedule IV.
- (4) Notwithstanding anything contained in the Motor Vehicles Act, 1988, or rules thereunder, untreated bio-medical waste shall be transported only in such vehicle as may be authorised for the purpose by the competent authority as specified by the Government.
- (5) No untreated bio-medical waste shall be kept stored beyond a period of 48 hours :

provided that if for any reason it becomes necessary to store the waste beyond such period, the authorised person must take permission of the prescribed authority and take measures to ensure that the waste does not adversely affect human health and the environment.

⁴[(6)The Municipal body of the area shall continue to pick up and transport segregated non bio-medical solid waste generated in hospitals and nursing homes, as well as duly treated bio-medical wastes for disposal at municipal dump site].

7. PRESCRIBED AUTHORITY

⁵[(1) ⁶[Save as otherwise provide, the prescribed authority for enforcement] of the provisions of these rules shall be the State Pollution Control Boards in respect of States and the Pollution Control Committees in respect of the Union Territories and all pending cases with a prescribed authority appointed earlier shall stand transferred to the concerned State Pollution Control Board, or as the case may be, the Pollution Control Committees].

⁷[(1A)The prescribed authority for enforcement of the provisions of these rules in respect of all health care establishments including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, Animal houses, pathological laboratories and blood banks of the Armed Forces under the Ministry of Defence shall be the Director General, Armed Forces Medical Services].

- (2) The prescribed authority for the State or Union Territory shall be appointed within one month of the coming into force of these rules.
- (3) The prescribed authority shall function under the supervision and control of the respective Government of the State or Union Territory.

⁴ Inserted by Rule 3 of the Bio-Medical Waste (M & H) (Second Amendment) Rules, 2000 vide notification S.O.545(E), dated 2.6.2000.

⁵ Substituted by Rule 4 of the Bio-Medical Waste (M & H) (Second Amendment) Rules, 2000 vide notification S.O.545(E), dated 2.6.2000.

⁶ Substituted by Rule 2 (a) of the Bio-Medical Waste (M&H) (Amendment) Rules, 2003 vide notification S.O.1069 (E), dated 17.9.2003.

⁷ Inserted sub-rule (1A) by Rule 2(b), *ibid*.

- (4) The prescribed authority shall on receipt of Form I make such enquiry as it deems fit and if it is satisfied that the applicant possesses the necessary capacity to handle bio-medical waste in accordance with these rules, grant or renew an authorisation as the case may be.
- (5) An authorisation shall be granted for a period of three years, including an initial trial period of one year from the date of issue. Thereafter, an application shall be made by the occupier/operator for renewal. All such subsequent authorisation shall be for a period of three years. A provisional authorisation will be granted for the trial period, to enable the occupier/operator to demonstrate the capacity of the facility.
- (6) The prescribed authority may after giving reasonable opportunity of being heard to the applicant and for reasons thereof to be recorded in writing, refuse to grant or renew authorisation.
- (7) Every application for authorisation shall be disposed of by the prescribed authority within ninety days from the date of receipt of the application.
- (8) The prescribed authority may cancel or suspend an authorisation, if for reasons, to be recorded in writing, the occupier/operator has failed to comply with any provision of the Act or these rules :

Provided that no authorisation shall be cancelled or suspended without giving a reasonable opportunity to the occupier/operator of being heard.

8. AUTHORISATION

- (1) Every occupier of an institution generating, collecting, receiving, storing, transporting, treating, disposing and/or handling bio-medical waste in any other manner, except such occupier of clinics, dispensaries, pathological laboratories, blood banks providing treatment/service to less than 1000 (one thousand) patients per month, shall make an application in Form I to the prescribed authority for grant of authorisation.
- (2) Every operator of a bio-medical waste facility shall make an application in Form I to the prescribed authority for grant of authorisation.
- (3) Every application in Form I for grant of authorisation shall be accompanied by a fee as may be prescribed by the Government of the State or Union Territory.

⁸[(4)]The authorisation to operate a facility shall be issued in Form IV, subject to conditions laid therein and such other condition, as the prescribed authority, may consider it necessary.]

9. ADVISORY COMMITTEE

⁹[(1)]The Government of every State/Union Territory shall constitute an advisory committee. The Committee will include experts in the field of medical and health, animal husbandry and veterinary sciences, environmental management, municipal administration, and any other related department or organisation including non-governmental organisations ¹⁰[***] . As and when required, the committee shall advise the Government of the State/Union Territory and the prescribed authority about matters related to the implementation of these rules.

¹¹[(2) Notwithstanding anything contained in sub-rule (1), the Ministry of Defence shall constitute in that Ministry, an Advisory Committee consisting of the following in respect of all health care establishments including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories and blood banks of the Armed Forces under the Ministry of Defence, to advise the Director General, Armed Forces Medical Services and the Ministry of Defence in matters relating to implementation of these rules, namely:-

(1) Additional Director General of

Armed Forces Medical Services Chairman

(2) A representative of the Ministry of

Defence not below the rank of Deputy

Secretary, to be nominated by that Ministry Member

(3) A representative of the Ministry of Environment

and Forests not below the rank of Deputy Secretary

⁸ Inserted by Rule 5 of the Bio-Medical Waste (M&H) (Second Amendment) Rules, 2000 vide notification S.O.545(E), dated 2.6.2000.

⁹ Re-numbered as Sub Rule (1) by Rule 3 of the Bio Medical Waste (M&H) (Amendment) Rules, 2003 notified vide Notification No.S.O.1069(E), dated 17.9.2003.

¹⁰ Omitted by Rule 6 of the Bio-Medical Waste (M & H)(Second Amendment) Rules, 2000 vide notification S.O.545(E), dated 2.6.2000.

¹¹ Inserted sub Rule (2) by Rule 3 of the Bio Medical Waste (M&H) (Amendment) Rules, 2003 notified vide Notification No.S.O.1069(E), dated 17.9.2003.

To be nominated by that Ministry. Member

(4) A representative of the Indian Society of

Hospitals Waste Management, Pune Member

¹²[9A. MONITORING OF IMPLEMENTATION OF THE RULES IN ARMED FORCES HEALTH CARE ESTABLISHMENTS

- (1) The Central Pollution Control Board shall monitor the implementation of these rules in respect of all the Armed Forces health care establishments under the Ministry of Defence.
- 2) After giving prior notice to the Director General Armed Forces Medical Services, the Central Pollution Control Board along with one or more representatives of the Advisory Committee constituted under sub-rule (2) of rule 9 may, if it considers it necessary, inspect any Armed Forces health care establishments.]

10. ANNUAL REPORT

Every occupier/operator shall submit an annual report to the prescribed authority in Form II by 31 January every year, to include information about the categories and quantities of bio-medical wastes handled during the preceding year. The prescribed authority shall send this information in a compiled form to the Central Pollution Control Board by 31 March every year.

11. MAINTENANCE OF RECORDS

- (1) Every authorised person shall maintain records related to the generation, collection, reception, storage, transportation, treatment, disposal and/or any form of handling of bio-medical waste in accordance with these rules and any guidelines issued.
- (2) All records shall be subject to inspection and verification by the prescribed authority at any time.

12. ACCIDENT REPORTING

When any accident occurs at any institution or facility or any other site where bio-medical waste is handled or during transportation of such waste, the authorised person shall report the accident in Form III to the prescribed authority forthwith.

¹² Inserted Rule 9A by Rule 4 of the Bio Medical Waste (M&H) (Amendment) Rules, 2003 notified vide Notification No.S.O.1069(E), dated 17.9.2003.

13. APPEAL

¹³[(1)] ¹⁴[Save as otherwise provided in sub-rule (2), any person] aggrieved by an order made by the prescribed authority under these rules may, within thirty days from the date on which the order is communicated to him, prefer an appeal ¹⁵[in form V] to such authority as the Government of State/Union Territory may think fit to constitute:

Provided that the authority may entertain the appeal after the expiry of the said period of thirty days if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time.

¹⁶[(2)] Any person aggrieved by an order of the Director General, Armed Forces Medical Services under these rules may, within thirty days from the date on which the order is communicated to him prefer an appeal to the Central Government in the Ministry of Environment and Forests.]

¹⁷[14. COMMON DISPOSAL / INCINERATION SITES

Without prejudice to rule 5 of these rules, the Municipal Corporations, Municipal Boards or Urban Local Bodies, as the case may be, shall be responsible for providing suitable common disposal/incineration sites for the biomedical wastes generated in the area under their jurisdiction and in areas outside the jurisdiction of any municipal body, it shall be the responsibility of the occupier generating bio-medical waste/operator of a bio-medical waste treatment facility to arrange for suitable sites individually or in association, so as to comply with the provisions of these rules].

¹³ Re-numbered as sub-rule (1) by Rule 5 (a) of the Bio Medical Wastes (M&H) (Amendment) Rules, 2003 notified vide Notification No.S.O. 1069(E), dated 17.9.2003.

¹⁴ Substituted by Rule 5(a), *ibid.*

¹⁵ Inserted by Rule 7 of the Bio-Medical Waste (M & H) (Second Amendment) Rules, 2000 vide notification S.O.545 (E), dated 2.6.2000.

¹⁶ Inserted sub-rule (2) by Rule 5(b) of the Bio Medical Waste (M&H) (Amendment) Rules, 2003 notified vide Notification No.S.O.1069(E), dated 17.9.2003.

¹⁷ Inserted by Rule 8 of the Bio-Medical Waste (M&H) (Second Amendment) Rules, 2000 notified vide S.O.545(E), dated 2.6.2000.

SCHEDULE I

(See Rule 5)

CATEGORIES OF BIO-MEDICAL WASTE

¹⁸ [Waste Category No.]	Waste Category ¹⁹ [Type]	Treatment and Disposal ²⁰ [Option +]
Category No.1	Human Anatomical Waste (human tissues, organs, body parts)	Incineration [@] /deep burial*
Category No.2	Animal Waste (animal tissues, organs, body parts carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals, colleges, discharge from hospitals, animal houses)	Incineration [@] /deep burial*
Category No.3	Microbiology & Biotechnology Wastes (Wastes from laboratory cultures, stocks or specimens of micro-organisms live or attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biologicals, toxins, dishes and devices used for transfer	local autoclaving/micro-waving/incineration [@]

¹⁸ Substituted by Rule 9 (i) of the Bio-Medical Waste (M & H) (Second Amendment) Rules, 2000 notified vide S.O.545(E), dated 2.6.2000.

¹⁹ Added by Rule 9(ii), *ibid.*

²⁰ Substituted by Rule 9 (iii), *ibid.*

	of cultures)	
Category No.4	Waste sharps (needles, syringes, scalpels, blades, glass etc. that may cause puncture and cuts. This includes both used and unused sharps)	disinfection (chemical treatment@@/auto claving/microwaving and mutilation /shredding ##
Category No.5	Discarded Medicines and Cytotoxic drugs (wastes comprising of outdated, contaminated and discarded medicines)	incineration@/destruction and drugs disposal in secured landfills
Category No.6	²¹ [Soiled] Waste (Items contaminated with blood, and body fluids including cotton, dressings, soiled plaster casts, lines beddings, other material contaminated with blood)	incineration @ autoclaving/microwaving
Category No.7	Solid Waste (wastes generated from disposable items other than the waste ²² [sharps] such as tubings, catheters, intravenous sets etc.)	disinfection by chemical treatment@@ autoclaving/microwaving and mutilation/shredding##
Category No.8	Liquid Waste (waste generated from laboratory	disinfection by chemical treatment @@ and discharge into drains.

²¹ Substituted by rule 9(iv), ibid.

²² Substituted by Rule 9 (v) of the Bio-Medical Waste (M & H) (Second Amendment) Rules, 2000 notified vide S.O.545(E), dated 2.6.2000.

	and washing, cleaning, house-keeping and disinfecting activities)	
Category No.9	Incineration Ash (ash from incineration of any bio-medical waste)	disposal in municipal landfill
Category No.10	Chemical Waste (chemicals used in production of biologicals, chemicals used in disinfection, as insecticides etc.)	Chemical treatment @@ and discharge into drains for liquids and secured landfill for solids

@@ Chemicals treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent. It must be ensured that chemical treatment ensures disinfection.

Mutilation/shredding must be such so as to prevent unauthorized reuse.

@ There will be no chemical pretreatment before incineration. Chlorinated plastics shall not be incinerated.

* Deep burial shall be an option available only in towns with population less than five lakhs and in rural areas.

²³[+ Options given above are based on available technologies. Occupier/operator wishing to use other State-of-the-art technologies shall approach the Central Pollution Control Board to get the standards laid down to enable the prescribed authority to consider grant of authorisation].

²³ Substituted by Rule 9 (iii) of the Bio-Medical Waste (M& H) (Second Amendment) Rules, 2000 notified vide S.O.545 (E), dated 2.6.2000.

SCHEDULE II

(see Rule 6)

COLOUR CODING AND TYPE OF CONTAINER FOR DISPOSAL OF BIO-MEDICAL WASTES

Colour Coding	Type of Container	Waste Category	Treatment options as per Schedule I
Yellow	Plastic bag	Cat.1, Cat. 2, Cat.3, Cat. 6	Incineration/deep burial
Red	Disinfected container/plastic bag	Cat. 3, Cat.6, Cat.7	Autoclaving/Microwaving/ Chemical Treatment
Blue/White translucent	Plastic bag/puncture proof container	Cat.4, Cat.7	Autoclaving/Microwaving/ Chemical Treatment and destruction/shredding
Black	Plastic bag	Cat.5 and Cat.9 and Cat.10 (Solid)	Disposal in secured landfill

Notes :

1. Colour coding of waste categories with multiple treatment options as defined in Schedule I, shall be selected depending on treatment option chosen, which shall be as specified in Schedule I.
2. Waste collection bags for waste types needing incineration shall not be made of chlorinated plastics.
3. Categories 8 and 10 (liquid) do not require containers/bags.
4. Category 3 if disinfected locally need not be put in containers/bags.

SCHEDULE III

(see Rule 6)

LABEL FOR BIO-MEDICAL WASTE CONTAINERS/BAGS

BIOHAZARD SYMBOL

CYTOTOXIC HAZARD SYMBOL



BIOHAZARD

CYTOTOXIC

HANDLE WITH CARE

Note : Label shall be non-washable and prominently visible.

SCHEDULE IV

(see Rule 6)

LABEL FOR TRANSPORT OF BIO-MEDICAL WASTE CONTAINERS/BAGS

Day..... Month.....

Year

Date of generation.....

Waste category No.....

Waste Class

Waste description

Sender's Name & Address

Receiver's Name & Address

Phone No.....

Phone No.....

Telex No.....

Telex No.....

Fax No.....

Fax No.....

Contact Person.....

Contact Person.....

In case of emergency please contact :

Name & Address

PhoneNo.

Note : Label shall be non-washable and prominently visible.

SCHEDULE V

(see Rule 5 and Schedule I)

STANDARDS FOR TREATMENT AND DISPOSAL OF BIO-MEDICAL WASTES

STANDARDS FOR INCINERATORS :

All incinerators shall meet the following operating and emission standards :

A. Operating Standards

1. Combustion efficiency (CE) shall be at least 99.00%.
2. The Combustion efficiency is computed as follows :

$$\text{C.E.} = \frac{\% \text{CO}_2}{\% \text{CO}_2 + \% \text{CO}} \times 100$$

3. The temperature of the primary chamber shall be $800 \pm 50^\circ\text{C}$.
4. The secondary chamber gas residence time shall be at least 1 (one) second at $1050 \pm 50^\circ\text{C}$, with minimum 3% Oxygen in the stack gas.

B. Emission Standards

Parameters	Concentration mg/Nm ³ at (12% CO ₂ correction)
(1) Particulate matter	150
(2) Nitrogen Oxides	450

(3) HCl 50

(4) Minimum stack height shall be 30 metres above ground.

(5) Volatile organic compounds in ash shall not be more than 0.01%.

Note :

- Suitably designed pollution control devices should be installed/retrofitted with the incinerator to achieve the above emission limits, if necessary.
- Wastes to be incinerated shall not be chemically treated with any chlorinated disinfectants.
- Chlorinated plastics shall not be incinerated.
- Toxic metals in incineration ash shall be limited within the regulatory quantities as defined under the Hazardous Waste (Management and Handling) Rules, 1989.
- Only low sulphur fuel like L.D.O./L.S.H.S./Diesel shall be used as fuel in the incinerator.

STANDARDS FOR WASTE AUTOCLAVING :

The autoclave should be dedicated for the purposes of disinfecting and treating bio-medical waste,

(I) When operating a gravity flow autoclave, medical waste shall be subjected to :

- (i) a temperature of not less than 121°C and pressure of 15 pounds per square inch (psi) for an autoclave residence time of not less than 60 minutes; or
- (ii) a temperature of not less than 135°C and a pressure of 31 psi for an autoclave residence time of not less than 45 minutes; or
- (iii) a temperature of not less than 149°C and a pressure of 52 psi for an autoclave residence time of not less than 30 minutes.

(II) When operating a vacuum autoclave, medical waste shall be subjected to a minimum of one pre-vacuum pulse to purge the autoclave of all air. The waste shall be subjected to the following : a temperature of not less than 121°C and pressure of 15 psi per an autoclave residence time of not less than 45 minutes ; or

(ii) a temperature of not less than 135°C and a pressure of 31 psi for an autoclave residence time of not less than 30 minutes;

(III) Medical waste shall not be considered properly treated unless the time, temperature and pressure indicators indicate that the required time, temperature and pressure were reached during the autoclave process. If for any reasons, time temperature or pressure indicator indicates that the required temperature, pressure or residence time was not reached , the entire load of medical waste must be autoclaved again until the proper temperature, pressure and residence time were achieved.

(IV) Recording of operational parameters

Each autoclave shall have graphic or computer recording devices which will automatically and continuously monitor and record dates, time of day, load identification number and operating parameters throughout the entire length of the autoclave cycle.

(V) Validation test

Spore testing :

The autoclave should completely and consistently kill approved biological indicator at the maximum design capacity of each autoclave unit. Biological indicator for autoclave shall be *Bacillus stearothermophilus* spores using vials or spore strips, with at least 1×10^4 spores per millilitre. Under no circumstances will an autoclave have minimum operating parameters less than a residence time of 30 minutes, regardless of temperature and pressure, a temperature less than 121°C or a pressure less than 15 psi.

(VI) Routine Test

A chemical indicator strip/tape that changes colour when a certain temperature is reached can be used to verify that a specific temperature has been achieved. It may be necessary to use more than one strip one strip over the waste package at different location to ensure that the inner content of the package has been adequately autoclaved.

STANDARDS FOR LIQUID WASTE :

The effluent generated from the hospital should conform to the following limits :

PARAMETERS	PERMISSIBLE LIMITS
pH	6.5-9.0
Suspended solids	100 mg/1
Oil and grease	10 mg/1
BOD	30 mg/1
COD	250 mg/1
Bio-assay test	90% survival of fish after 96 hours in 100% effluent

These limits are applicable to those hospitals which are either connected with sewers without terminal sewage treatment plant or not connected to public sewers. For discharge into public sewers with terminal facilities, the general standards as notified under the Environment (Protection) Act, 1986 shall be applicable.

STANDARDS OF MICROWAVING :

1. Microwave treatment shall not be used for cytotoxic, hazardous or radioactive wastes, contaminated animal carcasses, body parts and large metal items.
2. The microwave system shall comply with the efficacy test/routine tests and a performance guarantee may be provided by the supplier before operation of the unit.
3. The microwave should completely and consistently kill the bacteria and other pathogenic organisms that is ensured by approved bio-logical indicator at the maximum design capacity of

each microwave unit. Biological indicators for microwave shall be Bacillus Subtilis spores using vials or spore strips with at least 1×10^4 spores per milliliter.

STANDARDS FOR DEEP BURIAL

1. A pit or trench should be dug about 2 metres deep. It should be half filled with waste, then covered with lime within 50 cm of the surface, before filling the rest of the pit with soil.
2. It must be ensured that animals do not have any access to burial sites. Covers of galvanized iron/wire meshes may be used.
3. On each occasion, when wastes are added to the pit, a layer of 10 cm of soil shall be added to cover the wastes.
4. Burial must be performed under close and dedicated supervision.
5. The deep burial site should be relatively impermeable and no shallow well should be close to the site.
6. The pits should be distant from habitation, and sited so as to ensure that no contamination occurs of any surface water or groundwater. The area should not be prone to flooding or erosion.
7. The location of the deep burial site will be authorized by the prescribed authority.
8. The institution shall maintain a record of all pits for deep burial.

(see rule 5)

SCHEDULE FOR WASTE MANAGEMENT FACILITIES LIKE INCINERATOR/AUTOCLAVE / MICROWAVE SYSTEM

<p>A. Hospitals and nursing homes in towns with population of 30 lakhs and above</p>	<p>By 30th June, 2000 or earlier</p>
<p>B. Hospitals and nursing homes in towns with population of below 30 lakhs -</p> <p>(a) with 500 beds and above</p> <p>(b) with 200 beds and above but less than 500 beds.</p> <p>(c) With 50 beds and above but less than 200 beds</p> <p>(d) With less than 50 beds</p>	<p>By 30th June, 2000 or earlier</p> <p>By 31st December, 2000 or earlier</p> <p>By 31st December, 2001 or earlier</p> <p>By 31st December, 2002 or earlier</p>
<p>C. All other institutions generating bio-medical waste not included in A and B above.</p>	<p>By 31st December, 2002 or earlier</p>

²⁴ Substituted 'Schedule VI' by Rule 2 of the Bio-Medical Waste (M&H) (Amendment) Rules, 2000 notified vide notification S.O.201(E), dated 6.3.2000 and came into force w.e.f. 6.3.2000.

FORM I

(See rule 8)

²⁵[APPLICATION FOR AUTHORISATION/RENEWAL OF AUTHORISATION]

(To be submitted in duplicate)

To,

The Prescribed Authority

(Name of the State Govt. /UT Administration)

Address.

1. Particulars of Applicant

(i) Name of the Applicant

(in block letters & in full)

(ii) Name of the Institution :

Address :

Tele No., Fax. No., Telex No.,

2. Activity for which authorisation is sought:

(i) Generation

(ii) Collection

(iii) Reception

(iv) Storage

(v) Transportation

(vi) Treatment

(vii) Disposal

(viii) Any other form of handling

²⁵ Substituted by Rule 10 of the Bio-Medical Waste (M &H) (Second Amendment) Rules, 2000 notified vide S.O.545(E), dated 2.6.2000.

3. Please state whether applying for fresh authorisation or for renewal :
(in case of renewal previous authorisation number and date)
4. (i) Address of the institution handling bio-medical wastes:
(ii) Address of the place of the treatment facility:
(iii) Address of the place of disposal of the waste :
5. (i) Mode of transportation (in any) of bio-medical waste :
(ii) Mode(s) of treatment :
6. Brief description of method of treatment and disposal (attach details):
7. (i) Category (see Schedule I) of waste to be handled
(ii) Quantity of waste (category-wise) to be handled per month

8. 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 prescribed authority in relation to these rules and to fulfill any conditions stipulated by the prescribed authority.

Date :

Signature of the applicant

Place :

Designation of the applicant

FORM II

(see rule 10)

ANNUAL REPORT

(To be submitted to the prescribed authority by 31 January every year).

1. Particulars of the applicant:

(i) Name of the authorised person(occupier/operator):

(ii) Name of the institution:

Address

Tel.No.

Telex No.

Fax No.

2. Categories of waste generated and quantity on a monthly average basis :

3. Brief details of the treatment facility :

In case of off-site facility :

(i) Name of the operator

(ii) Name and address of the facility :

Tel. No., Telex No., Fax No.

4. Category-wise quantity of waste treated :

5. Mode of treatment with details :

6. Any other information :

7. Certified that the above report is for the period from

.....

Date :

Signature

Place :

Designation.....

FORM III

(see Rule 12)

ACCIDENT REPORTING

1. Date and time of accident :
2. Sequence of events leading to accident :
3. The waste involved in accident :
4. Assessment of the effects of the
accidents on human health and the environment:
5. Emergency measures taken :
6. Steps taken to alleviate the effects of accidents :
7. Steps taken to prevent the recurrence of such an accident :

Date :

Signature

Place:

Designation

²⁶[FORM IV

[see Rule 8(4)]

(Authorisation for operating a facility for collection, reception, treatment, storage, transport and disposal of biomedical wastes.)

1. File number of authorisation and date of issue.....
2.of is hereby granted an authorisation to operate a facility for collection, reception, storage, transport and disposal of biomedical waste on the premises situated at
3. This authorisation shall be in force for a period of Years from the date of issue.
4. This authorisation is subject to the conditions stated below and to such other conditions as may be specified in the rules for the time being in force under the Environment (Protection) Act, 1986.

Date

Signature.....

.....

Designation

*Terms and conditions of authorisation **

1. The authorisation shall comply with the provisions of the Environment (Protection) Act, 1986 and the rules made thereunder.
2. The authorization or its renewal shall be produced for inspection at the request of an officer authorised by the prescribed authority.
3. The person authorized shall not rent, lend, sell, transfer or otherwise transport the biomedical wastes without obtaining prior permission of the prescribed authority.
4. Any unauthorised change in personnel, equipment or working conditions as mentioned in the application by the person authorised shall constitute a breach of his authorisation.
5. It is the duty of the authorised person to take prior permission of the prescribed authority to close down the facility.

* Additional terms and conditions may be stipulated by the prescribed authority.

²⁶ Added by Rule 11 of the Bio-Medical Waste (M &H) (Second Amendment) Rules, 2000 notified vide S.O.545(E), dated 2.6.2000.

²⁷[FORM V]

(see rule 13)

Application for filing appeal against order passed by the prescribed authority at district level or regional office of the Pollution Control Board acting as prescribed authority or the State/Union Territory level authority.

1. Name and address of the person applying for appeal :
2. Number, date of order and address of the authority which passed the order, against which appeal is being made (certified copy of order to be attached)
3. Ground on which the appeal is being made.
4. List of enclosures other than the order referred in para 2 against which appeal is being filed.

Signature

Date :

Name & Address.....

F.No.23(2)/96-HSMD

V.RAJAGOPALAN, Jt. Secretary

Note : The Principal rules were published in the Gazette of India vide number S.O.630(E), dated 20.7.98 and subsequently amended vide (1) S.O.201(E), dated 6.3.2000; (2) S.O.545(E), dated 2.6.2000; and (iii) S.O.1069(E), dated 17.9.2003.

²⁷ Added by Rule 11 of the Bio-Medical Waste (M &H) (Second Amendment) Rules, 2000 notified vide S.O. 545(E), dated 2.6.2000.

Annexure E – Annual Report 2012-2013 of Nature in Need , BMWT Services, Satara

27 **E**



Association of Hospital Owner's, Satara
(Undertaking) (Reg. No. 6158)

Nature In Need, BMWT Services, Satara.

Reg. No. MPWB/20 (PANS)/BMW - PUNE - 37/2010 Dated: 28/12/2010



Project :- S. No. 83, Songaon, Tal. & Dist. Satara (Reg. No. 11/1226, Dated: 1/08/2005)
 Office :- T1 301A, Shree Gunindra Apartment, Near Adalwada, Sheriwadi, Satara - 415001
 Mobile :- 8007775800, 8007775731 to 36.

To,
 Sub Regional Officer,
 Maharashtra Pollution Control Board,
 Satara.

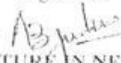
Subject :- Submission of Annual Report of Jan. 2012 to Dec. 2012.

Respected Sir :
 We are submitting herewith the detailed annual report month wise as per your prescribed details for the month of January 2012 to December 2012.

1)	(1) Name of the authorised person	:-	Mr. A. B. Jadhav
	(2) Name of the institute	:-	M/S. NATURE IN NEED, BMWT Services, C.T.No.83, Kachara Depot, A/Po. Songaon, Dist. Satara
	Tel. No.	:-	8007775800.
2)	Categories of waste generated & Quantity on a monthly average	:-	Enclosed herewith.
3)	Brief Detail of the treatment facility	:-	Incineration, Autoclave, Shredding, Chemical treatment (Disinfection).
4)	a) Name of the Operator	:-	Mr. A. B. Jadhav
	b) Name & address of the facility	:-	M/s. NATURE IN NEED, BMWT Services, C.T.No.83, Kachara Depot, A/Po. Songaon, Dist. Satara.
	Mobile No.	:-	8007775800.
5)	Category-wise quantity of Waste Treated	:-	Enclosed herewith.
6)	Mode of treatment with details	:-	Enclosed herewith.
7)	Certified that the above report is for the period from	:-	January 2012 to December 2012.

Date :- 28/01/2013,
 Place :- Satara.



Signature,

NATURE IN NEED
BMWT Services, Satara

Sub Regional Officer
 M.P.C. Board, Satara
 28/01/2013



ISO 9001:2008 CERTIFIED COMPANY
Association of Hospital Owner's, Satara
(Undertaking) (Reg. No.6168)

Nature In Need, BMWT Services, Satara.



Reg No-MPCB / ZO (PAMS) / BMW - PUNE - 37/2010, Dated : 28/12/2010

Project :- S. No 81, Songaon, Tal. & Dist. Satara. (Reg. No-11/1226, Dated : 1/08/2005)

Office :- 1135/A, Shree Gurukrupa Apartment, Near Adalatwada, Shaniwar Pathi, Satara - 415 002

Mobile :- 8007775000, 8007775731 to 98.

to..

MONTH WISE RECEIVED, TREATMENT & DISPOSAL OF BIO-MEDICAL WASTE

FROM JANUARY-2012 TO DECEMBER-2012.

MONTH	Quantity of BMW received & treated per month M/T		
	Incineration (K.g)	Autoclave / Shredder (K.g)	Total Quantity(K.g)
January - 2012	13201	366	13567
February-2012	13332	362	13694
March-2012	14161	390	14551
April-2012	12947	369	13316
May-2012	13592	392	13984
June-2012	13591	1014	14605
Jully-2012	13272	886	14158
August-2012	13143	1763	14906
Septembar-2012	15794	814	16608
Octombar-2012	19572	806	20378
Novembar-2012	14491	973	15464
Decembar-2012	14545	507	15052
TOTAL	171641	8642	180283

PLACE : SATARA.

DATE : 28.01.2013.



Sign. & Stamp

Abhishek
NATURE IN NEED
NATURE IN NEED
BMW T Services, Satara

013

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7



(ISO 9001:2008) CERTIFIED COMPANY

Document No. 12/01/2014
Rev. Date: 12/01/2014

Association of Hospital Owner's, Satara
(Undertaking) (Reg. No.6168)



Nature In Need, BMWT Services, Satara.

Reg. No. MPCB/ZO (PANSI) / BMW PUNE - 37/2010, Dated: 28/12/2010

Project :- S. No.83, Songaon, Tal. & Dist. Satara. (Reg. No-17/1226, Dated: 1/08/2005)
Office :- 1138/A, Shree Gunakrupa Apartment, Near Adalatwada, Shanwar Peth, Satara - 415 002
Mobile :- 8007775800, 8007775791 to 98.

NO. NIN/STR-OUT/2014-004

To,
Sub Regional Officer,
Maharashtra Pollution Control Board,
Satara.

Subject :- Submission of Annual Report of Jan. 2013 to Dec. 2013.

Respected Sir,

We are submitting herewith the detailed annual report month wise as per your prescribed details for the month of January 2013 to December 2013.

- | | | | |
|----|--|----|--|
| 1) | (1) Name of the authorised person | :- | Mr. A. B. Jadhav |
| | (2) Name of the institute | :- | M/S. NATURE IN NEED, BMWT Services,
C.T.No.83, Kachara Depot, A/Po. Songaon,
Dist. Satara |
| | Tel. No. | :- | 8007775800. |
| 2) | Categories of waste generated &
Quantity on a monthly average | :- | Enclosed herewith. |
| 3) | Brief Detail of the treatment facility | :- | Incineration, Autoclave, Shredding,
Chemical treatment (Disinfection). |
| 4) | a) Name of the Operator | :- | Mr. A. B. Jadhav |
| | b) Name & address of the facility | :- | M/s. NATURE IN NEED, BMWT Services,
C.T.No.83, Kachara Depot, A/Po. Songaon,
Dist. Satara. |
| | Mobile No. | :- | 8007775800. |
| 5) | Category-wise quantity
of Waste Treated | :- | Enclosed herewith. |
| 6) | Mode of treatment with details | :- | Enclosed herewith. |
| 7) | Certified that the above report is
for the period from | :- | January 2013 to December 2013. |

Date :- 20/01/2014.
Place :- Satara.

Recd
received
20/1/2014

Administrative Officer
MPC Board Satara
MINISTRATIVE BLDG (1st)
1st Floor, Behind B.I. Store
Outer Bazar Satara - 415001
☎: (02152) 233527



Signature,

[Signature]
NATURE IN NEED
NATURE IN NEED
BMWT Service's, SATARA.

Annexure F - Annual Report 2013-2014 of Nature in Need, CBMWTFD Services, Satara

25 F

ISO 9001 - 2008 CERTIFIED COMPANY

Association of Hospital Owner's, Satara
(Undertaking) (Reg. No.6168)

Nature In Need, BMWT Services, Satara.

Reg. No. MPCB / ZO (PAMS) / BMW PUNE - 37/2010, Dated : 28/12/2010





Project :- S. No 83, Songaon, Tal. & Dist. Satara. (Reg. No-17/1226, Dated : 1/08/2005)
 Office :- 1138/A, Shree Gurusrupa Apartment, Near Adatavada, Shanwar Peth, Satara - 415 012
 Mobile :- 8007775800, 8007775791 to 93.

NO. NIN/STR-OUT/2014-004

To,
 Sub Regional Officer,
 Maharashtra Pollution Control Board,
 Satara.

Subject :- Submission of Annual Report of Jan. 2013 to Dec. 2013.

Respected Sir,
 We are submitting herewith the detailed annual report month wise as per your prescribed details for the month of January 2013 to December 2013.

1)	(1) Name of the authorised person (2) Name of the institute	:- :-	Mr. A. B. Jadhav M/S. NATURE IN NEED, BMWT Services, C.T.No.83, Kachara Depot, A/Po. Songaon, Dist. Satara
	Tel. No.	:-	8007775800.
2)	Categories of waste generated & Quantity on a monthly average	:-	Enclosed herewith.
3)	Brief Detail of the treatment facility	:-	Incineration, Autoclave, Shredding, Chemical treatment (Disinfection).
4)	a) Name of the Operator	:-	Mr. A. B. Jadhav
	b) Name & address of the facility	:-	M/s. NATURE IN NEED, BMWT Services, C.T.No.83, Kachara Depot, A/Po. Songaon, Dist. Satara.
5)	Mobile No.	:-	8007775800.
6)	Category-wise quantity of Waste Treated	:-	Enclosed herewith.
7)	Mode of treatment with details	:-	Enclosed herewith.
	Certified that the above report is for the period from	:-	January 2013 to December 2013.

Date :- 20/01/2014.
 Place :- Satara.

Ma
received
20/1/2014

Sub Regional Officer
 M.P.C. Board Satara
 MINISTERIAL BUILDING
 1st Floor, Behind 3rd Street
 Outer Bazaar Satara-415001
 ☎ (02152) 233627



Signature,

NATURE IN NEED
NATURE IN NEED
BMWT Service's, SATARA.



ISO : 9001 - 2008 CERTIFIED COMPANY

Document No - P/CC/06/01
Rev Date - 23/03/2010

Association of Hospital Owner's, Satara
(Undertaking) (Reg. No.6168)



Nature In Need, BMWT Services, Satara.

Reg. No. MPCB / ZO (PAMS) / BMW - PUNE - 37/ 2010, Dated : 28/12/2010

Project :- S. No 83, Songaon, Tal. & Dist. Satara. (Reg: No-11/1226, Dated : 1/08/2005)
Office :- 1138/A, Shree Gurukrupa Apartment, Near Adalatwada, Shaniwar Peth, Satara - 415 002.
Mobile :- 8007775800, 8007775791 to 98.

No.:

MONTH WISE RECEIVED, TREATMENT & DISPOSAL OF BIO-MEDICAL WASTE

FROM JANUARY-2013 TO DECEMBER - 2013.

MONTH	Quantity of BMW received & treated per month M/T		
	Incineration (K.g)	Autoclave / Shredder (K.g)	Total Quantity(K.g)
January - 2013	14873	483	15356
February-2013	12403	410	12813
March-2013	14331	416	14747
April-2013	13400	448	13848
May-2013	14244	513	14757
June-2013	13086	491	13577
Jully-2013	13440	451	13891
August-2013	14236	453	14689
Septembar-2013	13145	450	13595
Octombar-2013	15261	435	15696
Novembar-2013	14206	413	14619
Decembar-2013	13689	439	14128
TOTAL	166314	5402	171716

He
ceived
21/1/2014
MPC Board Satara
ADMINISTRATIVE BUILDING
1st Floor, Peace Satara
1138/A, Shree Gurukrupa Apartment
Near Adalatwada, Shaniwar Peth, Satara - 415 002.
DATE: 20.01.2014.



Sign. & Stamp

NATURE IN NEED

NATURE IN NEED
BMWT Service's, SATARA.

**Annexure G - Proforma of Letter of Bio Medical Waste Authorization provided to
Samarth Hospital, Dr Amita Mahajani, President, AHO, Satara**

51

MAHARASHTRA POLLUTION CONTROL BOARD
SUB REGIONAL OFFICE, SATARA.

Tei No. (02162) 233527



Administrative Building
2 nd Floor, Behind S. T. Stand
Sadar Bazar, Satara - 415 001

LETTER OF BIO-MEDICAL WASTE AUTHORISATION

(Authorization for operating a facility for generation, storage & disposal of Bio-Medical Waste)

I) File number of authorization & date of issue

Consent No.: WP/SRO/STR/KRI/BMW/PN -19609-13 Auth-498/18231 Date 28/11/2013

II) M/s. Samarth Hospital, Dr. Amita Vinit Mahajani, 189/B, Yadogopal Peth, Satara, Tal & Dist-Satara (40 Beds) is hereby granted an authorization of handling of bio-medical waste on premises located at above address.

III) This authorization shall be in force for a period up to 31/03/2015.
An application shall be made by the occupier/operator for renewal 30 days before expiry of earlier authorization.

IV) This authorization is issued subject to compliance of the condition stated below & to such other conditions as may be specified in the Rules for the time being in force under the Environment (Protection) Act, 1986.

Terms & Conditions of Authorization

- 1) The authorized person shall comply with the provisions of the Environment (Protection) Act, 1986 & the Rules made there under.
- 2) The authorization shall be produced for inspection at the request of an officer authorized by the prescribed authority.
- 3) i) The authorized person shall not rent, lend or sell the bio medical waste or facility.
ii) The authorized person shall transfer the BMW generated at above premises to the "Transporter" or "Operator of Facility" promoted by Municipal Council Corporation authorized by MPCB under Bio-Medical Waste (Management & Handling) Rules, 1998 for collection, transportation, treatment & by deep burial method as per BMW (M&H) Rules, 1998.
- 4) Any unauthorized change in equipment or working conditions as mentioned in the application by the person authorized shall constitute a breach of this authorization.
- 5) It is the duty of the authorized person to take prior permission of the prescribed authority to close down the facility.

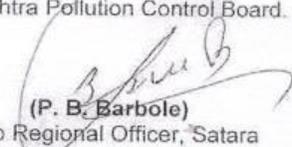
6) The authorization is granted for generation, storage & disposal of Bio-Medical Waste (BMW) in waste Categories & Quantities listed here in below:

Sr. No.	Category No.	Description	Quantity (Kg/M)	Treatment & Disposal
1.	1	Human Anatomical Waste	26	M/s.Nature in Need, BMWT Service, Satara, Tal & Dist-Satara
2.	2	Animal Waste	---	
3.	3	Microbiology & Biotechnology waste	---	
4.	4	Waste sharps	31	
5.	5	Discarded Medicines & Cytotoxic Drugs	17	
6.	6	Solid Waste	19	
7.	7	Solid Waste	25	
8.	8	Liquid Waste	100 Lit.	
9.	9	Incineration Ash	---	
10.	10	Chemical Waste	---	

The occupier shall join the common BMW Treatment & Disposal Facility authorized by MPCB in Satara i.e. **M/s.Nature in Need, BMWT Service, Satara, Tal & Dist-Satara** by becoming Member & shall send the BMW under intimation to Board.

- 7) The liquid waste generated from the hospital (from laboratory & washing, cleaning, housekeeping & disinfecting activities) shall be treated suitably to conform to the standards prescribed in schedule V of said rules & the Environment (Protection) Act, 1986.
- 8) (i) BMW shall be treated & disposed off in accordance with Schedule - I & in compliance with the standards prescribed in Schedule V of the said Rules.
- 9) (i) BMW shall not be mixed with other wastes or reused, recycled or sold in any form.
- (ii) BMW shall be segregated into containers/bags at the point of generation in accordance with Schedule - II prior to storage, treatment & disposal. The containers shall be labeled according to Schedule - III.
- (iii) If a container containing BMW is to be transported from the premises where BMW is generated to any waste treatment facility outside the premises, the container shall, apart from the Label prescribed in Schedule - III, also carry information prescribed in Schedule - IV & shall be transported by Authorized Transporter only.
- (iv) Notwithstanding anything contained in the Motor Vehicles Act, 1988, Rules, Or rules there under, BMW shall be transported only in such vehicle as may be authorized for the purpose by the competent authority as specified by the Government.
- (v) No untreated BMW shall be kept stored beyond a period of 48 hours.

- 10) Every "Authorized Person" shall submit any Annual Report to the prescribed authority in Form – II by 31st January every year including information about the categories & quantities of BMW handled during the preceding year.
- 11) (i) Every authorized person shall maintain records related to the generation collection, reception, transportation, treatment, disposal & or any form of handling of BMW in accordance with these Rules & any guidelines issued.
(ii) All records shall be subject to inspection & verification by the prescribed authority
- 12) When any accident occurs at any institution or facility or any other site where BMW is handled or during transportation of such waste, the authorized person shall report the accident in Form – III to the prescribed authority forth with.
- 13) The Occupier will obey all the lawful instructions issued by the Board Officers from time to time.

For & on behalf of the
 Maharashtra Pollution Control Board.

 (P. B. Barbole)
 Sub Regional Officer, Satara

To,
 The Applicant,

 M/s. Samarth Hospital,
 Dr. Amita Vinit Mahajani,
 189/B, Yadogopal Peth, Satara,
 Tal & Dist-Satara

Copy submitted to:-
 1. The Member Secretary, MPCB, Mumbai.
 2. The Principal Scientific Officer, MPCB, Mumbai.

Copy f. w. cs. to:-
 1. The Chief Accounts Officer, MPCB, Mumbai.
 Authorization fee of **Rs.16,500/-** received vide D. D. No. **151606** dtd – **19/10/2013**
 Drawn on **Bank of Maharashtra**.

Copy forwarded to: -
 The Regional Officer, MPCB, Pune. :- For information.

Annexure H - List of Integrated CBMWTSDF in Maharashtra with Incineration, Autoclave and Shredder

Information on Integrated Common Bio-medical waste treatment and disposal facilities in Maharashtra with Incineration, Autoclave and Shredder.

Sr. No.	Name of Corporation /Council	Name of Common Bio-Medical Waste Treatment Facility
1	Mumbai Corporation	M/s. SMS Envoclean Pvt. Ltd., Deonar dumping Ground, Mumbai
2	Navi Mumbai Corporation	M/s. Mumbai Waste Management Ltd., P-32, MIDC, Taloja, Tal. Panvel, Dist. Raigad
3	Thane Municipal Corporation	M/s. Enviro Vigil, Chhatrapati Shivaji Mah. Hospital Compound, Kalwa, Thane
4	Kalyan-Dombivli Municipal Corporation.	M/s. PRS Enterprises, Atharwadi Jail Road, Kumbharde, Kalyan
5	Nashik Corporation	M/s. Water Grace Products Nashik
6	Ahmed-nagar Municipal Corporation.	M/s. Bioclean Systems Ltd., Gat No.34, Burudgaon, Tal. & Dist. Ahmednagar
7	Jalgaon Municipal Corporation	M/s Mansai Bio-Medical Waste Enterprises Pvt. Ltd 90, Krishnendu, Gandhi Nagar, Jalgaon- 425001
8	Pune Municipal Corporation.	M/s. Passco Environmental Services ,Yashvantrao Chavan Memorial Hospital, Pimpri Chinchwad Municipal Corporation, Sant Tukaram Nagar, Pimpri, Pune- 411 018.
9	Pimpri Chinchwad Municipal Corporation	M/s. Yashvantrao Chavan Memorial Hospital, Pimpri Chinchwad Municipal Corporation, Sant Tukaram Nagar, Pimpri, Pune- 411 018. (Passco Environmental Services)
10	Talegaon Dabhade Municipal Council	M/s. Mimer Medical College, C/o. Life Secured Services, Talegaon Dabhade, Pune
11	Satara Municipal Council	<u>Nature N Need Satara</u> C.T. No. 83, Songaon Kachra Depot, Tal & Dist. - Satara.
12	Karad Municipal Council	M/s. Karad Hospital Association Shaniwar Peth, Nearpalika Oxidation Pond, 12 dabari, Karad Dist - Satara
13	Solapur Municipal Corporation.	M/s. Bioclean Systems Ltd., 83, Railway Lines, Nirgude Bungalow, Daffrin Chowk, Solapur.
14	Akluj Municipal Council	M/s. Sumitra Incinerator, Gat No. 311/ 1R2, At- Khudus, Post- Velepuri, Tal- Malshiras, Dist- Solapur.

15	Sangli-Miraj-Kupwad Municipal Corporation.	M/s. Surya Central Treatment Facility, Plot No. D 60, MIDC, Miraj.
16	Kolhapur Municipal Corporation.	M/s. Daas Enterprises, R.C.No. 206, C.S.No.29/92A, Kasaba Bawda, Kolhapur
17	Ichal-karanji /Jaysingpur / Kurundwad / peth-vadgoon Municipal Council	M/s. S.S. Services, C/o. Ichalkaranji Mun. Corpn., Takawade Road, Ichalkaranji
18	Ratnagiri Municipal Council	1 Maharashtra Bio-Hygenic Management, E-19, Lote Parshuram, Khed, Ratnagiri
19	Amravati Municipal corporation & Yavatmal Municipal Council	M/s. Global Ecosave System, S.No.238,Durgapur Road, Badnera, Amravati.
20	Chandrapur Municipal Council	M/s. Superb Hygiene Disposals, B-16/7, MIDC, Chandrapur
21	Nagpur Municipal Corporation	M/s. Superb Hygiene Disposals,Plot No 133 Mauja Bhandewadi, Nagpur
22	Aurangabad Municipal Corporation.	M/s. Water Grace Products, Survey No. 122, Near Patoda Village, Aurangabad.
23	Nanded Municipal - Corporation.	M/s. Superb Hygiene Disposals , Nanded
24	Jalna Municipal council	M/s. Atul Environment Services (office) 54, shivadatta HSG. Soc. Cid-co N-8, Aurangabad-431003
25	Beed Municipal Council	M/s. Champavati Pollution Control Society, Beed Gut No.301 and Gut No. 307 at Village Pali, Tal & Dist- Beed.
26	Latur Municipal Council	M/s.Akshay Industries, Latur, Plot No. C-8/1, MIDC- Latur, Dist- Latur.
27	Gondia Municipal Council	M/s. Krupa Wastages, Ramdeo Sadan, Manohar Chowk, Gat. No. 530, At. Dahegaon, Tal. Amgaon, Dist. Gondia (Note: Establish is given to this facility. Presently, BMW generated in this region is treated by M/s. Superb Hygenic Disposal, CBMWTSDF, Nagpur.)

Annexure I - Inspection Schedule of CBMWTSDF in Maharashtra by Regional Officers, MSPCB

राजीव कुमार मिश्रा
सदस्य सचिव
Rajeev Kumar Mital
MEMBER SECRETARY

 महाराष्ट्र प्रदूषण नियंत्रण मंडळ
MAHARASHTRA POLLUTION CONTROL BOARD

D.O. Letter No.MPCB/MS/BMW/2013/६८१
Dated: September 13, 2013

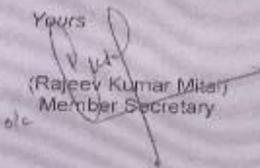
Sub: Inspection Schedule of Common Bio-Medical Waste Treatment and Disposal Facilities (CBMWTSDF) by Regional Officers, MPCB

Dear

There are in all 36 CBMWTSDF in the State of Maharashtra. Performance monitoring of these facilities is carried out regularly by the FO/SRO of the Board. However, considering the sensitivity, pollution potentials and various non-compliances reported by Media, Medical Associations, NGOs, etc., there is an urgent need to ensure inspection of these facilities by higher authorities of the Board at a regular frequency.

It is therefore proposed to cover inspection of all CBMWTSDF once in three months by respective Regional Officer in addition to monthly monitoring of local FO/SRO. The proposed schedule of monitoring of all existing facilities for next three months is enclosed (**Annexure- A**) along with the monitoring protocol prepared based on CPCB guidelines (**Annexure- B**).

You are directed to complete the inspection of CBMWTSDFs as per schedule before end of the respective month and upload inspection report in given format regularly directly on MPCB website.

Yours

(Rajeev Kumar Mital)
Member Secretary

To,
The Regional Officer, MPCB,
Mumbai / Navi Mumbai / Thane / Kalyan / Pune / Nashik / Aurangabad /
Amravati / Kolhapur / Nagpur / Chandrapur.

Copy submitted to:
The Chairman, MPCB, Mumbai, for information.

Copy to:
PSO, MPCB, Mumbai – for information and necessary action.

कल्पवृक्ष पॉइंट, सायन सर्कल, सायन (पूर्व), मुंबई - ४०० ०२२ टेलि. २४०१ ०४०६ • फॅक्स - २४०२ ३५१६
Kapatlan, Point, Sion Circle, Sion (East), Mumbai - 400 022. Tel.: 2401 0706 • Fax: 2402 3516
E-mail: ms@mpcb.gov.in • Website: http://mpcb.gov.in

Maharashtra Pollution Control Board

Schedule of Regional Officers Inspection of Common BMW T&D Facilities in Maharashtra (Dec. 2012)

Sl. No.	Regional Officer	Name & Address	Jurisdiction	Proposed inspection schedule			
				District	Sept	Oct	Nov
1	Mumbai	SMS enviroclean Pvt. Ltd. Govandi, Mumbai	Mumbai & Mumbai Suburb	X			
2	Navi Mumbai	MWML, Talaja, Tal Panvel, Dist Raigad	Thane & Raigad	X			
3		Evergreen Environment, Uran, Dist-Raigad	Raigad		X		
4	Thane	Envirovigil Chhatrapati Shivaji Maharaj Hospital Campus, Kalwa, Thane	Thane & Raigad	X			
5		Touch & Glow, Palghar, Dist. Thane	Thane		X		
6	Kalyan	PRS Enterprises, Umbarde, Kalyan (Closed.)	Thane	X			
7	Pune	Passco Environmental Solutions Pvt. Ltd, Pune	Pune	X			
8		Passco Environmental Solution Pvt Ltd. Pimpri, Pune	Pune	X			
9		Jai bhavani Bio Medicare Systems, Jalochi, Tal-Baramati, Dist-Pune	Pune		X		
10		Life Secure Enterprises, MIMER Medical Collage, Talegaon Dabhade Pune	Pune & Raigad		X		
11		Nature Need BMW T Services Ltd., Satara	Satara				X
12		Karad Hospital Association, Karad, Dist.- Satara	Satara				X
13		Bioclean Systems (India) Pvt. Ltd., Solapur.	Solapur			X	
14		Sumitra Incinerator Pvt. Ltd. Akfuj, Dist - Solapur (Closed)	Solapur			X	
15	Nashik	Water Grace Products, Mumbai Agra Road, Nashik	Nashik	X			
16		Mansal Bio-Medical Waste Enterprises Pvt.Ltd. Shivaji Nagar, Jalgaon	Jalgaon			X	
17		Bioclean System (I) Pvt. Ltd., Ahmednagar	Ahmednagar		X		
18		Shri Swami Samarth Enterprises, Dhamane Dist. Dhule	Dhule & Nashik	X			
19	Aurangabad	Water Grace Products, Paithan Road, A'bad	Aurangabad	X			
20		Atul Environment Services, Jalna.	Jalna, Parbhani, Hingoli	X			
21		Champavati Waste Management, Beed	Beed, Osmanabad & Nanded		X		
22		Superb Hygienic disposal (I) Pvt. Ltd. Tuppa, Nanded	Nanded		X		
23		Sangameshwar Pollution Control Society, Nanded Naka, Udgir, Dist Latur (Closed.)	Latur				X
24		Akshay Industries, MIDC, Latur	Latur & Osbad				X
25	Amaravati	Global Eco save Systems, Dist Amravati.	Amravati, Akola, Yavatmal,	X			
26	Kolhapur	Nature In Need, Bawda, Kolhapur	Kolhapur	X			
27		S.S. Services, Sangli Naka, Ichalkaranji	Kolhapur			X	
28		BioMedical Waste disposal Association Gadhinglaj	Kolhapur			X	
29		Shri Govind Bio-Medical Waste Corporation Ltd., Kudal, Dist.-Ratnagiri	Sindhudurg & Kolhapur				X
30		Maharashtra Bio-Hygenic Waste Management, Lote Parshuram, Khed, Dist- Ratnagiri	Ratnagiri, Sindhudurga, Raigad	X			
31		Surya central treatment & disposal facility, MIDC, Miraj	Sangli		X		
32		Sangli Miraj Kupwad Municipal Corporation	Sangli		X		
33	Nagpur	Superb Hygienic Disposal, Ramdaspeth Nagpur -10	Nagpur & Wardha	X			
34		Krupa Wastages, Amgaon, Dist. Gondia	Gondia		X		
35	Chandrapur	Superb Hygienic Disposal Pvt. Ltd., Dist. Chandrapur	Chandrapur & Gadchiroli	X			
36		Christianand Hospital, Bramhapuri Dist.-Chandrapur	Chandrapur	X			
TOTAL				16	10	7	3

MAHARASHTRA POLLUTION CONTROL BOARD

Performa for inspection Report: (To be submitted by Regional Officer, MPCB)

A) Details of CBMWTSDF

1	Name and Address	
	Contact Person:	
	Telephone No:	
	Mobile No.	
	Fax No.	
	Email:	
	Web site	
2	Date of visit	
3	Month of commissioning	
4	Authorization No. and validity	
5	Consent No. and validity	
6	Jurisdiction: (Details)	

B) Segregation and Storage

1	No. of bags collected per month	
	i Yellow	
	ii Red	
	iii Blue	
	iv Black	
2	Total nos. of HCEs cater service	
	a Bedded hospitals:	
	b Non bedded Hospital:	
	i Dispensaries	
	ii Blood Bank	
	iii Path Lab	
	iv Institutes	
	v Veterinary	
3	Annual Report submitted in Form -II	
	(Enclosed last three years copies duly certified by facility operator)	

C) Water Consumption and Waste water generation

1	Quantity and Source of water.(m3/day)	
	i Domestic	
	ii Process	
	iii Cooling	
	iv Boiler	
	v Laundry	
	vi Any other (washing, cleaning, lab., housekeeping)	
2	Source of water supply-Details with quantity (CMD)	
3	Waste water generation	
	a STP	
	b ETP	
4	Effluent treatment Plant units and capacity along with flow diagram :	
5	Location of discharge of treated effluent/ sewage	

D) Emission Details

i	Details of Incinerator & make model and year of establishment :	
ii	Capacity (Kg/hr):	
iii	Type of fuel used & Quantity(KLD) :	
iv	Air Pollution Control facility (unit and capacity)	
v	Temperature of Primary chamber (°C):	
vi	Temperature of Secondary Chamber (°C):	
vii	Automatic feeding system:(Yes/ NO)	
viii	Stack Details : (height and diameter)	
ix	Emergency vent : (Yes/ NO)	
x	Sampling port details : (Yes/ NO)	
xi	Online temperature monitoring/ recording	
xii	Whether incinerator is as per CPCB guidelines:	(Yes/ NO)
	DG Set Capacity :KVA	

iii	Stack Height			
iv	Acoustic enclosure provided			
E. Detail of Shredder				
i	Make and model			
ii	capacity (Kg/hr)			
F. Detail of Autoclave				
i	Make and model			
ii	Pre-vacuum Horizontal feeding			
iii	Capacity Kg/hr or Lits/hr			
iv	Records of Spore Test Result maintained -(Yes/No)			
v	Thermal Routine test conducted for each batch(Yes/No)			
G. Storage room of BMW				
H. Incineration Ash & ETP sludge send to CHWTSDF				
i	CHWTSDF membership details			
ii	HW Rules Form -V maintained (Annual Returns)			
I. Recordkeeping				
	Maintenance of Log sheet			
J. Disposal of disinfected plastic recycle waste				
i	Name of authorized plastic recycler			
ii	Quantity disposed (Kg)			
K. Nos. of vehicles provided for transportation of BMW				
i	Enclosed list with photographs of vehicles			
ii	Make, Model and Capacity			
L. Fire Fighting System				
M. First Aid Arrangement				
N. Whether training provided top staff / waste handlers				
O. Latest Monitoring report				
i. Stack				
	Sr.no	date	Complied /Noncomplied	
ii. Effluent				
	Sr.no	date	Complied /Noncomplied	
P. Overall Observation				
i				
ii				
iii				
iv				
v				
Q. Recommendations				
i				
ii				
Place			Name	
Date			Designation	

Annexure J- The Biomedical Waste (Management and Handling) (Amendment) Rules 2003

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 17th September, 2003.

S.O. 1069(E).- In exercise of the powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following rules further to amend the Bio-Medical Waste (Management and Handling) Rules, 1998, namely:-

1. (1) These rules may be called the Bio-Medical Waste (Management and Handling) (Amendment) Rules, 2003.
- (2) They shall come into force on the date of their publication in the Official Gazette.
2. In rule 7 of the Bio-Medical Waste (Management and Handling) Rules, 1998 (hereinafter referred to as the said rules),-
 - (a) in sub-rule (1), for the opening words "The prescribed authority for enforcement", the words "Save as otherwise provide, the prescribed authority for enforcement" shall be substituted;
 - (b) after sub-rule (1), the following sub-rule shall be inserted, namely:-

"(1A). The prescribed authority for enforcement of the provisions of these rules in respect of all health care establishments including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, Animal houses, pathological laboratories and blood banks of the Armed Forces under the Ministry of Defence shall be the Director General, Armed Forces Medical Services."

3. In the said rules , existing rule 9 shall be re-numbered as sub-rule (1) thereof , and after sub-rule (1) as so re-numbered, the following sub-rule shall be inserted , namely:-

" (2) Notwithstanding anything contained in sub-rule (1) , the Ministry of Defence shall constitute in that Ministry, an Advisory Committee consisting of the following in respect of all health care establishments including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories and blood banks of the Armed Forces under the Ministry of Defence , to advise the Director General, Armed Forces Medical Services and the Ministry of Defence in matters relating to implementation of these rules, namely:-

- (1) Additional Director General of
Armed Forces Medical Services Chairman
- (2) A representative of the Ministry of
Defence not below the rank of Deputy
Secretary, to be nominated by that Ministry Member

- 52
- (3) A representative of the Ministry of Environment and Forests not below the rank of Deputy Secretary To be nominated by that Ministry. Member
- (4) A representative of the Indian Society of Hospitals Waste Management, Pune Member"

4. In the said rules, after rule 9, the following rule shall be inserted, namely:-

"9A. Monitoring of implementation of the rules in Armed Forces Health Care Establishments.-

- (1) The Central Pollution Control Board shall monitor the implementation of these rules in respect of all the Armed Forces health care establishments under the Ministry of Defence.
- (2) After giving prior notice to the Director General Armed Forces Medical Services, the Central Pollution Control Board along with one or more representatives of the Advisory Committee constituted under sub-rule (2) of rule 9 may, if it considers it necessary, inspect any Armed Forces health care establishments."
5. In the said rules, existing rule 13 shall be re-numbered as sub-rule (1) thereof; and-
- (a) in sub-rule (1), as so re-numbered, for the opening portion, for the words " Any person" , the words, brackets and figure " Save as otherwise provided in sub-rule (2), any person " shall be substituted ;
- (b) after sub-rule (1) as so re-numbered, the following sub-rule shall be inserted, namely:-

"(2) Any person aggrieved by an order of the Director General, Armed Forces Medical Services under these rules may, within thirty days from the date on which the order is communicated to him prefer an appeal to the Central Government in the Ministry of Environment and Forests."

[F. No.23-2/96-HSMD]
Dr. V. RAJAGOPAL, Jt. Secy.

Note: The Principle rules were published in the Gazette of India vide tification number S.O. 630 (E) dated 20.7.98 and subsequently amended *vide*- (1) S.O.201 (E) dated 6.3.2000; and (2) S.O.545 (E) dated 2.6.2000.

Annexure K- Authorization for BMW generators and CBMWTDF Services, by MSPCB

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010437/24020781/24014701 Fax: 24024068 / 24023515 Website: http://mpcb.mah.gov.in E-mail: psodivision@mpcb.gov.in No. MPCB/PSO/B: 281		Kalpataru Point, 2 nd - 4 th Floor Opp. Cine Planet Cinema, Near Sion Circle, Sion (E) Mumbai-400 022. Date: 10/03/2014.
--	---	--

Office Order No. E-17/2014.

Sub: Delegation of powers for grant of combined consent and authorization to Health Care Establishments, Industries generating/handling Biomedical waste and CBMWTDF (Common Biomedical Waste Treatment, Storage and Disposal Facility)

Ref: MoM of 19th CAC Meeting held on 16/01/2014.

Maharashtra Pollution Control Board is implementing Bio-Medical Waste (M & H) Rules 1998 as amended in the State of Maharashtra. As per BMW Rule B(1) every occupier of an institution generating, collecting, receiving, storing, transporting, treating, disposing and /or handling bio-medical waste in any form / manner, except such occupier of clinics, dispensaries, pathological laboratories, blood banks providing treatment service to less than 1000 patients per month shall apply the prescribed authority for grant of authorization.

CPCB vide letter dated 04.06.2012 has revised the classification of industries into Red/ Orange and Green category and has classified CBMWTDF of Sr. No.14 and HCEs of Sr. No. 26 in RED category. Therefore, it is mandatory to all HCEs covered under and generating and handling BMW to obtain Consent from the Board as per provision of Water (P&CP) Act, 1974 and Air (P&CP) Act, 1981. Also all HCEs, industries generating and handling BMW and CBMWTDFs are required to obtain authorization under BMW, MSW and HW Rules, etc. as applicable.

To ensure effective implementation of process to grant Consent under Water (P&CP) Act, 1974 and Air (P&CP) Act, 1981 and BMW authorization under BMW (M & H) Rules, 1998 grant of combined consent was under consideration and was placed before 19th CAC for consideration. It is now decided that all HCEs, industries generating, handling BMW and CBMWTDF shall be classified into Red category for the purpose of consent management as per CPCB's direction dated 04/06/2012.

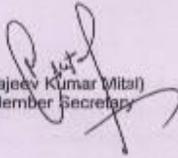
In view of above, following delegations of power are herewith delegated to the committee / officers of the Board for grant of combined consent and BMW authorization.

.....2/-

Sr. No	Category	HCEs covered	Authority
1	Category -I	HCEs upto 25 beds (only bedded hospital)	Sub Regional Officer
2	Category -II	1) Pathological Laboratories treating more than 1000 patient per Month 2) HCEs having 26 to 50 beds	Regional Officer
3	Category -III	1) HCEs having 51 to 100 beds 2) CBMWTSDF other than Municipal Corporations	HOD
4	Category -IV	1) 101 to 200 beds 2) CBMWTSDF situated in Municipal Corporations	Consent Committee
5	Category- V	HCEs having 201 beds and Above	Consent Appraisal Committee

Note : The R & D labs, generating BFW shall obtain authorization alongwith Consent only as per C.I. norms applicable for industry

This is subject to post facto approval of Board.


(Rajeev Kumar Mital)
Member Secretary

Annexure L- State Project Management Unit- letter by MSPCB

राजीव कुमार मिश्रा
सदस्य सचिव
Rajeev Kumar Mishra IAS
MEMBER SECRETARY



महाराष्ट्र प्रदूषण नियंत्रण मंडळ
MAHARASHTRA POLLUTION CONTROL BOARD

No.: MPCB/MS/BMW/ 86

Date: 24.09.2013

Office Order No. B6 /2013

Sub: Constitution of State Project Management Unit (SPMU) in the State of Maharashtra for implementation of GEF-UNIDO funded MoEF Project entitled "Environmentally Sound Management of Medical Waste in India".

Background

India is a signatory to Stockholm convention with an aim to protect the Human Health and the Environment from adverse effects of Persistent Organic Pollutants (POPs). The State of Maharashtra has confirmed its participation in the GEF-UNIDO funded MoEF project titled "Environmentally Sound Management of Medical Waste in India" with an aim to reduce and ultimately eliminate the Persistent Organic Pollutants (Dioxin and Furans) and also reduces associated pollution problems of Air, Water, Soil and Sediments by ensuring Environmental Sound Systems for Bio-medical Waste. The State Pollution Control Board has been asked to constitute a State Project Management Unit (SPMU).

Terms of References:

1. The SPMU shall be responsible for overall project implementation, including approvals, sanctions and release of funds.
2. It shall monitor utilization of UNIDO funds and States co-funding through balanced matching and effective process management, project review and oversight mechanisms.
3. The SPMU shall also be responsible for reporting inputs, bottlenecks and other feedbacks to the State Project Steering Committee and PMC from time to time to ensure achievement of the project outputs as per project framework.
4. SPMU shall have powers to co-opt/invite additional expert members as per need.
5. SPMU will have power to frame financial delegation and procedures to be followed, appointment of auditor and allocation of budget within the framework of contract document.
6. The members are entitled for TA/DA as per UNIDO contract terms/MPCB.
7. Term of SPMU shall be coterminous with the project duration.

-2/-

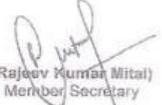
O.O. BMW/UNIDO/MPCB/SPMU

कल्पतरु पोईंट, सायन सर्कल, सायन (पूर्व), मुंबई - ४०० ०२२, टेलि. २४०१ ०३०६ • फॅक्स २४०२ ३५१६
Kalpataru Point, Sion Circle, Sion (East), Mumbai - 400 022. Tel: 2401 0706 • Fax: 2402 3516
E-mail: ms@mpcb.gov.in • Website: http://mpcb.gov.in

: 2 :

Accordingly, State Project Management Unit (SPMU) for the State of Maharashtra is constituted as under:

- | | |
|---|-----------------------------|
| 1. Member Secretary
MPCB, Sion, Mumbai | : Nodal Officer |
| 2. Dr. A. R. Supate
PSO, MPCB, Mumbai | : State Project Coordinator |
| 3. Dr. Nagaonkar B. S.
Asst. Director, Directorate of Health Services,
GoM, Mumbai | : Member |
| 4. Prof. Dr. Nitin Desai
Dean, Dr. D. Y. Patil Biotechnology University
Navi Mumbai | : Expert Member |
| 5. State Project Technical Advisor, UNIDO | : Member (UNIDO) |
| 6. Shri. C. A. Sawant
JSA, MPCB, Mumbai | : Administrative Assistant |


(Rajeev Kumar Mital)
Member Secretary

Copy submitted to:

1. Hon'ble Chairman, MPCB, Mumbai
2. Principal Secretary, Environment Department, GOM, Mantralaya, Mumbai.
3. Dr. M. Subba Rao, Director, MoEF, Gol, New Delhi

Copy to:

1. Dr. S.P. Dhus, Regional Coordinator, UNIDO, New Delhi
2. Chief Accounts Officer, MPCB, Mumbai

O.O. BMW/UNIDO/MPCB/SPMU

F.No. B-31011 (BMW)/30/93/HWMDI-1122-1162

By Speed Post

Most Important
May 04, 2010

To
The Member Secretary
(All SPCBs/PCCs)

Subj: Approval for adoption of 'plasma pyrolysis technology' for treatment of bio-medical waste as per Bio-medical Waste (Management & Handling) Rules, 1998 as amended - reg.

You are aware that Schedule I of the Bio-medical Waste (Management & Handling) Rules, 1998 notified under the Environment (Protection) Act, 1986 stipulates that 'any occupier/operator wishing to use other State-of-the-art technologies (other than stipulated under Schedule I of the BMW Rules) shall approach the Central Pollution Control Board to get the standards laid down to enable the prescribed authority to consider grant of authorization'

Accordingly, it is to inform that CPCB has accorded provisional approval to adopt "Plasma Pyrolysis Technology" for treatment of bio-medical waste category (1) & (2) as per Schedule I of the Bio-medical (Management & Handling) Rules, 1998 as amended. A copy of the approval communicated to the Secretary, Technology Information, Forecasting & Assessment Council (TIFAC), Department of Science & Technology, Technology Bhawan, New Mehrauli Road, New Delhi - 110 016 and the conditions imposed for adoption of the said technology is enclosed for kind information and ready reference.

You are therefore requested to consider granting Consent to Establish or Operate as required under the Water Act, 1974 & Air Act, 1986 and imposing the necessary conditions while granting authorization under BMW Rules notified under the E (P) Act, 1986 to the occupier (s)/ common bio-medical waste treatment facility operator (s) which proposes to adopt plasma pyrolysis technology for bio-medical waste as mentioned above. Assessment and monitoring of such facilities be conducted periodically and detailed report submitted to this office to analyse the same.

Yours faithfully,

J.S. Kamyotra
(J.S. Kamyotra)
Member Secretary

Encl.: As above

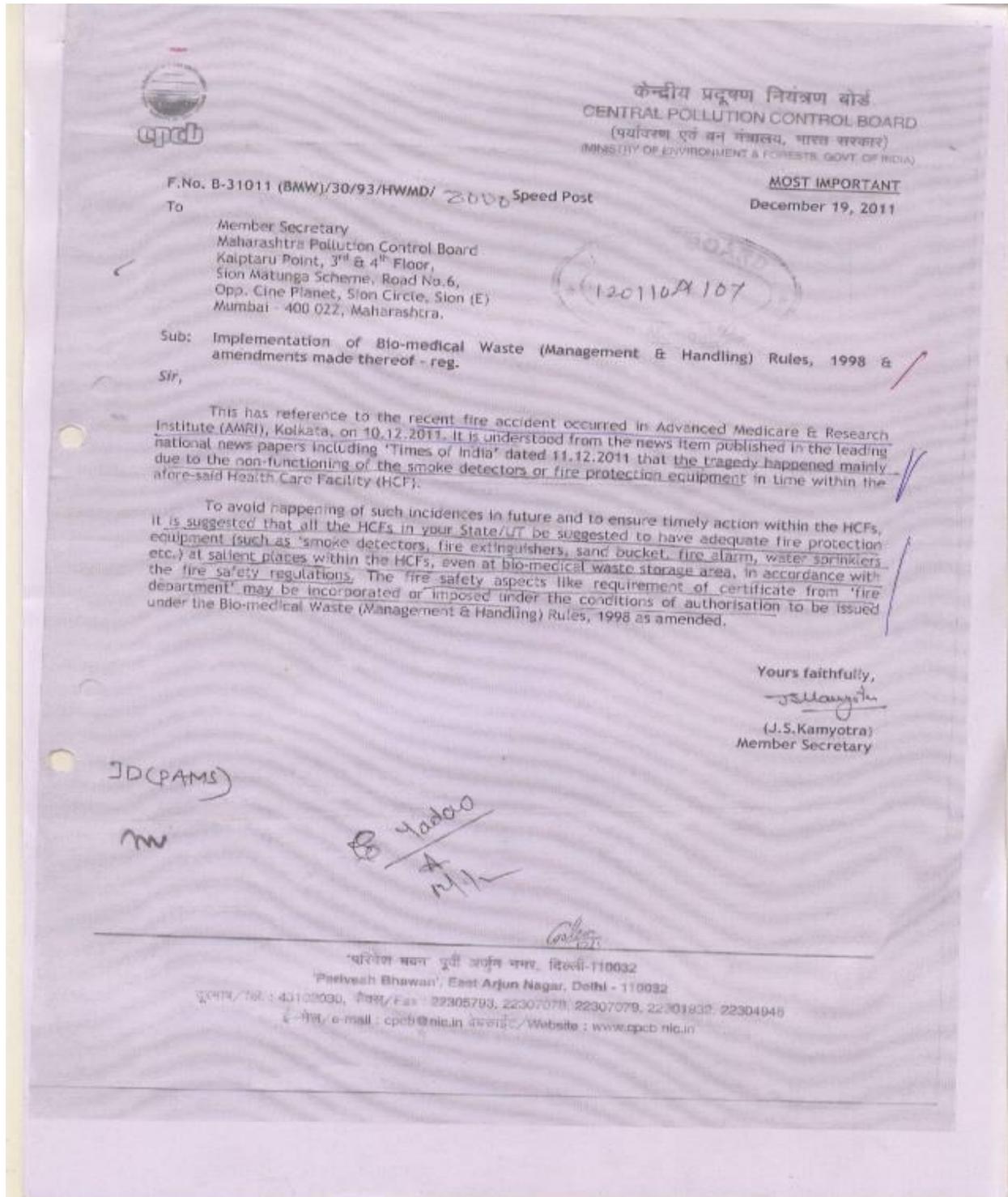
Copy for information to:

- 1. Dr. M. Subba Rao, Director, ISM Division, Ministry of Environment & Forests, Govt. of India, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi - 110 003.
- 2. Zonal offices of CPCB (as per list) : with a request to follow-up with the concerned SPCBs and PCCs fall under your jurisdiction.
- 3. PS to CCB : for kind information of 'CCB' please

Handwritten signature/initials

J.S. Kamyotra
(J.S. Kamyotra)

Annexure N- Fire_Safety Guidelines for MSPCB by CPCB



Annexure O - CPCB Guidelines to MSPCB for Needle Blaster



केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
(पर्यावरण एवं वन मंत्रालय, भारत सरकार)
(MINISTRY OF ENVIRONMENT & FORESTS, GOVT. OF INDIA)

Speed Post

F.No.B-31011(BMWY/30/93/2011/HWMD) 3036

December 16, 2011

To
Member Secretary
Maharashtra Pollution Control Board
Kalptaru Point, 3rd & 4th floor,
Sion Matunga Scheme Road No.6,
Opp. Cine Planet, Sion Circle, Sion (E)
Mumbai - 400 022.

120107/A-38

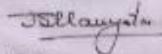
Sub: Approval for adoption of "Sharp Blaster (Needle Blaster)" for treatment for bio-medical waste category no. 04 as per Bio-medical Waste (Management & Handling) Rules, 1998 as amended - reg.

Sir,

You are aware that Schedule I of the Bio-medical Waste (Management & Handling) Rules, 1998 (BMW Rules) notified under the Environmental (Protection) Act, 1986 stipulates that *any Health Care Facility (HCF) or Common Bio-medical Waste Treatment Facility (CBWTF) Operator wishing to use other State-of-the-art technologies other than stipulated under Schedule I of the said rules, shall approach the Central Pollution Control Board (CPCB) to get the standards laid down to enable the prescribed authority to consider grant of authorization.*

Accordingly, it is to inform that CPCB has accorded approval to "Sharp Blaster (Needle Blaster)" technology for treatment of Bio-medical Waste category no. 04 as listed under Schedule-I of the BMW Rules (Copy of the letter conveying approval of the said technology to M/s Safe Environmental Solutions Ltd. is enclosed for ready reference).

It is therefore, requested to consider and impose necessary conditions while considering grant of Consent to Operate under the Water (Prevention & Control of Pollution) Act, 1974 & Air (Prevention & Control of Pollution) Act, 1981 and/or authorization under Bio-Medical Waste (Management & Handling) Rules, 1998, to the occupier (s)/Common Bio-medical Waste Treatment Facility operator (s) proposing to adopt "Sharp Blaster (Needle Blaster)" for bio-medical waste treatment as mentioned above. Assessment and monitoring of such facilities be conducted periodically and observation if any forwarded to this office to analyse the same for imposing any additional conditions, if required.

Yours faithfully

(J.S. Kamyotra)
Member Secretary

JDCPANI

Encl.: As above

Orig.
- to be
- circulate
- to be
- to be

परिेश भवन' पूर्ण अर्जुन नगर, दिल्ली-110032
Parivash Bhawan, East Arjun Nagar, Delhi - 110032
दूरभाष/Tel: 43102030, फॅक्स/Fax: 22305793, 22307078, 22307079, 22301932, 22304948
ई-मेल/e-mail: cpcb@nic.in वेबसाइट/Website: www.cpcb.nic.in

F.No.5-31011(BMW)/30/93/2011/HWMD/

To

M/s Safe Environmental Solutions Ltd.
Q Park, Bath Road, Woodchester, Stroud,
Gloucestershire, England,
GL 5 5 HT.

Speed Post

December 02, 2011

2094-96

Sub: Approval for adoption of "Sharp Blaster (Needle Blaster)" for treatment of bio-medical waste category no.04 as per Bio-medical Waste (Management & Handling) Rules, 1998 as amended - reg.

Sir,

This has reference to the provisional approval granted by CPCB for the technology namely 'Sharp Blaster (Needle Blaster)' for treatment of bio-medical waste category no. 04 (i.e waste sharps) as required under the Bio-medical Waste (Management & Handling) Rules, 1998 as amended.

Your application for regular approval for the said technology was considered in 12th Meeting of the Expert Committee on Bio-medical Waste Management for Evaluation of the State-of-the-Art-Technologies for Treatment of Bio-medical Waste which was held on July 07, 2011 at CPCB, Delhi and accordingly approval of the Sharp Blaster (Needle Blaster) technology based on 'dry heat sterilization' in canister for treatment of waste category no. 04 as listed under Schedule I of the BMW Rules, 1998 is hereby granted for a period of 02 (two) years under the Bio-medical Waste (Management & Handling) Rules, 1998 as amended subject to the conditions as specified below:

- i. The bio-medical waste category no. 04 shall be continuously subjected to dry heat sterilization at a temperature not less than 185°C, at least for a period of 2 1/2 hours in each cycle, which includes sterilization duration of 90 minutes.
- ii. A microprocessor shall be attached with the system to ensure maintaining operational parameters and to record the operating parameters in each cycle including automated operation with no manual handling;
- iii. The system should completely & consistently kill/inactivate 100 % of the bacteria and other pathogenic organisms at the maximum design capacity of the system, as ensured by approved biological indicator.
- iv. The biological indicators for the system shall be *Geobacillus stearothermophilus* as well as *Bacillus atrophaeus* spores using vials or spore with at least 1×10^6 spores per milliliter (once in quarter) and Strip test while treating the every canister should be adopted as prescribed under BMW Rules and records maintained;
- v. The compressed canister in which sharp wastes are treated shall be disposed off by deep burial or through sanitary landfill in consultation with the respective SPCBs/PCCs;
- vi. The infected or contaminated carbon filter used to absorb the fumes & microorganism if any, during the treatment, shall be disinfected and the same shall be disposed off either by deep burial or through sanitary landfill in consultation with the SPCBs/PCCs.
- vii. The proponent should try to make available cheaper/affordable equipment including the consumable like canister;
- viii. Lid used for the canister should be of minimum thickness possible and free from PVC and it should be made of Poly propylene only;

Contd..2/

Annexure P - BMWM - Achievements by MSPCB

Achievements

- Board has carried out work of inventorization of new Health Care Establishments (HCEs) in the State of Maharashtra through outsourced agency by physical survey. About 90 % of the compliance is achieved by April 2010.
- There are 26 numbers of incineration based Common Bio-Medical waste Treatment, Storage and Disposal facility (CBMWTSDf) and 7 numbers of CBMWTSDf based on deep burial system for Bio-Medical waste management.
- Frequency is determined for inspection and monitoring of HCEs and Common Bio-Medical waste Treatment, Storage and Disposal facility (CBMWTSDf).
- Quarterly Worksheet in prescribed format is prepared to maintain update of Bio-Medical Waste information.
- Board has allotted the Project of reasonable fixing of charges by CBMWTSDf on HCEs to expert agency namely, M/s. Environment Management Consultant, Mumbai. This project work is already started.
- Board has allotted the Project of preparation of present status report on BMW management issues to M/s. Environment Management Consultant, Mumbai with part funding from CPCB.
- Board is implementing GPS based vehicle tracking system in the BMW transportation vehicles of CBMWTSDf to ascertain the real time, geographical position of the movement of the vehicle.
- Maharashtra State has given confirmation to the Govt. of India to Participate in the project of "Environmental sound management of Medical waste in India" to reduce & ultimately eliminate Dioxin & Furans. Which are persistent Organic Pollutants.
- Board has extended financial assistance to CPR Hospital Kolhapur for construction of STP. (amount Rs.24 Lakh)
- Board has prepared a prescribed format (Undertaking) for HCEs (Clinics, dispensaries, Blood Bank, Pathology Lab.) treating / providing services to less than 1000 patient per month to obtain information from these HCEs about the number of patient treated and the details of waste management.
- Board has conducted Awareness program through All India Institute of Local Self Government (AIILSG) in 11 cities in Maharashtra. (Jan.2009 to March 2009) on Bio-Medical Waste management issues. More than 1000 participants were benefited.

➤ Prosecuted 24 HCEs in the Court of Law u/s. 15 of Environment (Protection) Act, 1986.

➤ Prosecuted 2 CBMWTSDF in the Court of Law u/s. 15 of Environment (Protection) Act, 1986.

.....

Annexure -Q

Photographs Taken at Office & Actual Site of Biomedical Waste Disposal Centre of Nature in Need at Songaon, Satara



Office of common Bio-medical waste collection Transportation & Disposal Center



Actual Site of common Bio-medical waste Disposal Center at Songaon, Satara



Front view of Common Bio-medical waste of Nature in Need, Songaon, Satara



Shredder at Nature in Need Disposal Center Capacity 50 kg. per hour



इ.टी.पी. प्लांट व अंडरग्राऊंड टँक

E.T.P. Plant & Underground Tank in the premises of Nature in Need, Songaon, Satara



केमिकल डिसइन्फेक्शन टँक

Chemical Disinfection Tank in the premises of Nature in Need, Songaon, Satara



कार्बन कलेक्ट बॅग व स्टरेलायझेशन टँक

Carbon Collect Bags & Sterilization Tank in the premises of Nature in Need Songaon, Satara



जैव-वैद्यकीय कचरा साठवण्याची जागा

Biomedical Waste Collected in Color coded bags and stored at separate place at Nature in Need, Songaon, Satara



Incinerator Machine in Progress



Horizontal autoclave Machine
Capacity 25 Kg per hour



Incinerator Burner No. 1 & 2



Sample Collection at Inspection Visit
by Maharashtra Pollution Control
Board at site of Nature Need at
Songaon, Satara



जैव-वैद्यकीय कचरा वाहतुक गाडी क्र. १

Vehicle for Bio-Medical Waste Collection & Transportation from Hospitals to Nature in Need site at Songaon



जैव-वैद्यकीय कचरा वाहतुक गाडी क्र. २

Vehicle for Bio-Medical Waste Collection & Transportation from Hospitals to Nature in Need site at Songaon



एम.पी.सी.बी.व्हिजीट स्टॅक मॉनिटरिंग

Maharashtra Pollution Control Board Visit for Inspection & Stack Monitoring at Nature in Need Site, College, Songaon, Satara



नर्सिंग कॉलेजच्या विद्यार्थीनीना माहिती

Training Session in progress for Students Training Session in progress for Students of Nursing At Site of Nature in Need, Songaon, Satara

Dr Sujata Pawar

Principal Invigilator

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IMPLEMENTATION OF THE BIOMEDICAL WASTE (MANAGEMENT AND HANDLING) RULES 1998 BY HOSPITALS IN SATARA CITY

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EXECUTIVE SUMMARY REPORT

India's progressive social development and economic growth has increased the demand for better health care and medical facility. The growth of hospitals and private clinics are surely a good sign of better health care facilities however this has also increased the concern for generation of bio medical waste and its safe disposal.

Improper handling, treatment, storage, transport and disposal of Bio Medical Waste can lead to serious health hazards. If infectious waste is not segregated at the point of generation and stored separately, it can convert the entire waste into dangerous, infectious waste leading to spread of harmful, fatal and communicable diseases.

If this happens, the first casualty i.e. persons directly at risk are the Doctors, Nurses and Hospital support staff, sanitary staff collecting and disposing of waste and ultimately, general public at large. This poses serious threats to environment.

To control the storage, transportation and final disposal of biomedical waste, law has prescribed certain standard methods of classification of biomedical waste, its storage in color coded bins and disposal as per prescribed methods. Health Care Establishments (HCEs) are the major generators of the BMW. HCEs need to take authorization from MPCB for handling of BMW.

The Government in order to resolve this issue had notified Bio-medical Waste (Management and handling) Rules, 1998 under the Environment (Protection) Act, 1986. These rules apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio medical waste in any form. These Rules, are notified in 1998 by the Ministry of Environment & Forests (MoEF) under the Environment (Protection) Act, 1986. The 'prescribed authority' for enforcement of the provisions of these rules in respect of all the health care facilities located in any State/Union Territory is the respective State Pollution Control Board (SPCB)/ Pollution Control Committee (PCC) and in case of health care establishments of the Armed Forces under the Ministry of Defence shall be the Director General, Armed Forces Medical Services (DGAFMS). These rules consists of six schedules and five forms.

Bio-medical waste has been defined as any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological and including categories mentioned in Schedule I. The increasing health care facility is a sign of growth of medical development in the country however it is also raises concern of safe disposal of bio medical waste. The rules framed for the safe disposal of bio medical waste imposes liability of safe disposal of bio medical waste to the occupier. The occupier includes a hospital, nursing home, clinic dispensary, veterinary institution, animal house, pathological laboratory, blood bank by whatever name called, means a person who has control over that institution and or its premises

According to World health organization report "waste from health care activities" the 20% of the total amount of waste generated from health care activities is infectious, toxic or radioactive. Further this waste contains potentially harmful microorganisms which can cause infectious disease to patients, health care workers and to general public. The world health organization estimates that in the year 2000 21 million hepatitis B virus infections, two millions hepatitis C virus infection and 26000 HIV infections worldwide have caused due to the use of contaminated

syringes. The reason for this alarming statistics is non proper disposal and of needles and syringes worldwide.

In India the quantum of waste generated in India is estimated to be around 1-2 kg per bed per day in a hospital and 600 gm per day per bed in a general practioner's clinic. The number health care establishment in Maharashtra has increased in the past few years and similarly the quantum of waste generation has also increased.

The Bio-Medical Waste (Management and Handling) Rules, 1998 provides for treatment and disposal of bio medical. The rules has been provides for disposal of waste in accordance in accordance with Schedule I, and in compliance with the standards prescribed in Schedule V. It also provides for standards of compliance to be adopted while disposal. It has been provided under Schedule V. Every occupier is required to set up required bio medical waste treatment facilities incinerator, autoclave, microwave system for the treatment of waste, or, ensure requisite treatment of waste at a common waste treatment facility.

The Central Pollution Control Board (CPCB) has prescribed guidelines for Common Bio-Medical Waste Treatment Facilities as well as for design and construction of Incinerators However, Health being a state subject, it is the responsibility of the concerned State Government to take necessary steps to monitor the disposal of biomedical wastes through the State Pollution Control Boards (SPCBs), and Pollution Control Committees (PCCs) in the Union Territories, as per the provisions made under the Bio-medical Waste (Management & Handling) Rules, 1998.

A Common Bio-medical Waste Treatment Facility (CBWTF) is an important and cost effective way to treat and dispose bio medical waste. The installation of individual treatment facilities by small healthcare units requires comparatively high capital investment. Apart from it requires separate manpower and infrastructure development for proper operation and maintenance of treatment systems. The Common Bio-medical Waste Treatment Facility (CBWTF) is an answer to these important problems. The Central Pollution Control Board (CPCB) has prescribed guidelines for Common Bio-Medical Waste Treatment Facilities as well as for design and construction of Incinerators. The State Government takes necessary steps to monitor the disposal of biomedical wastes through the State Pollution Control Boards (SPCBs)/Pollution Control

Committees (PCCs) in the Union Territories, as per the provisions made under the Bio-medical Waste (Management & Handling) Rules, 1998.

The need for proper bio medical waste management has gain important in recent years with the growth private health care sector in India. Technology is playing a major role in bringing quality in healthcare, be it better nursing communication systems, patient monitoring devices or telemedicine to provide low cost diagnosis to remote patients, etc. The concepts of medical tourism, where hospitals of specialized nature will sooner or later come to light. In this scenario a separate and autonomous department of Government with penal powers is need of the time to deal with bio medical waste management in India.

In Maharashtra, Maharashtra Pollution Control Board (MPCB) enforces these Rules by

- Authorization of HCEs for generation and handling of BMW
- Authorization of CBMWTFs for collection, treatment and disposal of BMW
- Periodic inspection and audit of the "system" to ensure complianceto the law.
- Taking action on non-compliance.
- Carrying out inventorization of BMW to report the status
- Undertaking awareness programs at HCEs

Biomedical Waste Management in Maharashtra

Analysis of the BMW data carried on by the Maharashtra state Pollution Control Board shows that there was a significant increase in the number of HCEs in Maharashtra . As in 2009, Maharashtra had a total of 46,676 HCEs. Out of the total, 16,060 HCEs belonged to bedded and 30,616 HCEs were non-bedded. In 2010, Maharashtra has as total of 45,784 HCEs. Out of the total establishments, 14,438 HCEs are bedded and, 31,346 HCEs are non-bedded. It may be observed that the bedded HCEs decreased by 10 % and non-bedded HCEs increased by 2% .

Total Quantity of BMW Generated and Treated Total BMW generated in Maharashtra is close to 43,380 kg/day. This estimate includes BMW generated from both bedded and non bedded HCEs. Region wise, Mumbai contributes approx. 23.26% of the total BMW load. Pune contributes approx. 19.58% and Nagpur is close third with 17.33% contribution.

Total BMW treated in Maharashtra is close to 38,202 kg/day out of a total of generated BMW of 43,380 kg/day from both bedded and non bedded facilities. However as per information from CBMWTDF Operators, the total BMW treated in Maharashtra is close to 41,154 kg/day. This variation in data shows lack of coordination on BMW - between MPCB, HCEs and CBMWTDF operators.

Awareness is crucial for the compliance and so, the frequency of such activities needs to be increased by Regional Offices of MPCB, especially across non-bedded HCEs and bedded HCEs with less than 50 beds, as in Satara city. Arrangement should be made for periodic awareness programs and training campaigns to generate awareness amongst MPCB, HCEs, CBMWTDF operators and transporters as well as common public to understand the risk associated with BMW management.

In order to know whether all relevant legal provisions are being followed by the HCEs in Satara, and to find out the difficulties and problems in implementing these rules The researcher has undertaken this Minor Research Project on this topic, which is approved by Shivaji University and UGC and is funded by UGC.

The present study is conducted in Satara city. Hence it is limited to all health care establishments within the boundaries of Satara Municipal Council. Satara Municipal Corporation has divided the area of Satara city into 39 wards (parabhog) for governance and representation. Health care establishment, especially hospitals in Satara City, were selected randomly by applying simple random sampling method. Questioner, Interview and observation techniques have been used for collection of data. A questioner sheet was given to selected hospitals. Few in depth case studies have been conducted to collect detailed information about implementation of legal norms and difficulties if any in their compliance.

In Satara, Association of Hospital Owners (AHO) along with CBMWTDFs, namely, NATURE IN NEED and Indian Medical Association (IMA) have arranged for simple, feasible, and environment friendly solutions for BMW management at different hospital routes for every type of bio medical waste as per the BMW (management and Handling) Rules 1998 as amended in 2011.

Former President of AHO, Dr Sandip Shrotri and President of AHO, Dr Amita Mahajani and the authority of CBMWTDF operator Shri A. B. Jadhav and Sagar Jadhav have developed the coherent scheme for bio medical waste management in Satara City, where the bio medical waste is collected by employees of Nature in Need and is transported to and disposed off at the CBMWTDF centre at Songoan near Satara City. CBMWTDF Nature in Need has Incinerator, shredder, Autoclaving machine, sterilization tank, Disinfectant Tank etc. and is substantially following the guidelines prescribed by Central Pollution Control board and Maharashtra Pollution Control Board from time to time regarding collection, transportation and disposal of bio medical waste. (See Annexures A to Q)

Waste audits have been made mandatory for renewal of Consent to Operate. This has ensured increase in credibility of CBMWTDF Nature in Need and better Health, Safety and Environment compliance from employees from HSEs in Satara city.

However, in practice, sometimes it is difficult for the HCEs to monitor the waste generated under different categories as only nos. of colored bags and total weight of bags are recorded and reported in the registers. This can lead to difficulties in exact mapping between data from authorization and data generated through weighing of color coded bags. It may be worth therefore to revisit categorization and color codes to achieve simplicity as well as mapping in data recording and management.

Very few and isolated awareness generation activities have been undertaken by Regional Office of MPCB and zonal office at Satara. Awareness is crucial for the compliance and so, the frequency of such sensitization programmes needs to be increased, especially across non-bedded HCEs and bedded HCEs in Satara, with less than 5 beds.

Arrangement should be made for periodic awareness programs to raise awareness amongst common public to understand the risk associated with BMW management. Parameters related to awareness should be selected and monitored before and after training to evaluate the change imparted by training amongst hospital support staff, sanitary staff as well as general public.

If requirements (under the Shops and Establishment Act, and BMW Rules) could be integrated with BMW authorization then this will ensure that more HCEs (which are not authorized and /or not members of CBMWTDFs) will be brought under compliance of this Act.

Special incentive may be provided to those HCEs and CBMWTDFs who are strictly and regiourosly following all the norms as per legal provisions. Similarly, penal action ought to be taken by the Zonal pollution Control Board against the HCEs who violate the rules and procedure.

E-resource (manual) on BMW management should be made easily accessible to all. All information available regarding BMW management should be made available on the website and social media, for enlightenment of entire population of Satara regarding Bio Medical waste management and Disposal and various health hazards associated with it.

From the research conducted in Satara city through the site visits to Health Care establishments and supervision, inspection of record with Nature in Need and on discussion with doctors and support staff in health care establishments, it can be stated that Common Bio-medical Waste Treatment Facility (CBWTF) Nature in Need in Satara, plays an essential role in collection, transportation and the safe disposal of bio medical wastes at Songaon. Many health care establishments have clear policy with regard to removal of biomedical waste.

The majority of health care establishments in Satara city are following of Bio-medical Waste (Management and handing) Rules, 1998

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