

Indian Audit and Accounts Department



Case Study
on
“Bio-Medical Waste Management in West Bengal”

Report No. 1 of 2020, C&AG of India, Government of West Bengal.

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Courseware designed and prepared by: - Regional Training Institute, Jammu
Website: <https://rtijammu.cag.gov.in>

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From the Director General's Desk

The Regional Training Institute, Jammu established in 1989, caters to the training needs of 15 user offices. In pursuit of excellence in the assigned areas of training in respect of Audit and Accounts, the Institute focuses on the development of the knowledge and skills of IAAD officers by organizing trainings, workshops and seminars, besides bringing out a series of interesting case studies on frauds/deviation from rules and regulations etc. as reported and reflected in the Audit Reports of the Union Government/State Governments.

The case study on *Bio-Medical Waste Management in West Bengal* is based on Report No. **Report No. 1 of 2020, C&AG of India, Government of West Bengal.**

The case study is meant for use in imparting training to the officers of various audit offices of the IA&AD. We look forward to suggestions and feedback from our user offices.

Sd/-

Dr. Abhishek Gupta

Director General

RTI, Jammu

29th November, 2022

Section -I

Case Study for

Participants

INTRODUCTION

The case study is in the form of a fictional story that revolves around solving a problem. The core area of focus is taking a decision as to whether an audit observation would be sustainable and the leadership role and team deficiencies during an audit as seen from the perspective of a Senior Audit Officer. The purpose of the proposed case is to highlight shortcomings in preparedness of the State in respect of reducing vulnerabilities, health hazards in health and FW sector, and also to bring out the weaknesses in the functioning of institutional structures and processes as well as inadequate procedures for handling, treatment and disposal of Bio-Medical Waste (BMW) generated by hospitals, nursing homes, blood banks, veterinary institutions, *etc.*

The story is seen through the eyes of the lead characters, S/Sh. Sourav Guha, Senior Audit Officers, Sh. Ajeet Kumar and Sh. Abhirup Ghosh, Assistant Audit Officers, assisted by Sh. Pradyut Pal, Sr. Auditor.

Disclaimer: The case study has been designed as an occurrence taking place during A performance audit of Bio medical waste management with specific focus on vulnerability and health hazards in health and family welfare sector and is meant to provide a glimpse of the various technical aspects to be kept in mind during the performance audit on the activities of West Bengal Pollution Control Board (WBPCB), under the control of the Environment Department, Government of West Bengal (GoWB) for handling, treatment and disposal of Bio-Medical Waste (BMW) generated by hospitals, nursing homes, blood banks, veteran ary institutions, *etc.*

The case study is meant to foster an appreciation of the challenges that may be faced by officials in conducting such audits. This case study is only a guide to be used in training and should not be considered as being at par with audit reports or regulations or manuals or other instructions for audit.

BACKGROUND/CONTEXT

S/Sh. Sourav Guha, Senior Audit Officers, in-charge of a local audit parties had been assigned the responsibility of undertaking a Performance Audit (PA) of Bio Medical Waste Management with specific focus on vulnerability and health hazards in health and family welfare sector and to ascertain the activities of West Bengal Pollution Control Board (WBPCB), under the control of the Environment Department, Government of West Bengal (GoWB) for handling, treatment and disposal of Bio-Medical Waste (BMW) generated by hospitals, nursing homes, blood banks, veterinary institutions, *etc.* The audit parties also comprised of S/ Sh. Ajeet Kumar Ghosh and Yash Pal both experienced Assistant Audit Officers, assisted by Sh. Pradyut Pal, Sr. Auditors.

In compliance with the Performance Auditing guidelines, Sh. Soran Guha and his team had carried out a pilot study of West Bengal Pollution Control Board (WBPCB), under the control of the Environment Department, Government of West Bengal (GoWB) for handling, treatment and disposal of Bio-Medical Waste (BMW) generated by hospitals, nursing homes, blood banks, veterinary institutions, *etc.* to understand the auditee environment and the rules and regulations applicable to the entity. During the pilot study, the team had also carried out a risk analysis of the various activities undertaken by the auditee with reference to the set parameters of the entity.

Based on the pilot study, the audit team had identified the Audit Objectives with reference to the Waste Management activities/objectives of the entity. The Audit Criteria against which the performance of the entity was proposed to be evaluated and the proper evidence collection method to be followed was also determined. According to the PA guidelines, Shri Sourav Guha and his team had formulated the proposed Audit Design Matrix and submitted the same to the Principal Accountant General (Audit), for obtaining approval of the Headquarters office. Following the approval of the Audit Design Matrix, the scope of audit, the field audit programme and the audit methodology were decided.

An entry conference was held with and the audit entity on February 2018 with the Director Health and Family Welfare department and the audited entity was informed about the areas proposed to be audited along with the audit objectives, the audit approach and the time-frame within which the audit was expected to be carried out. Audit criteria/parameters/norms against which the performance audit was to be benchmarked were also discussed with the entity.

Now as per the approved audit programme and the Audit Design Matrix, the team had been directed to assess the performance of the Health Care Facilities Environment Department, WBPCB and H&FW Department. Besides, audit coverage was extended to Departments of Correctional Administration (CA), Home & Hill Affairs (H&HA) and Animal Resources Development. In addition, Common Bio-Medical Waste Treatment Facilities (CBMWTFs), compared to the criteria laid down in the following: -

- (i) Relevant provisions under Environment (Protection) Act, 1986;
- (ii) Provisions under Bio-Medical Waste (Management and Handling) Rules, 1998 and Bio-Medical Waste Management Rules, 2016;
- (iii) Guidelines issued by the Central Pollution Control Board (CPCB) for BMW management and **Guidelines for installation of CBWTF issued by CPCB.**
- (iv) Guidelines/ orders/ instructions issued by WBPCB; and
- (v) Orders/ circulars/ instructions issued by H& FW Department relating to management of BMW

To evaluate the prevailing management controls and administrative procedures connected with the Bio Medical Waste Management, the audit team commenced the field audit of six CBMWTF functioning in the state and selected 5 districts based on simple random sampling method in the State. Govt. HCFs in the five selected districts were selected based on bed strength. **Joint inspection was also done in 31 private HCFs randomly selected in five test checked districts by the audit team.** The Information and data was collected from Records of H&FW Department, Environment Department, WBPCB along with its Waste Management Cell (WMC) and Seven Circle Offices/ Regional Offices were scrutinized in audit. Besides, coverage was extended to Animal Resource Development (ARD) Department, Correctional Administration (CA) Department and Home & Hill Affairs (H&HA) Department as these Departments also operated HCFs and contributed to generation of BMW.

Following their examination of the records and the analysis of information collected during the audit, Sh. Sourav Guha and his teams came up with the following audit findings: -

MAIN STORY

Case- 1 Quantification of BMW and Assessment Risk

Authority	Mandate/Activity	Audit findings
WB Pollution Control Board	<p>Inventorisation of occupiers and data on bio-medical waste generation, treatment and disposal</p> <p>BMW generation was not assessed in the State.</p>	<p>1. WBPCB's inventory of BMW generating units was incomplete, It was observed that 48.32 <i>per cent</i> of the existing HCFs remained outside the inventory of the WBPCB</p> <p>2. In seven test-checked WBPCB Circle Offices (COs)/ Regional Offices (ROs), 97 per cent of the identified HCFs, did not submit Annual Reports during the period 2015-18.</p> <p>3. WBPCB was intentionally understating and manipulating the BMW generation figure to make it appear that all generated BMW was being treated before disposal.</p> <p>4. Non-lifting of BMW by CBMWTFs never reported by HCFs to WBPCB</p>
(CBMWTFs)	<p>(CBMWTFs) were set up in West Bengal between 2003 and 2015 and all HCFs in the State were required to hand over the BMW generated by each HCF to the CBMWTF catering for the area ensuring treatment and disposal by the CBMWTF.</p> <p>Analysing the gap between the requirement and availability of treatment facility and preparing Action Plan for setting up new</p>	<p>1. Gap between the requirement and availability of BMW treatment facilities was not analysed and as such there was no Action Plan for development of new CBMWTFs.</p> <p>2. No weighing machine to weigh the quantity of BMW generated was maintained by HCFs.</p> <p>3. CBMWTFs failed to comply with Central Pollution Control Board (CPCB) norms of distance and beds to be covered, to ensure waste disposal within 48 hours of generation. 3,037 Metric Tonne (MT) of BMW reported to have been collected by four out of</p>

	<p>CBMWTFs</p> <p>As per the prescribed method the blood samples, were to be handed over to CBMWTFs for incineration, after pre-treatment.</p> <p>The CBMWTF operator was to install online real time tracking and monitoring provision (GPS) in those vehicles and provide access to the State PCB for cross checking at any time.</p>	<p>six CBMWTFs was beyond the capacity of the installed incinerators</p> <p>4. Label for transporting Bio-Medical Waste or Containers Neither details (registration number, etc.) of any vehicle were registered with WBPCB, nor online access to monitor movement of vehicles through GPS was provided to WBPCB for Utilisation of vehicles for transportation of BMW by CBMW</p> <p>5. Autoclaves meant for disinfecting plastic, glasses and sharp waste was not in operation in four out of six CBMWTFs</p>
Director Health & Family Welfare	<p>Health and Family Welfare (H&FW) Department, GoWB is responsible for enforcing the Bio-Medical Waste Management Rules, 2016 in all Health Care Facilities (HCFs).</p> <p>As per the BMWM Rules 2016, no occupier shall establish on-site treatment and disposal facility,</p>	<p>1. Wrong segregation caused plastic BMW being irregularly burnt:</p> <p>Absence of red plastic bags for segregation of recyclable (plastic) BMW was noticed across the test-checked HCFs. In 24 of the 70 test-checked HCFs, there was no procurement of red bags during the period covered in audit. It was Autoclavable plastic BMW irregularly burnt leading to incineration of the plastic BMW. A highly toxic chemical called dioxin is emitted in harmful quantities due to burning of plastics which is carcinogenic and hormone disruptor for human health. The audit team had prepared a proforma for collection of data from various HCFs(*)</p> <p>2. Irregular burning and disposal in unauthorised burial pits</p> <p>3. Highly infectious wastes not pre-</p>

		<p>treated</p> <p>4. Un-treated liquid chemical wastes mixed with general effluents</p> <p>5. In seven test-checked WBPCB Circle Offices (COs)/ Regional Offices (ROs), 97 <i>per cent</i> of the identified HCFs, did not submit Annual Reports</p> <p>6. serious irregularities were observed by Audit in segregation of BMW in 52 (74.29 <i>per cent</i>) of the 70 test-checked HCFs.</p> <p>7. There was no separate collection system and no effluent treatment system in place for liquid chemical waste in 94.29 <i>per cent</i> test-checked HCFs</p> <p>8. Control and Monitoring mechanisms were not in place. Clinical Establishment licenses were issued to 390 HCFs without valid BMW authorisation.</p> <p>9. In spite of widespread violations of the Rules and Standards by the HCFs and the CBMWTFs across the State, no punitive action against the defaulters under Section 5 and Section 15 of Environment Protection Act, 1986 was found to have been taken by WBPCB to enforce compliance.</p>
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Thus, these observations clearly indicated that WBPCB did not establish a system or device a mechanism whereby it could establish linkages between Departments like H&FW, ARD, Correctional Administration, H&HA, *etc.* and integrate data for developing a dependable inventory of BMW generating units. It was observed that 48.32 *per cent* of the existing HCFs remained outside the inventory of the WBPCB. Inventorisation of occupiers and data on bio-medical waste generation, treatment and disposal of BMW generation was not assessed in the State as per BMW guidelines, 2016.

The table below indicates how the audit party assessed the risk factor for non disposal/treatment of the BMW in HCFs.

Category/ Type of Bag/ Container to be used	Type of waste	Treatment & disposal Options
Yellow Yellow coloured non-chlorinated Plastic bag	i) Human Anatomical waste Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of	
	Pregnancy Act 1971, amended from time to time).	
	ii) Animal Anatomical waste Experimental animal carcasses, body parts, organs, tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals or colleges or animal houses.	Incineration or plasma pyrolysis ³⁶ or deep burial ³⁷ .
	iii) Soiled waste Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components.	Incineration or Plasma Pyrolysis or deep burial. In absence of above facilities, autoclaving or micro-waving/ hydroclaving followed by shredding or mutilation or combination of sterilisation and shredding. Treated waste to be sent for energy recovery.
	iv) Expired/ discarded medicines Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials, etc.	Expired 'cytotoxic drugs and items contaminated with cytotoxic drugs to be returned back to the manufacturer or supplier for incineration at temperature >1200 °C or to common bio- medical waste treatment facility or hazardous waste treatment, storage and disposal facility for incineration at >1200°C or Encapsulation or Plasma Pyrolysis at >1200°C. All other discarded medicines shall be either sent back to manufacturer or disposed by incineration.
	v) Chemical waste Chemicals used in production of biological and used or discarded disinfectants.	Incineration or Plasma Pyrolysis or Encapsulation in hazardous waste treatment, storage and disposal facility.
	vi) Discarded linen, mattresses, beddings contaminated with blood or body fluid.	Non-chlorinated chemical disinfection followed by incineration or Plasma Pyrolysis or for energy recovery. In absence of above facilities, shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent for energy recovery or incineration or Plasma Pyrolysis.

Autoclave safe plastic bags or containers	vii) Microbiology, Bio-technology and other clinical laboratory waste Blood bags, Laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.	Pre-treatment to sterilize with non-chlorinated chemicals on-site as per National AIDS Control Organisation or World Health Organisation guidelines and thereafter for incineration.
Separate collection system leading to effluent treatment system	viii) Chemical liquid waste Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, Silver X-ray film developing liquid, discarded Formalin, infected secretions, aspirated body fluids, liquid from laboratories and floor washings, cleaning, house-keeping and disinfecting activities, etc.	After resource recovery, the chemical liquid waste to be pre-treated before mixing with other wastewater- combined discharge to conform to the discharge norms given in Schedule- III of BMWM Rules.
Red Red coloured non-chlorinated plastic bags or containers	Contaminated waste (Recyclable) Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and <i>fixed needle syringes</i>) and vacutainers with their needles cut and gloves.	Autoclaving or micro-waving/ hydroclaving followed by shredding or mutilation or combination of sterilization and shredding. Treated waste to be sent to registered or authorized recyclers or for energy recovery or plastics to diesel or fuel oil or for road making, whichever is possible. Plastic waste should not be sent to landfill sites.
White (Translucent) Puncture proof, Leak proof, tamper proof containers	Waste sharps including Metals Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps.	Autoclaving or Dry Heat Sterilization followed by shredding or mutilation or encapsulation in metal container or cement concrete; combination of shredding cum autoclaving; and sent for final disposal to iron foundries (having consent to operate from the State Pollution Control Boards or Pollution Control Committees) or sanitary landfill or designated concrete waste sharp pit.
Blue Cardboard boxes with blue coloured marking	i) Glassware Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes. ii) Metallic Body implants	Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling.

Source: Segregation Schedule I as per BMWM Rules, 2016

According to BMWM Rules, 2016, the responsibility of inventorisation of Occupiers and data on bio-medical waste generation, treatment and disposal vests with State Pollution Control Boards (SPCBs).

No punitive action against the defaulters under Section 5 and Section 15 of Environment Protection Act, 1986 was found to have been taken by WBPCB to enforce compliance.

Further, the Rules provide for constitution of a State Level Expert Committee for overall review and promotion of clean or new technologies for BMW management in West Bengal, which were found operational till date (April 2019). As a result, management of BMW in the State lacked co-ordination and holistic focus. There was no co-ordination mechanism for sharing of BMW information between WBPCB and H&FW Department. Also there was no formal mechanism in place for discussion with Urban Development and Municipal Affairs Department regarding implementation of BMWM Rules.

CONCLUSION

In the aforesaid context, trainees may discuss and analyze: -

- (1) Whether WBPCB did not establish a system or devise a mechanism whereby it could establish linkages between Departments and integrate data for developing a dependable inventory of BMW generating units?
- (2) Whether BMW generating units in the State remained outside the purview of WBPCB monitoring?
- (3) Whether responsibilities of the various functionaries involved in implementation at various levels of the organisational hierarchy either under the WBPCB or under various Departments, was fixed at any level of the organisational hierarchy?
- (4) Whether the WBPCB did not take requirement for its meetings seriously in view of the shortfall in meetings and subsequent non implementation of its vital decisions?
- (5) Whether the expert members should be drawn from the relevant fields such as pollution control board, Health and family welfare departments, environmental sciences, Public Health specialists, etc. for needs to be analyzed and discussed?
- (6) Participants may therefore focus on the implementation of the recommendations by the WHO in their discussion. Other issues that may be analyzed by participants include:
 - (7) Whether WBPCB ensured proper and timely lifting of BMW by CBMWTFs in view of the fact that rule 4(q) of BMW Rules, 2016 provide that every occupier shall inform the prescribed authority immediately in case the operator of the facility does not collect BMW within the intended time or as per the agreed time?
 - (8) Whether WBPCB ensured that the occupier were handing over the segregated BMW to operators in accordance with BMWM Rules, 2016?
 - (9) Whether WBPCB ensured timely submission of annual reports by all the occupiers or operators of CBMWTFs in view of the fact that rule 13(1) of BMWM Rules, 2016

provided that every occupier or operator of CBMWTFs shall submit an annual report to the prescribed authority in Form-IV, on or before the 30th June of every year?

(10) What prompted WBPCB to intentionally understate and manipulate BMW generation figure to make it appear that all generated BMW was being treated before disposal?

(11) What efforts were made by WBPCB to analyse the gap between the requirement and availability of BMW treatment as well as development of CBMWTFs?

(12) Whether WBPCB endeavored to ensure that the operator of CBMWTFs would transport BMW from the premises of an occupier to any off-site BMWTF only in the vehicles having label as provided in Part-A of Schedule-IV along with necessary information as specified in Part B of Schedule IV.

(13) How WBPCB ensured that the operators were autoclaving or microwaving the recyclables from the treated bio-medical wastes such as plastics and glass?

Case 2: Adequacy of Waste Treatment facilities

(A) CBMWTFs covered area beyond prescribed limit

Six Common Bio-Medical Waste Treatment Facilities (CBMWTFs) were set up in West Bengal between 2003 and 2015 and all HCFs in the State were required to hand over the BMW generated by each HCF to the CBMWTF catering for the area ensuring treatment and disposal by the CBMWTF. Though the quantity of BMW shown (by WBPCB and CBMWTFs) as generated/ treated in 2016 was only about 50 per cent of actual BMW generation in the State, coverage and capacity of the CBMWTFs when assessed in audit even with these understated figures, revealed the following:

CBMWTF was supposed to cater to maximum 10,000 beds of HCFs situated at a radial distance of maximum 150 km to ensure that the generated BMW could be collected, treated and disposed within 48 hours. The CBMWTFs, however, did not comply with the norms of CPCB in terms of distance covered and beds covered, to ensure waste disposal within 48 hours of generation. 3,037 Metric Tonne (MT) of BMW reported to have been collected by four out of six CBMWTFs was beyond the capacity of the installed incinerators.

(B) No internal bio-medical waste control system was set up in hospitals.

The hospitals were not in a position to determine the amount of BMW produced or control the flow of the waste. Assessment of quantity of BMW at source of generation

was deficient. It was found by the visiting audit team, that 39 HCFs (55.71 per cent) of the 70 test-checked HCFs, did not maintain the BMW Register for recording category and colour coding-wise quantity of BMW generated and collected by the CBMWTF. Moreover, in violation of the CPCB guidelines, none of the HCFs had any weighing machine to weigh the quantity of BMW generated. Only approximate weight of collected BMW as indicated by the CBMWTFs in their collection slips was recorded as BMW generation figure by the HCFs. Thus, even at the point of generation, the basic records did not capture the actual quantum of BMW generated.

(C) Poor status of storage of BMW materials at HCFs

Every Occupier was supposed to make a provision, as per BMW Rules, within the premises for a safe, ventilated and secured location for storage of segregated BMW for direct transportation from such place to the CBMWTF for appropriate treatment and disposal. Such storage was to be roofed, divided in compartments, having ramp, sloped tile flooring with provision for water supply, signboard and BMW logo. 36 of the 70 test-checked HCFs did not have separate storage places for BMW at all. Storage rooms as used in 24 HCFs were not as per specifications and were BMW stored with Municipal wastes indicating slack BMW management. In spite of having vacant storage facility, four HCFs out of 38 did not use the same for reasons not on record. In HCFs not having/using storage facility, BMW was found lying in the open at corner of wards, corridors and not in safe and secured condition. In 12 HCFs, BMW was found lying mixed with municipal waste (MW) in open or in municipal van.

(D) Deviation of storage norms at CBMWTFs As per the revised guidelines issued by Central Pollution Control Board (CPCB) for CBMWTFs based on BMW Rules 2016, every CBMWTF was also required to have a covered main storage room with partitions for different colour coded containers/ plastics of BMW collected from the HCFs. The front portion of the room was to be used for unloading wastes from the vehicles and back or side portion for shifting of wastes to respective treatment rooms. It was observed that three out of six CBMWTFs did not have any such storage room. Though there was main storage room in other three CBMWTFs, these were neither as per specifications nor being used by the operators. Further, all BMW was found heaped directly in the incinerator and/ or autoclave room without any segregation based on colour resulting in dumping of treated and un-treated wastes alongside. Wastes were also found stored even outside the incinerator room (Medicare, Belgachia) and scattered all around in the premises (Greenzen, Siliguri). Blood and body fluids were found leaching from the heaps of wastes and percolating to ground in many Health centers e.g. Medicare, Belgachia, Greentech and Mograhat.

(E) In-house transportation and feeding of BMW in violation of norms

None of the CBMWTFs were found to be using closed trolleys, instead BMW was brought to the incinerator/ autoclave by dragging in open drums. Moreover, none of the CBMWTFs, except WBWML Haldia, had installed any automatic feeding device for feeding of BMW into incinerators to avoid manual feeding. The process of manual feeding not only involved risk of leakage of hot flue gases and any backfire but also exposed the incinerator operator to the harmful furnace atmosphere. Conclusion: Segregation and storage of BMW before disposal, at HCFs and CBMWTFs which constitutes the first step towards efficient management of the BMW was grossly inadequate and irregular. Disposal of highly infectious blood samples was appalling, BMW was disposed with Municipal wastes, BMW was heaped directly in front of incinerators without colour segregation with blood and body fluid leaching from waste. Instead of managing the risk involved, the spectrum of risk increased manifold with huge quantum of non-hazardous solid waste getting contaminated by mixing infectious BMW with it. More alarming was exposing the health care workers and handlers of BMW to infection by not providing any protective gears to them and absence of health check-ups and immunisation.

Budget Allocation for Bio Medical Waste Management

As per Schedule 6III of the BMWM Rules, 2016, State Government of Health or Union Territory Government or Administration are required to allocate adequate funds to Government health care facilities for bio-medical waste management

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

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

The various budget heads under which the grant is awarded from the Centre can be;

- Training Heads
- Resources needed for BMW Management
- Request for Proposal (RFP) for contracting with CBWTF

Such budget must include action plan for;

- Logistics: Bins, bags, puncture proof containers, PPEs, trolleys, needle cutters, pre-treatment equipment, bar-code labels and

chemicals

- Outsourcing: Waste Collection and Personnel
- Training
- IEC/Patient Education: Posters, Pamphlets

CONCLUSION

In the aforesaid context, trainees may discuss and analyse: -

- (1) Reasons why management of BMW in the State lacked co-ordination and holistic focus? Why there was no co-ordination mechanism for sharing of BMW information between WBPCB and H&FW Department?
- (2) Why there was no formal mechanism in place for discussion with Urban development and Municipal Affairs Department regarding implementation of BMWM Rules?
- (3) To motivate the desired behavior among waste generators, economic incentives ought to be used, such as tax-exemptions, lower license fee for fully compliant operations, etc. how the efficient use of resources and the limited generation of waste can be adopted?
- (4) The H&FW Department was supposed to issue licenses to the private HCFs with a condition to obtain authorisation from the WBPCB for BMW Management, whether the conditions for issue of licenses were fulfilled?
- (5) Whether attempt by WBPCB to enforce rule to establish connectivity for ensuring real time monitoring of HCFs was found on record?
- (6) Under what circumstances, WBPCB did not ensure compliance of CPCB guidelines regarding availability of covered main storage room with partitions for different colour coded containers/ plastics of BMW collected from the health care facilities (HOFs)?
- (7) Whether WBPCB endeavored to ensure the compliance of CPCB guidelines, which prescribed that a CBWMTF would cater to maximum 10,000 beds of HCFs situated at a radial distance of maximum 150 Km so that the generated BWM could be collected, treated and disposed within forty-eight hours?

Case 3:- Lack of Protective gears:

Every BMW generator was to ensure occupational safety of staff handling BMW by providing appropriate and adequate personal protective equipment. Audit Findings show that 34 of 39 test-checked HCFs had never done health check-up, out of 5,646 staff who handled BMW, 31 of the 39 test-checked HCFs had never taken up immunisation programme for 5,115 staff handling BMW. Store records of the 39 test-checked

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Government HCFs showed that 27 HCFs did not have any stock of Personal Protective Equipment (PPE) like heavy duty gloves, masks, gumboot, etc., for the staff handling potentially infectious wastes. No procurement was also made of such PPEs during the period covered in audit. As such, the health care workers and others involved in handling of bio-medical waste were being exposed to infectious environment without immunisation, health check-up and protective gear.

(1) Appalling disposal of highly infectious blood samples

Highly infectious blood samples are to be segregated in Autoclave safe plastic bags or containers to be pre-treated to sterilize with non-chlorinated chemicals on-site as per National AIDS Control Organisation or World Health Organisation guidelines and then given to the common bio-medical waste treatment and disposal facility. On the contrary they were found strewn around and scattered on the premises in North Bengal Medical College Hospital. It was irregularly Appalling disposal of highly infectious blood samples, segregated in red plastic (meant for autoclavable waste) in Imambara Hospital, Hooghly. As per the prescribed method the blood samples, were to be handed over to CBMWTFs for incineration, after pre-treatment. Hence, it needed to be segregated in Yellow bag meant for incineration by CBMWTFs. Segregation in Red bags would cause Autoclaving again of the same blood samples by CBMWTFs instead of incineration.

(2) BMW disposed with Municipal wastes

The BMW Rules 2016 specifically states that Occupiers are not to give treated bio-medical waste with municipal solid waste and no untreated bio-medical waste shall be mixed disposed with Municipal waste and other wastes. BMWs were found to have been gathered in black bags meant for municipal wastes or in buckets/ cardboard boxes with no colour coding. This resulted in disposal of BMW along with municipal wastes potentially contaminating the entire quantity of municipal solid waste with adverse effect to human health and the environment.

(3) Autoclavable plastic BMW irregularly burnt

Wrong segregation caused plastic BMW being irregularly burnt:

Absence of red plastic bags for segregation of recyclable (plastic) BMW was noticed across the test-checked HCFs. In 24 of the 70 test-checked HCFs there was no procurement of red bags during the period covered in audit. It was Autoclavable plastic BMW irregularly burnt audit observed that yellow plastic bags were used to collect the plastic BMW, leading to incineration of the plastic BMW. A highly toxic chemical called dioxin is emitted in harmful quantities due to burning of plastics which is carcinogenic and hormone disruptor for human health.

(4) Unauthorised selling of un-treated saline bottles Plastic saline bottles were found segregated from BMW. Bottles were segregated and packed for transportation for unauthorised sale and not for handing over to the CBMWTF. Saline bottles were prone to carry infection after coming in contact with patients. Un-treated recycling carried risk of contamination. Hence, improper segregation not only resulted in inappropriate treatment of BMW but also caused emission of additional pollutants to environment by incineration of inappropriate waste.

(5) Awareness camps/ trainings not conducted for the stakeholders.

BMWM Rules, 2016 specifically entrusted WBPCB with the responsibility of conducting training in co-ordination with the H&FW Department for staff of health care facilities (HCFs), municipal workers, common bio-medical waste treatment facilities (CBMWTFs) and State Pollution Control Boards (SPCBs) for ensuring compliance with the various provisions of handling, segregation, collection, storage, transportation, treatment and disposal of BMW as specified in the Rules. WBPCB attributed (October 2016) the poor compliance to the Rules to lack of awareness amongst various stakeholders.

(6) Autoclaves meant for disinfecting plastic, glasses and sharp waste was not in operation in four out of six CBMWTFs All recyclable BMWs like plastics, glasses and sharps were to be disinfected by autoclaving or micro-waving/ hydroclaving at prescribed temperature and pressure followed by shredding or mutilation or combination of sterilisation and shredding before they are sold to an authorised recycler/ iron foundries by a CBMWTF. Waste sharps, if not recycled, were to be encapsulated in metal or concrete container and sent to landfill or designated waste sharp pit. Plastics were to be sent for energy recovery of plastics to diesel or fuel oil or for road making, whichever is possible. Plastic waste was not to be sent to landfill sites. Joint inspection along with WBPCB representative revealed that the autoclaves in four out of six CBMWTFs were not in operation. In WBWML, Haldia, the autoclave was never used as all BMW was incinerated.

(7) Occupational safety of health care workers handling BMW compromised The status of health check-up, immunization and provisioning of personal protective equipment for health care workers and others handling BMW in the test-checked HCFs was poor

Provisions as per Rule

Health Check-up: Every BMW generator was required to conduct health check-up of all its health care workers and others involved in handling of BMW at the time of induction and at least once in every year

Immunisation: Immunise all its health care workers and others, involved in handling of bio-medical waste for protection against diseases including Hepatitis B and Tetanus

Protective gears: Every BMW generator was to ensure occupational safety of staff handling BMW by providing appropriate and adequate personal protective equipments.

Audit Findings 34 of 39 test-checked HCFs had never done health check-up, out of 5,646 staff who handled BMW, 31 of the 39 test-checked HCFs had never taken up immunisation programme for 5,115 staff handling BMW, Store records of the 39 test-checked Government HCFs showed that 27 HCFs did not have any stock of Personal Protective Equipment (PPE) like heavy duty gloves, masks, gumboot, etc., for the staff handling potentially infectious wastes. No procurement was also made of such PPEs during the period covered in audit.

As such, the health care workers and others involved in handling of bio-medical waste were being exposed to infectious environment without immunisation, health check-up and protective gear.

CONCLUSION

In the aforesaid context, trainees may discuss and analyze: -

- (1) Whether WBPCB should ensure strict adherence by the CBMWTFs to the provisions of the Rules and CPCB guidelines by fully implementing the GPS tracking and monitoring of BMW carrying vehicles.
- (2) Whether Sub-optimal performance of the test-checked CBMWTFs in treating incinerable wastes coupled with high percentage of failed quality tests of emissions (43 per cent) was alarming, as this indicated release of pollutants in atmosphere at higher than the permissible level.
- (3) Whether every operator of a CBMWTF was maintaining a log book for each of its treatment equipment recording therein weight of batch, categories of waste treated, time, date and duration of treatment cycle and total hours of operation, whether each HCF maintained log books for incinerators or for autoclaves as per prescribed format, to ascertain actual period of operation of the equipment, with quantity of wastes treated.
- (4) Participants should also discuss steps to be taken for strict compliance on the part of the common treatment facilities by ensuring immediate connectivity of on-line monitoring systems of flue gas emissions, movement of BMW carrying vehicles, etc., WBPCB may consider enforcement of various provisions of Environment (Protection) Act, imposing fines so that non-compliance of the rules becomes economically unviable for both the Occupiers and Operators.

(5) Whether WBPCB organized adequate training programmes to staff of HCFs and CBMWTFs as well as its own staff on segregation, collection, storage, transportation, treatment and disposal of BMWs?

Case 4: Control and Monitoring Mechanism

1. Non-prioritisation of prevention and minimization of waste strategies

BMWM Rules, 2016 mainly stipulated guidelines for treatment and disposal of BMW. Prevention and minimisation of BMW generation over treatment and disposal of BMW as priorities remained unaddressed in the State in the absence of specific legislation and/or due to non-formulation of any policy on prevention and minimisation. Further, the Rules provide for constitution of a State Level Expert Committee for overall review and promotion of clean or new technologies for BMW management. Formation of such a Committee has not been operationalised till date (April 2019). As a result, management of BMW in the State lacked co-ordination and holistic focus. There was no co-ordination mechanism for sharing of BMW information between WBPCB and H&FW Department. Also there was no formal mechanism in place for discussion with Urban Development and Municipal Affairs Department regarding implementation of BMWM Rules.

2. Monitoring mechanism not followed by H&FW Department - Majority of HCFs running without valid authorization

Authorization:- As per BMWM Rules, 2016, every hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank, health care facility and

clinical establishment, irrespective of their system of medicine and by whatever name they are called are required to obtain authorization from the prescribed authority i.e. State Pollution Control Board / Pollution Control Committee, as the case may be. Validity of authorization in case of bedded health care facilities will be synchronized with the validity of the consents. Armed Forces Healthcare Establishments shall obtain authorization from DGAFMS.

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

Authorization under Bio-Medical Waste Management Rules, 2016

Procedure for Authorization

In charge of the health care facility needs to apply to the respective State Pollution Control Board (SPCB) in respect of States or Pollution Control Committees (PCC) in respect of Union Territories for fresh or renewal

of authorization, for the activities being carried out in handling of Bio Medical Waste Management by the health care facility.

Application

Application must be submitted to the respective SPCB/PCC for fresh or renewal of authorization in prescribed format as per Form II as prescribed under Bio Medical Waste Management Rules, 2016 given at Annexure 3.

Information requirements of Application

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

Grant of Authorization

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

Validity of Authorization

(a) For bedded Healthcare Facilities

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

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

(b) For non-bedded Healthcare Facilities

One-time authorization is required to be obtained from respective SPCBs/PCCs in case of non-bedded health care facilities such as clinic, dispensary, veterinary institution, animal house, pathological

laboratory, blood bank, etc. These HCFs have to apply for a fresh authorization to amend earlier authorisation in case there is any change or variance in relation to the activities of HCF.

Authorization for non-bedded HCFs shall be deemed to have been granted, if not objected by the prescribed authority within a period of ninety days from the date of receipt of duly completed application along with such necessary documents.

During Audit it was established that Clinical Establishment licenses issued to 390 HCFs without valid BMW authorization. The H&FW Department was supposed to issue licenses to the private HCFs with a condition to obtain authorisation from the WBPCB for BMW Management. Review of the Clinical Establishment (CE) Registry of H&FW Department showed that CE licenses of 390 HCFs were issued/ renewed in four test-checked districts 55, without valid authorisation. Further, no instance of cancellation of CE license on grounds of not having valid authorisation was noticed.

Under test-checked WBPCB Regional Offices and Circle Offices jurisdiction, 74.88 per cent of 4,164 HCFs were operating without valid authorisation.

Every Occupier and Operator handling bio-medical waste was to apply to the WBPCB for grant of authorisation for BMW management. The WBPCB was supposed to issue provisional Bio-Medical Waste authorisation (BMA) upon verification of the capacity of the HCF or Operator in terms of infrastructure required for appropriate handling. For all bedded-HCFs, the authorisation was also to be renewed from time to time following the same procedure. WBPCB, in its Annual Report for 2016, showed that only 49 out of 5,537 HCFs did not have valid authorisation. The position was, however, factually incorrect as audit scrutiny of records of test-checked WBPCB Regional Offices and Circle Offices showed that as many as 3,118 (74.88 per cent) out of 4,164 HCFs, which were operating did not have valid authorization.

Under test-checked WBPCB Regional Offices and Circle Offices jurisdiction, 74.88 per cent of 4,164 HCFs were operating without valid authorization

3. Non-formation of Monitoring Committees

As per BMW Rules, 2016 committee was to be formed under the chairmanship of the respective health secretary. The Advisory Committee shall include representatives from the Departments of Health, Environment, Urban Development, Animal Husbandry and Veterinary Sciences of that State Government, State Pollution Control Board, Urban Local Bodies, Municipal Corporation, representatives from Indian Medical Association, common bio-medical waste treatment facility and non-governmental organization. Monitoring of the implementation of Rules by the Committee at State level and district

level was inadequate. BMWM Rules, 2016 also stipulated formation of the District Level Monitoring Committee (DLMC) under chairmanship of District Magistrate to monitor implementation of the provisions of the Rules by the HCFs and the Common BMW Treatment Facilities in the district. The DLMC was required to report at least once in six months to the SLAC which in turn was required to conduct review meeting for taking further necessary action. It was observed in audit that an Advisory Committee, constituted by Environment Department in March 1999 and reconstituted in June 2002, met only once in July 2002 and thereafter remained defunct. The H&FW Department constituted the SLAC, in December 2017, which held two meetings in January 2018 and September 2018. A representative from the Urban Development and Municipal Affairs (UD&MA) Department was also included in the SLAC. It was, however, noted that neither was the role of UD&MA Department defined with reference to BMW Management Rules nor was the issue raised of mixing of BMW with Municipal solid waste that was found in large scale across the State. DLMCs were formed in 18 out of 23 districts (between December 2017 and January 2018) and first meeting was held in nine districts, so far. Besides the above, WBPCB, on the recommendation of the Standing Committee on Environment, Forests and Tourism, West Bengal Legislative Assembly, formed a Monitoring Committee in 2007 to oversee proper implementation of the Rules in Government Hospitals. The Committee was to meet quarterly. Against normative requirement of 20 meetings during 2013 to 2018, the Committee met only thrice (once in 2013 and twice in 2015) during 2013 and 2018. WBPCB/ Department of Health & Family Welfare, however, did not act upon the directions of the Committee for better management of BMW.

5. Supervision and monitoring by the BMW Committees in HCFs found inadequate.

As per BMWM Rules 2016, every BMW generator was supposed to establish a monitoring committee, which was to meet in every six months. The record of the minutes of the meetings of this committee along with the annual report was required to be uploaded to WBPCB. The healthcare establishments having less than 30 beds were required to designate a qualified person to review and monitor the activities relating to bio-medical waste management within that establishment and submit the annual report. Out of the 39 test-checked Government HCFs, however, 16 HCFs did not form any committee to monitor and oversee the management of BMW. Though committees existed, 12 HCFs could not furnish any records regarding convening of meetings and minutes thereof. The remaining 11 HCFs though convened a few meetings no deliverable milestones were achieved. Moreover, minutes of none of the 70 test-checked (including 31 private units) HCFs were uploaded with the Annual Reports of WBPCB. This indicated absence of an effective and adequate internal control mechanism to manage BMW.

6. Lack of monitoring by Central Pollution Control Board: The Central Pollution Control Board (CPCB) acted as the nodal authority to oversee implementation of the BMWM Rules across the country. WBPCB was required to compile, review and analyse the information received in the Annual Reports by 30 June every year from all the Occupiers and Operators in the State and send this information to the Central Pollution Control Board on or before the 31st July of every year. The Annual Reports were also to be available online on the websites of Occupiers, State Pollution Control Boards and Central Pollution Control Board. The CPCB was to compile, review and analyse the information received and send this information, along with its comments or suggestions or observations to the Ministry of Environment, Forest and Climate Change on or before 31st August every year. The BMW data with regard to West Bengal hosted on the website of CPCB, however, contained various anomalies impacting on its reliability and highlighted monitoring failure on the part of CPCB.

Legal Actions that can be taken against HCFs for violation of the provisions of the Directions under Section 5 of The Environment (P) Act, 1986 as follows;

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

Legal Actions for violation of the provisions under Section 15 of The Environment (P) Act, 1986 includes:

- Imprisonment up to five years or fine up to one lakh rupees for each failure or contravention of the Rules or both;
- In case of violation continues, additional fine which may extend to five thousand rupees for every day of violation;
- If the contravention continues beyond a period of one year after the first date of contravention, the offender shall be punishable with imprisonment for term which may extend to seven years (as may be decided by Honorable Courts).

CONCLUSION

In the aforesaid context, trainees may discuss and analyse: -

- (1) Whether management of BMW in the State lacked co-ordination and holistic focus. There was no co-ordination mechanism for sharing of BMW information between WBPCB and H&FW Department.
- (2) What formal mechanism could be adopted regarding implementation of BMWM rules with Urban Development and Municipal Affairs Department?

(3) Whether all producers of waste are legally and financially responsible for the safe and environmentally sound disposal of the waste they produce. What principle should be adopted to assign liability to the party that causes damage to the environment and health of handlers of BMW?

(4) Whether WBPCB ensured receipt of reports from the District Level Monitoring Committees once in six months for taking further necessary action as per rule 12(5) of BMWM Rules, 2016?

(5) Whether WBPCB ensured receipt of minutes of meetings of committees formed by the occupiers once in six months as per rule 4(r) of BMW Rules, 2016?

Case 5: Manpower and Accountability

1. Lack of human resource

WBPCB had staff shortage in excess of the normal average of 25 per cent. The vacancy in the cadre of Junior Environment Engineer (JEE) was as high as 92.86 per cent and in that of Assistant Environment Engineer (AEE) it was 45.28 per cent.

2. Lack of legal action by WBPCB against defaulters

As per Rule 18 of BMWM Rules, the Occupiers or Operators of common bio-medical waste treatment facilities are liable for all the damages caused to the environment or public due to improper handling of BMW. WBPCB was supposed to take legal action against the defaulters under Section 5 and Section 15 of Environment Protection Act, 1986 and Issue directions under Section 5 for closure, prohibition or regulation of any operation or process, supply of electricity or water, and any other service and Arrange punishment through court of law under Section 15 as imprisonment up to five years or fine up to Rs. one lakh or both. In spite of widespread violations of the Rules and Standards by the HCFs and the CBMWTFs across the State, no punitive actions, as mentioned above, were found to have been taken by WBPCB to enforce compliance. The numbers of hearings held and directions issued by WBPCB during 2013-14 to 2017-18 with respect to the HCFs and CBMWTFs were meagred. Closure notices to HCFs were issued for operating without consent and/ or authorisation of WBCPB, irregular segregation, etc. only in four case of which three were subsequently revoked.

3. Responsibility and accountability of various agencies/ functionaries

Successful enforcement of any rules like Bio-Medical Wastes Management Rules depends on the clarity of the accountability regime of the functionaries involved in

implementation. The BMW Management Rules, 2016 elaborated on duties and responsibilities of various organisations like GoI Ministry of Environment and Forest, Central and State PCBs, various State Government Departments, etc. The State Government/ WBPCB, however, did not issue any order further delineating the duties and responsibilities at various levels of the organisational hierarchy either under the WBPCB or under various Departments. Despite gross and widespread irregularities and violations of BMW Rules 2016, no responsibility was fixed at any level of the organisational hierarchy in the absence of orders clearly delineating the duties and responsibilities of the various functionaries.

CONCLUSION

In the aforesaid context, trainees may discuss and analyse: -

- (1) Duties and responsibilities at various levels of the organisational hierarchy so that accountability can be fixed and rules enforced.
- (2) In spite of widespread violations of the Rules and Standards by the HCFs and the CBMWTFs across the State, what punitive actions, were found to have been taken by WBPCB to enforce compliance.
- (3) What efforts were made by WBPCB to make the shortage of staff good to ensure implementation of provisions of BMWM Rules, 2016?

SECTION- II
Teaching Notes
Learning Objectives
Etc.

Synopsis

Bio-Medical waste is a form of hazardous waste because it contains properties which render them hazardous. As per the Bio-Medical Waste Management Rules, 2016 (BMWM Rules) the term "Bio-Medical Waste" (BMW) means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or research activities pertaining thereto or in the production or testing of biologicals or in health camps, including the categories mentioned in Schedule I25 appended to the BMWM Rules, 2016.

According to the World Health Organisation, health care services in pursuing their aims of reducing health problems and eliminating potential risks to people's health, inevitably create waste that may itself be hazardous to health. The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste. Inadequate and inappropriate handling of health-care waste may have serious public health consequences and a significant impact on the environment. Sound management of health-care waste is thus a crucial component of environmental health protection. With the objective of providing a regulatory framework for management of bio-medical waste (BMW) generated in the country the Ministry of Environment and Forests, Government of India (GoI) framed (July 1998) the Bio-Medical Waste (Management and Handling) Rules, 1998 under the Environment (Protection) Act, 1986. Thereafter, GoI reviewed these rules and with the objective of implementing these rules more effectively, to improve the collection, segregation, processing, treatment and disposal of these bio-medical wastes in an environmentally sound management thereby, reducing the bio-medical waste generation and its impact on the environment, framed a more comprehensive set of Rules in supersession of the existing rules called Bio-Medical Waste Management Rules, 2016. (BMWM Rules) in March 2016. These Rules prescribe the procedures for handling, treatment and disposal of Bio-Medical Waste (BMW) generated by hospitals, nursing homes, blood banks, veterinary institutions, etc. In the State of West Bengal, the West Bengal Pollution Control Board (WBPCB), under the

control of the Environment Department, Government of West Bengal (GoWB), is the Authority prescribed to enforce provisions of the BMW Rules. The Health and Family Welfare (H&FW) Department, Government of WB is responsible for enforcing the Rules in all Health Care Facilities (HCFs). The responsibility in respect of BMW generated from veterinary HCFs lies with the Animal Resources Development (ARD) Department. The Audit on Bio-Medical Waste Management covered a period of five years from April 2013 to March 2018, through examination of records of the Environment Department, WBPCB and H&FW Department. Besides, audit coverage was extended to Departments of Correctional Administration (CA), Home & Hill Affairs (H&HA) and Animal Resources Development. In addition, Common Bio-Medical Waste Treatment Facilities (CBMWTFs) were also covered in audit.

Teaching And Learning Objectives

The objectives of this case study are to enable the participants to identify whether: -

- Quantum of waste being generated in the State had been assessed and risks to environment and health posed by BMW identified;
- Treatment and disposal facilities were adequate in the State;
- Stake holders were sensitised and awareness created among Occupiers, Operators and handlers of BM
- Effective compliance to Rules by the Occupiers and Operators of the Common Bio-Medical Waste Treatment Facilities (CBMWTFs) was taking place in the State;
- Monitoring was effective in checking compliances; and
- Man-power was adequate and accountability determined.

Target Audience

This case study is meant for use in trainings relating to Performance Audit to be conducted for Group A (Non IA&AS) and Group B officers.

Relevant Readings

- (i) Relevant provisions under Environment (Protection) Act, 1986;
- (ii) Provisions under Bio-Medical Waste (Management and Handling) Rules, 1998 and Bio-Medical Waste Management Rules, 2016;

- (iii) Guidelines issued by the Central Pollution Control Board (CPCB) for BMW management;
- (iv) Guidelines/ orders/ instructions issued by WBPCB; and
- (v) Orders/ circulars/ instructions issued by H& FW Department relating to management of BMW.
- (vi) Performance Audit Report on Bio-Medical Waste Management in West Bengal

SECTION- III

Assignment Questions

Teaching Plan

Takeaway responses

Etc.

Assignment Questions

The class may be divided into small groups. The case study document may be given to them. After they read the case study, the groups may be requested to go through the issues pointed out and identify possible solutions. After the groups have identified solutions, the issues may be discussed in the class. Some points for analysis are: -

For case 1:-

- *How can we say that WBPCB was intentionally understating and manipulating the BMW generation figure to make it appear that all generated BMW was being treated before disposal?*
- *What, in your opinion, could be the results of non-updating of WBPCB's inventory of BMW generating units?*
- *Can we conclude that assessment of quantity of BMW at source of generation was deficient.? Try to elaborate*
- *Recommend the mechanism to be adopted by WBPCB to ensure that the operators do autoclaving or microwaving the recyclables from the treated bio-medical wastes such as plastics and glass.*
- *Chalk out the strategy to be adopted by WBPCB to ensure that CBMWTFs transport BMW from the premises of an occupier to any off-site BMWTF only in the vehicles having label as provided in BMW Rules, 2016.*

For case 2:-

- *Can we recommend the measures that were required to be taken by the WBPCB to minimize the risk of health hazards? Discuss*
- *How we can conclude that gap analysis between the requirement and availability of treatment facility and preparing Action Plan for setting up new CBMWTFs was inadequate?*
- *Suggest ways to ensure compliance of CPCB guidelines regarding availability of covered main storage room with partitions for different colour coded containers/plastics of BMW collected from HCFs.*
- *Enumerate all possible methods to ensure compliance of CPCB guidelines, which prescribed that a CBMWTF would cater to maximum 10,000 beds of HCFs situated at a radial distance of maximum 150 km so that the generated BWM is collected, treated and disposed within forty-eight hours.*

For case 3:-

- *Can we say, the health care workers and others involved in handling of bio-medical waste were being exposed to infectious environment without immunisation, health check-up and protective gear? Discuss*
- *Discuss how monitoring of implementation of rules by the committee at state level and district level was inadequate, and discuss the possible solutions which could have been adopted to protect the handlers of BMW.*
- *How can effective training programmes be chalked out to train staff of HCFs, CBMWTFs and WBPCB on segregation, collection, storage, transportation, treatment and disposal of BMWs?*

For case 4:-

- *Discuss how management of BMW in the State lacked co-ordination and holistic focus. There was no co-ordination mechanism for sharing of BMW information between WBPCB and H&FW Department.*
- *Discuss the failure of WBPCB for grant of authorisation for BMW management. The WBPCB was supposed to issue provisional Bio-Medical Waste authorisation (BMA) upon verification of the capacity of the HCF or Operator in terms of infrastructure required for appropriate handling.*
- *Enumerate steps to be taken by WBPCB for timely reporting from the District Level Monitoring Committees and Committees formed by the occupiers.*

For case 5:-

- *Discuss how WBPCB was supposed to take legal action against the defaulters under Section 5 and Section 15 of Environment Protection Act, 1986 and Issue directions under Section 5 for closure, prohibition or regulation of any operation or process, supply of electricity or water, and any other service and Arrange punishment through court of law under Section 15 as imprisonment up to five years or fine up to Rs. one lakh or both.*
- *Can we say that in spite of widespread violations of the Rules and Standards by the HCFs and the CBMWTFs across the State, no punitive actions, were found to have been taken by WBPCB to enforce compliance?*
- *Discuss the numbers of hearings held and directions issued by WBPCB during the period under audit with respect to the HCFs and CBMWTFs and closure notices to HCFs issued for operating without consent.*
- *Suggest ways for fulfilling manpower requirements as well as ideal utilization of manpower available with WBPCB.*

Teaching Plan

The participants may be organized into groups of 4-5 members each.

Individual Reading Time:	20 minutes
Group Discussion Time:	20 minutes
Discussion in the plenary: 10 minutes for each group + 10 minutes for other groups to respond: 20 minutes per group x (say) 4 groups:	80 minutes
Summing up and recounting of similar observations by faculty:	20 minutes
Time for final summing up by groups:	10 minutes
Total	150 minutes

Suggested/possible answers to assignment questions

While reading and discussing the above cases in case study, participants may discuss or share their experiences and knowledge of the area of and similar instances seen in audit.

Question 1

- Some participants may hold the view that since the Rules were prepared by the Ministry of Environment, we cannot say that WBPCB had failed in monitoring and control mechanism to identify the risk caused by BMW generating units in the state, measures required for disposal and treatment of BMW and the roles and responsibilities of various departments in implementing the rules and regulations laid down under Rules? Here the facilitator would refer to the audit criteria clarifying that WBPCB had to issue BIO Medical waste authorisation upon verification of the capacity of HCF or Operator in terms of infrastructure required for appropriate handling of BMW. Besides, he may also bring out the fact that as many as 74.88% HCFs were operating without valid authorization which resulted in less effective Institutional control.
- The participants may discuss the non-compliance of the laid down procedures and standards in treatment of BMW due to overburdened staff and inadequate facilities in the Health care sectors of the state. Some participants may take an alternative view with reference to audit criteria that coordination and monitoring of the National/State policy and the respective National/State and District level plans was affected by non-preparation/non- updating data by various agencies. This could generate an interesting discussion between groups.

Question 2

- Participants may discuss the system of dissemination and sharing of data relating to generation of BMW and vulnerable areas with the line departments and other organisations/ stakeholders. Some of the participants may suggest that a survey should be conducted in such cases amongst common people (with the available data) to know their views about possible preventive measures that may minimize risk to life and environment in the state.
- Participants may be made to discuss in a group about the absence of research on risk to environment and health posed by BMW generation in the state.

Question 3

- Participants may discuss the audit conclusion that non-compliance with certain

prescribed requirements resulted in less effective institutional control. Some of the participants may question the conclusion by putting forth an alternative view that in spite of the violation of the rules by the HCF across the state no punitive action against the defaulters has been taken as per environment Act 1986 by WBPCB to enforce compliance.

Here the facilitator may like to intervene and tell the participants that WBPCB did not establish a system or device mechanism to establish linkage between departments like H&FW, Correctional Administration ARD, H&HA etc.

- The participants may discuss the observation relating to lack of serious efforts by the Government towards ensuring disposal and treatment of bio-medical waste generation in the state as per BMW Rules,2016.
- Participants may be involved in a discussion relating to the observation on responsibility of State Pollution Control Board for inventorisation of occupiers and data on bio-medical waste generation, treatment and disposal which resulted in non- assessment of BMW generation in the state. Further possible suggestions on manpower audit may be invited from the participants

Question 4

- Participants can have a thread bare discussion on audit observations relating to the amount of assessment of quantity of BMW at source of generation and maintenance of records for category and colour coding wise quantity of BMW generated in HCF, amount of BMW produced and controlling the flow of waste generated.
- Participants may be asked to discuss the observation on ineffective enforcement of regulations that in turn, enabled poor status of storage of BMW materials at HCFs unauthorized storage of unsegregated BMW within the premises exposing the health care workers and BMW handlers to infections and health hazards.
- Facilitator may discuss the failure of the agencies lacking in co-ordination and holistic focus in providing formal mechanism and issue of licenses to HCF with conditions to be fulfilled for running of hospitals.

Question 5

- Participants can discuss the observation relating to lack of awareness camps /trainings conducted for the stakeholders by WBPCB in co-ordination with the H&FW department for ensuring compliance with the various provisions of handling, segregation, collection, storage, transportation treatment and disposal

of BMW as per rules. Some participants may try to put forth a view that lack of infrastructure be linked to examination of budget proposals and projection of funds.

- Participants can discuss the possible ways of prevention and minimisation of Bio Medical waste produced and strategies that can be adopted by the state for disposal and treatment of BMW. The policies that can be framed by the state for prevention and minimisation of BMW by enforcement of certain laws and imposing of fines for breaking of Rules by HCFs.

Summing Up

While summing up, the trainers should mention that the case is based on Report No. 1of 2020, C&AG of India, Government of West Bengal.