PRE-FEASIBILITY REPORT

FOR

ENVIRONMENTAL CLEARANCE

(Category "B" under Schedule 7(da) of EIA Notification dated 14.09.2006 and it's Subsequent Amendments)

PROPOSED COMMON BIO-MEDICAL WASTE TREATMENT FACILITY

BY M/s INDO TECH WASTE SOLUTION

LOCATION: - KHASRA NO-1161 AT VILLAGE- KUMROUA, BLOCK- SARON, TEHSIL & DISTRICT- KASGANJ, UTTAR PRADESH

TOTAL PROJECT COST: - 1.72 CRORES,

PLANT AREA: - 0.408 HECTARE (4081 Sq. M.),

APPLICANT NAME

M/s. INDO TECH WASTE SOLUTION

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NABET Approved EIA Consultant Organization; (S.No.-173 as per list dated June, 2020) (NABET Certificate No: NABET/EIA/1821/SA103;	**Wolkem India Limited** (Consultancy Division) E- 101-102, Mewar Industrial Area, Madri, Udaipur – 313003 (Rajasthan) Phone No. 0294-2494600-2 Fax: 0294-2494608 E-mail - om.shukla@wolkem.com	NABL Accredited Environmental & Chemical Laboratory & Recognized by MoEF&CC, GOI, New Delhi

Feb 2021

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PRE-FEASIBILITY REPORT

Proposed Common Bio-Medical Waste Treatment Facility at Village- Kumroua, Block-Saron, Tehsil & District- Kasganj Uttar Pradesh

1. Executive Summary

Rapid growth in population, severe environmental degradation and increased awareness about the health care has created a need for a wide variety of medical facilities. Medical care is vital for our life and health, but the Bio-Medical Wastes generated from medical activities and the hospitals represents a real problem of living nature and human world and that are incompatible with the environment.

The concept of Common Bio-Medical Waste Treatment Facility not only addresses these problems but also prevents scattering of treatment equipment in the city/ area. Moreover, monitoring of these facilities is much easier rather than scattered captive Bio-Medical Waste Treatment Facility and one can be ensured of cleaner and safer environment.

The objective for the proposed project is to

- Establish a Common Bio-medical Waste Treatment facility including the Incinerator, autoclave, shredder and effluent treatment unit.
- Collection of Segregated Biomedical Waste and its transportation, storage, treatment and disposal in accordance to the Bio-Medical Waste Management Rules 2016.
- Compliances with statutory and environmental norms.
- Develop concise waste management principles.
- Introduce a continuing waste management education program for all staff to increase awareness of Occupational Health & Safety issues and waste minimization principles.
- Adopt policies and procedures to minimize the environmental impacts of waste treatment and disposal.
- Reporting to regulatory authorities as needed.

Table-1: Salient Features of the Project

<table>
<tr><td>Nature of the Project</td><td>Common Bio-medical Waste Treatment Facility (CBWTF)</td></tr>
<tr><td>Project Proponent</td><td>M/s Indo Tech Waste Solution</td></tr>
<tr><td>Location& GPS Co-ordinates</td><td>Village-Kumroua, Block- Saron, Tehsil & District- Kasganj Uttar Pradesh
<table>
<tr><th>Sr. No.</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>A</td><td>27°57'28.14"</td><td>78°36'34.74"</td></tr>
<tr><td>B</td><td>27°57'29.41"</td><td>78°36'37.18"</td></tr>
<tr><td>C</td><td>27°57'30.85"</td><td>78°36'36.09"</td></tr>
<tr><td>D</td><td>27°57'29.53"</td><td>78°36'33.70"</td></tr>
</table></td></tr>
<tr><td>Toposheet No.</td><td>45I/9, 53L/12, 54I/5 & 53L/8</td></tr>
<tr><td>Land Area</td><td>0.408 Hectare (4081 Sq. m.) Proposed Plant Layout is attached as an Annexure-I</td></tr>
</table>

<table>
<tr><td>Project Capacity</td><td>The proposed project having capacity to cater around 10,000 beds with a treatment capacity of 7.5 Tonne/day. At present the project is to cater a waste quantity of around 10000 beds from surrounding hospitals.
The proposed treatment facilities at the site are:
Autoclaving: 250kg/batch
Shredding: 150kg/hrs
Incineration: 200kg/hrs
ETP: 5 KLD</td></tr>
<tr><td>Water Requirement</td><td>Total 5 KLD water is required for the proposed project.
Source: Bore Well<table><tr><th>S. No.</th><th>Particulars</th><th>Water Demand (KLD)</th></tr><tr><td>1.</td><td>Water Sprinkling. Floor Washing, Vehicle Washing etc</td><td>1.4 KLD</td></tr><tr><td>2.</td><td>Boiler Blow Down</td><td>0.1 KLD</td></tr><tr><td>3.</td><td>Domestic Use</td><td>2 KLD</td></tr><tr><td>4.</td><td>Green Belt Development</td><td>1.5 KLD</td></tr><tr><td colspan="2">Total</td><td>5 KLD</td></tr></table></td></tr>
<tr><td>Power Requirement</td><td>Total Power Requirement- 63 KW
Source- Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL)
Backup- 62.5 KVA DG Set</td></tr>
<tr><td>Manpower Requirement</td><td>42 Persons</td></tr>
<tr><td>Project Cost</td><td>Rs.1.72 Crores</td></tr>
<tr><td>Land Ownership</td><td>Proposed Land is taken on lease by Mr. Raman Kumar, Partner of M/s Indo Tech Waste Solution for 15 years. Land Document attached as an Annexure-II</td></tr>
<tr><td>Nearest Town and Habitation</td><td>Nearest Town and Habitation is Pachlana 1 Km in NNE</td></tr>
<tr><td>Nearest Railway Station</td><td>Kasganj Railway Station (16.10 km in S)</td></tr>
<tr><td>Nearest Airport</td><td>Agra (Pandit Deen Dayal Upadhyay) Airport (110 km in SW)</td></tr>
<tr><td>Nearest Highway</td><td>MDR 82W (0.07km in W)</td></tr>
</table>

2. Introduction of Project/Background Information

The concern about disposal of infectious waste generated by the hospitals is increasing rapidly due to the fear of the spread of viruses such as Acquired immune Deficiency Syndrome (AIDS) and Hepatitis B. These waste (bio-medical waste generated from health care establishments) present a high risk of causing potential damage to the human health and the environment by way of spreading. To prevent the spread of such infectious waste that finds its genesis in bio-medical waste (from hospitals, clinics, laboratories, dispensaries etc.) a scientific approach is required. From the beginning it is essential that professionally trained personnel should handle the waste.

Common Bio Medical Waste Treatment Facility is a set-up where bio medical waste generated from a number of health care units, is imparted necessary treatment to reduce adverse impacts on the human health and environment. Bio-medical waste is generated during the diagnostic procedures, treatment or immunization of human beings or animals, research activities pertaining to the production or testing biological. Bio-medical waste is of hazardous category and if not managed properly, it may cause serious community health hazards. Therefore, Ministry of Health Government of India has made it mandatory for each and every health care facility to manage the waste of this category.

The present proposal by M/s Indo Tech Waste Solution is to utilize 0.408 Hectare (4081 Sq.m.) of land for setting up of Common Bio-Medical Waste Treatment Facility at Khasra No-1161 at Village-Kumroua, Block- Saron, Tehsil& District- Kasganj Uttar Pradesh.
Gram Panchayat NOC is attached as **Annexure-III**

2.1 Introduction of the Project and its Proponent

The Proposed project of addition of CBWTF as a part of the Common Hazardous Waste Treatment, Storage and Disposal facilities (TSDFs) which falls under Category B, Schedule 7(da) as "Bio-medical Waste Treatment Facility" as per the EIA notification 14th September, 2006 and subsequent amendments dated 1st December 2009, 17th April 2015, 21st December 2016 and 27th March 2018. The setting up of CBWTF attracts the recent directions of National Green Tribunal dated 28th November, 2013 making Environmental Clearance from MoEF&CC mandatory.

Bio-medical Waste Management Rules, 2016 notified on 28th March, 2016 and as amended thereof under the Environment (Protection) Act, 1986, stipulates that it is the duty of every Health Care Facility (HCF) to establish a bar code system for bags or containers containing biomedical waste (BMW) to be sent out of the premises or place for any purpose by 27th March, 2019. Also, Rule 5 of the BMWM Rules, 2016 stipulates that it is the duty of every Operator of Common Bio-medical Waste Treatment Facility (CBWTF) to establish bar code system for handling of bio-medical waste.

Project Proponent

A group of professional, with the vision of entering into socially relevant and environmentally conscious areas, joined hands to promote the firm in the name of "Indo Tech Waste Solution". The Promoter of the company is working in this service industry for more than ten years. The Promoter proposed to put up the CBWTF in District Kasganj, Uttar Pradesh identified to cover waste generated in and around area covering radius of 75 K.M. or more if required (from this facility, having 10,000 beds approx.) During Construction phase the labours and workers will be hired from nearby villages. Number of persons required in operational phase will be as per the requirement when the plant is operational and will help in generating employment. It will be ensured that collection, transportation, storage & treatment of Bio-medical Waste is done in a systematic manner by complying all regulatory norms as stipulated in Bio-medical Waste Management Rules 2016 and as per CPCB Guidelines for installation of Bio-medical Waste Treatment Facility.

2.2 Brief Description of Nature of Project

The basic principle of good BMW practice is based on the concept of 4Rs, namely, reduce, reuse, recycle, and recover. The best BMW management (BMWM) methods aim at avoiding generation of waste or recovering as much as waste as possible, rather than disposing. Therefore, the various methods of BMW disposal, according to their desirability, are prevent, reduce, reuse, recycle, recover, treat, and lastly dispose. Hence, the waste should be tackled at source rather than end of pipe approach. Common Bio Medical Waste treatment and disposal facility means any facility wherein treatment, disposal of BMW or processes incidental to such treatment and disposal is carried out.

As per the Gazette Notification dated 28th March, 2016 it is the duty of every occupier (a person having control over an institution or premises) of an institution generating biomedical waste including a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank to take all steps to ensure that such waste is handled without any adverse effect to human health and the environment. Under there rules:

- The ambit of the rules has been expanded to included vaccination camps, blood donation camp, surgical camps or nay other healthcare activity.
- Phase out the use of chlorinated plastic bags, gloves and blood bags within two year.
- Pre-treatment of the laboratory waste, microbiological waste, blood samples and blood bags through disinfection or sterilization on site in the manner as prescribed by WHO or NACO.
- Provide training to all its health care worker & immunize all health workers regularly.
- Establish a BAR Code System for bags or containers containing Bio-Medical Waste for disposal.
- Report major accident,
- Existing incinerator to achieve the standard for retention time in secondary chamber for Dioxin and Furans with in Two Year.
- Bio Medical Waste has been classified in to 4 Categories instead 10 to improve the segregation of waste at source.
- Procedure to get authorization simplified. Online procedure for authorization for HCFs. The validity of authorization synchronized with validity of consent orders for bedded HCFs. One Time authorization for non-bedded HCFs.
- The new rules prescribe more stringent standards for incinerator to reduce the emission of pollutant in environment.
- Inclusion of emission limits for Dioxin and furans.

- No Occupier shall establish on site treatment and disposal facility, if a service of Common bio- medical waste treatment facility is available at distance of seventy-five (75) kilometre.
- Operator of Common Bio- Medical Waste Treatment Facility to ensure the timely collection of bio medical waste from the HCFs and assist the HCFs in conduct of training.

Bio Medical Waste was defined under per Bio-Medical Waste Management Rules, 2016 and the main features of the rules are:

1. Segregation of Bio-Medical Waste from other waste
2. Untreated Bio-Medical waste should not be stored for beyond 48 hours
3. Waste shall be stored in following colour containers/ Bags:
    - Yellow: Incineration Waste
    - Red: Autoclave/ Microwave Chemical Treatment
    - Blue: Autoclave/ Microwave Chemical Treatment
    - White: Autoclave/ Microwave Chemical Treatment/Encapsulation

The Biomedical Waste generator will take authorization from State Pollution Control Board. Central Pollution Control Board (CPCB) has made guidelines for installation of Common Biomedical Waste Management facility (CBWTF) which has defined following criteria:

1. CBWTF should be located away from residential and sensitive areas
2. One CBWTF should at least cater to 10,000 beds and/ or 75 Kms in radius from its location.
3. CBWTF should have following equipment for process/treatment of Bio-Medical Waste:
    - Incinerator
    - Autoclave/ Microwaving/ Hydroclaving
    - Shredder
    - Sharp pit/Encapsulation
    - Vehicle/Container Washing Facility
    - Effluent Treatment Plant
4. CBWTF should have following infrastructure:
    - Treatment Equipment Room
    - Main waste storage Room
    - Treated Waste Storage Room
    - Administrative Room
    - D.G. set room
    - Site Security
    - Green Belt
    - Sign Board
    - Weighing Room/bridge
    - Fire Hydrant/ Fighting System
    - First Aid Facility Centre

- Rest Room with Wash Room (bathing & eye Wash Systems)
- Designated Vehicles (Internal separated cabins & AC with mechanical closing gates of vehicles)
- Recycle Waste Record Room & sales record room

5. CBWTF should have proper record keeping
   - Waste quantum received and treated
   - Solid Waste Disposal
   - Logbook for equipment
   - Site records
6. CBWTF should have proper waste collection & transportation facility
7. CBWTF needs to dispose the treated waste in following manner:

Table-2: Biomedical wastes categories and their segregation, collection, treatment, processing and disposal options

Category	Type of Waste	Type of Bags or Container to be Used	Treatment and Disposal Optional
1	**2**	**3**	**4**
Yellow	**(a) Human Anatomical Waste:** Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time)	Yellow colored non-chlorinated plastic bags	Incineration or Plasma Pyrolysis or deep burial*
	(b) Animal Anatomical Waste: Experimental animal car cases, body parts, organs, tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals or colleges or animal houses.		
	(c) 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 Sterilization and shredding. Treated

			Waste to be sent for energy recovery.
	(d) Expired or Discarded Medicines: Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc.	Yellow colored non-chlorinated plastic bags or containers	Expired `cytotoxic drugs and items contaminated with cytotoxic drugs to be returned back to the manufacturer or supplier for incineration at temperature >1200 0C or to common bio-medical waste treatment facility or hazardous waste treatment, storage and disposal facility for incineration at >12000C Or Encapsulation or Plasma Pyrolysis at>12000C.All other discarded medicines shall be either sent back to manufacturer ordisposed by incineration.
	(e) Chemical Waste: Chemicals used in production of bio logical and used or discarded disinfectants.	Yellow colored containers or non-chlorinated plastic bags	Disposed of by incineration or Plasma Pyrolysis or Encapsulation in hazardous waste treatment, storage and disposal facility
	(f) 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.	Separate collection system leading to effluent treatment system	After resource recovery, the chemical liquid waste shall be pre-treated before mixing with another wastewater. The Combined discharge shall conform to the discharge norms given in Schedule- III.
	g) Discarded linen, mattresses, beddings contaminated with Blood or body fluid.	Non-chlorinated yellow plastic bags or suitable packing material	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.
	(h) Microbiology, Biotechnology and other clinical laboratory waste: Blood bags, Laboratory cultures, stocks or specimens of micro-organisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.	Autoclave safe plastic bags or containers	Pre-treat to sterilize with no chlorinated chemicals on-site as per National AIDS Control Organization or World Health Organization guidelines. Thereafter for Incineration.
Red	**Contaminated Waste (Recyclable)** (a) Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and *fixed needle syringes*) and vacutainers with their Needles cut) and gloves.	Red colored non-chlorinated plastic bags or containers	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)	**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	Puncture proof, Leak proof, tamper proof containers	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

	metal sharps		consent to operate from the State Pollution Control Boards or Pollution Control Committees) or sanitary Landfill or designated concrete waste sharp pit.
Blue	**(a) Glassware:** Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes.	Cardboard boxes with blue colored marking	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.
	(b) Metallic Body Implants	Cardboard boxes with blue colored marking	

2.3 Need for the project and its importance to the Country and or Region

Inadequate biomedical waste management causes severe threats at community level. There are some common bio-medical waste treatment and disposal facility exist in the distant places however; Kasganj District does not have any such facility of its own. Ministry of Environment, Forests & Climate Change (MoEFCC), Govt. of India has notified the Bio-Medical Waste (Management & Handling) Rules, 1998 as amended Rule 2018. In accordance to the rule, every occupier of a Health Care Establishment (HCE) shall either set up requisite bio-medical waste treatment facilities on site or ensure requisite treatment of the bio-medical waste at an approved Common Biomedical Waste Treatment Facility. No untreated bio-medical waste shall be kept stored beyond a period of 48 hours.

As per the guideline of CPCB, one CBWTF facility will cover 75 km area and 10000 beds. As per the record available, there are three common facility at Mathura, Agra & Shajahanpur, each Facility is at distance 105KM, 92KM, and 104Km respectively from project site.

Table-3 Current Scenario of Available CBMWTF in nearby district

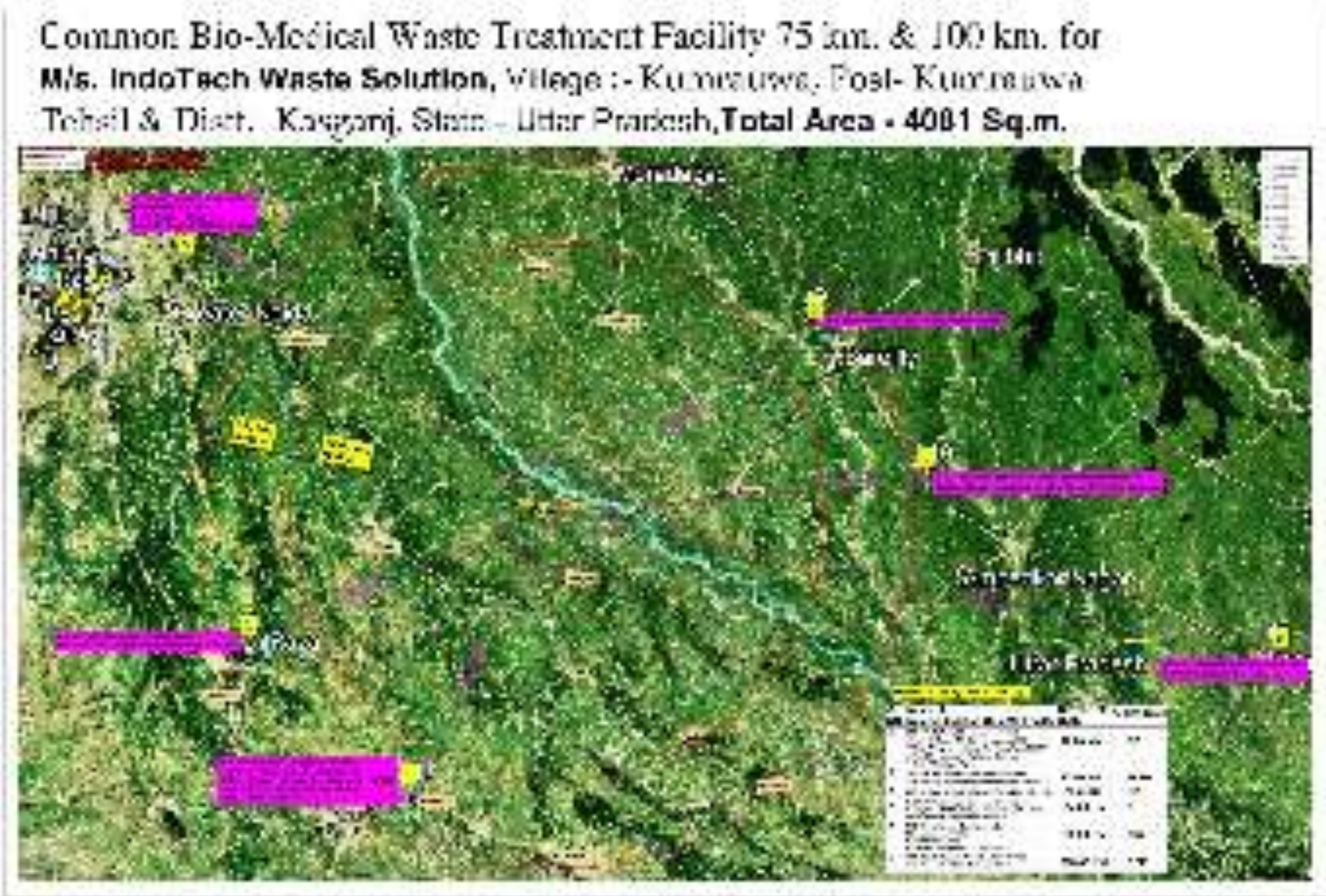
S. No	Name of CBWTF	Address	Covering District and Total Beds		Radius	Total Treatment Capacity
1	Bio Medical Waste Disposal Agency	Khasra No 622, Rava-Neem – Gaon Road, Village Pandwa, Mantt, District Mathura	Mathura Aligarh Kashganj Eta Firozabad Sambhal Hathras	4633 6737 905 697 2251 1306 1488	**105 Km**	Incinerator-200kg/hr, Autoclave-50Kg/shift, Shredder-100Kg/hr
			TOTAL	**16711**		

2	Dutt Enterprises Ltd	Khasra No.670, Mauja-Darhera, Tehsil-Atmadpur, Agra	Agra Mainpuri Firozabad Hathras Bhind& Morena **TOTAL**	8708 889 - - 1517 **11168**	**92 Km**	Incinerator-200kg/hr, Autoclave-50Kg/shift, Shredder-100Kg/hr
3	SP Green Light Environment Waste Management LLP	Saalpur Nava diya Meeranpur Katra, Tilhar Shajahanpur	Bareilly Pilibheet Moradabad Rampur Amroha J.P.Nagar Shajahanpur **TOTAL**	9726 1190 4939 1720 1991 - 2443 **22009**	**104 Km**	Incinerator-150kg/hr, Autoclave-430ltr/shift, Shredder-50Kg/hr

All the three Plants adjoining/ surrounding/ nearby the proposed plants are operating/ covering more than 10,000 beds (against the prescribed limit under the Rules) in the coverage area and the existing treatment capacity is not adequate and proper for the CBWTF. In fact, the total number of beds covered by these three units together is 49,888 (50,000 approx.) which is far beyond the permissible capacity of 30,000 (i.e.10,000 each).

The above figures are from the UP Pollution Control Board, which was submitted by the UPPCB to the Oversight Committee, NGT, U.P., Lucknow, vide order dated 20.07.2020, before the Hon'ble NGT in the O.A. 710 of 2017 (Shailesh Singh vs. Sheela Hospital & Trauma Centre, Shahjahanpur & Ors.) connected with O.A.'s 711, 712& 713 of 2017 is attached as an **Annexure-IV**

Figure-1 Nearby Common Bio-medical Waste Treatment Facility



2.4 Demand and Supply Gap

As per the guideline, one CBWTF facility will cover 75 km area and upto 10000 beds. However, the proposed project is aimed to cater approx..10000 beds and will cover 75 km or more if required as per authority requirements.

In view of above M/s Indo Tech Waste Solution is applying for Environment Clearance. It is pertinent to mention here that in the said report, it is categorically mentioned that the above figures of number of 49,888 beds (50000 approx.) in the particular areas are **excluding the Clinics, Laboratories, Research Institutes, Animal Houses, Ayush Hospital, Blood Banks, Pathological Labs as well as Veterinary Hospitals**.

In addition to this there are number of HCF's which are not authorised and also there are many proposed HCF's which have applied for authorisation and will be operational very soon. **Therefore, 3 CBWTF are covering in excess of 50,000 beds** as there are number of beds which are not accounted for but had a clear mention in the UP PCB report submitted to Oversight Committee in compliance of the order dated **20th July, 2020 passed by Hon'ble NGT in O.A. No.710 of 2017** (connected with **O.A.'s 711,712 & 713 of 2017**). There is enough demand and supply gap as per the authenticated government/ department records and an emergent need for one more CBWTF to be permitted for operation in the area/s.

Table-4 Waste Generation (Category Wise) per day (in kg)

S. No.	Product / Waste Category	Quantity	Units
1	Recyclable waste Plastic (Tubings, Bottles, Gloves, Syringes and Vacutainers)	Approximately 1300	Kg/day
2	Recyclable Waste Glass and Sharp (Broken glasses, Medicine vials, Metallic Body Implants, Contaminated Glass, Ampoules, Needles, Scalpels, Syringes with fixed needles, Blades and Brunt Needles)	Approximately 250	kg/day
3	Incinerable Waste (Human Anatomical Waste, Soiled Linen & Beddings, Animal Anatomical Waste, Blood Bags, Discarded Medicine, Cytotoxic drugs, Items Contaminated with Cytotoxic Drugs,)	Approximately 1750	kg/day
4	Ash	50	Kg/day
5	Treated water	Used within premises	

2.5 Employment Generation Due to the Proposed Project

During Construction phase the labours and workers will be hired from nearby villages. Total 42 numbers of persons are proposed to hire for Plant operations and transportation including staff, skilled and unskilled workers.

3 Project Description

3.1 Location of the Project

The proposed Common Bio-Medical Waste Treatment Facility will be established in an area of (4081 Sq. m.) located at Khasra No. 1161, Village-Kumroua, Block- Saron, Tehsil & District-Kasganj Uttar Pradesh. The land is agriculture land, the land use will change from agriculture land to the common bio-medical waste treatment facility. Figure-2 shows the Project Location, Figure-3 & 4 shows Topographical Map of the Proposed Project (10 km & 15 km radius) and Figure-5 shows the Project Boundary on Google Map.

Figure-2 Location/Satellite View of the Proposed Site

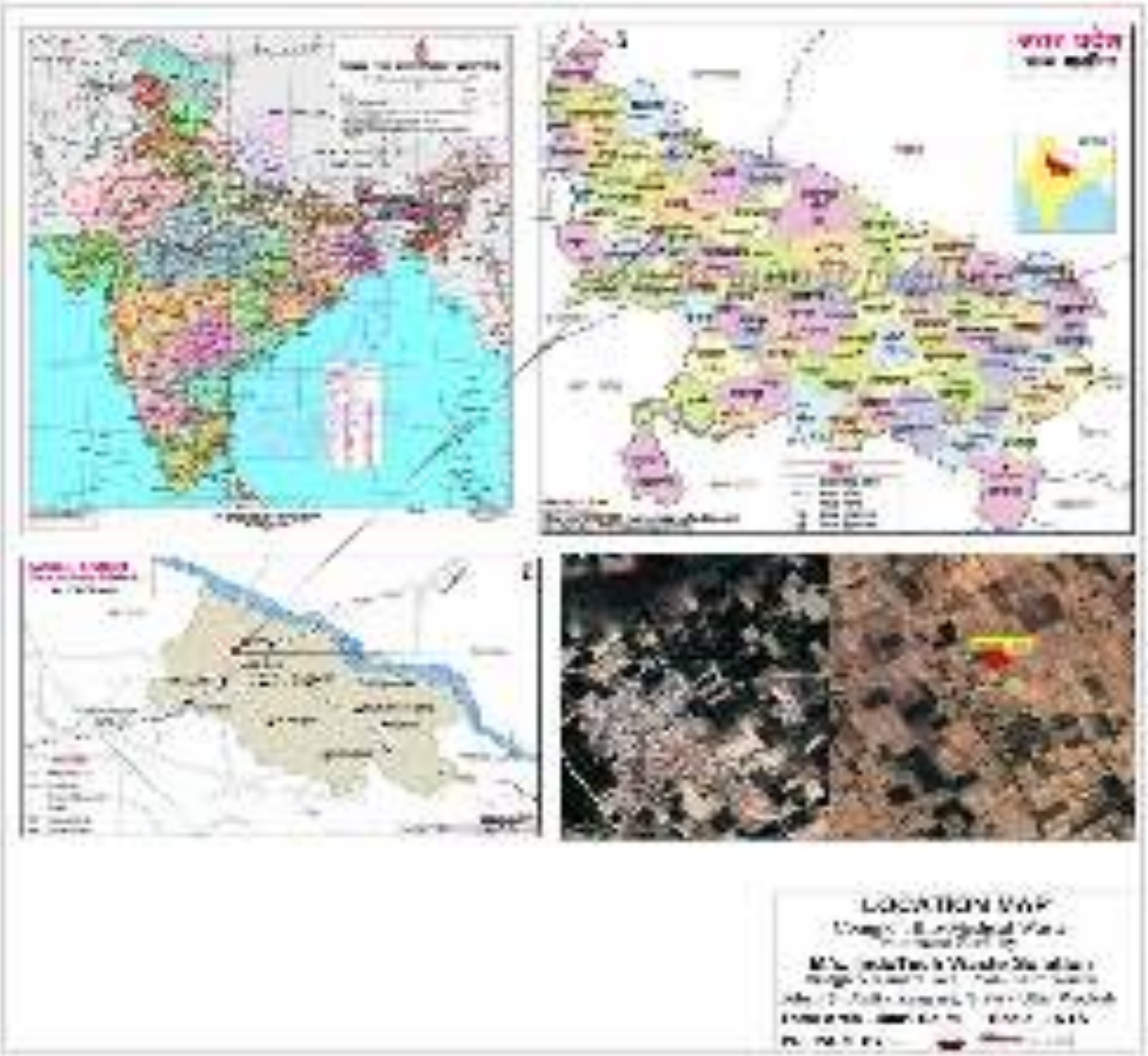


Figure-3 Topographical Map (10 km radius) of the Proposed Site

Figure-4 Topographical Map (15 km radius) of the Proposed Site

Figure-5 Project Boundary on Google Map

3.2 Details of Alternative Site

One alternative site was examined for setting up of Common Bio-Medical Waste Treatment Facility at village- Vishanpur, Tehsil-Iglas, Aligarh, Uttar Pradesh. The alternative Aligarh site was coming under 75 km radius of existing Mathura CBMWT Facility as per BMW Rules 2016.

3.3 Size of the Facility

The proposed facility will be set up at 0.408 Hectare (4081 Sq. m.) land. The total cost of the project is estimated to be Rs.1.72 crores

The following are the proposed Equipment's/Machineries to be installed in the plant.

Table-5 Equipment's Capacity and Number

Sr. No	Equipment/ Machinery	Capacity	Nos
1	Static Dry Incinerator	200kg / hour	1
2	Horizontal Cylindrical Autoclave	2500ltr/ hour or 250kg/ batch	1
3	Shredder	150kg/ hour	1
4	Effluent Treatment Plant	5KLD	1

3.4 Project description with process details

A Common Bio-medical Waste Treatment Facility (CBWTF) is a set up where biomedical waste, generated from a number of healthcare units, is imparted necessary treatment to reduce adverse effects that this waste may pose. The Incineration Ash may finally be sent for disposal in a TSDF landfill facility located nearby.

3.4.1 Waste Segregation, Collection, Transportation, Storage, Treatment and Disposal

- **Waste Segregation**

Waste segregation will reduce the load of bio-medical waste and this also minimizes the environmental impacts associated with further processing. Waste will have to be segregated into domestic refuse, hazardous waste and infectious waste separately. Further the infectious waste will have to be segregated into plastics, metals, and other infectious waste generated. Segregation is done effectively if performed at source. CPCB has issued clear guidelines for colour coded segregation.

Collection of Bio-Medical Waste

The Collection of Bio Medical Waste will be carried out in a manner so as to avoid any possible hazard to human health and environment. Following steps will be followed for collection of the waste from bio-medical units:-

- Segregated waste will be collected from the endpoint of healthcare units on a daily basis by the by staff.
- The waste will be collected from the colour coded bags in health care units to colour coded containers (non-chlorinated bags) in dedicated vehicles. Sharps will be collected in puncture proof containers.

- A Record Book will be maintained by the Healthcare unit in acknowledgement of waste collected.
- Non-segregated waste will not be accepted and such incidents will be reported to the prescribed authority.
- All the collection staff will be equipped with protective gears for handling Biomedical Waste.
- Each and every care will be taken to ensure that the segregated biomedical waste, handed over by the Health care unit, to reach Bio Medical Waste Treatment Facility without any damage, spillage and unauthorized access by public or animals etc.

➢ **COVID-19 Isolation Wards**

- Healthcare Facilities having isolation wards for COVID-19 patients need to follow these steps for ensure safe handling and disposal of bio-medical waste generated during treatment.
- Keep separate colour coded bins/bags containers in wards and maintain proper segregation of waste as per BMWM Rules -2016 and amended and CPCB guidelines for implementation of BMW Management Rules.
- As precaution double layered bags (using 2 bags) should be used for collection of waste from COVID-19 isolation wards so as to ensure adequate strength and no-leaks.
- Collect and store biomedical waste separately prior to handling over the same CBWTF. Use a dedicated collection bin labelled as COVID-19 waste and keep separately in temporary storage prior to handling over to authorise staff of CBWTF. Biomedical waste collected in such isolation wards can also be lifted directly from the wards into the CBWTF collection van.
- In addition to mandatory labelling, bags/containers used for collecting biomedical waste from COVID-19 wards, should be labelled as COVID-19 Waste. This marking would enable CBWTF to identify easily to priority treatment and disposal immediately upon receipt.
- General waste not having contaminated should be disposed as Solid waste as per SWM Rules, 2016.
- Maintain a separate record of waste generated from COVID-19 isolation wards.
- Use dedicated trolley and collection bins in COVID-19 isolation wards. A label COVID-19 Waste to be pasted on these items also.
- The (inner and outer) surface of containers/bins/trolleys used for storage of COVID-19 Waste should be disinfectant with 1% sodium hypochlorite solution.
- Report opening or operation of COVID-19 wards to SPCBs.
- Depute dedicated sanitation worker separately for BMW and general solid waste so that waste can be collected and transferred timely to temporary waste storage areas.

➢ **Bar Code Labelling**

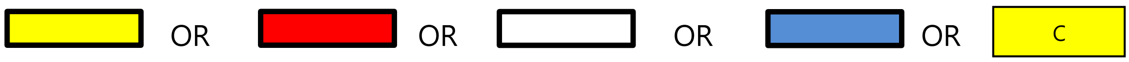
There shall be two types of bar code labelling:

1. Bar code or QR code label shall be pre-printed directly on the designated colour coded bags/containers, which may be procured by HCF through the Operator of a CBMWTF or through any vendor, fulfilling the specifications stipulated under CPCB guidelines; or
2. Bar code or QR code labels shall be pasted on the designated colour coded bags/ containers, which can be procured by the HCF either through the Operator of a CBMWTF or through Vendor.

Specification of Bar-code or QR code label:

The Bar code label for use on the colour coded bags or containers for handling bio-medical waste should have following specifications;

Colour mark on the label: A colour mark or text is required on bar code label for easy identification of the bar code (by the workers handling bio-medical waste) with designated colour coded bag or container. The bar code should have a colour mark (in Yellow/Red/White/Blue) in the form of block of size at least 7 mm X 7 mm or Text of font size 12 specifying the colour of the BMW in the bags or containers. The colour mark or Text shall be placed at the top left corner of the bar code label.



In case of cytotoxic drugs, the alphabet 'C' should be printed on yellow colour block. In case of B/W label, colour mark can be specified in the form of 'Text' specifying the colour of BMW waste as "YELLOW" / "RED" / "WHITE" / "BLUE" printed on top left side of the bar code label.

YELLOW OR RED OR WHITE OR BLUE OR YELLOW C

Unique Number of the HCF and its specification: Unique number to each HCF shall be developed and provided by concerned SPCB/PCC/DGAFMS. Unique number can be produced based on following criteria:-

i. Name of the Health Care Facility (HCF): The name of the HCF shall be indicated by first five alphabets in the name of the by the HCF. In case the name of HCF is less than 5 letters, the rest of spaces may be filled with *. (E.g., All India Institute of Medical Sciences-ALLIN). Followed by:

ii. Name of the Place where HCF is located: Name of the place where HCF is located shall be indicated by 6-digit local pin code provided by Postal department. Followed by;

III. Name of the State/ UT: Name of the State/UT should be in the form of two-digit alphabetical number. Followed by:

iv. Type of HCF: Type of HCF should be in the form of alphabetical number in capital but not more than two letters i.e., first two letters of a type of HCF/first letter in two words of a HCF) as given below:

BH - Bedded Hospital
CL - Clinic

DI - Dispensary
HO - Homeopathy
MH - Mobile Hospital
SI - Siddha
UN - Unani
VH - Veterinary Hospital
YO - Yoga
AH - Animal House
BB - Blood Bank,
DH - Dental Hospital
NH - Nursing Home,
PL - Pathological Laboratory
FA - Institutions/Schools/Companies etc. with First Aid facilities
HC - Health Camp
and followed by;

Numerical Number of the HCF: Numerical number of the health care facility shall not be more than five numerical numbers to be assigned to the HCF in between i.e., 00001 to 99999.

Concerned SPCB/PCC shall upload a list of HCFs along with their unique number of HCF at their website. In case of long list, SPCBs may provide search option on their website for retrieving unique code vis-à-vis name of HCF

Label sequence Number: CBMWTFs should use central software to generate unique label sequential number. The operator of CBMWTF should provide range of such sequence numbers to label vendors to produce labels or produce labels by themselves. The records of label sequence numbers and to whom allotted should be maintained for verification of SPCBs/PCCs.

Specifications for the bar code label: In addition to the specification of Bar code, the bar code label should have following specifications as detailed below:

i. The bar code label should be pasted only at the centre or close to centre of the colour coded bag or container prescribed under the BMWM Rules, 2016 and further amendments made thereof.

ii. Size of bar code label should be such that it should be able to accommodate desired information specified in this section.

iii. The bar code / QR code should be black in colour and its back ground should be white colour and it should be clearly legible on the label.

iv. The bar code label should be tamper proof, water proof and its colour should not be faded in due course of at least for 48 hours after its use.

v. The bar code label should be able to resist the prevailing atmospheric temperatures and should not fade its colour till its end of life.

vi. Bar code labels should not have any traces of heavy metals or any other objectionable chemical constituent.

vii. All bar-coded labels should be of good quality preferably a very chromo paper label having specifications prescribed under these guidelines.

viii. The adhesive used for bar code label should be pressure sensitive, tear resistance and should be of acrylic based adhesive and after use of labels on the colour coded bag (s) or container(s), the label should not peel off on its own or by normal abrasion during handling.

- **Transportation of Bio-Medical Waste**

The Bio-Medical Waste collected will be transported to CBWTF in a fully covered specially designated vehicle. The vehicle will be designed as per the guidelines of CPCB.

- Separate cabins will be provided for driver/staff and the bio medical waste cabin.
- The base of the waste cabin will be leak proof and will be easy to wash and disinfect.
- The inner surface of the waste cabin will be made of smooth surface to minimize water retention.
- The vehicle will be properly labelled with the symbol of Biohazard as per schedule III of the Rules and will display the name, address and telephone number of the Company.
- The waste cabin will have provision for sufficient opening from rear side so that Bio Medical Waste can be easily loaded and unloaded.
- The vehicles will be provided with the first aid kit to handle emergency situations.
- Mobile phones will be given at all the vehicles for effective supervision and monitoring the collection and transportation work.

- **Transportation Vehicle- Specification**

- A fleet of 10 dedicated vehicles designed as per the specification and guidelines of CPCB/ UPPCB
- Separate cabins for driver/staff and the bio medical waste.
- The inner surface of the waste cabin will be smooth to minimize water retention, easy to wash and disinfect.
- The waste cabin will have provision for sufficient opening from rear side so that BMW can be easily loaded and unloaded.
- Each vehicle will be fabricated so as to carry BMW without any spillage, leakage and meeting the other statutory requirements.
- The vehicles will be properly labelled with the symbol of Biohazard as per schedule III of the Rules and will display the name, address and telephone number of the Company.
- The vehicles will be provided with the first aid kit to handle emergency situations.
- Vehicles will be equipped with communication equipment's and safety gadgets.
- Apart from above, the GPS Tracking system will be installed in vehicles to monitor the movement of vehicles.

- **Waste Storage Area**

Main waste storage room will be provided near the entry of the Common Bio Medical Waste Treatment Facility to unload and store all the Bio Medical Waste that will be transported to the facility by vehicles.

- The Size of the room will be adequate to store all wastes transported to the CBWTF.
- The front portion of the room will be utilized for unloading the wastes from the vehicle and back or side portion shall be utilized for shifting the wastes to the respective treatment equipment.
- The area in front of the room will be made impermeable so that any liquid spilled during unloading does not percolate into the ground. The liquid, if any, generated during handling of waste and washing, shall be diverted to the inlet of ETP.
- Waste shall be stacked with clear distinction as per the colour coding.
- The main waste storage room will be well ventilated, easy to wash floors and walls and will have smooth and fine surfaces.

- **Treatment Equipment Room**

- A separate housing will be provided for each treatment equipment at the CBWTF.
- Each room will have well designed roof and walls, will be properly ventilated and easy to wash. The floor and interior finishing of the room will be such that chances of sticking/harbouring of micro-organisms are minimized. Smooth and fine flooring and tiles walls will be provided to a height of 2 metres from the floor.
- A separate cabin will be provided to supervise the operation of the equipment and to record the waste handling and equipment operation data.
- Attached to each equipment room there will be two waste storage rooms, one for the storage of untreated waste and another for treated waste.
- Following separate treatment rooms will be provided:

(i) Incinerator Room
(ii) Autoclave Room
(iii) Shredder Room

- **Treated Waste Storage Room**

A separate room will be provided for the storage of treated waste. The waste shall be stored in separate groups as per the disposal options. This room will also be provided with smooth and fine flooring and tiles on walls. The room will be well ventilated.

- **Disposal of Treated Bio Medical Waste**

The treated bio medical waste will be disposed as under:

- Plastic waste after disinfection and shredding will be handed over to authorized plastic waste recycler.
- Disinfected sharps will be encapsulated on site.

- An ash pit will be provided inside the CBWTF for storage of Incineration ash. Ash pit will be non-leachate and will be covered properly to avoid any rain water entry. If available, the ash will be sent to TSDF site as specified by the prescribed authority.
- Oil and grease will be incinerated.
- Treated water will be used for gardening purpose.

➢ **Washing Facility for Vehicle/Containers**

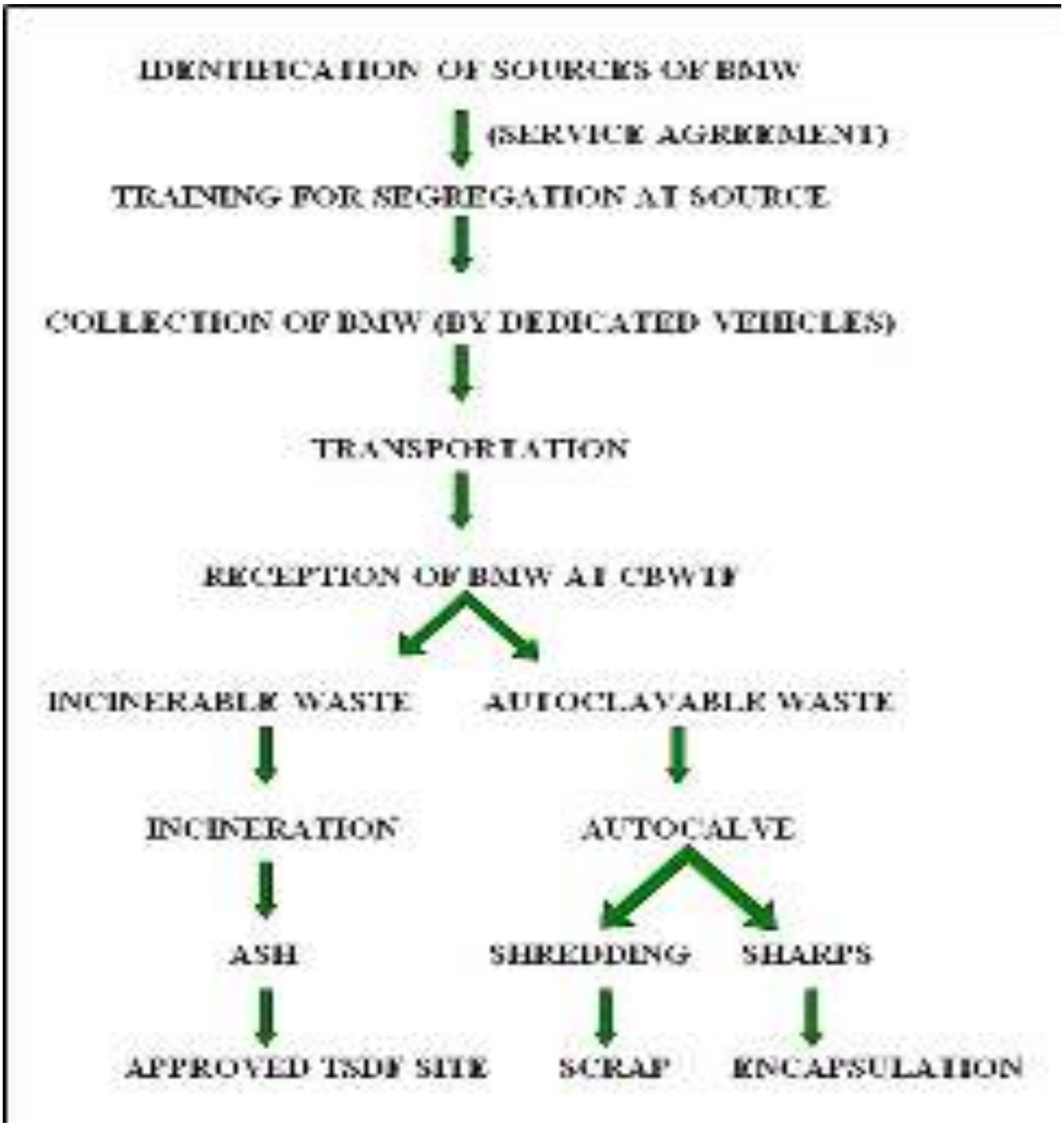
A separate area will be provided for washing of vehicles/containers. The floor will be smooth and impermeable so that liquid does not percolate into the ground. The liquid generated out of washing of vehicles and containers will be collected and treated in an Effluent Treatment Plant. The impermeable area will be of appropriate size so as to avoid to spillage of liquid during washing.

3.4.2 The CBWTF unit will comprise of the following plants:

A. Static Dry Incinerator
B. Horizontal Cylindrical Autoclave
C. Shredder
D. Effluent Treatment Plant

Waste coming from COVID 19 patients to the CBWTF facility will be disposed as per Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/Diagnosis/ Quarantine of COVID-19 Patient dated 18th April 2020

Figure-6 Flow Chart CBMWTF



A. Static Dry Incinerator

Incineration defined as thermal destruction of Bio-Medical Waste at elevated temperature. The temperature of the primary chamber is minimum of 800°C and the secondary chamber is minimum of 1050°C±50°C, at under controlled operational conditions. The product after combustion is oxides of carbon water and ash as residues. The unit in which the process takes place is termed as Incinerator.

The dry technology incinerators are most advanced incinerator technology in the World. High level of automation, variable frequency drives at all critical points to ensure the finest adjustment of chemicals for injection in the system to control the pollutant gases for complying the stringent norms in the World.

Purposed Capacity of Incinerator-200kg/hr (Static Solid Health)

Dry Technology with fully automation and fitted with advanced Air pollution Control Device

Use of high temperature filter Candles in filtration system.
Temperature resistance in filter Candles up to 900 degree C.
Most Effective air pollution control designed to treat the small particulate matter
Achieve the finest adjustment of chemicals for injection in the system to control the pollutant gases Furans & Dioxin.
Zero discharge thorough incineration process.
Operates at high temperature, thus avoids corrosion.

- **Constructional Features of Static Dry Incinerator**

Main Combustion Chamber/Primary Chamber

The primary chamber is fabricated out of Mild Steel and is refractory lined from inside with refractory bricks 115mm thick backed by insulation bricks 115mm thick. This is equipped with loading door, ash removal door and automatic burner operated by temperature indicating controller which is set at minimum 800°C. High pressure air from a blower is provided through a number of nozzles fitted in the walls of the primary chamber. Since refractory is very thick and air is circulated within the chamber, it ensures a very low skin temperature of the Incinerator. The primary chamber is provided with an Automatic waste feeding system. The waste is introduced on the hearth in a way so as to prevent the heap formation. Suitable raking arrangement is provided for uniform spreading of waste on the hearth.

Post Combustion Chamber/Secondary Chamber

Secondary chamber is manufactured out of Mild Steel and refractory lined from inside with refractory bricks 115mm thick backed by insulation bricks 115mm thick, combustion air is added at the inlet of the secondary chamber via a series of nozzles. This is equipped with automatic burner. A temperature indicating controller is provided, which is connected to the control panel. The operating temperature is 1050±50°C. The secondary chamber is so designed so as to ensure a minimum 2 seconds residence time to gas flow.

Gas Cooler

It is necessary to drop down flue gases temperature for the cleaning before entering filtration system. For this reason, thermal energy (heat) must be removed from the flue gases. The flue gases travel through Gas cooler via refractory lined duct and quickly cooled down to the filter operating temperature. The heat removed from the flue gases is transferred into atmosphere by air.

Flue Gas Neutralizing System

After the gases exit the flue gas cleaning system, they enter the Flue Gas Neutralization System. The Flue gas neutralizing System is provided to neutralize the SO_2, NOx, and HCL present in the flue gases through alkali reagent.

Dioxin Control System

The dioxin control system is provided to take care of NOx, Dioxin & Furans and odor present in the flue gases

Filtration System with Pneumatic Controls (Torri Therm)

After the Flue gas neutralizing unit neutral flue gases enter the Torri Therm filtration system in which most advance technology dust collection system efficiently traps fine dust particles from flue gases before exit to chimney. Torri Therm filtration system is based on the pulse jet principle having the capacity to remove stubborn sub-micron particles. Flue gas entering the filtration system is uniformly distributed among the chamber, the larger particles drop out into the hopper, and smaller particles are entrapped on the filtration media forming a layer or cake. Clean gas passes through the filtration media. Pulse jet cleaning begins on the filters. The compressed air enters each row of filters intermittently from the blowpipe located above the filter house. The drop in pressure of air in the filter media creates a pressure wave, which passes through the whole length of the filter. The adherent dust is loosened by the sudden filter deformation / flexing and falls into the dust hopper. Torri Therm filters are used for high collection efficiency, suit physical and chemical nature of the flue gases to be handled and humidity and temperature of the air. The Torri Therm filter House is provided with rotary locks at the bottom for continuous dust removal of dust from the flue gases.

I. D. Fan

The Induced Draft Fan maintains the balance draft and draws out the clean gases into the atmosphere through a 30 mtrs high stack. The I. D. Fan is dynamically balanced. The I.D. Fan is belt driven and connected to an electric motor.

Forced Draft Fan

A forced draft fan is provided to supply air inside the primary and secondary chambers. The F.D. Fan is dynamically balanced and is connected to the electric motor.

Fuel Oil Tank & Piping

Fuel oil tank of suitable capacity fabricated out of Mild Steel is provided. The fuel tank will have all connections for supply, return, drain and visual checking of the quantity of fuel present in the tank. Complete fuel oil piping from the fuel tank to both burners is provided along with the return line.

Burners

Fully automatic burners complete with ignition transformer, ignition electrodes, necessary fuel lines, photocell, blower, fuel pump and fuel oil nozzles are provided for primary and secondary chambers

Electrical Control Panel

The control panel supplied with the Incinerator is placed separately. It consists of PLC along with display unit. The display unit automatically and continuously monitors and record dates, time of day, batch sequential number and operating parameters such as temperatures in both the chambers.

Chimney of 30 Meters high from ground level

Chimney of 30 mtrs height is provided complete with ladder, inspection platform, stack drain, aviation light and other accessories. Chimney is provided for release the clean gases in the atmosphere.

Figure-7 Static Dry Incinerator

B. Horizontal Cylindrical Autoclave

Proposed Capacity of Cylindrical Autoclave: 2500 ltr/hr (250kg/ batch)

Boiler: 200kg/hr (Oil fired Boiler)

Autoclave

An autoclave is a specialized piece of equipment designed to deliver 135°C temperature under 31 psi pressures to a chamber, with the goal of decontaminating or sterilizing the contents of the chamber. Decontamination is the reduction of contamination to a level where it is no longer a hazard to people or the environment. EWC intends to establish an autoclave with above principle. To ensure safety and quality control, all bio-hazardous materials and items contaminated with potentially infectious agents should be decontaminated before use or disposal. Such items include, but are not limited to: culture media, surgical instruments, laboratory equipment, glassware, and biomedical waste including sharps.

- **Technical Specification for Horizontal Cylindrical Autoclave Capacity 250kg/ Batch**

  Technical Details

Name of Equipment	Autoclave
Model	AR BMW-2500
Capacity of Autoclave	2500ltr/hrs or 250kg/batch
Type	Horizontal
Waste Material	Bio Medical Waste
Chamber	
MOC / Thickness	Stainless Steel 316 L/5mm
Size	1200 W x 1200 H x 1800D mm
Operating Pressure	2.2kg/cm2
Working Pressure	3.2kg/cm2
Hydro Test Pressure	120-150 Degree C
Vacuum Breaker	Fitter to Jacket to prevent possible buckling of jacket
VACUUM Pump	
Type	Water Based
Motor	5HP 2280 RPM
Steam Condenser	MOC-SS. 304 will be fitted in the vacuum line to condense the steam before entering inside the vacuum pump
Steam Generator	
Material Handling	
Carriage	MOCSS 316L

Figure-8 Horizontal Cylindrical Autoclave

C. Shredder

Proposed Capacity of Shredder – 150 kg/hr

The autoclaved bio medical waste plastic is shredded to pieces before being disposed-off. It is used to destroy waste to prevent their reuse. Shredding is a process by which waste are de-shaped or cut into smaller pieces so as to make the waste unrecognizable. Shredder has non- corrosive sharp blades capable for shredding of plastic waste, sharps, bottles, needles, tubing's, and other waste. The low speed two shaft systems are effective for shredding hard and solid waste.

Shredder to use for shredding bio – medical waste shall confirm following requirement:

1. The shredder for bio –medical waste shall be of robust design with minimum maintenance requirement.
2. The shredder should be properly designed and covered to avoid spillage and dust generation. It should be designed such that it has minimum handling.
3. The hopper and cutting chamber of the shredder should be designed to accommodate the waste bag full of bio medical waste.
4. The shredder blade shall be highly resistant and should be able to shred waste sharp syringe, scalpels, glass vials, blade, plastics catheters, broken ampoules, intravenous sets, bottles, blood bags, gloves, bandages etc. It should be able to handle/ shred wet waste, especially after autoclave.
5. Shredder blade shall be non - corrosive and hardness steel.
6. Shredder should be designed and mounted so as not to generate high noise & vibration
7. If hopper lid or door of collection box is opened, the shredder should stop automatically for safety of operator.
8. In case of shock-loading (non- shred able material in the hopper) there should be mechanism to automatically stop the shredder to avoid any emergency/ accident.
9. The motor shall be connected to the shredder shaft through a gear mechanism, to ensure low RPM and safety.
10. The shredder should have low rotational speed (maximum 50 rpm). This will ensure better gripping and cutting of the bio- medical waste.
11. The discharge height (from discharge point to ground level) shall be sufficient (minimum 3 feet to accommodate the containers for collection of shredded material. This would spillage of shredded material.

Sharp Pit/ Encapsulation:

Encapsulation is the best method for safe disposal of sharps, Needles will be mixed with cement and aggregate to make homogeneous mix to concrete blocks of higher strength. MS frames will be provided to make these blocks for smooth outer finish.

Power Requirement

The power requirement for the process of Autoclave, Incinerator and shredder will be 63 KW will be supply from Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL), which will include the misc. plant operation load. To provide backup a DG set of 62.5 KVA will be provided

Vehicles: 10 Nos. as per requirement

Safety gadgets: Gloves, Mask, Apron, Gumboots & Immunisation

Details of Raw Material

1.Plastic Containers: As per requirement

2. Plastic Bags: As per requirement

3. Diesel: 90ltrs. /hour

4. Spares: As per requirement of Plant and machinery

5.Chemicals: Sodium Hypochlorite, Caustic Soda, Quick Lime etc.

6. Safety Gadget: Gloves, apron, mask, boots & Immunization

Operational Methodology

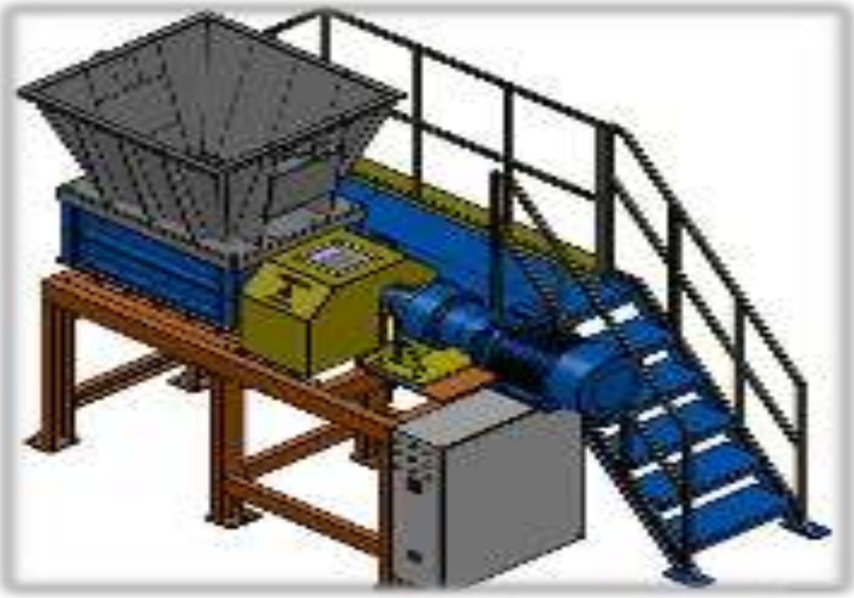
The Bio-Medical Waste generated in the health care units has to follow a specified path from source of its generation to its final disposal at the facility in accordance with the Bio-Medical Waste (Management & Handling) Rules, 2016 and standards prescribed by the Pollution Control Authorities. The process of BMW Management involves:

- Collection of segregated waste from health care establishments,
- Transportation in specially designed closed vehicles from the Health Care Unit to the CBWTF,
- Treatment of BMW by incineration or autoclaving at CBWTF,
- Shredding of treated waste & its disposal.

The responsibility of Health Care Unit for the safe disposal of Bio-Medical Waste ends once the segregated BMW is handed over to the operator of CBWTF.

The hospital waste consists 50-55% of incinerable waste and 35%-40% autoclavable waste and sharp waste 3 to 5%. Therefore, it is necessary that hospital waste is properly handled, segregated and stored by trained staff of health care establishments. The clients shall be advised to keep four containers as per BMW Rules.

Figure-9 Shredder



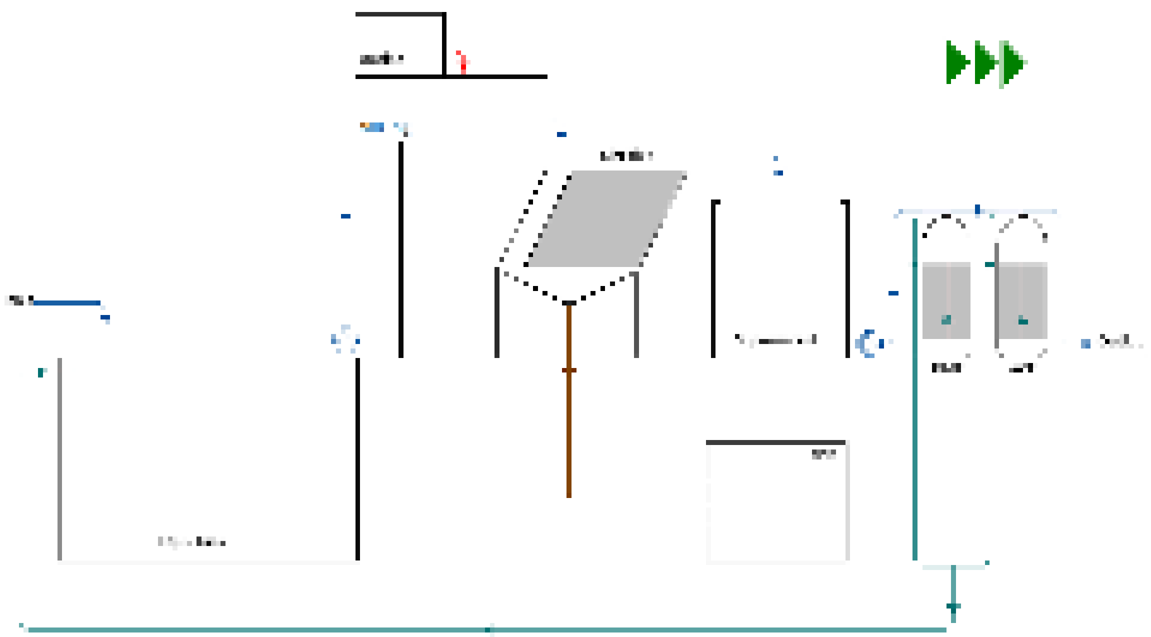
D. Effluent Treatment Plant

Proposed ETP: **5 KLD with Chemical Treatment System**

- **Description of treatment of ETP**

The wastewater passes through the oil and grease tank to remove excess oil from the wastewater. The waste water after removal of oil and grease will collected in equalization tank to holding the waste water for some pre-determined time in a continuously mixed basin to produce a uniform waste water. The wastewater then subjected to Flocculation tank. In a flocculation tank, the water is stirred or otherwise moved around so that the particles move around, bump into other particles. Chemicals (most commonly "alum"/ polyelectrolyte) are often added to the water going into a flocculation tank to help aid particle formation. The next step in the process is to separate the solid sludge with the wastewater hence the wastewater will be transfer to Tube settlers which capture the settle able fine floc that escapes the clarification zone beneath the tube settlers and allows the larger floc to travel to the tank bottom in a more settle able form. The tube settler's channel collects solids into a compact mass which promotes the solids to slide down the tube channel to sludge drying beds and the water content will be goes into the carbon filter to remove contaminants and impurities, utilizing chemical adsorption. Finally, the water will be supplies to the Multistage Evaporator to evaporate the wastewater.

Figure-10 Schematic Diagram of ETP



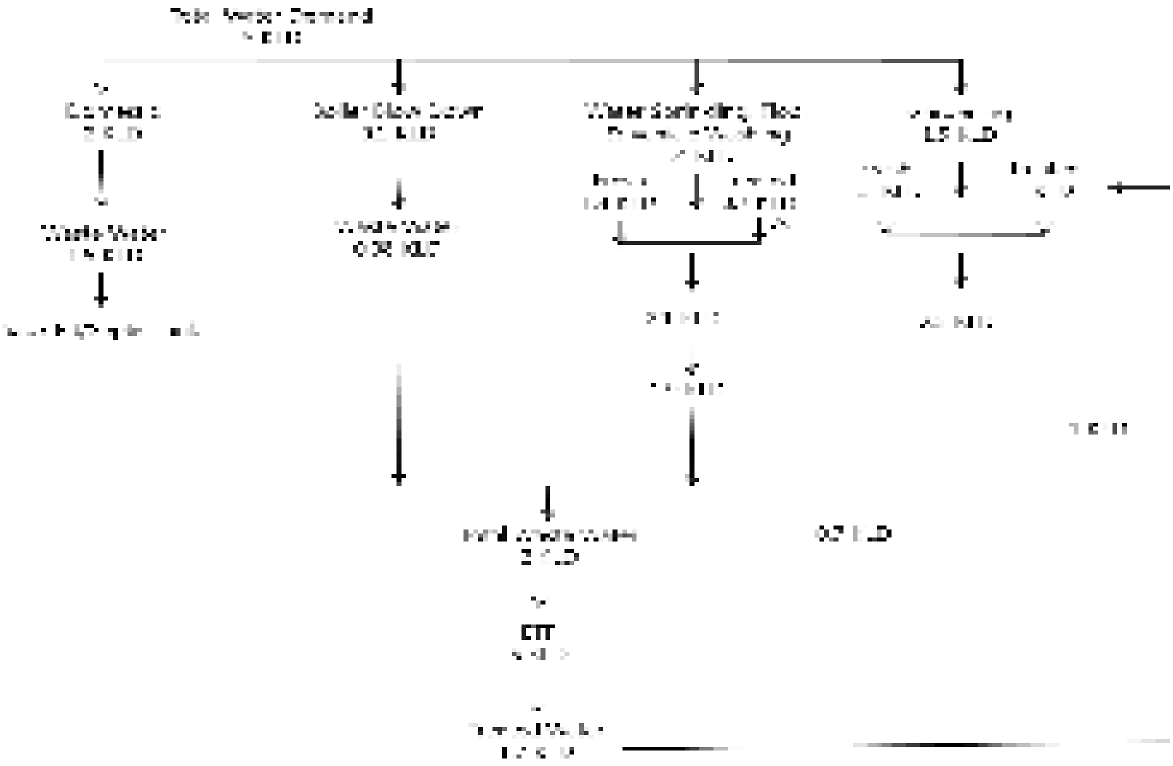
3.5 Water Requirement and its Availability

During Construction phase water requirement will be approx. 2 KLD
Source- Water Tankers
During Operational Phase water requirement will be approx. 5KLD.
Source- Bore Well
The amount of total waste water generated out of proposed CBWTF is 2 KLD which shall be treated in 5 KLD ETP. It will be a Zero Liquid Discharge Unit
Details of water consumption for the proposed activity are given in Table below:

Table-6 Water Balance for Operational Phase

S. No.	Activity	Total Water	Treated Water (Requirement)	Discharge to ETP
1.	Floor & Vehicle Washing, Water Sprinkling	1.4KLD	0.7 KLD	1.9 KLD
3.	Boiler Blow down	.1 KLD	-	0.08 KLD
4.	Domestic use	2 KLD	-	Sent to Soak Pit/Septic Tank
5.	Gardening	1.5 KLD	1 KLD	-
Total		**5 KLD**	**1.7 KLD**	**2 KLD**

Figure-11 Water Balance Diagram



3.6 Energy and Power Requirement and its Availability

Total Power requirement 62 KW will be supply from Dakshinanchal Vidyut Vitran Nigam Ltd (DHVVNL) cater to the needs of the BMW facility. Sufficient capacity DG set (62.5 KVA) is proposed for power backup.

3.7 Manpower Requirement

During Construction phase the labors and workers will be hired from nearby Villages of impact area around 10 KM preferably and in absence of such cases we hire from outside. Number of persons required in operational phase is proposed below:

Table-7: Manpower Details

Sr. No.	Manpower/Profile No.	Number
1.	In Plant	8
2.	Administration	4
3.	Marketing	6
4.	Drivers/ Helpers/ Office	24
5.	TOTAL	**42**

4 Site Analysis

4.1 Connectivity

The proposed Common Bio-medical Waste Treatment Facility is going to be established near Village- Village-Kumroua, Block- Saron, Tehsil & District- Kasganj Uttar Pradesh in Uttar Pradesh. The proposed project site is meeting guidelines of CBWTF issued by MoEF&CC.

Table-8 Location Criteria for the Proposed Project

Parameters	Criteria	Observation
Lake or pond (Distance from SW body)	Should not be within 200 m	No water body located in site. Paraller Lower Ganga Canal at 2.93km W direction
River	Should not be within 100 m	No river within 100m of site. Ganga River at 4.31 km N direction
Flood plain	Should not be within 100-year flood plain	Not in the flood plain area
High way – State or National	Should not be within 500 m	No NH/SH within 500 m MDR 82W is 0.07 km at W direction
Habitation – Notified habituated area	Should not be within 500 m	No habitation within 500m from the proposed site area. The nearest habitation from the proposed site is Pachlana 1 km at NNE direction.
Public Parks	Should not be within 500 m	No public parks within 500m
Critical habitat area – area in which one or more endangered specieslive	Not suitable	There are no endangered species in the site

Reserved Forest area	Not suitable	No Reserved Forest area is coming under 15 Km radius of project site.
Wet lands	Not suitable	Not a wet land
Air Port	Should not be within zone around the airport(s)	Agra Airport is the nearest airport at an aerial distance of 110 km in SW direction.
Water supply	No Water supply well within 500 m	No water supply wells exists within 500m
Coastal Regulation Area	Not suitable	Not in the CRZ area
Ground Water Table level	GW table should be >2m from the base of the landfill	No landfill proposed.
Presence of monuments / religious structures	Not suitable	No monuments / religious structure exists

4.2 Land Form, Land Use and Land Ownership

The site is located at, Khasra 1161, Village-Kumroua, Block- Saron, Tehsil & District- Kasganj, Uttar Pradesh, with plot area of 0.40 Hectare (4081 Sq. m.). The land is agricultural land, the land use will change from agriculture land to the Common Bio-medical Waste Treatment Facility (CBWTF).

4.3 Topography (along with map)

Topographical map of the study area (10 km & 15 km radius around the site) presented in Figure- 3 & 4.

4.4 Environmental Sensitivity

Table-9 Environment Setting of the Study Area

<table>
<tr><th>S. No.</th><th>Particulars</th><th colspan="3">Details</th></tr>
<tr><td>A.</td><td>Nature of the Project</td><td colspan="3">Common Bio-medical Waste Treatment Facility</td></tr>
<tr><td>B.</td><td colspan="4">Size of the Project</td></tr>
<tr><td>1.</td><td>Project Capacity</td><td colspan="3">The proposed project having capacity to cater around 10,000 beds with a treatment capacity of 250kg/hr. However, at present the project is to cater a waste quantity of around 10000 beds from surrounding hospitals.</td></tr>
<tr><td>C</td><td colspan="4">Location Details</td></tr>
<tr><td>1.</td><td>Village</td><td colspan="3">Kumroua</td></tr>
<tr><td>2.</td><td>Tehsil</td><td colspan="3">Kasganj</td></tr>
<tr><td>3.</td><td>District</td><td colspan="3">Kasganj</td></tr>
<tr><td>4.</td><td>State</td><td colspan="3">Uttar Pradesh</td></tr>
<tr><td rowspan="3">5.</td><td rowspan="3">Latitude & Longitude</td><td>Sr. No.</td><td>Latitude</td><td>Longitude</td></tr>
<tr><td>A</td><td>27°57'28.14"</td><td>78°36'34.74"</td></tr>
<tr><td>B</td><td>27°57'29.41"</td><td>78°36'37.18"</td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td></td><td></td><td><table><tr><td>C</td><td>27°57'30.85"</td><td>78°36'36.09"</td></tr><tr><td>D</td><td>27°57'29.53"</td><td>78°36'33.70"</td></tr></table></td></tr>
<tr><td>6.</td><td>Topo sheet No.</td><td>45I/9, 53L/12, 54I/5 & 53L/8</td></tr>
<tr><td>D</td><td colspan="2">Environmental Settings of the Area</td></tr>
<tr><td>1.</td><td>Ecological Sensitive Areas</td><td>No</td></tr>
<tr><td>2.</td><td>River / water body</td><td><table><tr><th>River/ water body</th><th>Distance</th><th>Direction</th></tr><tr><td>Paraller Lower Ganga Canal</td><td>2.93</td><td>W</td></tr><tr><td>Burhiganga Nala</td><td>3.94</td><td>E</td></tr><tr><td>Ganga River</td><td>4.31</td><td>N</td></tr></table></td></tr>
<tr><td>3.</td><td>Nearest Town / City</td><td>Pachlana 1 Km in NNE</td></tr>
<tr><td>4.</td><td>Nearest Railway Station</td><td>Kasganj Railway Station (16.10km in S)</td></tr>
<tr><td>5.</td><td>Nearest Airport</td><td>Agra (Pandit Deen Dayal Upadhyay) Airport (110 km in SW)</td></tr>
<tr><td>6.</td><td>Seismic Zone</td><td>IV</td></tr>
<tr><td>D</td><td colspan="2">Cost Details</td></tr>
<tr><td>1.</td><td>Total Project Cost</td><td>Rs.1.72 Crore</td></tr>
<tr><td>E</td><td colspan="2">Requirements of the Project</td></tr>
<tr><td>1.</td><td>Water Requirement</td><td>5 KLD</td></tr>
<tr><td>2.</td><td>Manpower Requirement</td><td>42</td></tr>
</table>

Figure- 12 Location of Project & Connectivity Map (15 Km)

4.5 Climate Data from Secondary Source

The climate in the region shows broadly four seasonal variations, namely:
Winter: December - February
Summer: March – May
Monsoon: June - September
Post-monsoon: October – November

Information presented in subsequent paragraphs is from the Indian Meteorological Department (IMD), Long Term Climatological Tables (1981-2010). These tables give useful information about a region’s weather, since they are collected over a 30-year period. The temperature of the Aligarh district (nearest IMD station) is found to be varying between 7.4°C to 39.6°C, and average annual rainfall observed to be 781.6 mm.

4.6 Social Infrastructure

Health

Kasganj cluster is served by number private and Government hospitals and they provide specialized Clinical service to the Urban as well as Rural population in the cluster.

Fire and Emergency

Fire Brigades in Kasganj Cluster are equipped with high-tech and advanced features to tackle all kind of problems during an emergency. Fire fighters are centrally placed in the city so that they are able to cover all areas to control an emergency situation.

5 Environmental Mitigation Measures

In consideration to the prevailing site features and the proposed Common Bio-medical Waste Treatment Facilities, outlined in earlier Chapters, it is necessary to ensure that the proposed plant and facilities would be adequately designed with necessary environment protection measures. This Chapter, accordingly, outlines the environment protection measures for the proposed Bio-medical Waste Treatment Facility at the Kumroua Village, Block Saron , Kasganj site comprising of Incinerator, Autoclave, Shredder and ETP.

A large number of adverse impacts occur from facility operations. These impacts can be fatal accidents (e.g., scavengers buried under waste piles) infrastructure damage (e.g., damage to access roads by heavy vehicles) pollution of the local environment (such as contamination of groundwater and/or aquifers by leakage and residual soil contamination.

5.1 Air Pollution and Control

D.G. sets: For mitigation of impacts of air pollution, stack height of 3.5 m above roof level shall be provided for proposed D.G. set of capacity 1 x 62.5 kVA.
Proposed project will have Online Continuous Emission Monitoring System. Proposed Incinerator with Dry technology with fully automation and fitted with advanced Air Pollution Control Device is proposed. Specifications of Incinerator given below-:

- Use of high temperature filter Candles in filtration system.
- Temperature resistance in filter Candles up to 900 deg .C.

- Most Effective air pollution control designed to treat the small particulate matter.
- Achieve the finest adjustment of chemicals for injection in the system to control the pollutant gases Furans & Dioxin.
- Zero discharge thorough incineration process.
- Operates at high temperature, thus avoids corrosion.

To control emissions from incinerator 0f 200kg/hr Chimney (30m above ground level) will be provided. To control or prevent fugitive emission regular maintenance of pollution control devices will be carried out. Good housekeeping shall be done & greenbelt development all along with the boundary wall shall be done. The unit will further bring down the pollution level in emission within specified limits set out by the pollution control board.

5.2 Noise Pollution management

The noise is generated due to the activities like mechanical movement, waste handling in unit, motors, vehicular movement, generators, etc. General noise levels within plant are expected to remain below 75 dB (A). To reduce the ambient noise, DG Set of 1x62.5kVA will be bought Acoustic Enclosed and stack height of 3.5 m above roof level will be provided as per CPCB guidelines. Noise generating units like Machinery area will be well insulated with enclosed doors. Maintenance of vehicles and machinery will be done in a sustainable manner to ensure best performance and less loss.

5.3 Water Pollution management

Following measures shall be adopted for water conservation:

Reduction:

The first step is reduction of water consumption, with strict measurement and control of consumption. So, minimum water will be used for floor & vehicle washing.

Re-use:

Treated water of 1.7 KLD from the ETP of 5KLD capacity will be reused in Water Sprinkling, floor & vehicle washing and gardening.

5.4 Odour Control

- Odour normally generated from the biomedical waste
- As per BMW Rules the waste should be treated within 48 hrs. of its generation.
- Daily washing of waste collecting containers, vehicle compartment and floor of store room.
- Closed cabin vehicles shall be used for the collection and transportation of bio-medical wastes.
- Masks shall be provided to workers to avoid health issues due to odour.
- Hygienic conditions shall be maintained.
- Green Belt/Plantation

5.5 Energy Saving Measures

1. Daylight provision shall be made in industry by using openable windows (use of sunlight in lieu of conventional power).

2. LEDs & Solar lights shall be provided.
3. Energy efficient motors shall be used for water pumping and ETP.
4. Transformer will be having efficiencies as per ECBC Norms.
5. Adhering to light power densities (LPD) as per ECBC Norms.

6 Planning Brief

6.1 Planning Concept

The proposed project is a Common Bio-medical Treatment Facility. As this is an fresh site basic facility of infrastructure like admin building, processing area, effluent treatment facility, greenbelt, storage area, etc. will need to be developed. Transportation of waste will be carried out through existing road network around the site. Proposed plant layout is attached herewith in Annexure-II.

6.2 Assessment of Infrastructure Demand

Key infrastructures such as hospitals, schools, bank, places of worship and social/ community facilities such as park, market, playground etc. education, health care and community development are available in the cluster. Internal roads, parking facilities etc. will be provided at the site.

6.3 Amenities/Facilities

The project is situated at about 20 km from Kasganj District and is well connected through rail and road network. Communication facilities such as post office, telecommunications are available in Kasganj district and in nearby villages. Medical facilities and electricity are available in the all nearby areas.

6.4 Greenbelt

Around 33% of the total project area i.e. 0.33 acre of land will be developed as green belt. The green belt will be developed considering the native species and CPCB guidelines will be followed.

6.5 Connectivity (Road/Rail/Waterways)

The proposed CBWTF unit is well connected to Road/Highways for transportation of MSW.

6.6 Health and Safety System

During the working, and allied activities, all the precautionary measures shall be taken into account for safety and security.

Following safety & security measures will be enforced;

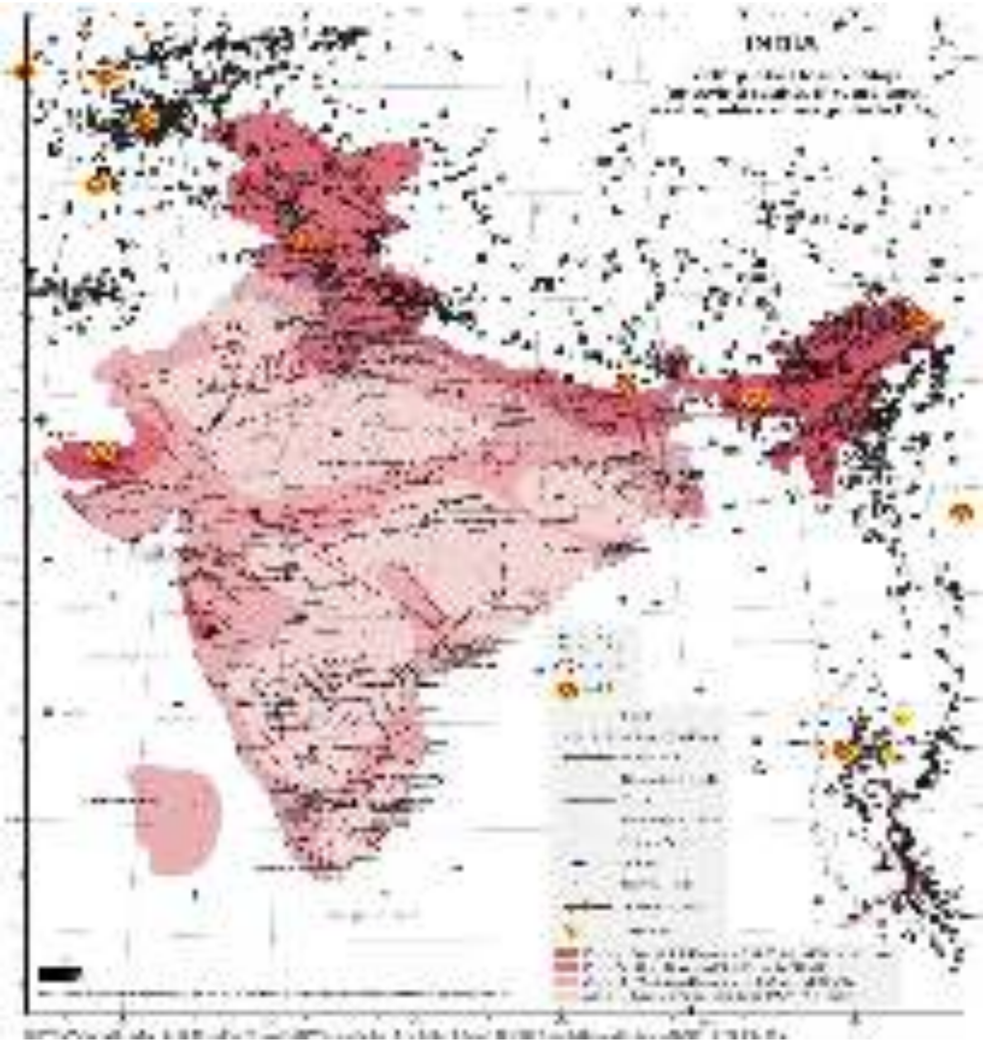
- Project entrance will have a permanent check post and record shall be maintained of all persons / vehicles entering the project site area.
- Round the clock security arrangement shall be provided to prevent inadvertent entry of persons.

All safety measures prescribed under mining laws will be followed strictly. All workers will be medically examined in pre- placement phase and also periodically. First Aid Personnel with first aid kit will be available at the project site to provide first aid to injured person. Arrangement for transportation of persons to nearby medical facilities will be made. Potable water facility will be provided to workers. Personal protective equipment's will be provided to workers as safeguards. Regular medical check-up camps shall also be arranged for detection of occupational diseases and minor disease in the nearby villages. Free check-up and medicine for treatment for their acute and chronic illness shall be provided. Awareness program will be organized for workers.

6.7 Disaster Management and Risk Assessment

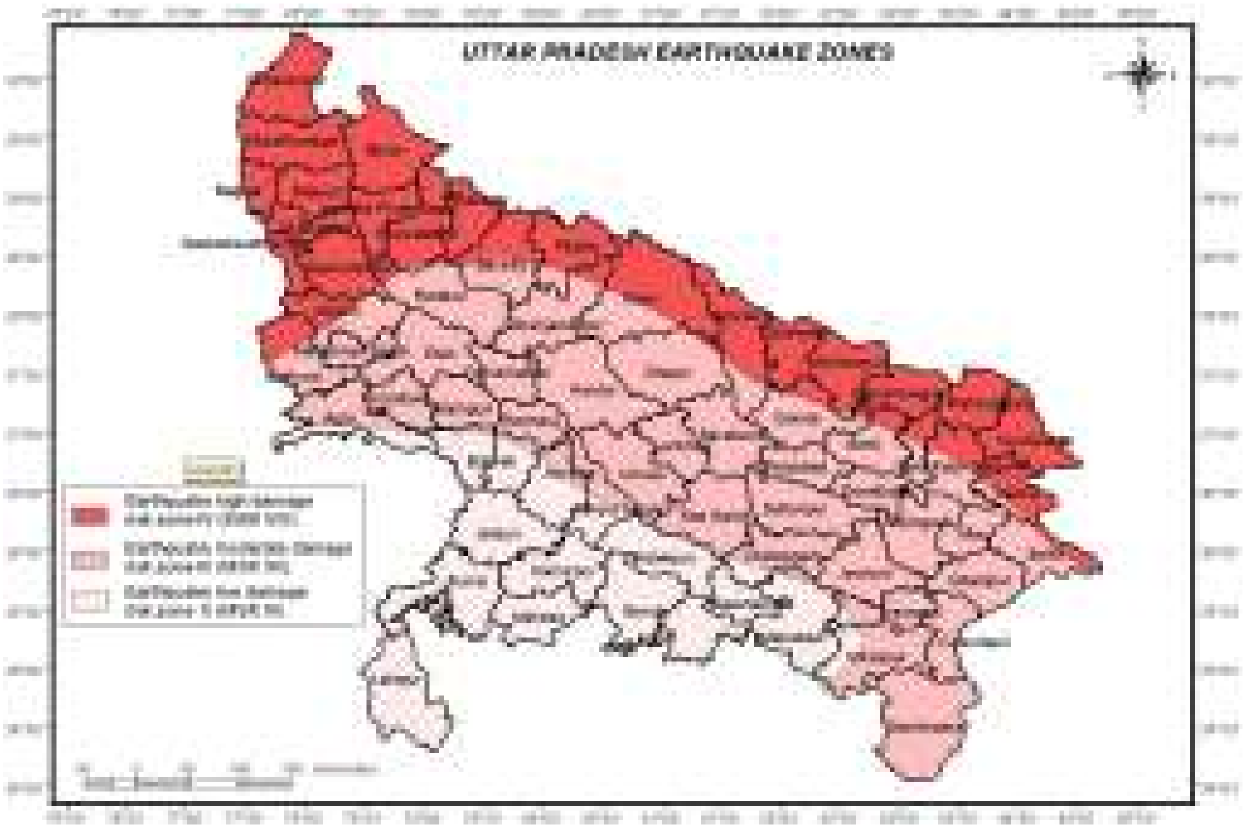
This may deal with action plan for high-risk accidents like subsidence flood, fire, seismic activities etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of lessee to meet such eventualities and the assistance to be required from the local authority may also be described. The area lies in seismic Zone IV which is moderate active zone; however precautionary measures shall be adopted.

Figure-13 Seismic Zone Map of India



Source-https://ndma.gov.in/en/zone-map.html

Figure-14 Seismic Zone Map of Uttar Pradesh



Some of the aspects to be included in emergency plan are as follow:

- Organization details of command structure, working systems, implementation procedure sand emergency control centre& have of incident controller, site main controller, their duties & other key personnel.
- Communication centres & persons involved call signs & list of telephone numbers.
- Availability of special emergency equipment e.g., heavy lifting gear, bulldozers, dumper, and special fire-fighting equipment.
- Details of voluntary organizations with names of organizers, telephone numbers, resources etc. Humanitarian arrangements e.g., transport evacuation centres, emergency feeding, treatment of injured, first aid, ambulances etc.
- No other accidents like subsidence of flood, tailing dam failure etc. observed during mining in the region.

  In spite of following all the precautionary measures and safety rules, regulations and procedures, mining accidents cannot be ruled out completely. Following are the accidents which can take place in semi-mechanized opencast mining and measures proposed to be taken.
- Fall of human beings or fall of machines from benches/ dumps/ haul roads.
- Fire & explosion in machinery.
- Emergency situation due to social reason such as public unrest, terrorism etc.

- **Preventive Measures**:
  - Fire-fighting equipment in the machinery/ workshop/ office will be maintained. Persons will be trained in the use of fire-fighting equipment and mock rehearsal will be conducted.
  - Training of security personnel.
  - Procedures as laid down in Disaster Management Plan to be followed.
- **Training:**

  Persons will be trained in the following:
  - Training of protective equipment.
  - Procedures for reporting emergencies.
  - Location and use of fire-fighting equipment.
  - Knowledge of alarm system and siren.
  - Evacuation procedures.
- **Emergency Equipment & Facilities:**
  - Mobiles.
  - Fire-fighting equipment's
  - Emergency medical supplies

Other protective equipment's i.e., goggles, helmet, face shield, hand gloves, safety belts, barricade tape. First Aid box will be provided.

7 Proposed Infrastructure

7.1 Administration Room

An administrative room will be provided within the CBWTF for general administration, record keeping, billing and other works related to operation and maintenance of CBWTF.

7.2 Site Security

CBWTF will be provided with proper boundary walls to prevent unauthorized access to the site by human and livestock. Security guards will be provided for day and night security of the CBWTF.

7.3 Sign Boards

An identification board will be provided and displayed at the entrance of the facility. The board will clearly display the name of the facility, the name, address and telephone number of the Operator and prescribed authority, the hours of operation and the telephone numbers of the person to contact in the event of emergency. Apart from above, other sign boards will also be displayed inside the CBWTF indicating the different activities and areas earmarked for treatment and storage of Bio Medical Waste, etc.

7.4 Green Belt

The open area inside the CBWTF will be provided with proper green belt. Trees and plantation will be provided. The treated water will be used for horticulture purpose.

7.5 Vehicle Parking

Proper parking space will be provided within the confines of the CBWTF to park all the vehicles meant for collection and transportation of Bio Medical Waste.

7.6 On-site Emergency Plan

An onsite emergency is caused by an accident or hazard that takes place within the plan area and the effects are confined to the plant area.

7.7 Fire & Life Safety

- **Safety Precautions**
    - Smoking must be prohibited.
    - Vehicle access should be strictly controlled.
    - Fuel tanks, packaged materials shall be kept in separate rooms.
    - Ventilation must be sufficient to cope with the maximum expected vapor levels in building.
    - Storage tank vents to atmosphere should be sized for fire-heated emergency vapor release.
    - Electrical equipment must be explosion-proof to meet national electrical code requirements.
    - Dry chemical extinguishers should be accessible for small fires. An adequate supply of hand-held and wheeled types should be available.
    - Hydrants should be strategically placed with adequate hoses.
    - Small spills should be remediated with sand, earth, or other non-combustible absorbent material, and the area then flushed with water. Larger spills should be diluted with water and diked for later disposal.
- **Precaution in Case of Fire**
    - For proposed Common Bio-medical waste treatment, all practicable measures shall be taken to prevent outbreak of fire and its spreads, both internally and externally, to provide and maintain:
    - Safe means of escape for all person in the event of a fire, and
    - The necessary equipment and facilities for extinguishing fire.
    - Effective measures shall be taken to ensure that all the workers are familiar with the means of escape in case of fire and have been adequately trained in the routine to be followed in such cases.
    - Protection may be provided with impervious clothing, gloves and footwear. Suitable materials include polyvinyl plastic, neoprene or rubber.
- **Measures to be adopted while Chemical & Fuel Handling:**
    - Workers shall wash their hands thoroughly after handling.
    - Fuels/chemicals shall be used only in a well-ventilated area.
    - Workers shall use spark-proof tools and explosion proof equipment.

- Workers shall avoid contact with eyes, skin, and clothing.
- Container shall be kept tightly closed.
- Workers shall avoid contact with heat, sparks and flame.
- Operator training as well as written operating instructions, safety rules and check lists shall be provided.

7.8 Waste Water Management

➢ **Water Use & Wastewater Discharge**

During the process water will be used at following points:

S. No.	Activity	Total Water	Treated Water (Requirement)	Discharge to ETP
1.	Floor & Vehicle Washing, Water Sprinkling	1.4KLD	0.7 KLD	1.9 KLD
3.	Boiler Blow down	.1 KLD	-	0.08 KLD
4.	Domestic use	2 KLD	-	Sent to Soak Pit/Septic Tank
5.	Gardening	1.5 KLD	1 KLD	-
Total		**5 KLD**	**1.7 KLD**	**2 KLD**

Although incineration process is dry, there is no use of water for incineration process but company will maintain a fleet of dedicated vehicles to collect the wastes from the hospitals. All the vehicles will be washed and disinfected daily at the site which generates sufficient quantity of waste water. In addition, the storage area as well as the other waste handling areas will also be washed with water daily. All these wash stream from the major effluent discharge from the unit.

Table-10 Expected Characteristics of Raw Effluent Sample

S. No.	Parameters	Value
1.	PH	7-8
2.	Oil & Grease	8-9
3.	Total Suspended Solids	350-500
4.	BOD_3 @ 27^0 C	150-250

Table-11 Designed Parameters for the Expected Characteristics of the Treated Waste Water

S. No.	Parameters	Value
1.	PH	6-8.5
2.	Oil & Grease	<10
3.	Total Suspended Solids	<100
4.	BOD_3 @ 27^0 C	<30
5.	COD	<250
6.	Bio Assay Test	99.99% surviving after 96 hours

➢ **Rain Water Harvesting**

Project Management will make proper utilization of rainwater by harvesting by appropriate rain water-harvesting mechanism. Roof water will be collected by adopting proper treatment (O&G Trap), the collected water will be used for various uses (dust suppression, floor washings, toiler flushing, greenbelt, etc.).

7.9 Solid Waste Management

- Incinerator ash will be generated as waste after the treatment of Bio medical waste and is disposed as per the rules.
- Municipal solid waste generated will be sent to district municipal corporation site for safe disposal.
- Used plastic bottles will be shredded into pieces and resulting plastic will be later sold to recyclers.
- The domestic waste will be disposed through municipal dustbins.
- ETP will be used for the treatment of waste water.
- ETP Sludge shall be treated on site using incineration facility and Incineration Ash will be disposed to nearest TSDF site.

8 Rehabilitation and Resettlement Plan

No, Rehabilitation and Resettlement (R & R) Plan required.

9 Project Schedules and Cost Estimates

9.1 (Likely date of start of construction and likely date of completion (time schedule for the project to be given)

Project will be operational after getting environmental clearance from SEAC, Uttar Pradesh.

9.2 Estimated project cost along with analysis in terms of economic viability of the project

Total Project Cost: 1.72 Crores
Total CER Cost: 3.4 Lakhs As per CER office memorandum of MoEF&CC dated 01.05.2018, the project proponent has to spend 2% on CER activities.

Table-12 Estimated Cost of Common Bio Medical Waste Treatment Facility

Land	On Lease / rented
Building	Rs. 700000/-
Plant & Machinery	Rs. 14000000/-
Other fixed and Pre-Operating Cost	Rs. 2500000/-
Total	Rs. 17200000/-

Table-13EMP Budget

Sr. No.	Particulars	Capital cost in lacs	Budget in lacs (per Year)
1	Greenbelt	2.0	0.75
2	Environment Monitoring	-	1.5
2	Solid Waste Management	2.0	0.75
3	Waste Water Management/ETP	6.0	3.0
4	APCD Management	30.0	3.6
5	Misc.	2.0	1.0
Total		**42.0**	**10.8**

Table-14Budgetary Breakup for CER

S. No.	Activity	Capital cost in lakhs/Year	Recurring cost in lakhs/Year
1.	**Promoting Education** (providing infrastructure like construction of additional class rooms, furniture, smart class facilities, support to special children education /therapy etc. in nearby village)	0.85	0.10
2.	**Health Care** (Performing free Cataract surgeries, Infrastructure support to area Govt. Hospitals like providing bed and equipment for treatment etc.) COVID financial assistance	0.85	0.10
3.	**Environment care** (taking up avenue plantation, Plantation in communities, providing solar power/ lights, rain water harvesting etc)	0.85	0.10
4.	**Rural Development** (laying roads, construction of drains, community halls, other infrastructure for development of surrounding villages)	0.85	0.10
Total		3.4	0.4

10Analysis of Proposal (Final Recommendation)

Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area.

CBWTF (Common Bio-Medical Waste Treatment Facility) is a proposed infrastructural set up where Bio-Medical Waste will be treated & disposed of in a most economical and viable method.

It is a system that is designed to ensure Win-Win situation for all the Stake holders:

- General Public& the End User of Hospital Facilities: Happens to gain in cleaner & infectious free environment.
- Hospital Staff: Less of work load since bulk of the responsibilities are outsourced / transferred to well trained staff of Service Provider.
- Hospital Management: Will be able to focus better on their Core Competence.
- Service Providers: Eventually gains from Economies of Scale. Therefore, this project shall ensure following benefits to the society:
    - Cleaner and heal their surroundings.
    - Reduction in the incidence of hospital acquired and general infections.
    - Reduction in the cost of infection control within the hospital.
    - Reduction in the possibility of disease and death due to reuse and repacking of infectious disposal.
    - Low incidence of community and occupational health hazards.
    - Reduction in the cost of waste management through appropriate treatment and disposal of waste.
    - Employment generation for people.

11Conclusion

We all have already seen the hazards posed by the mishandling of Bio Medical Waste. It is generated primarily from health care establishments and is a relatively recent issue and there are a lot of gaps in information. The management of Bio-Medical Waste is still in its infancy all over the world. Management of waste presupposes scientific approach to the process of waste generation, storage, transportation, treatment and its disposal. This arduous task can only be achieved by the synergistic efforts of the Health Care Establishments, Government Health Department, Pollution Control Boards and Service Provider for Bio-Medical Waste Management. It is then that we can build a pollution free environment & planet Earth a better place to live in.

The proposed CBWTF project of for treatment of bio-medical waste, generated from a number of healthcare units is to reduce adverse effects that this waste may pose. It also reduces pressure on regulatory agencies for compliance monitoring. By operating the treatment equipment at CBWTF to its full capacity, the cost of treatment per kilogram gets significantly reduced. It also reduces pressure on regulatory agencies for compliance monitoring. By operating the treatment equipment at CBWTF to its full capacity, the cost of treatment per kilogram gets significantly reduced.

Figure-15 Proposed Site Photographs