PRE-FEASIBILITY REPORT FOR REPLACEMENT OF 02 NOS OF INCINERATORS, PGIMER, CHANDIGARH.

APPLICANT

Biomedical Division, PGIMER, Chandigarh

CONSULTANT

#391, Idma Laboratories Ltd.
Industrial Area, Phase-1,
Panchkula, Haryana
1.0 EXECUTIVE SUMMARY

The proposed project is for replacement of two existing incinerators at Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh with latest technology for treatment of biomedical waste.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Nature of project</td>
<td>Biomedical waste treatment facilities</td>
</tr>
<tr>
<td>B.</td>
<td>Size of project</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Proposed capacity</td>
<td>Total Capacity of incinerator :- 170 kg/hr each (Approx)</td>
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<tr>
<td></td>
<td></td>
<td>Total Quantity of waste treatment in average:- 1000 -1200 kgs/day</td>
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<tr>
<td></td>
<td></td>
<td>Project area of Incinerator Plant - 1Kanal(196.81Sq.Mtr)</td>
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<tr>
<td></td>
<td></td>
<td>Total Plot area of Institute – 277 Acre</td>
</tr>
<tr>
<td>2.</td>
<td>Existing Capacity</td>
<td>02 No. Of Incinerators</td>
</tr>
<tr>
<td>C.</td>
<td>Project Location</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Village</td>
<td>Chandigarh</td>
</tr>
<tr>
<td>4.</td>
<td>Tehsil</td>
<td>Chandigarh</td>
</tr>
<tr>
<td>5.</td>
<td>District</td>
<td>Chandigarh</td>
</tr>
<tr>
<td>6.</td>
<td>State</td>
<td>Chandigarh (U.T.)</td>
</tr>
<tr>
<td>7.</td>
<td>Latitude</td>
<td>N 30°46’ 0.075”</td>
</tr>
<tr>
<td>8.</td>
<td>Longitude</td>
<td>E 76°46’ 0.688”</td>
</tr>
<tr>
<td>9.</td>
<td>Toposheet No.</td>
<td>53B/13, 53B/14</td>
</tr>
<tr>
<td>D.</td>
<td>Environmental Settings Details</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Nearest Major Town</td>
<td>Chandigarh</td>
</tr>
<tr>
<td>11.</td>
<td>Nearest State Highway</td>
<td>NH-21</td>
</tr>
<tr>
<td>12.</td>
<td>Nearest Railway Station</td>
<td>Chandigarh Railway Station about 8.50 km in SSE</td>
</tr>
<tr>
<td>13.</td>
<td>Nearest Airport</td>
<td>Chandigarh airport about 11.2 km in S direction.</td>
</tr>
<tr>
<td>14.</td>
<td>Ecological Sensitive Areas (National Park, Wild Life Sanctuaries, Biosphere Reserves etc.)</td>
<td>Sukhna Wildlife Sanctuary about 6km in SE. &amp; Bird Sanctuary about 5km in SSE.</td>
</tr>
<tr>
<td>15.</td>
<td>Seismic Zone</td>
<td>Seismic Zone - IV</td>
</tr>
<tr>
<td>E.</td>
<td>Cost Details</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Total Project Cost</td>
<td>460 Lakhs (Approx.)</td>
</tr>
</tbody>
</table>
2.1 Introduction/Background

Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh is proposing replacement of 02 nos. of existing Incinerators with latest technology of Incinerators with capacity not less than 170 kg/hour to meet the latest recommendations regarding incinerators as per CPCB Guidelines.

Two number incinerators Model PY 400 of M/s Thermax Ltd. With allied equipment’s were commissioned in the Institute on 25-05-1998. The incinerator units are being used to treat approximately 1000-1200 kgs of biomedical waste daily. As of now the condition of incinerators has deteriorated and technically the complete system installation is old and dilapidated. For implementation of latest recommendations regarding Incinerator. Such as automatic feeding devices, system for automatic recording of the operational parameters (PLC) based controlled system. Devices for measuring negative draft in primary chamber, air flows rate in the incinerator chamber and pressure drop across venture scrubber, flue gas analyzer etc.

To achieve above modification, OEM i.e. original equipment manufacturer M/s Thermax Ltd. Was contacted and in response M/s Thermax Ltd submitted in writing that it is technically not feasible to incorporate such modification in the existing incinerator installation. As already installed incinerator are more than 15 years old and outlived their life and have also undergone major repairs. In order to handle increased load & to ensure its smooth operation as per latest guidelines of CPCB, it is proposed to replace the existing incinerator with the new ones.

2.2 Nature of Project.

The proposed project is the replacement of 02 no.s of existing Incinerators with latest technology of Incinerators with capacity not less than 170 kg/hour at Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh.

As per EIA notification No 1533 of 14th September 2006 and its amendment dated 17 April 2015 for Bio-Medical Waste Treatment Facilities, the project is falling under activity 7 (da) in category B1 i.e. environment clearance is required. The proposed project include design, supply, installation, testing and commissioning of two number incinerator at the existing site, each having minimum biomedical waste burning capacity of not less than 170 kg/hour by replacing the existing incinerator to meet the latest recommendations regarding incinerator mandatory under CPCB guidelines complete in all respect.

2.4 Need for the project and its importance to the country

Exposure to infectious BMW can result in disease or injury. It may contain infectious agents, toxic or hazardous chemicals or pharmaceuticals, radioactive wastes and waste sharps. The infectious wastes may contain any of the great variety of pathogenic microorganisms.
Pathogens in infectious wastes may enter the human body through a number of routes like a puncture or cut in the skin, mucous membranes, by inhalation or ingestion. Sharps may not only cause cuts and punctures but also infect the wounds if they are contaminated with pathogens. Because of this dual risk – of injury and disease transmission – sharps are considered as a very hazardous waste class. For e.g: WHO estimates that, in 2000, injections with contaminated syringes caused 21 million hepatitis B virus (HBV) infections, two million hepatitis C virus infections and 260,000 HIV infections worldwide.

As per the Bio-Medical Waste (Management and Handling) Rules, 1998 it is the duty of every occupier (a person having control over an institution or premises) of an institution generating bio-medical 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. Every occupier is required to set up requisite bio-medical waste treatment facilities like incinerator, autoclave, microwave system for the treatment of waste or ensure requisite treatment of waste at a common waste treatment facility.

In U.T. Chandigarh investigations were carried out to assess the generation and disposal of biomedical waste in the various medical establishments in the urban and rural areas of the U.T. Chandigarh. It was found that there are approximate 45-50 private and 8-10 medical establishments in the U.T., Chandigarh including Nursing Homes, Clinics, Dispensaries, Pathological labs., Hospitals, Veterinary Institutions and Animal houses and total number of bed available are approximate 4500 (1300 in Private sector and 3200 in Govt. sector). Accordingly total quantity of bio-medical waste generated in Chandigarh is 1800 kg/day and the rate of generation of bio-medical waste 0.4 kg/day/bed.

After the replacement of these two Incinerators the proposed facility will be able to treat 1000-1200 kg/day of biomedical waste generated in PGI.

2.5 Employment Generation (Direct and Indirect) due to the project

About 07 people are working in the same project (04 Sanitary attended, 2 operators and 01 technician) they will continue further, along with other indirect employment will be generated for transportation and other related activities. Details of Manpower are given below:
Sanitary attended = 04
Operators = 02
Technician = 01
Total = 07

3.0 PROJECT DESCRIPTION:

The proposed project is the replacement of 02 Nos. of existing Incinerators with latest technology of Incinerators with capacity not less than 170 kg/hour at Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh. The proposed project include
design, supply, installation, testing, and commissioning of two number incinerator at the existing site, each having minimum biomedical waste burning capacity of not less than 170 kg/hour by replacing the existing incinerator to meet the latest recommendations regarding incinerator mandatory under CPCB guidelines complete in all respect.

3.1 Location of project

The project site is located at sector 12, Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh.

<table>
<thead>
<tr>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>N 30°46' .075”</td>
<td>E 76° 46' 0.688”</td>
</tr>
</tbody>
</table>

Topo-sheet details

Surveyed by: Survey of India.
Topo-sheet No. 53B/13, 53B/14
Scale: 1:50000.
Published: 2009 first Edition.

The location of the area is shown in Figure 1 shows the location Map & Fig 2 shows the buffer map.
Figure 1 – Location Map
3.2 Size or magnitude of operation: The proposed project is the replacement of 02 no.s of existing Incinerators with latest technology of Incinerators with capacity not less than 170 kg/hour at Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh.

3.3 Project description with process details:

The proposed project is for treatment of Bio-Medical Waste by replacing the two incinerators. As per "bio-medical waste" means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological, including the Categories mentioned in Schedule I to these rules; Bio-Medical Waste is comprising of following category which will be transport and treated as per method given below:

3.3.1 Categories of Bio-Medical Waste and its mode of Treatment:

<table>
<thead>
<tr>
<th>No.</th>
<th>Category</th>
<th>Waste Category</th>
<th>Method of Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No.1</td>
<td><strong>Human anatomical waste</strong> (Human tissues, organs, body parts)</td>
<td>Incineration</td>
</tr>
<tr>
<td></td>
<td>Yellow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>No. 2</td>
<td><strong>Animal Waste</strong> (animal tissue, organs, body parts carcasses, bleeding parts, fluid, blood and)</td>
<td>Incineration</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Treatment Method</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Microbiology &amp; biotechnology waste (Waste from laboratory cultures, stocks or specimens of micro-organism live or attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biological toxins, dishes and devices used for transfer of cultures)</td>
<td>Autoclaving/shredding</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Waste Sharps (needles, syringes, scalpels, blades, glass, etc. That may cause puncture and cuts. This include both used and unused sharps)</td>
<td>Autoclaving/shredding</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Discarded medical and cytotoxic drugs (Wastes comprising or outdated, contaminated and discarded medicines)</td>
<td>Incineration</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Soiled waste (items contaminated with blood, and body, fluids including cotton, dressings, soiled plaster casts lines beddings, other material contaminated with blood)</td>
<td>Incineration</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Solid waste (wastes generated from disposable items other than the waste sharps such as tubings, catheters, intravenous sets etc.)</td>
<td>Autoclaving/shredding</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Liquid Waste (waste generated from laboratory and washing, cleaning, house-keeping and disinfecting activities).</td>
<td>Disinfection by chemical treatment and discharge into drains</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Incineration ash (ash from incineration of bio-medical waste)</td>
<td>Disposal in municipal landfill</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Chemical Waste (Chemicals used in production of biological, chemicals used in disinfection, as insecticides, etc.)</td>
<td>Chemical discharge into drains for liquids and secured landfill for solids</td>
<td></td>
</tr>
</tbody>
</table>

### 3.3.2 Process Description for Incineration system

The unit is already established and running two incinerators and one shredder, the BMWTF have enough space within it to install required treatment equipment, incoming and outgoing waste storage area, vehicle-parking and washing area, staff room, Security Cabin, Sharp Pits,
Chimney foundation, Boundary wall etc. In the proposed project PGIMR is proposing to replacement of these two with new and state of art technology. BMWTF will have following infrastructure:

**Incineration Plant**

The system consists of following components

1. Feed section
   a. Feed tanks
   b. Feed pumps
   c. Heaters
2. Incineration system
   a. Primary chamber
   b. Secondary chamber
   c. Mixing chamber/ Quench chamber
   d. Waste heat recovery system
   e. Force evaporation (Liquid quenching)
3. Flue gas treatment section
   a. Cyclone, Multicyclone
   b. ID Fan (Booster)
   c. 1st stage scrubbing - Water
   d. 2nd stage scrubbing – Alkaline
   e. 3rd stage scrubbing – Sodium hypochloride
   f. Mist eliminator,
   g. ID Fan, Chimney

**a. Primary and secondary chamber**

Incinerator system shall consists of primary chamber and secondary combustion chambers in series, followed by quenching section. Both the combustion chambers shall have refractory lined self-supported structure. Primary chamber burner and secondary chamber burner shall fire the liquid fuel, when required. Primary and secondary chambers are wall mounted burners. Air blowers, supply combustion air to these burners and liquid waste atomizers. Fuel oil flow will be regulated to maintain the temperature inside the furnaces, with help of modulation control panel. Combustion air flow will be regulated by manually operated air flow dampers. Temperature in primary chamber will be maintained at about 800 – 900 deg C. Burners will be provided with flame detector, which controls flame and burner for safe and automatic operation. Liquid waste shall be injected using pumps through nozzle into primary chamber. Atomizing air will be supplied to it which will helps in proper combustion of the waste. The nozzles shall be supplied with air to avoid any damage, which also helps for efficient combustion. Primary combustion chamber, which is a rotary kiln, also has a solid waste charging system with double door automatic feeding system to ensure safety of a person and equipment as well.

The flue gases from the primary chamber travel to the secondary chamber which will be further heated beyond 1150 deg C with help of burner and air supply for complete
combustion. The secondary chamber will be designed in such a way that the residence time of flue gas coming from primary chamber will be more than 2 sec.

Ash generated in the incinerator shall fall at the rear end of primary chamber (Rotary Kiln) in ash collection pit and at the bottom of secondary combustion chamber, which shall be removed periodically by opening ash removal door at side for its further disposal to a secure land fill site. All the operating parameters will be controlled and monitored by onlinesystem. Sight glass near burner assembly and minimum two no. of peep holes will be provided in primary chamber and secondary chamber as well. With help of which, the flame and chamber can be seen from both the chambers. Both the chambers will be provided with refractory bricks which can withstand approx 1500 degC. Explosion window with vent pipe will be provided in both the chambers for safety of the equipment and personnel, to release the flue gases to safe location and avoid backfire in case of any eventuality of pressure rise.

b. Quench chamber
Quenching chamber is provided to quench the flue gas to desirable temperature by adding fresh air. The air is being fed with quench air blower and flow rate is controlled by controlling the blower speed with help of VFD. Quenching system will be placed at the first stage of an APCS to reduce temperature of flue gas after secondary chambers immediately from 1200 deg C to 500 deg C. Gas quench system includes use of a cooling blower. Apart from this due to quenching formation of furans and dioxins will be eliminated. Waste heat recovery Liquid Quench system.

c. Flue gas treatment Section
The flue gases after getting cooled in quenching chamber and waste heat recovery section, will be passed through series of cyclones and scrubbed in three stages
• Cyclone,
• Multicyclone
• ID Fan (Booster)
• 1st stage scrubbing - Water
• 2nd stage scrubbing – Alkaline.
• 3rd stage scrubbing – Sodium Hypochlorite
• Mist eliminator,
• ID Fan, Chimney.

Cyclone Separator / Multicyclone Separator:
Flue gas from forced evaporation system will be passed through cyclone separator and Multicyclone separator, which shall be connected in series to remove solid particles up to ~100 micron from flue gas.

d. Venturi scrubber/ Water scrubber
In venturi scrubber the flue gases will come in close contact of alkaline water which will help in scrubbing of any tiny suspended particles, and acid in the gas will react with alkali in the circulating water. It also helps in cooling of the gas to major extent.

e. Wet Scrubber/ Alkaline scrubber
Wet scrubber will be used to clean acid gas and remove toxic or fine particles. An alkaline solution is injected into the Wet Scrubber or sprayed to scrub all the acidity of gas and smaller particulate matter.
The scrubber solution needs to be removed and replaced frequently, as it becomes contaminated with the particulates and salts from reaction with the acid. The purged stream from scrubber may have to be treated before disposal.

f. Mist eliminator
After treating in venturi scrubber & wet scrubber, the flue gases are again treated in polishing scrubber – also having packed bed, where it will be treated with Hypochlorite solution to remove odor, if any / and also remaining neutralization of acid, if any. The flue gases leaving the polishing scrubber will be passed through mist eliminator to remove the liquid droplets and solid particles if any.

g. ID fan
The ID fan shall be handling all the flue gases coming out of polishing scrubber. It also maintains required /little vacuum (draught) in primary and secondary chambers. It shall discharging the gases to chimney.

h. Chimney /stack
The stack is cylindrical, vertical, self supporting unit designed to discharge flue gases coming from polishing scrubber. Salient features include:
• Base size
• Overall height
• Type of CS with SS cladding construction
• Flange inlet connection
• Sampling connection for local sampling and online analyser as well
• Online monitoring system for HC, CO, HCl, SOx, NOx, PM

(i) Online Monitoring System: It is proposed to install online monitoring system to measure major pollutant parameter. Online monitoring system will be installed for major following parameters i.e HC, CO, HCl, Sox, NOx and PM.
As per requirement Compliance to CPCB Guidelines for Common Hazardous Waste Management Facility for Operational Parameters of Combustion Chamber shall be done

3.3.3 UTILITIES & OTHER INFRASTRUCTURE

3.3.3.1 MAIN WASTE STORAGE ROOM
The waste storage room will be provided near the entry point of the BMWTF to unload and store all bio-medical wastes that have been transported to the facility by vehicle. The size of the room will be adequate to store all wastes transported to the BMWTF. The front portion of the room is utilized for unloading the wastes from the vehicle and back or side portion is utilized for shifting the wastes to the respective treatment equipment. In the front of the room where vehicle is parked for unloading, the floor will be made impermeable so that any liquid spilled during unloading does not percolate into the ground. The liquid generated during handling of wastes and washing, shall be diverted to the inlet of ETP. In the main storage room, wastes is stacked with clear distinction as per the color coding of the containers. From here, the coloured containers may be sent to the respective treatment equipment. Proper care is taken to keep the facility and surroundings free from odours. The main storage room too is having provisions similar to that of equipment room such as roofing, well ventilated, easy to wash floors & walls, smooth and fine surfaces etc. Pests control facilities shall be provided and Measures shall be taken to control escape of litter from the site and to control pests and insects at the site.

Separate and sufficient storage space will be provided for storage of incinerator Ash.

3.3.3.2 WEIGHING SCALE
Weighing scale will be provided at the entry point.

3.3.3.3 ADMINISTRATIVE ROOM:
This room is utilized for general administration, record keeping, and billing etc, which will be provided with necessary facilities as communication facilities, proper lighting, ventilation and first aid box facilities.

Daily records will maintain for the waste accepted and treated waste removed from the site. This record includes the following details:
• Waste accepted: - waste collection date, name of the healthcare unit, waste category as per the rules, quantity of waste, and vehicle number and receiving date (at site).
• Treated waste removed: - date, treated waste type, quantity, vehicle number and location of disposal.

3.3.3.4 SITE SECURITY:
High walls, fencing and guarded gates is provided at the facility to prevent unauthorized access to the site by humans and livestock.

3.3.3.5 PARKING:
Provision is available within the confines of the site for parking of required number of vehicles, loading and unloading of the vehicles meant for transporting waste to and from the facility, etc.

3.3.3.6 SIGN BOARD:
An identification board of durable material and finish is displayed at the entrance to the facility. There is clear display of the name of the facility, the name, address and telephone
number of the operator and the prescribed authority, the hours of operation and the telephone numbers of the personnel to be contacted in the event of an emergency.

3.3.3.7 GREEN BELT:
The area under green cover is 101.97 acres. Necessary provision will be made to prevent and control noise generated, if any, due to the activities at the site. Necessary protective gear for the waste handlers shall be provided.

3.3.3.8 WASHING ROOM:
A washing room is provided for eye washing/hand washing/bathing etc.

3.3.3.9 Firefighting system

Proper firefighting and emergency alarm will be provided at appropriate space. Firefighting system comprises of single loop pressurized water line which will be through separate water storage tank. Water hydrant will be provided on this loop at appropriate location. The line will be pressurized through jockey pump and diesel pump will also be provided in the line to operate the system in absence of power. Different type and size of fire extinguisher shall be provided in incineration shed, office area and security cabin and at assembly point.

3.4 Raw material required along with estimated quantity, likely source, marketing area of final product/s, mode of transport of raw material and finished product.

According to a WHO report, around 85% of the hospital wastes are actually non-hazardous, 10% are infectious and 5% are non-infectious but hazardous. According to Indian Society of Hospital Waste Management, The quantum of waste that is generated in India is estimated to be 1-2 kg per bed per day in a hospital and 600 gm per day per bed in a general practitioner’s clinic. It is estimated that 20-25% of total Hazardous waste is Biomedical waste.

3.4.1 Quantity of Biomedical Waste Generation

a. From PGI:

Total No. of Beds at PGI: 1740 Sanctioned Beds

0208 (Observation beds)

Total Quantity of Bio-Medical Waste generated (in kgs/day): 1416.2

Quantity of incinerable waste generated (in kgs/day): 863.1

Quantity of non incinerable waste generated (in kgs/day): 553.1

Category-wise total waste generated quantities (in kgs/day):
<table>
<thead>
<tr>
<th>No.</th>
<th>Category</th>
<th>Waste Category</th>
<th>Method of Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No. 1</td>
<td>Human anatomical waste</td>
<td>11.18 in average kgs/day</td>
</tr>
<tr>
<td>2</td>
<td>No. 2</td>
<td>Animal Waste</td>
<td>1.6 in average kgs/day</td>
</tr>
<tr>
<td>3</td>
<td>No. 3</td>
<td>Microbiology &amp; biotechnology waste</td>
<td>90 in average kgs/day</td>
</tr>
<tr>
<td>4</td>
<td>No. 4</td>
<td>Waste Sharps</td>
<td>319.5 in average kgs/day</td>
</tr>
<tr>
<td>5</td>
<td>No. 5</td>
<td>Discarded medical and cytotoxic drugs</td>
<td>Nil in average kgs/day</td>
</tr>
<tr>
<td>6</td>
<td>No. 6</td>
<td>Soiled waste</td>
<td>815.72 in average kgs/day</td>
</tr>
<tr>
<td>7</td>
<td>No. 7</td>
<td>Solid waste</td>
<td>143.6 in average kgs/day</td>
</tr>
<tr>
<td>8</td>
<td>No. 8</td>
<td>Liquid Waste</td>
<td>Not assessed STP under process</td>
</tr>
<tr>
<td>9</td>
<td>No. 9</td>
<td>Incineration ash</td>
<td>34.6 in average kgs/day</td>
</tr>
<tr>
<td>10</td>
<td>No. 10</td>
<td>Chemical Waste</td>
<td>Not assessed STP under process</td>
</tr>
</tbody>
</table>

b. From Other hospital and nursing homes:

Total Estimated Quantity treated:

Fuel Oil: Light Diesel Oil (Approx 7000Ltr/Month) shall be required for the incineration of BMW.

3.4.2 COLLECTION & TRANSPORTATION OF BIOMEDICAL WASTE

COLLECTION OF BIO-MEDICAL WASTE

The collection and transportation of bio-medical waste is carried out in a manner so as to avoid any possible hazard to human health and environment. Collection and transportation are the two operations where the chances of segregated bio-medical waste coming in contact with the public, rag pickers, animals/birds, etc are high. Therefore, all carries taken to ensure that the segregated bio-medical waste, handed over by the healthcare units, reach BMWTF without any damage, spillage or unauthorized access by public, animals etc.

Temporary storage at healthcare unit is designated the coloured bags handed over by the healthcare units is collected in similar coloured containers with cover. Each bag is labeled as per the Schedule III & IV of the Bio- Medical Waste (Management & Handling) Rules, so that at any time, the healthcare units can be traced back that are not segregating the bio-
medical wastes as per the rules. The coloured containers is strong enough to withstand any possible damage that may occur during loading, transportation or unloading of such containers. These containers is also be labeled as per the schedule iii of the rules. Sharps is be collected in puncture resistant container. The person responsible for collection of bio-medical wastes is also carrying a register with him to maintain the records such as name of the healthcare unit, the type and quantity of waste received, signature of the authorized person from the healthcare unit side, day and time of collection etc. A responsible person from the BMWTF operator is always accompanying the vehicle to supervise the collection and transportation of bio-medical waste.

TRANSPORTATION OF THE COLLECTED BIO-MEDICAL WASTE TO THE BMWTF:

The bio-medical waste collected in coloured containers is transported to the BMWTF in a fully covered vehicle. Such vehicle is dedicated for transportation of bio-medical waste only. Depending upon the volume of the wastes to be transported, the vehicle may be a three-wheeler, light motor vehicle or heavy duty vehicle. In either case, the vehicle is possessing the following:

(I) Separate cabins are provided for driver/staff and the bio-medical waste containers.

(II) The base of the waste cabin is leak proof to avoid pilferage of liquid during transportation.

(III) The waste cabin may be designed for storing waste containers in tiers.

(IV) The waste cabin is so designed that it is easy to wash and disinfect.

(V) The inner surface of the waste cabin is made of smooth surface to minimize water retention.

(VI) The waste cabin is having provisions for sufficient openings in the rear and/or sides so that waste containers can be easily loaded and unloaded.

(VII) The vehicle is labeled with the bio-medical waste symbol (as per the schedule iii of the rules) and should display the name, address and telephone number of the CBMWTF.

It is ensured that the total time taken from generation of bio-medical waste to its treatment, which also includes collection and transportation and treatment time, shall not exceed 48 hours.

3.4.3 Resource optimization/ recycling and reuse envisaged in the project, if any, should be briefly outlined

Generated hot gas will be utilized for the different application to reduce fuel consumption.

3.4.4 Availability of water its source, energy/ power requirement & source

Water

Water requirement & its source
Approx 8KL per day will required for the proposed project, which will be Sourced from Municipal Co-orporation water supply, Chandigarh.
Energy/ Power Requirement: Total Sanctioned load for complete institute :-25 MW (Approx.) power required for proposed project is around 50 KW which will be sourced from Union Territory Chandigarh Electricity dept. for Backup power source: Double Power Supply will be available.

3.4.5 Quantity of waste to be generated (liquid and solid) and scheme for their management/ disposal

Solid & Hazardous Waste:

From the incinerator process 34.6 in average kgs/day of incinerator ash will be generated which will store in designated storage area and will be disposed off as per Hazardous waste handling and Management rule to secured landfill of M/S Nimbua Greenfield Punjab Ltd. Small quantity of waste oil will be generated which will be disposed off as per Hazardous waste handling and Management rule.

Liquid Waste: The effluent will be mainly generated from scrubber bleed, washing area. The same shall be treated through ETP. The Effluent treatment plant shall consist of primary, secondary and tertiary treatment plant. The treated effluent shall be utilized for gardening purpose.

3.4.6 Schematic representations of the feasibility drawing which give information of EIA purpose

The proposed activities of the industry; fall under category A Sr. no. 7 (da) in the Government of India Notification no. 1533 dated 14th September, 2006; which require prior Environmental Clearance before starting construction, production or any other allied activities related to the project. For getting the Environmental Clearance; it is required to carry out the Environmental Impact Assessment (EIA) study report.

Environmental Impact Assessment (EIA) is a formal process used to predict how industrial Development or construction project will affect natural resources such as water, air, land, Socioeconomic and bio ecological environment. Generic structure of EIA will comprises following points:

- **Introduction:** This chapter briefly provides project details and EIA regulations that mandate the preparation of this EIA report.
- **Project Description:** This chapter discusses the background of the project along with details on mining procedure and technology. A detailed account of the surrounding area is provided highlighting settlements, topography, ore type and formation.
- **Analysis of Alternatives:** This chapter discusses the alternatives to the project in term of demand, input & supply, activity, location and process.
- **Description of Environment:** This chapter describes the prevailing environmental status as per EIA Guidelines Manual – Mining of Minerals. This provides detailed
status of air, water, noise, biological and socio-economic environment within the study area represented by 10 km radius area around lease area.

- **Anticipated Environment Impact & Mitigation Measures:** This chapter identifies potential impacts of the project on the baseline environment, as described in Chapter 4, and proposes mitigation measures to be adopted to minimize adverse impacts.

- **Environmental Monitoring Program:** This chapter will include details of mitigation measures and methods of determining their effectiveness through timely environmental monitoring.

- **Additional studies:** This chapter details the additional studies undertaken as per the Terms of Reference (ToR) issued by EAC.

- **Project benefits:** This chapter includes the benefits accrued to the locality, neighborhood, region and nation as a whole.

- **Environmental Management Plan:** This chapter highlights the Environment Management Plan (EMP) that is integrated into the mining process to minimize adverse environmental impacts.

- **Summary and Conclusion:** This chapter summarizes the entire EIA report and highlights data significant to impacts on surrounding environment.

- **Disclosure of Consultant engaged:** The section gives details of the EIA consultant appointed by the project proponent as per the EIA Guidelines Manual – Mining of Minerals.

4 SITE ANALYSIS

4.1 Connectivity
The proposed Biomedical Waste treatment facility is located at Sector -12, PGIMER, Chandigarh. The Site is well located with major district road and Highway NH-21.

4.2 Land form, land use and land ownership
Land form: As per Master plan of Chandigarh the proposed location is demarked for Hospital activities. No land use conversion will be carried out for proposed activities.

4.3 Existing infrastructure:
The proposed project is the replacement of 02 Nos. of existing Incinerators with latest technology of Incinerators with capacity not less than 170 kg/hour. Existing infrastructure is available, as per requirement and it will be upgrade to meet the CPCB standards.

4.4 Topography
The topography is plain
4.5 Social infrastructure available

The project site is located in sector - 12 of Chandigarh. The location is around the human settlement and all basic amenities of life are easily available in the area. Necessary infrastructure such as road, Primary Health Centre, School, drinking water, electricity, communication, road network, transportation facility is available in the vicinity.

5 PLANNING BRIEF

5.1 Planning Concept (type of industries, transportation etc) Town and country planning/ development authority classification

5.2 Land use planning (break up along with green belt etc)

Total Plot area of PGI Institute is 277 Acre, out of which 1 kanal (196.81 Sq. Mtr) is demarcated for BMW treatment facilities. 101.97 Acres is proposed for green belt around 36.81%.

5.3 Assessment of infrastructure demand (physical and social)

Necessary infrastructure Necessary infrastructure as Road Primary health center, school, drinking water, electricity, communication, road network, transportation facility is available in the vicinity.

5.4 Amenities/ Facilities

Major basic facilities are available for the proposed project. Road, electricity, water, transportation facility etc. are well developed in the surrounding area.

6 PROPOSED INFRASTRUCTURES

6.1 Industrial area (Processing area)

Total Plot area of PGI Institute is 277 Acre, out of which 1 kanal (196.81 Sq. Mtr) is demarcated for BMW treatment facilities.

6.2 Residential area (Non processing area)

No Labour colony is envisaged in the proposed project. Although PGI itself has hostel Residential Quarters in the institute.

6.3 Green belt

Institute has green belt around 36.81% and the project is replacement of Incinerator only.

6.4 Social infrastructure

Basic amenities of life are easily available in the area. Primary health centre, school, drinking water, electricity, communication, road network, transportation facility is available in the vicinity.
6.5 Connectivity (Traffic and transportation road/ rail/ metro/ water ways etc)
The proposed Biomedical Waste treatment facility is located at Sector -12, PGIMER, Chandigarh. The Site is well located and connected with major district road and Highway.

6.6 Drinking water management (Source & supply of water)
Approx. 8KL per day will be required for the proposed project, which will be sourced from Municipal Corporation water supply, Chandigarh.

6.7 Sewerage system
Domestic waste water generated shall be treated in the STP and later shall be partly reused for gardening purpose.

6.8 Industrial waste management
The industrial waste generated mainly will be in form of hazardous waste and solid waste.

From the incinerator process 34.6 in average kgs/day of incinerator ash will be generated which will store in designated storage area and will be disposed off as per Hazardous waste handling and Management rule to secured landfill of M/S Nimbua Greenfield Punjab Lt. small quantity of waste oil will be generated which will be disposed off as per Hazardous waste handling and Management rule.

Liquid Waste: The effluent will be mainly generated from scrubber bleed, washing area. The same shall be treated through ETP. The Effluent treatment plant shall consist of primary, secondary and tertiary treatment plant. The treated effluent shall be utilized for gardening purpose.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Type of Waste</th>
<th>Quantity</th>
<th>Storage/ Disposal Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>incinerator Ash</td>
<td>34.6 in average  kgs/day</td>
<td>Shall be disposed in Hazardous waste disposal sitesecured landfill of M/S Nimbua Greenfield Punjab Lt.</td>
</tr>
<tr>
<td>2.</td>
<td>Scrubber bleed</td>
<td>10 KL/day</td>
<td>ETP</td>
</tr>
<tr>
<td>3.</td>
<td>ETP Sludge</td>
<td>20kg/Month</td>
<td>Shall be disposed in Hazardous waste</td>
</tr>
</tbody>
</table>
6.9 Power requirement & Supply/ source
Total Sanctioned load for complete institute :- 25 MW power required for proposed project is around 50 KW which will be sourced from Union Territory Chandigarh Electricity dept. for Backup power source: Double Power Supply will be available.

7 Rehabilitation and Resettlement (R & R) Plan: Not applicable

7.1 Policy to be adopted (Central/ state) in respect of the project affected persons including home oustees, land oustees and landless laborers
Not applicable

8 Project schedule and cost estimates
8.1 Likely date of start of construction and likely date of completion
Likely date of start of construction: Within Six months after obtaining EC
Likely date of completion of construction: 2017

8.2 Estimated project cost along with analysis in terms of economic viability of the project
Total project cost: 460 Lakhs (Approx.)
Cost break will be provided in EIA report.

9 Analysis of proposal (Final Recommendations)

9.1 Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area:
This is already Hospital for social welfare of people.