

# Hospital Waste Management Plan

## District Head Quarter Hospital, Skardu

2020



GB-EPA





# Hospital Waste Management Plan

District Head Quarter Hospital, Skardu



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## Background

Hospital Waste Management (HWM) continues to be a major challenge, particularly, in most healthcare facilities of the developing world. Lackadaisical behavior and inappropriate disposal methods exercised during handling and disposal of Hospital Waste (HW) is posing significant health hazards and environmental pollution.

Hospitals in Pakistan generate about 250,000 tons of waste per year, which has been reported to be poorly handled and managed by the hospital staff and administration. Almost all hospitals in Pakistan do not practice HWM in the facilities. Segregation, handling, storage, transportation and disposal of waste is below par with World Health Organization (WHO) guidelines, Hospital Waste Management Rules 2005 and Pakistan Bio-safety Rules 2005.

Gilgit-Baltistan like other provinces of Pakistan has been facing serious environmental issues, amongst which environmental pollution, waste management and sanitation are ranked as top. Increasing population, unplanned haphazard development, rural urban migration to avail better opportunities of jobs, education and medical facilities are the key factors of environmental pollution. Rapidly growing economic activities in urban centers of the region, along with booming population, have strained the region's existing services and urban infrastructures. As a result, most of the services are failed to address the basic needs of the population associated with environmental sanitation.



Figure 1: An example of open dumping of Hospital Waste near Child ward at DHQ-Skardu.

Solid waste collection and disposal is one of the key environmental issues in the region. The solid waste generated in urban areas is managed by municipal corporations in respective district headquarters. The common solid waste in the towns are plastic shopping bags, paper, wrappers, organic waste, disposable water bottles, cans and tetra packs etc. Beside this, waste generated from households, poultry, barbershops, butchers and automobile workshops are the major sources of solid waste in the town. The existing sanitation and waste disposal system cannot cope with the volume of solid waste generated in major towns of the region. More importantly the solid waste generated by hospitals are not properly collected, transported and disposed. Hospital waste in addition to other waste is being dumped openly near water bodies, which cause serious environmental threats and pose adverse impacts on human health. Municipal Committees have very limited machineries/tools/equipment and financial and human resources for safe disposal of these wastes.



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Gilgit-Baltistan Environmental Protection Agency (GB-EPA), since its establishment in 2007, is trying to address the key environmental issues of the region including municipal and hospital waste. A survey in 2012 on solid waste management revealed that there is no proper solid waste management system in all urban centers of the region. The infectious waste generated from hospitals is being dumped in open areas nearby hospital. The municipal corporation is collecting this infectious waste and dump it near Gilgit River openly. This haphazard disposal of hospital waste in surrounding of human settlements and hospitals are the potential source of different diseases and nuisance.



*Figure 2: MC .Skardu staff filling waste in open tractor trolley for disposal at open sites near Indus River bank around Skardu city.*

The current document named as Hospital Waste Management Plan is a soft component of hospital waste management initiative of GB-EPA started in five district hospitals in the region. The project aims to demonstrate a robust and environmentally safe hospital waste management systems, in accordance to the local needs and requirements as per hospital Waste Management Rules 2005 approved by federal government.



# Importance of Hospital Waste Management

The absence of appropriate HWM mechanism leads to numerous health and environmental consequences not only within the hospital but also to the population in the vicinity. The hazardous nature of hospital waste is due to the presence of toxic or hazardous chemicals, radioactive materials, sharps, infectious agents, and composition of genotoxic or cytotoxic chemicals. Individuals in proximity of hazardous health-care waste are potentially at high risk, which either handle such waste or are exposed to it. The main groups at risk are:

- Doctors, paramedics and hospital administration.
- Patients in health-care facilities or receiving home care
- Visitors to health-care facilities
- Workers in support services, such as sweepers, people who do laundry
- Workers transporting waste to a treatment or disposal facility
- Workers in waste-management facilities (such as landfills or treatment plants), as well as informal recyclers (scavengers)

The general public could also be at risk whenever hazardous health-care waste is abandoned or disposed improperly. The hazards associated with scattered, small sources of health-care waste cannot be overlooked. In 2000, the World Health Organization (WHO) estimated that at world level accidents caused by sharps accounted for 6,000 cases of infection with the hepatitis B virus, 16,000 cases of infection with hepatitis C virus and 200 to 5,000 cases of HIV infection amongst the personnel of health-care facilities.

### Mercury in Health sector

Mercury is used in several medical equipment, especially fever thermometers and blood-pressure monitoring equipment. These represent a hazard in terms of both breakage and long-term disposal. A less well-known source of mercury in medical waste is batteries used in medical equipments, particularly the small button batteries. American and European manufacturers are removing mercury from their products, but it may still be present in those produced elsewhere (EC, 2006; Department of Environmental Protection, 2009). Many health-care facilities have adopted a policy of gradual replacement with mercury-free alternatives.

Health-care facilities also contribute up to 5% of the release of mercury to water bodies through untreated wastewater. Environment Canada estimates that one third of mercury load in sewerage systems comes from dental practices.

Health-care waste incineration is one of the main sources of mercury release into the atmosphere from health-care facilities. The United States Environmental Protection Agency estimates that medical incinerators may have historically contributed up to 10% of mercury air releases. In the United Kingdom, more than 50% of total mercury emissions come from mercury contained in dental amalgam, and laboratory and medical devices.

Sources: Risher (2003); WHO (2005)



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## Legal Framework for HWM

The present Hospital Waste Management Plan has been prepared in line with Gilgit-Baltistan Environmental Protection Act, 2014; and Hospital Waste Management Rules, 2005. Other International obligations, such as WHO guidelines for Health Care Waste 2004, Basel Convention articles (Box-1), Stockholm Convention on Persistent Organic Pollutants (POPs) (Box-2), and recommendations of the sustainable development conferences have been taken into account during formulation of the waste management plans for selected hospitals in GB.

According to WHO guidelines and Hospital Waste Management Rules 2005, "safe handling and disposal of all kinds of Hospital Waste is sole responsibility of the hospital authorities". The HWM Rule 2005, clearly specify the roles and responsibilities of hospital authorities at different levels for hospital waste management and disposal in an environmentally sustainable way.

The United Nations Conference on the Environment and Development (UNCED) in 1992 led to the adoption of Agenda 21, which recommends set of measures for waste management. The recommendations may be summarized as follow:

- Prevention and minimization of waste production.
- Reuse or recycle the waste to the extent possible.
- Treatment of waste by using safe and environmentally sound methods.
- Disposal of the final residues by landfill in confined and carefully designed sites.

Agenda 21 also stresses that any waste producer is responsible for the treatment and final disposal of its own waste; where possible, each facility should dispose its waste within its own boundaries.

### Box-1: Basel Convention:

The Basel Convention is the most comprehensive global environmental treaty on hazardous and other waste. It has 170 member countries (parties) and aims to protect human health and the environment against the adverse effects resulting from the generation, management, trans-boundary movements and disposal of hazardous and other waste. The Basel Convention specifically refers to:

Y1 – Clinical wastes from medical care in hospitals, medical centers and clinics

Y3 – Waste pharmaceuticals, drugs and medicines.

The convention also has a category of hazardous characteristics defined as "H 6.2 – Infectious substances – substances or wastes containing viable micro-organisms or their toxins which are known or suspected to cause disease in animals or humans."

### Box-2: Stockholm Convention:

The Stockholm Convention on Persistent Organic Pollutants (POPs), is a global treaty to protect human health and the environment from persistent organic pollutants (POPs). POPs are chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissues of living organisms and are toxic to human and wildlife. POPs circulate globally and can cause damage wherever they travel.

Under Article 5 and Annex C, governments that are party to the convention are required to reduce or eliminate releases from unintentional production of POPs – in particular, polychlorinated dibenzo-p-dioxins and dibenzofurans.

These chemicals are formed and released to the environment by medical waste incinerators and other combustion processes. Governments must require the use of best available techniques and promote best environmental practices for new incinerators within four years after the convention comes into force for the country.



### Hospital Waste Management Practices

Skardu City is head-quarter of district Skardu. Being administrative, business and educational hub of the region, the city is growing very fast. Current population is estimated around six lacs and DHQ Skardu is the only secondary level health care facility in district Skardu and Baltistan region. According to hospital administration DHQ hospital OPD and emergency provide health care facilities to more than 2000 patients daily.



Figure 3: A view of dump site of HW near Female Ward at DHQ Skardu

DHQ Skardu started its operation in 1967 as agency hospital and then gradually upgraded in the last decades from 50 beds to 169 beds including trauma and maternal and child health care center in 2001.

Although significant progress has been made in infrastructure development at DHQ Skardu in recent decades, but very little attention has been given to improve hospital waste management system. In 1998 WHO provided an incinerator of 100 kg capacity- but this never worked since its installation, because other components of the Hospital waste management such as collection, transportation, disposal and capacity building of waste handling staff was not addressed properly.



Figure 4: Improper dumping of hospital waste

At present there are twelve males and four females are engaged in sanitary work at DHQ-Skardu. Generally, waste from wards, OT and Labor rooms is collected on daily basis at evening and morning shifts. The un-segregated waste is dumped at different locations inside the hospital premises. The municipal committee Skardu has provided tractor trolleys-laying near these dumping points.



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Generally the waste is dumped around these trolleys and are been picked by municipal staff fortnightly, on request of hospital administration. The municipal committee Skardutakes the whole junk of un-segregated waste in open tractor trolley depending upon their availability-and dump it in open areas near river bank outside of Skardu town.



## Classification of Hospital Waste

There are several classification systems for hospital wastes: The World Health Organization, and the Federal EPA classification. Taking into account the characteristics of the selected facilities, a simple and practical way to classify solid waste is according to their hazardous level i.e. hazardous (risk waste) and non-hazardous (non-risk waste). Hazardous waste comprises of infectious and special waste. Non-hazardous waste is of similar characteristics to that of household waste.

Specific characteristics of these types of waste (infectious, special and non-risk) are adopted from guidelines for the internal management of the health care centers (CEPIS/PAHO-WHO 1996).

### I. Hazardous Waste

#### a) Infectious Waste

Infectious waste is the waste that is (or has potential to be) contaminated and can spread diseases, viruses and bacteria. This waste is generated during different medical care stages i.e. diagnosis, treatment, immunization, research, etc. They represent different levels of potential danger, according to the degree of exposure to infectious agents. For detail characteristics see table-1.

#### b) Special Waste

Special waste is the waste generated during activities that have not been in contact with patients or infectious agents. They pose a health risk due to their hazardous characteristics such as corrosively, reactivity, inflammability, toxicity and radioactivity. These wastes are generated mainly during diagnosis and treatment. This category of wastes include Hazardous chemical wastes, Pharmaceutical and Radioactive waste.

### II. Non-hazardous

It is the waste generated by administrative and general activities not included in any of the above categories. These types of waste do not pose a health risk and their characteristics are similar to those of the common domestic waste. This category includes paper, cardboards, boxes, plastics, food leftovers, and waste from gardens.

Hospital waste is generated from many sources, including major sources such as wards, operation theatres, laboratories, labor rooms, vaccination centers, and pharmacy stores as well as minor sources such as doctor's offices, dental clinics, radiology and convalescent rooms. Characteristics and sources of hospital waste is given in the following table.



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Table 1: Major Sources of Hospital Waste and Characteristics

| Sources                                   | Risk waste   |   | Special waste  | No-Risk waste  |
|---|--|---|--|--|
|   | Sharps   | Infectious and pathological waste   | Chemical, pharmaceutical and cytotoxic waste   | Non-hazardous or general waste   |
| Wards (Medical/ Surgical/ Child/ CCU/ITC) | Hypodermic needles, intravenous set needles, broken vials and ampoules       | Dressings, bandages, gauze and cotton contaminated with blood or body fluids; gloves and masks contaminated with blood or body fluids                                     | Broken thermometers and blood-pressure gauges, spilt medicines, spent disinfectants                            | Packaging, food scraps, paper, flowers, empty saline bottles, Sanitary napkins, non-bloody intravenous tubing and bags |
| Operating theatre/ labor room             | Needles, intravenous sets, scalpels, blades, saws                            | Blood and other body fluids; suction canisters; gowns, gloves, masks, gauze and other waste contaminated with blood and body fluids; tissues, organs, fetuses, body parts | Spent disinfectants<br>Waste anesthetic gases  | Packaging; uncontaminated gowns, gloves, masks, hats and shoe covers   |
| Laboratory                                | Needles, broken glass, Petri dishes, slides and cover slips, broken pipettes | Blood and body fluids, microbiological cultures and stocks, tissue, infected animal carcasses, tubes and containers contaminated with blood or body fluids                | Fixatives; formalin; xylene, toluene, methanol, methylene chloride and other solvents; broken lab thermometers | Packaging, paper, plastic containers   |
| Pharmacy store                            |  |   | Expired drugs, spilt drugs   | Packaging, paper, empty containers   |
| Vaccination campaigns                     | Needles and syringes   |   | Bulk vaccine waste, vials, gloves  | Packaging  |



# Guiding Principles of Hospital Waste Management Plan

Keeping in view the current scenario of waste generation and existing management practices following will be the guiding principles of hospital waste management plan;

- 1. Minimization of waste**  
Reduce unnecessary injection to protect health care providers and the public from unnecessary health risks.
- 2. Segregation of waste**  
Separate waste at its source into 1) sharps; 2) infectious waste; 3) non-infectious waste.
- 3. Safe handling of sharps**  
Use puncture-proof safety boxes or needle removal for disposal of all needles and plastic syringes. Dispose of all medical sharps safely.
- 4. Safe collection of medical waste**  
Apply waste segregation and handling procedures to all health care areas. Waste handlers must use personal protective equipment and maintain a routine collection and transport schedule.
- 5. Safe final disposal**  
Use best available option for final disposal. .
- 6. Sustainability**  
Identify funds and partnerships necessary for sustainable medical waste management. Support must include supplies, maintenance, and operational funds.
- 7. Occupational safety**  
Support medical waste personnel with training, supervision, hepatitis B vaccination, and protective gear.



## Hospital Waste Management Mechanism

Current hospital waste management practices, recommendations of WHO and Hospital Waste Management Rules, 2005; following will be the four key components of Hospital Waste Management.

1. Collection Mechanism of Hospital Waste
2. Transportation Mechanism inside Hospital Waste
3. Disposal of Hospital Waste
4. Overall Management and reporting lines

## Collection Mechanism

### Ward Level

Sanitary staff at ward level will be responsible to collect hospital waste at primary level in color coded bags provided for waste collection and segregation at the point of generation. Quarter filled color coded bags will be placed in containers at secondary collection points in respective color coded bins provide in each ward at specific location identified by ward master and the shift in-charge. Waste collection will be done twice in 24 hours. Shift in-charge will be responsible for designating sweepers and collection time. Other responsibilities include record keeping of the volume of waste generated in ward and liaison with ward master for effectively implementation of the hospital waste management plan. Type of waste generates and responsibilities of ward staff are given in the following figure.

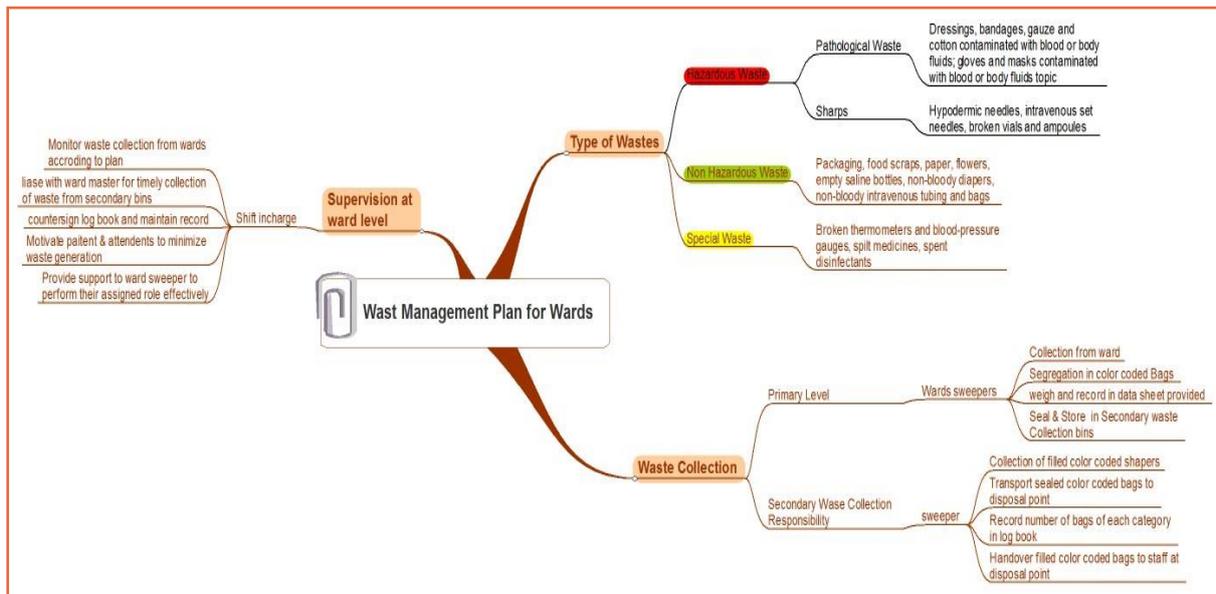


Figure 5: Proposed Waste Management Plan at Ward Level



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## Laboratory

Laboratory staff mainly technicians will be responsible to segregate the waste at point of generation. The types of waste in laboratories include risk and non-risk waste as shown in figure below. Color coded bags provided in each working bench should be used for this purpose. The waste will be collected by laboratory sweeper in the morning and evening. He will be responsible to remove color coded bags from the bin and to dump at secondary waste collection point, installed outside the laboratory. Monitoring of internal waste management in laboratory will be responsibility of Pathologist and laboratory shift in-charge. Waste from secondary point will be collected by the sweeper assigned for this task by ward master.

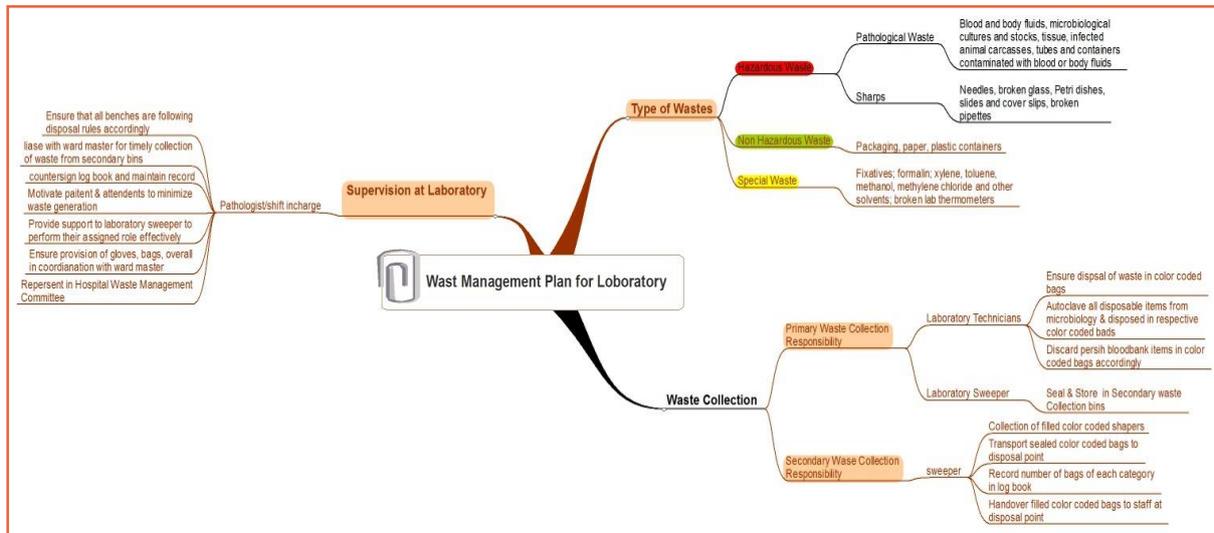


Figure 6: Waste Management Plan of Laboratory

## Outdoor Patient Department

About 1500 outdoor patients and attendants visit DHQ Hospital, Skardu on daily basis. The normal and initial medical checkups are done in the OPDs. Normally non-hazardous waste is generated in these departments; however a little amount of hazardous waste such as sharps and used ampoules from emergency treatment is produced each day.

## Operation Theater & Labor Rooms

The waste produced in operation theater and labor rooms falls in risk category containing a major part of sharps, blood and contaminated gauze and bandages. In order to avoid disease transmission and to prevent infection, it is necessary that each waste produced after every operation should be discarded immediately in provided color coded bins and shifted to outside of the operation theater in waste collection trolleys up to the secondary collection point. OT in-charge will be responsible to ensure proper waste collection and transportation in accordance with this waste management plan. The waste generated from labor rooms either from normal delivery or C-sections will be the responsibility of female staff working there. On-duty doctor will be responsible to ensure shifting of waste to secondary waste collection point in sealed color coded bins after each delivery. Type of waste, collection, disposal and monitoring is given in the following figure.



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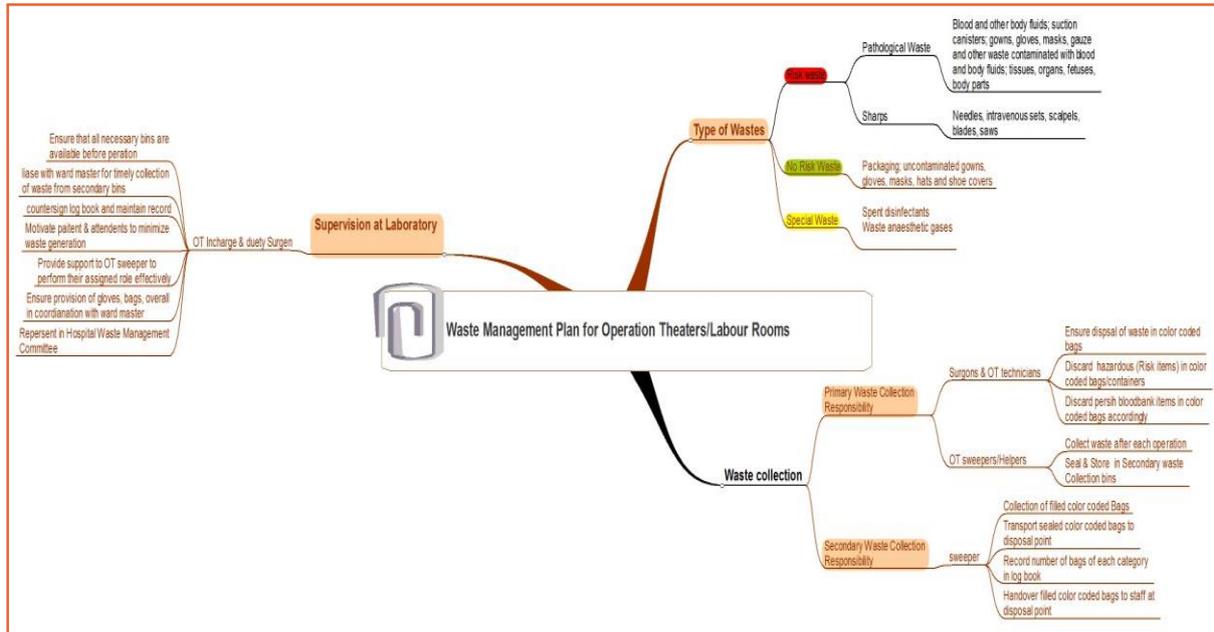


Figure 7: Proposed Waste Management Plan for OT and Labor Room

## Frequency of Waste Collection

Presently collection of waste from different health facilities and general areas is done at morning and evening times. It is suggested that same waste collection times should be observed in future. However, it is suggested that shift in-charge of each ward should ensure proper waste collection according to guidelines discussed in previous sections.

## Transportation Mechanism-inside Hospital

There are two stages of transportation of hospital waste. In stage one the waste dumped at secondary waste collection points in color coded sealed bags will be collected by the sweepers. Sweepers will take these color coded bags in waste trolley from each secondary collection point situated at different locations of the hospital premises to final disposal point. In second stage, filled and sealed bags will be handed over to incinerator operator who will sort out color coded bags for incineration and for dumping of non-risk waste bags at transfer station for final disposal to landfill site. Waste from operation theater and post operation wards will be primarily collected by ward sweepers and dumped in the secondary points. The waste from secondary points will be transported for final disposal. Waste Transportation system from secondary points from main areas is given in the following figure;



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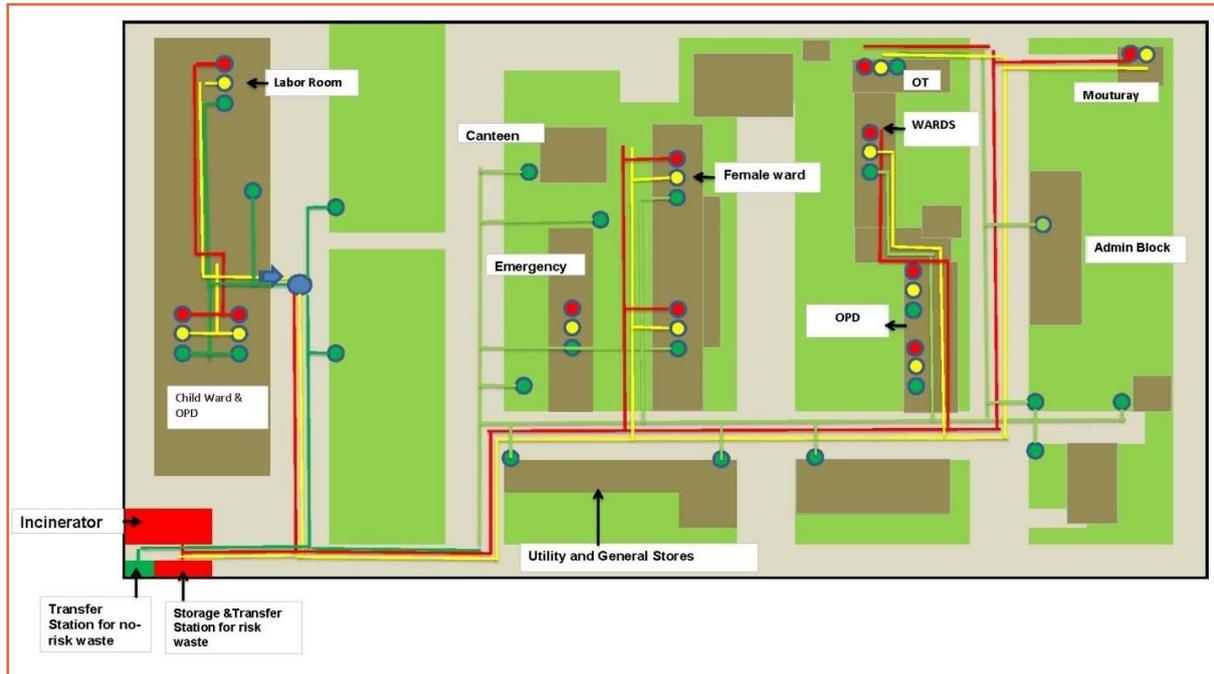


Figure 8: Waste Transportation Mechanism DHQ Hospital Skardu

## Disposal Mechanism

Hospital waste brought at disposal point will be segregated by the sweeper under the supervision of incinerator operator. The operator will weigh the risk and non-risk waste bags and place red and yellow coded color bags for incineration at assigned place and green color bags at transfer station for further disposal at landfill site. Plant operator will be responsible to fill data sheet after weighing the color coded bags accordingly.

### Risk Waste

Risk waste (Yellow & Red) bags will be placed at storage area provided for this purpose near incinerator. The risk waste will be incinerated according to the SOPs given in Annex-I in two shifts or as decided by the hospital management. However, it is proposed that risk waste should be incinerated soon after receiving in morning and evening shift.

### Non-Risk waste

Non-risk waste (General waste and Ashes) will be shifted to transfer station for final disposal to landfill site either by municipal committee or by hospital transport mechanism according to the SOPs given in Annex-II.

## Overall Management and Reporting

Medical Superintendent (MS) or head of the hospital will be responsible for overall management of the proposed hospital waste management plan. He will ensure smooth implementation of the waste



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management plan in coordination with heads of different departments and relevant agencies other than hospital. Hospital waste management plan derived from HWM Rules, 2005 and WHO Guidelines is given in the following diagram.

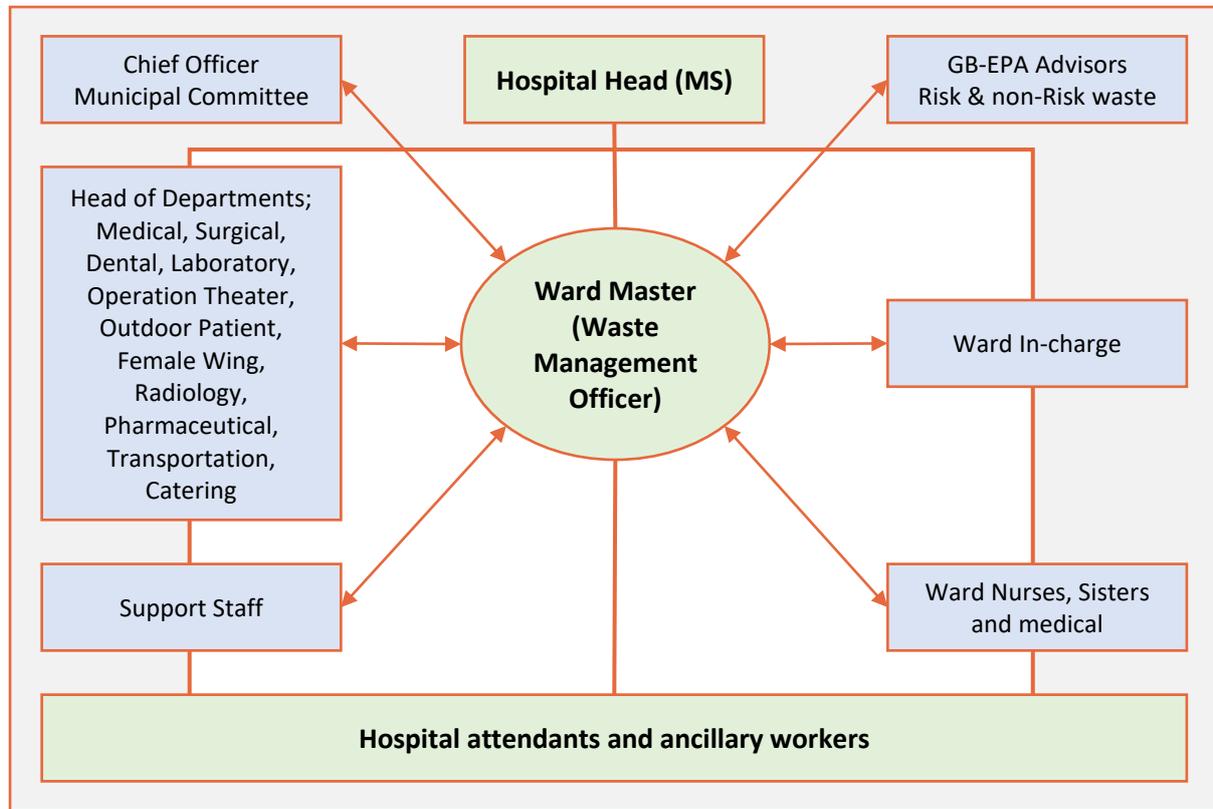


Figure 9: Reporting and management structure

Ward master will be the key person to provide administrative support for smooth operation of everyday activities related to hospital cleanliness according to this waste management plan. Whereas medical superintendent of the hospital will provide financial, programmatic and policy level support required for implementation of the proposed waste management plan when and where needed.



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### Structure and Responsibilities of Hospital Waste Management Team

According to Hospital Waste Management Rules 2005, it is mandatory for MS of hospital to notify the hospital waste management committee for safe handling and disposal of hospital waste. The structure of waste management team in DHQ Hospital, Skardu will be as under;

|     |   |           |
|-----|---|-----------|
| 1.  | Medical Superintendent  | Chairman  |
| 2.  | Head of Medicine (Medical Department)                           | Member    |
| 3.  | Head of Surgical Department                                     | Member    |
| 4.  | Head of Laboratory (Pathologist)                                | Member    |
| 5.  | Head of Operation Theater                                       | Member    |
| 6.  | Head of Dental Department                                       | Member    |
| 7.  | Head of ICU   | Member    |
| 8.  | Administrator   | Secretary |
| 9.  | Ward Master   | Member    |
| 10. | Representative of District Administration                       | Member    |
| 11. | Representative of SDA   | Member    |
| 12. | Representative Gilgit-Baltistan Environmental Protection Agency | Member    |

The waste management team will be responsible;

1. To provide overall technical guidance and support for implementation of the hospital waste management plan.
2. To review hospital waste management plan periodically and take measures to improve and scale up.
3. To supervise all action/responsibilities given in the waste management plan accordingly.
4. To approve rules/procedures to minimize waste generation in departments of hospitals by ensuring purchasing of recycle items at maximum level.
5. To generate periodic reports on efficiency of hospital waste management and take measures to overcome shortfall in terms of finances and human resources.

The meetings of the waste management team should be held bi-monthly. Presence of one third of the members of the waste management team will fulfill the quorum requirement for the meeting.

Individual responsibilities of waste management team members will be as under:

### Duties and Responsibilities of Medical Superintendent

According to Hospital Waste Management Rule, 2005; the medical superintendent of the hospital will be responsible to;

1. To constitute the hospital waste management team as described above.



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2. Designate a waste management officer<sup>1</sup>,
3. Facilitate the meetings of hospital waste management team and ensure implementation of its decisions,
4. Supervise implementation, monitoring and review of the Waste Management Plan and ensure it is kept updated,
5. Arrange a waste audit of the hospital by an external agency as may be designated by Government (GB-EPA), involving analysis for the existing waste stream and assessment of existing waste management practices,
6. Allocate sufficient financial and manpower resources to ensure efficient and effective implementation of the waste management plan, and
7. Ensure adequate training and refresher courses for the relevant staff.

### Duties and Responsibilities of Head of Departments

The head of departments shall be responsible for the proper management of the waste generated in their respective departments (Wards), and will be responsible to;

1. Ensure that doctors, nurses and clinical staff in their respective departments, are aware of the bio-medical waste management practices.
2. Ensure that waste handling staff is well trained and aware of the waste management practices.
3. Adopt measures and supervise waste handling staff to comply waste management procedures
4. Liaise with waste management officer (ward master), for smooth implementation of the waste management plan, monitoring and reporting of errors in waste management practices.
5. Assign shift in-charge in respective departments to supervise and implement the waste management plan accordingly.

### Duties and responsibilities of Waste Management Officer

The Waste Management Officer (WMO) will be responsible for the routine implementation and monitoring of the waste management plan and in particular shall;

#### For Waste Collection

1. Ensure internal collection of waste bags and waste containers and their transport to central facility for storage and safe disposal on daily basis.
2. Liaise with concern department (supply department), to ensure adequate and timely supply of bags, containers, protective clothing, and timely availability of sanitary equipment on demand.
3. Ensure that sanitary staff (sweepers) immediately replaces used bags and containers with the new bags and containers of the same type.
4. Ensure that bins are properly cleaned before replacement of new bags.

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<sup>1</sup> In case of DHQ Hospital, Ward Master is currently look after the waste management system. MS can notify him as waste management officer.



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5. Directly supervise the hospital sweepers assigned for collection and transportation of waste from secondary waste collection points.

### For Waste Storage

1. Ensure proper use of storage facility and kept secured for authorized entry.
2. Prevent unsupervised dumping of the waste bags and containers in hospital premises.

### For Waste Disposal

1. Supervise all waste disposal activities including incineration operations according to guidelines provided in the Hospital Waste Management Plan.
2. Coordinate with relevant departments and municipal authorities for timely disposal of waste from transfer station.
3. Ensure that the waste is not stored in hospital premises and transfer station for longer than 24 hours.

### For Staff Training and Information

1. Liaise with head of departments, administration to ensure that all hospital staff is fully aware of their duties and responsibilities according to Waste Management Plan.
2. Ensure that emergency procedures are available at all times that staff is aware of the action to be taken.
3. Investigate, record and review all incident reports regarding hospital waste management and
4. Record the quantities of waste generated by each department on weekly basis.

## Training of Sanitary Staff

For smooth implementation of the HWM intervention, GB-EPA has designed a comprehensive training program for incinerator operators and sanitary staff as an integral part of the intervention. The purpose of training is to develop skills and to raise awareness. Three incinerator operators in DHQ Hospital, Skardu have been trained by Strongman Technician on the usage of incinerator and to rectify minor technical problems. Comprehensive trainings will be given to sanitary and nursing staff on hospital waste management according to guidelines provided in this management plan. However, it is suggested that refresher courses should be held regularly as well as courses to inform staff of any changes that have taken place in the Waste Management Plan.

The training must focus on existing Waste Management Plan, the risk associated with waste, protective measures, the role and responsibilities of staff, and the technical instructions concerning the activities carried out by each category of staff. Special trainings events for waste handling should be arranged. Emphasis in such training events should be laid on sorting, collection and transportation procedures, cleaning and personal hygiene, PPE, protective measures when handling bags and measures to be taken in the event of an accident.

In addition, it is suggested that training program for management and administrative staff of hospital should be in place. The focus of these training events should be on awareness on national/provincial legislations and international conventions, responsibilities, and purchasing/minimization policies as articulated in Hospital Waste Management Rule 2005.



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### Sanitary Staff Protective Measures

Numbers of health risks to sanitary staff are associated with HWM. The purpose of protective measures is to reduce the risks of accident/exposure or the consequences to sanitary staff. At present there is no any protective measures for sanitary staff are in practice at DHQ Hospital. All sanitary staff dealing with infectious and general hospital waste work without personal protective equipment (PPE), and lack knowledge of health risk associated with hospital waste. Preventive measures can be divided into two categories: primary and secondary.

#### Primary Preventive Measures

For primary preventive measures following four areas are proposed that need to be adopted at DHQ Hospital during hospital waste management:

- Eliminating hazard: for example, by using less toxic substances, eliminating mercury, or using self-locking injection equipment.
- Collective and technical prevention: for example, using needle receptacles, ventilation.
- Organizational prevention: such as assigning duties and responsibilities to all involved, management (sorting, packaging, labeling, storage, and transport), best practices (such as refraining from putting the caps back on syringes), and training.
- Individual prevention: personal protective equipment, vaccination, washing hands etc.

#### Secondary Preventive Measures

MS, Ward Master and Shift in-charge will be responsible to ensure protective measures especially PPE are being complied with SOPs annexed in annexure. Since the protective measures depend on the risk concerned, therefore it is suggested that Ward Master will be responsible to analyze risks on a regular basis in order to monitor the effectiveness of the measures taken and to identify any additional steps to be taken. Other potential risks that need to be taken into account include chemical risks, mechanical risks, risk of burns (incinerators, autoclaves) and risk of falling when working in wet areas, etc.



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