DEPARTMENT OF HEALTH

COVID-19 WASTE MANAGEMENT SOURCEBOOK

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Contents

Definition of Terms

Terminologies	Definition
COVID-19	Coronavirus disease 2019 or COVID-19 is a respiratory illness caused by a virus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2).
COVID-19 Wastes	All health care wastes generated from the COVID-19-related activities are classified as infectious wastes which include but are not limited to empty vaccine vials, syringes / sharps, PPEs, cottons, tissues, and other materials which had contact with the patient.
Hazardous Wastes	By-products, side-products, process residues, spent reaction media, contaminated plant or equipment or other substances from manufacturing operations and as counter discards of manufactured products which present unreasonable risk and/or injury to health and safety to the people or to the environment. All wastes generated by health care facilities except general waste.
Health Care Facilities (HCFs) / Health Facility	An institution that has health care as its core service, function, or business. Health care pertains to the maintenance or improvement of the health of individuals or populations through the prevention, diagnosis, treatment, rehabilitation, and chronic management of disease, illness, injury, and other physical and mental ailments or impairments of human beings
Health Care Personnel / Workers	All staff in the health care facilities, i.e., doctors, nurses, administrative staff, paramedical, ancillary workers, institution workers, nursing attendants, dental aides, laboratory aides, janitors, maintenance, radiology aide, social workers, etc.
Health Care Wastes	Any solid and liquid waste generated as a result of (1) diagnosis, treatment, or immunization; (ii) research pertaining to mentioned activities in (i); (iii) research using laboratory animals for the improvement of human health; (iv) production or testing of biological products; and (v) other activities performed by health care facilities. It can be broadly categorized into hazardous and non-hazardous waste types.
Infectious or Pathological Wastes	Type of health care waste suspected to contain pathogens (bacteria, viruses, parasites, or fungi) in sufficient concentration or quantity to cause disease in susceptible hosts which come from hospitals, medical centers and clinics containing pathological, pathogenic, and infectious wastes, sharps, vaccine vials, PPEs, and others. Classified as M501 wastes
Non-Hazardous Waste	Waste that has not been in contact with infectious agents, hazardous chemicals, or radioactive substances, and that does not pose any special handling problem or hazard to human health or to the environment.

Non-Health Care Facility Settings	Any area or location except health care facilities in which potential COVID-19-related concerns, complaints, or clusters can occur such as in the home, office, schools, gyms, publicly accessible buildings, faith-based community centers, markets, transportation and business settings or restaurants.
Off-site Collection	Collection and transfer of segregated health care waste from the health care facility Central Storage Area (CSA) to DNR Accredited Transporter / Municipal Waste Collector / Supplier
Off-site Transport	Transport of segregated health care waste from health care facility to Treatment Facilities or to Final Disposal on-site collection area.
On-site Collection	Collection of segregated health care waste from the point of generation to designated color-coded bins.
On-site Transport	Transport of collected segregated health care waste from the designated-color-coded bins to Central Storage Area (CSA).
Pharmaceutical Wastes	Expired, spilt, and contaminated pharmaceutical products, drugs, vaccines, and sera that are no longer required and need to be disposed of appropriately. These wastes contain hazardous constituents harmful to the environment such as antibiotics, veterinary, and phytopharmaceuticals and others. Classified as M503 wastes
Treatment, Storage, and Disposal Facility (TSD Facility)	facility where hazardous wastes are transported, stored, treated, recycled, reprocessed, or disposed of
Waste Disposal	Intentional burial, deposit, discharge, dumping, placing, or release of any waste material into or on air, land, or water.
Waste Generators	Any person, organization, or facility engaged in activities that generate waste.
Waste Handlers	Any health care worker knowledgeable in waste management policy, health hazards, on-site transportation, storage, safety practices and emergency response related to health care wastes.
Waste Segregation	Separating the waste generated by the health care facility according to the specific treatment and disposal requirements.
Waste Transporters	Any person, organization, or facility registered to transport hazardous wastes.
Waste Treater	Any person, organization, or facility registered to treat, store, recycle, or dispose of hazardous wastes.

1 Introduction

1.1 Background

The Department of Health (DOH) has released its updated Health Care Waste Management (HCWM) Manual Fourth Edition on 23 April 2020 through Department Circular (DC) no. 2020-0191. This HCWM Manual serves as the most comprehensive set of guidelines on the safe management of wastes generated from heath care activities in the country, incorporating the requirements of all Philippine laws and regulations governing HCWM. It has been designed for the use of individuals, public and private establishments, and other entities involved in segregation, collection, handling, storage, treatment, and disposal of waste generated from heath care activities.

The Philippines has been declared under a State of Public Health Emergency due to the increasing cases of COVID-19 in the country. The surge in the generation of infectious COVID-19 wastes from handling potential and confirmed COVID-19 cases as well as the foreseen vaccination activities merits the need for additional guidance on managing infectious wastes. Thus, the COVID-19 Waste Management Sourcebook has been developed to supplement the existing DOH Health Care Waste Management Manual 4th Edition in view of the COVID-19 pandemic. This Sourcebook incorporates the Philippine policy issuances and guidelines developed in response to COVID-19 as well as relevant international standards.

1.2 Purpose, Intended Users, and Scope

The COVID-19 Waste Management Sourcebook aims to provide guidance on the proper management of COVID-19 wastes generated from all COVID-19 – related activities which include but are not limited to the segregation, collection, storage, transport, treatment and disposal of infectious wastes, infection prevention and control in health care facilities and other vaccination sites, and the use of personal protective equipment of health care workers.

This Sourcebook is mainly intended for the use of all health care facilities (HCFs) in the Health Care Provider Network (HCPN)[1] (Table 1.1) which consists of primary care facilities, dental clinics, diagnostic facilities, specialized outpatient facilities, infirmaries and hospitals, treatment and rehabilitation centers, and pharmaceutical outlets, as well as the temporary treatment and monitoring facilities (TTMFs) and COVID-19 vaccination sites in health facilities. The target users in the HCFs are personnel responsible for managing and handling COVID-19 wastes in all service areas as well as the facility's Health Care Waste Management Committee, if present.

On the other hand, the Sourcebook may also be used for reference of other related non-health care facility entities such as the laboratories involved in COVID-19 testing, DENR-accredited waste transporters and treatment, storage, and disposal (TSD) facilities, workplaces, and COVID-19 vaccination sites outside health care facilities. A section is also dedicated to discuss the management of infectious wastes generated at the household level, such as brought about by the use of face masks in view of the minimum public health standards in the new normal and the home quarantine or treatment of some patients.

[1] DOH Department Memorandum (DM) no. 2020-0268 – Interim Guidelines on Health Facilities in the New Normal

Table 1.1. Facilities generating COVID-19 wastes

Classification	Facility
Primary Care Facility	Urban/Rural Health Unit Barangay Health Station Medical Outpatient Clinic Medical Facilities for Overseas Workers and Seafarers Dental Clinic Birthing Home
Hospital	General Hospital (Levels 1,2,3) Specialty Hospital
Specialized Health Facility	Specialized Outpatient Clinic Dialysis Clinic Ambulatory Surgical Clinic Physical Therapy and Rehabilitation Facility Drug Abuse Treatment and Rehabilitation Facility Blood Services Facilities Pharmaceutical Outlet Human Stem Cell Clinic Quarantine Clinic
Diagnostic Facility	Radiologic Facility Clinical Laboratory Facility National/Subnational Reference Laboratory Drug Testing Facility HIV Testing Facility Newborn Screening Reference Center Newborn Hearing Reference Center Nuclear Medicine Facility
Transitional Care Facility	Custodial Care Facility (Nursing Home, Hospice) Mental Health Facility/Custodial Psychiatric Facility Infirmary Sanitarium Halfway House
Others	Animal Bite Center/Animal Bite Treatment Center Home Treatment Traditional and Complementary Medicine Clinic

Source: DOH HCWM Manual 4th edition, 2020.

The difference between HCFs and non-health care facility settings is that HCFs are institutions that focus on health care as its core service, function, or business. In the case of non-health care facility settings, health care is not its main function but instead it deals with other activities such as for residing, working, studying, exercising, public accessing, transporting and so on.

1.3 Expected Outcomes

All health care facilities, as waste generators, are responsible in observing proper COVID-19 waste management practices. The users of this Sourcebook will be guided on the implementation of the national policies and standards, and observance of safe and environmentally- sound COVID-19 waste management practices, to minimize and mitigate the risks brought about by the surge in generation of hazardous infectious wastes due to the COVID-19 pandemic. Compliance with these guidelines will ultimately result to the following:

- Compliance with the DOH-Philippine Covid-19 Emergency Response Project (PCERP) Environment and Social Management Framework (ESMF)
- Prevention of environmental pollution and degradation
- Contribution to occupational safety and health (OSH) as the risk of infection is minimized due to decreased exposure of health facility personnel and the waste handlers and collectors to infectious wastes
- Contribution to community health and safety as the indirect impact of the environmental exposure of the public to COVID-19 wastes is minimized
- Compliance to environmental and health facility laws, regulations, and standards and prevention of violations and sanctions
- Resilience and disaster- preparedness and -responsiveness of health care facilities especially in pandemics

With the guidance of this Sourcebook, it is expected that the health care facility personnel in-charge of COVID-19 waste management will be able to routinely conduct self- audit using the COVID-19 Waste Management Self-Assessment: Compliance Audit Checklist, Monthly Ward/Department Review, and Compliance Statement (Annexes A to C).

2 COVID-19 Wastes

Health care wastes (HCW) include all solid and liquid wastes generated from the (a) diagnosis, treatment, or immunization of humans, (b) research on human health including the use of laboratory animals, (c) production or testing of biological products, and (d) other activities of health care facilities[2]. They are generally categorized into hazardous and non-hazardous wastes with the following sub-classifications[2]:

Table 2.1. Classification of health care wastes

Hazardous	Non- Hazardous
Sharps Infectious Pathological Anatomical Pharmaceutical Genotoxic Chemical Radioactive Pressurized Containers	Recyclable Biodegradable Residual

Infectious wastes are hazardous wastes which are likely to be contaminated by bacteria, viruses, parasites, or fungi with microbial amount significant to cause disease to the host[2]. All health care wastes which have been generated from activities involving possible, suspected, probable, and confirmed COVID-19 are considered infectious. COVID-19 wastes are wastes that have been generated from COVID-19-related activities which include but are not limited to used personal protective equipment (PPE), sharps, syringes, cottons, tissues, other materials which had contact with the patient, body fluids, and empty vaccine vials[3].

Pathological, pathogenic, and infectious wastes, and sharps are categorized as M501 or pathological or infectious wastes[4]. Meanwhile, pharmaceuticals and drugs (M503) include expired pharmaceuticals and drugs stocked at producers and retailers' facilities which contain hazardous constituents harmful to the environment such as antibiotics, veterinary, and phytopharmaceutical and others[4]. All health care wastes generated in the COVID-19 vaccination activities shall be categorized as hazardous wastes under the sub-classification infectious wastes. Thus, infectious wastes and pharmaceutical wastes will be called COVID-19 wastes in this Sourcebook.

[2] DOH Health Care Waste Management Manual 4th Edition (April 2020)
[3] DOH Department Memorandum no. 2021-0031 – Interim Guidelines on the Management of Health Care Wastes Generated from COVID-19 Vaccination
[4] DENR Administrative Order no. 2013-22 – Revised Procedures and Standards for the Management of Hazardous Wastes

3 Risks from COVID-19 Wastes

COVID-19 wastes should always be assumed to potentially contain a variety of pathogenic microorganisms since their presence or absence cannot be determined at the time of producing and discarding the waste. According to the World Health Organization (2014)[5], exposure to hazardous wastes may result to disease or injury as they have a higher potential of causing infections due to one or more of the characteristics below:

- Contains pathogenic microorganisms in significant amounts to cause sickness
- Has sharp surfaces causing punctures
- Contains harmful chemicals
- Radioactive
- Genotoxic

For the purpose of discussion, 'hazard' will be defined as a condition that may lead to a negative outcome such as waste handling practices which do not meet the standards. 'Risk,' on the other hand, refers to the negative outcome resulting from a hazard (DOH HCWM, 2020), such as contracting illness from improper handling of wastes.

3.1 Occupational and Community Health and Safety

Individuals nearby or at close contact with infectious wastes are exposed to possible health risks if COVID-19 wastes are not properly managed. These risks may be classified into occupational and community- based, depending on the type of persons at risk. They are categorized as follows:

A. Occupational Risks

- Health care facility staff such as doctors, nurses, waste handlers, utility personnel, etc.
- Personnel supporting services for health care facilities such as laundry services
- Waste collectors and transporters of hauling services such as municipal waste collectors and DENR- accredited treatment, storage, and disposal (TSD) facilities
- Workers of waste management facilities such as TSDs, operators of waste treatment technologies, and sanitary landfills
- Scavengers, recyclers, and junk shop/MRF workers

B. Community- Based Risks

- Residents nearby health care facilities
- Residents nearby TSD facilities
- Residents nearby landfills
- Residents associating with family members with suspected or confirmed COVID-19

Patients and visitors in health care facilities are also considered at risk. Moreover, the general public is put at risk whenever COVID-19 wastes are not properly managed and disposed, especially if these wastes are related to COVID-19 care and testing.

[5]World Health Organization (2014). Safe management of wastes from health-care activities, 2nd edition.

3.2 Hazards and Transmission

The following are the hazards related to hazardous wastes and potential modes of transmission:

A. Infectious HCWs and Sharps

Pathogenic microorganisms in infectious COVID-19 wastes, and sharps may potentially cause infections by entry to the body through skin puncture, cut, or abrasion; mucous membrane; inhalation; or ingestion. According to the DOH Health Care Waste Management Manual (2020), some of the infections associated with infectious HCWs are gastroenteric infection, ocular infection, genital infection, skin infection, anthrax, meningitis, Acquired Immunodeficiency Syndrome (AIDS), hemorrhagic fever, septicemia, bacteremia, candidemia, viral hepatitis A and B, avian influenza, and respiratory infections.

In the case of respiratory infection, one of the most contagious diseases is caused by the coronavirus, specifically the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) or Coronavirus Disease 2019 (COVID-19). As reported by the World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC), COVID-19 has two modes of transmission namely direct and indirect. Table 3.2.1 accounts to the various transmission of COVID-19 as presented by Karia et al. (2020).

Table 3.2.1 COVID-19 Modes of Transmission

Direct Transmission	Indirect Transmission
1. Transmission via aerosols formed via surgical and dental procedures and / or in the form of respiratory droplet nuclei; 2. Body fluids and secretions (e.g. saliva, feces, urine, semen, and tears); and 3. Mother-to-child	1. Fomites or surfaces present within the immediate environment of an infected patient; and 2. Objects used on the infected person (e.g. stethoscope or thermometer)

Source: Karia et al., 2020.

B. Chemical and Pharmaceutical HCWs

Chemical and pharmaceutical wastes may cause intoxication, skin irritation or burns through ingestion, inhalation, skin contact, or absorption. These wastes may also contain substances which are flammable, corrosive, or reactive to other substances such as formaldehydes.

Chlorine, often found in disinfectants, may react with organic compounds in areas with poor ventilation and produce chlorine gas as by-product. Mercury which may be from discarded thermometers, is toxic when inhaled or in contact with the skin. Pharmaceuticals may not be segregated properly and be discarded in municipal waste or sewerage. Municipal wastes end up in landfills as it is the most common practice for their disposal globally. At present, there is still little understanding on the impacts of

residual pharmaceuticals and researches on potential resulting groundwater contamination are growing.

3.3 Environmental Health and Safety Impact

Mismanagement or mishandling of COVID-19 wastes not only pose risks to the public but also to the environment. These COVID-19 wastes cause pollution of the air, soil, and water. These environmental media also become agents of infection, e.g., the spread of cholera through untreated wastewater. Environmental pollution also causes the further spread of vector-borne diseases such as through pathogen- carrying rodents, cockroaches, and flies. Pollution due to mismanaged health care wastes is also associated with increased antimicrobial resistance (AMR). Moreover, these harmful environmental impacts affect biodiversity, posing risks to the natural inhabiting flora and fauna.

4 Management of COVID-19 Wastes in Health Care Facilities (HCFs)

4.1 COVID-19 Waste Segregation

Segregation is categorizing and separating COVID-19 wastes at all phases of the waste stream, from point of generation to disposal. As segregation should be practiced in all steps of waste handling, it is the responsibility of all, including waste generators. It is intended to decrease the risks innate to these wastes, as proper categorization ensures that wastes are clearly identified and that associated risks are clearly understood.

Systems for correct segregation ensure that the waste containers have the appropriate warnings and determines the appropriate measures for waste handling and management. It also enables the recycling of some materials and decreases the volume of wastes to be treated.

COVID-19 wastes should be segregated according to their classification found in Table 2.1. General or non-hazardous wastes may be segregated into recyclables, biodegradable, and non-biodegradable/non-recyclable wastes. Material recovery facilities (MRF) may also be set up in the HCF premise. The following shall be observed for the segregation of hazardous wastes:

a. Sharps – place directly into the designated puncture-proof container such as safety boxes
b. COVID-19 wastes – collect in covered bins with yellow plastic liner and disinfect onsite
c. Pathological wastes – refrigerate if not collected and treated within 24 hours
d. Anatomical wastes – including recognizable body parts and maternal/fetal materials; should be handled according to religious and cultural practices such as burial or cremation; placenta and other unrecognizable anatomical wastes may be buried in pits within the HCF
e. Chemical wastes – subcategories include mercury, batteries, cadmium- containing wastes, photochemical stains, and laboratory reagents
    i. Liquid chemical wastes – store in leak-proof containers or amber disposable bottles and shall not be disposed in drain
    ii. Solid chemical wastes – place in covered bins with brown plastic liner or box
    iii. Wastes with mercury – collect separately in accordance with DOH Department Memorandum No. 2011-0145 – Guidelines for the Temporary Storage of Mercury Wastes in HCF in Accordance with AO No. 0021 s. 2008 on the Gradual Phase-out of Mercury in All Philippine Healthcare Facilities and Institutions
f. Radioactive wastes – store in secure, radiation- proof, preferably lead-lined containers labelled with radionuclide and date of deposit; they shall be left to decay and reach the level of background radiation for discarding as general waste or collection by registered service provider
g. Pharmaceutical wastes – kept in original packaging for easy identification and prevention of unwanted chemical reactions, collected in covered bins with brown plastic liner or box, and shall not be disposed in drains; Expired and discolored pharmaceuticals shall be returned to the pharmacy for return to the manufacturers/supplier
    i. For correct management of pharmaceutical waste generated through COVID-19 vaccine programs or by treatment of patients, it is essential that the healthcare facility refer to the following Sections 2.2.2.4, 3.2.2, 3.2.5, 3.3, 4.4,

7.2.1, 7.3.1, 7.3.2, 7.4.2.2, 8.5, and 12.12 of the DOH HCWM Manual 4th Edition

ii. Further guidance can be obtained from Sections 2.3, 3.1.4 and 8.11.3 of the WHO Safe management of wastes from health-care activities 2nd Edition

iii. Below is a summary of the pharmaceutical disposal methods in and after emergencies, including for empty COVID-19 vaccine vials

Table 4.1.1. Summary of pharmaceutical disposal methods in and after emergencies

Disposal Method	Type of Pharmaceutical	Comments
Return to donor or manufacturer, transfrontier transfer for disposal	All bulk waste pharmaceuticals, particularly antineoplastics	Usually not practical- transfrontier procedures may be time consuming
Highly engineered sanitary landfill	Limited quantities of untreated solids, semi-solids and powders PVC plastics	Immobilization of waste pharmaceuticals is preferable before disposal
Engineered landfill	Waste solids, semi-solids and powders PVC plastics	Immobilization of solids, semi-solids and powders is preferable before disposal
Open, uncontrolled, non-engineered dump	Untreated solids, untreated semi-solids and untreated powders	As last resort, untreated solids, semi-solids and powders must be covered immediately with municipal waste Immobilization is preferable before disposal.; Not for untreated controlled substances
Immobilization: waste encapsulation or inertization	Solids, semi-solids, powders, liquids, antineoplastics and controlled substances	Immobilization: not applicable; Chemical decompositions are not recommended unless special expertise and materials are available
High-temperature incineration (>1200°C)	Solids, semi-solids, powders, antineoplastics and controlled substances	Expensive, particularly for purpose-built incinerators; Use of existing industrial plants may be more practical
Medium-temperature incineration with two-chamber incinerator, min. temperature of 850°C	In the absence of high-temperature incinerators, solids, semi-solids, powders and controlled substances	Antineoplastics best incinerated at high temperatures
Burning in open containers	Packaging, paper and cardboard	As last resort; Not acceptable for PVC plastics or pharmaceuticals
Sewer or fast-flowing watercourses	Diluted liquids, syrups, intravenous fluids, small quantities of diluted disinfectants (supervised)	Not recommended for antineoplastics, undiluted disinfectants or antiseptics
Chemical decomposition	NA	Not recommended unless special expertise and materials are available Not practical for quantities of more than 50kg

Source: Safe Management of Wastes from Health-Care Activities, 2nd Edition (WHO, 2014)

A. Waste Bins or Containers

Waste bins to be used shall be sturdy, leak- proof, with a well- fitted lid or cover removable by hand or foot pedal. However, to avoid contact with infectious wastes, the use of waste bins with foot pedals are preferred. Preferably, bins have foot pedal-operated covers to limit contact with the hands.

The size of bins shall also be similar to each other to avoid the tendency of placing wastes in bigger bins because it is sufficient enough to contain larger volume of wastes. Using the appropriate size of the waste bins will help accommodate wastes generated at the service area between waste collection intervals. Also, this can avoid unexpected piling up of wastes.

Waste bins shall be color-coded, if possible, to facilitate easy segregation. Yellow should be used for infectious wastes, brown for chemical and pharmaceutical wastes, orange for radioactive wastes, black for non-biodegradable general/non-hazardous wastes, and green for biodegradable wastes. Safety boxes preferably with handle shall be used for sharps.

Below are some examples of waste bins. Some bins are wheeled to enable easy transport of wastes.

Source: Tondo Medical Center, 2020.

Source: MG Plastics, n.d.

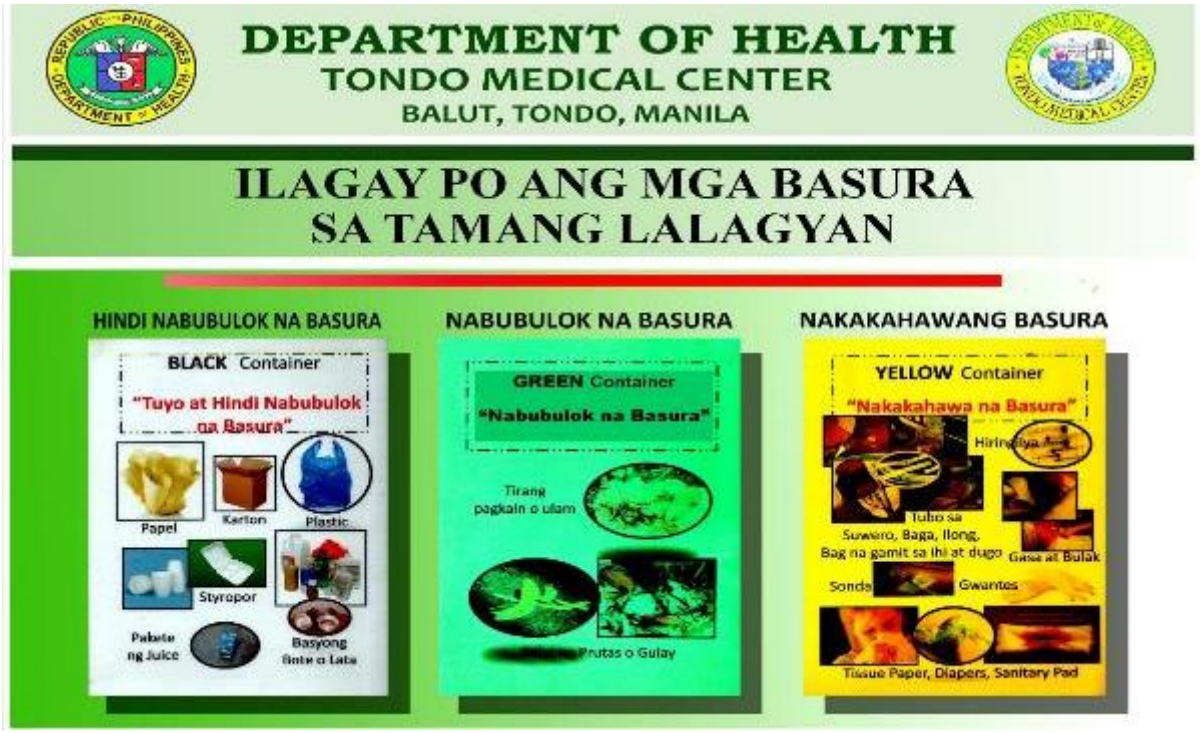
B. Location of Waste Bins

Waste bins for the segregation of health care wastes should be placed strategically near points of waste generation such as in HCF service areas, with the following considerations:

- Waste bins or containers for hazardous and non-hazardous wastes shall be located close together if possible
- Bins or containers for hazardous wastes shall not be placed in public areas, i.e., away from patients and visitors
- Bins with yellow plastic liners for infectious wastes shall be placed in service areas such as but not limited to the following: Emergency Room, Outpatient Department, Laboratory, Radiology, Dental and Isolation Rooms, Infectious Wards, Dialysis and Nurses Stations
- Waste bins may also be placed in limited locations in medical areas, with black bags for general waste, yellow bags for infectious wastes, and sharps safety boxes
- Waste bins for infectious wastes and safety boxes for sharps may be placed in mobile trolleys for bedside patient interventions such as blood sampling or drug administration
- Static bins lined with yellow plastic liners shall be located near sinks or washing facilities for infectious wastes such as masks, gloves, aprons, and used tissues. Below is an example of a static bin:

Source: Zahara and Fazir, 2020.

- Posting signages on waste containers and walls is an effective way of reminding all staff on correct waste management procedure. Examples are illustrated below:



Source: Tondo Medical Center, 2020.

Source: Tondo Medical Center, 2020.

Source: San Lazaro Hospital, 2020.

C. Plastic Liners

Plastic liners shall be used as lining of waste bins or containers, preferably of the color intended for waste classification and that of the bins, to prevent confusion. Yellow plastic liners should be used for infectious wastes, brown for chemical and pharmaceutical wastes, orange for radioactive wastes, black or colorless for non-biodegradable general/non-hazardous wastes, and green for biodegradable wastes. The use of colorless plastic liners for general wastes shall be allowed for security purposes and for easier monitoring of proper waste segregation.

Plastic liners are recommended to be of 0.07mmm thickness and chlorine- free as prescribed by ISO 7765-1:2004. It should be noted that not all plastic liners can withstand 121^{O}C and some can melt at the autoclave.

D. Labelling and Marking

Plastic liners and safety boxes filled with COVID-19 wastes shall be properly tagged with the following information:

- Name of HCF
- Service area where waste was generated/collected
- Type of waste
- Volume/ weight of waste
- Date and time of collection onsite or closure of container
- Name of person preparing label

Waste bins, similarly, should have label on the type of waste contained with DENR-EMB symbols representing the hazard classifications of wastes.

Table 4.1.2 summarizes the bin/container, plastic liner, and labelling requirements for each waste category.

Table 4.1.2. HCW bins and plastic liners specifications, color-coding, marking/labelling

Type of HCW	Receptacle	Specifications	Color Coding	Markings/Labeling
SHARPS: Bin/container	*Bin/ container*	Puncture proof container with wide mouth and cover.	Yellow	Properly labelled "Sharps" With label indicating source and weight of waste generated and date of collection. With Biohazard symbol. 
INFECTIOUS WASTE: Bin/container with plastic liner	*Bin/ container*	Strong, leak-proof bin with cover Size varies depending on waste volume	Yellow	Properly labelled "Infectious Waste" With Biohazard symbol 
	Plastic liner	Strong, leak-proof plastic bag Can withstand autoclave Thickness: 0.07mm (70µm) Sample sizes: XL size (39cm x 39cm x 95cm) – Size varies	Yellow	Properly labelled "Infectious Waste" Tag indicating source and weight of waste generated, date of collection Biohazard symbol optional

		depending on waste volume		
PATHOLOGICAL WASTE: Bin/container with plastic liner	*Bin/ container*	Strong, leak-proof bin with cover Size varies depending on waste volume	Yellow	Properly labelled "Pathological Waste" With Biohazard symbol 
	Plastic liner	Thickness: 0.07mm Sample sizes: XL size (39cm x 39cm x 95cm) – Size varies depending on waste volume	Yellow	Properly labelled "Pathological Waste" Tag indicating source and weight of waste generated, date of collection Biohazard symbol optional
ANATOMICAL WASTE: Bin/container with plastic liner	*Bin/ container*	Strong, leak-proof bin with cover Size varies depending on waste volume	Yellow	Properly labelled "Anatomical Waste" With Biohazard symbol 
	Plastic liner	Thickness: 0.07mm Sample sizes: XL size (39cm x 39cm x 95 m) – Size varies depending on waste volume	Yellow	Properly labelled "Anatomical Waste" Tag indicating source and weight of waste generated, date of collection Biohazard symbol optional
PHARMACEUTICAL WASTE:	*Bin/ container*	Strong, leak-proof bin with cover	Brown	Properly labelled "Pharmaceutical Waste" – only for

Bin/container with additional plastic liner for cytotoxic or liquid waste		Size varies depending on waste volume		expired drugs and containers If it is “Cytotoxic Waste” or “Genotoxic Waste”– then it should be labelled as such
	Plastic liner	Thickness: 0.07mm Sample sizes: XL size (39cm x 39cm x 95cm) – Size varies depending on waste volume	Brown	Properly labelled “Pharmaceutical Waste” – expired drugs and for containers “Cytotoxic Waste” “Genotoxic Waste”– cytotoxic, genotoxic, and antineoplastic waste Tag indicating source and weight of waste generated, date of collection
CHEMICAL WASTE: Bin/Container	*Bin/ container*	Strong, leak-proof bin with cover Material must be resistant to the wasted chemical Size varies depending on the volume of waste	Brown	Properly labelled “Chemical Waste”
RADIOACTIVE WASTE: Bin/container with plastic liner	*Bin/ container*	Radiation proof repositories, leak proof and lead-lined container Size varies depending on waste volume	Orange	Properly labelled “Radioactive Waste” Labelled with the name of radionuclide and date of deposition with radioactive symbol

	Plastic liner	Thickness: 0.07mm	Orange	Properly labelled "Radioactive Waste" Labelled with the name of radionuclide and date of deposition
NON-BIODEGRADABLE WASTE (NON-HAZARDOUS GENERAL WASTE): Bin/container with plastic liner	*Bin/ container*	Size varies depending on the volume of radioactive waste	Black	Properly labelled "Non-biodegradable Waste" Recyclable symbol optional
	Plastic liner	Thickness: 0.07mm Sample sizes: XL size (39cm x 39cm x 95cm) – Size varies depending on waste volume	Black or Colorless	Properly labelled "Non-biodegradable Waste" Tag indicating source and weight of waste generated, date of collection
BIODEGRADABLE WASTE (NON-HAZARDOUS GENERAL WASTE): Bin/container with plastic liner	*Bin/ container*	□ Size varies depending on the volume of radioactive waste	Green	□ Properly labelled "Biodegradable Waste"
	Plastic liner	Thickness: 0.07mm (70µm) Sample sizes: XL size (39cm x 39cm x 95cm) – Size varies depending on waste volume	Green	Properly labelled "Biodegradable Waste" Tag indicating source and weight of waste generated, date of collection

Source: DOH HCWM Manual 4th edition

4.2 Onsite COVID-19 Wastes Collection and Transport

The onsite collection and transport of COVID-19 wastes involve the collection of wastes from the service areas (e.g. wards) to the designated onsite storage inside the HCF premises. The collection and transport of HCWs should have procedures stating how wastes are to be transported and the schedule/interval.

Transportation of COVID-19 waste within the facility must take place during less busy times of the day, e.g., in the evenings or very early in the morning, using designated wheeled trolleys or bins that are not used for any other purpose.

Properly labelled COVID-19 and general wastes, including sharps containers, should be collected daily or as needed, when the waste bins are ¾ full, at times when there are less patients and visitors. The waste bags or plastic liners should be sealed tightly through a tie or tag and not through a staple, without compressing and generating aerosol. Pharmaceutical and chemical wastes should be collected based on generation and radioactive waste shall be based on completion of the decay process or neutralization.

Replacement bins and/or plastic liners should be available upon waste collection. The waste monitoring sheets shall also be immediately complied by the personnel in-charge.

At a minimum, individuals handling COVID-19 wastes, which includes the movement of bins within and around HCFs, should wear appropriate PPE such as boots, aprons, long-sleeved gowns, thick gloves, masks, and goggles. Proper hand hygiene shall be performed after handling waste.

A. Wheeled Trolleys/Bins

Hazardous and general/non- hazardous wastes should be collected and transported separately using wheeled trolleys or carts. Healthcare wastes can be bulky and heavy and should not be transported by hand due to the risk of accident or injury from infectious materials such as puncture from improperly disposed sharps protruding from container.

A dedicated transport trolley/cart or wheeled bin should be allotted for each waste category with the appropriate label, with a minimum for infectious waste, biodegradable, and non-biodegradable/recyclables. Meanwhile, hazardous wastes such as chemical and pharmaceutical should be transported separately in boxes. The following standards must be met for the wheeled trolley/cart or wheeled bin:

a. Safe to load and unload and at size appropriate according to the volume of wastes generated at the health care facility

b. Easy to push and to pull with heavy- duty wheels

c. Height not too high for safe loading of filled plastic liners and to avoid restricting the view of personnel transporting the waste

d. Has no sharp edges that could damage waste bags or containers during loading, unloading, and transport

e. Easy to clean and if enclosed, fitted with a drainage hole and plug

f. Labelled and dedicated to a particular waste type and secured with a lock if used for hazardous waste

g. Wheeled bins should be covered

h. Wheeled bins should be of appropriate color- coding: yellow for infectious waste, green for biodegradable, and black for non-biodegradable/recyclables

i. Available spare trolley/s in case of breakdowns and maintenance

Examples of trolleys/carts, boxes, and wheeled bins that could be used are:

Source: AJ Products, n.d.

Source: Amit Quality Product Co, n.d.

Source: MedProDisposal, n.d.

Source: MG Plastics, n.d.

B. Onsite Transport Route and Plan

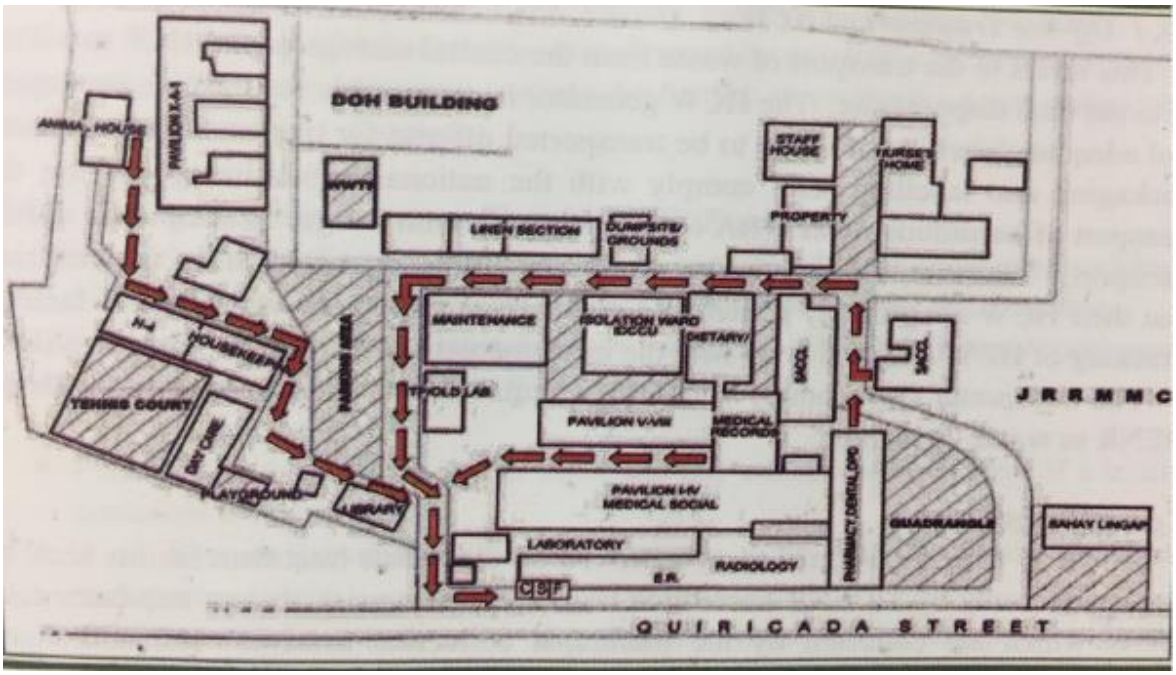
COVID-19 wastes should be transported during less busy times of the day, e.g., in the evenings or very early in the morning, to avoid unnecessary exposure of personnel, patients, and visitors. An onsite waste transport plan shall be developed by the facility with the route and schedule for waste collection from service areas to designated storage facility, with the general principle of "from clean to dirty." The waste collection and transport schedule shall be strictly observed.

The plan varies based on the design of the health facilities. Separate floors, stairways, or elevators shall be utilized, with the use of service elevators, mechanical pulley, or ramps for two-storey facilities. Below are the minimum aspects that shall be considered in an onsite waste transport plan:

a. Designated personnel in-charge of waste collection and/or transport with specific areas
b. Logistic route planning considering foot traffic in the facility
c. Schedule of collection and transport
d. Waste type and volume, including number of waste bags or containers/bins
e. Capacity of wheeled trolleys/carts and presence of wheeled bins
f. Distance and duration of transport between collection points and storage facility

The onsite waste transport plan shall be accessible to all waste handlers and be disseminated effectively if changes are to occur. Regular review of the plan should also be conducted to check if it properly implemented and if revisions should be made.

An example of a waste transport plan is provided below.



Source: San Lazaro Hospital, 2020

C. Cleaning of Waste Bins and Trolleys

In order to avoid infection transmission, waste bins and trolleys/carts must be cleaned and disinfected daily every after use using 4-5% concentration of sodium hypochlorite (NaClO) (DOH HCWM, 2020). A three-stage process shall be used for bin/trolley cleaning and disinfection:

- A cold wash;
- Hot detergent - disinfectant wash; and
- A hot wash; or
- Any alternative process which suitably sanitises/disinfects the bins.

The cleaning and disinfection process shall minimize aerosol generation, with random spot checks/swabs should be implemented to assess cleaning efficacy, conducted in designated areas with drainage. The wastewater from the cleaning process shall not be allowed to enter the stormwater system. Deodorizers may also be used.

Regular inspection of the bins and trolleys should also be conducted to check for damages and need for repair or replacement.

4.3 Onsite COVID-19 Waste Storage

COVID-19 wastes should be stored in a dedicated storage area to ensure there are no environmental impacts, including appropriate bunding to contain any potential spills. It is essential that COVID-19 wastes are properly segregated, packaged, labelled, handled and transported to minimize risk to waste handlers and the community. COVID-19 wastes should initially be placed in a container that is rigid, water- tight, and preferably with a closable cover/lid. If the container does not have a lid, it should be stored in an appropriately bunded[6] area.

A. Service Areas

COVID-19 wastes generated in service areas shall be stored prior to collection and transport in the nearest utility rooms, i.e., storage of cleaning materials, used linens, or at designated rooms, with proper color- coding and labels of the plastic liners and bins/containers. The rooms and/or containers are preferably lockable. Interim or short-term storage is done at the point of waste generation if the waste bins are ¾ full and are not yet for collection, to minimize the exposure patient and staff.

B. Central Storage Facility

The central waste storage facility or area of the health facility is where all COVID-19 wastes are retained after collection from the different service areas, prior to waste treatment or collection by an accredited third- party waste service provider. The storage facility should have designated area/space for general wastes, recyclables, hazardous wastes, phased- out mercury devices, and biodegradables (or composting site). The signages and labels of COVID-19 wastes in the storage facility shall be in accordance with DENR Administrative Order no. 2013-022. The following are the minimum requirements for waste storage facilities:

- Of adequate space/size requirement based on waste volume collected at the facility
- Located in the health facility at site distant from public areas, such as main entrance/exit gate, common walkways, lobbies, patient rooms, laboratories, operation rooms, dietary section
- Accessible only to authorized personnel handling waste, with lock
- Accessible to waste collection vehicles without the need of entering the health facility
- Protected from physical factors such as rain, floods, strong winds, and from animals and insects
- Made of study construction materials with impermeable, concrete flooring elevated considering flood, and adequately sloped for easy cleaning and good drainage, and has no cracks/gaps
- Connected to wastewater treatment plant
- Has continuous water supply (clean, running tap water) and washing facility with soap for personal hygiene of waste handlers
- Has adequate ventilation and lighting
- Has available cleaning materials such as water hose, scrubber with long handle, disinfectant, PPE, waste bags/bins, and firefighting equipment, e.g., fire extinguisher, smoke detectors
- Has available spill kits

[6] Bunded refers to having a raised area surrounding the storage area so that if there is a spill of liquids, the liquid is contained within the area.

- Has appropriate visible signages/labels, biohazard symbol, and warning sign per DENR standards

The following are additional considerations for the storage of infectious wastes:

- Clearly labeled using biohazard sign for infectious wastes
- Enclosed, with sealed or tiled floors and walls for easy disinfection
- Spacious enough to prevent compacting and spillage of untreated infectious wastes such as blood and body fluids
- With storage temperature not higher than 3 to 8^{o}C if infectious wastes will be stored for more than one week
- In the absence of refrigeration system for cooling of the storage facility, the storage duration, i.e., length of waste generation to treatment, shall not exceed 48 hours during the cool season and 24 hours for hot

Meanwhile, pharmaceuticals may be stored in non-hazardous storage areas or in accordance with their special handling needs. Special handling needs pertains to the chemical characteristics of the pharmaceutical waste such as for genotoxic drugs or specific disposal requirements in controlled drugs and antibiotics. Table 4.2 indicates the types of pharmaceutical wastes with its corresponding waste management if it is either placed in a non-hazardous area or handled with special treatment.

Table 4.2.1. Storage of pharmaceutical wastes

In Non-Hazardous Areas	With Special Handling Needs
Ampoules with non-hazardous content e.g., vitamins Fluids with non-hazardous contents, such as vitamins, salts (sodium chloride), amino salts Solids or semi-solids, such as tablets, capsules, granules, powders for injection, mixtures, creams, lotions, gels, and suppositories Aerosol cans, including propellant-driven sprays and inhalers.	COVID-19 vaccine vials (according to DOH DM 2020-0031 and other DOH issuances for the waste disposal and reverse logistics of the vaccine vials) Controlled drugs Disinfectants and antiseptics Anti-infective drugs, e.g., antibiotics Genotoxic drugs and wastes (highly toxic and should be identified and stored carefully away from other HCW in a designated secure location) Ampoules with antibiotics

C. Operations and Monitoring

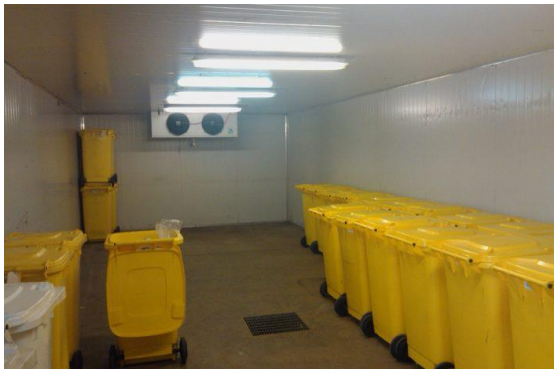
A record must be maintained for the monitoring and assessment of effective operations of the waste storage facility. Designated personnel/s must record the type and volume of wastes stored, and schedule of storage, treatment, and disposal, and personnel in-charge of collection and storage. The following measures are to be adopted for the safe storage of COVID-19 wastes:

- Disinfection of storage areas must be done regularly, or at least once a day.
- Development and review of contingency plan
- Inspection protocol with regular inspection and monitoring
- Protocol/system for repair and replacement of equipment and materials
- Institutionalized capacity building with documentation of names of trained personnel, job descriptions, topic and form of training, date of training, date for refresher or revalidation training
- Monitoring and documentation of hazardous waste storage
- Availability of, orientation, and regular use of material safety data sheets (MSDS)

The following are some examples of waste storage areas located within healthcare facilities:

Source: Lung Center of the Philippines, 2020

Source: Awodele et al., 2016



Source: J.J.'s Waste & Recycling, n.d.

Source: San Lazaro Hospital, 2020

4.4 Offsite COVID-19 Waste Collection and Transport

The offsite collection of COVID-19 waste refers to the collection of wastes from the health facility's central waste storage facility and loading to the waste collection vehicle by the municipal waste collector for general wastes and DENR- accredited transporter or treatment, storage, and disposal (TSD) facility for hazardous wastes. Meanwhile, offsite transport refers to the departure of the collected COVID-19 wastes from the health facility to the TSD facility or disposal site. The waste transporter shall be registered with the DENR as waste transporter and comply with national policies and regulations.

The standards and requirements set forth in the Republic Act no. 6969[7] and its Implementing Rules and Regulations (IRR) shall be observed. This includes the responsibility of the waste generator, i.e., health facility, to safely package and label the COVID-19 wastes to be collected and transported. Meanwhile, the third- party waste collector/transporter (service provider) shall provide waste bins with the following requirements:

a. Puncture- proof for sharps
b. Made up of high-density polyethylene materials (HDPE)
c. Chemical- resistant
d. Leak- proof, with fitted self-sealing lid that can withstand turbulence and physical factors
e. Color- coded appropriately (refer to Table 4.1.2)
f. Observance of protocols for radioactive wastes per Philippine Nuclear Research Institute (PNRI) regulations

The waste service provider shall also provide waste transport vehicles based on the standards provided in Annex B3 of the DOH HCWM Manual (2020, 4th edition) and adequately trained personnel with appropriate PPE. The following are the general protocol for the offsite collection and transport of COVID-19 wastes:

[7] Republic Act no. 6969 – Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990

- Collection of HCWs from the health facility by the waste service provider shall be daily
- General and hazardous wastes should be collected separately
- Waste containers and vehicles are enclosed or covered
- Plastic liners should be sealed tightly to prevent spillage
- Waste bins/containers, trolleys/carts, vehicles, and other equipment/materials are cleaned and disinfected every after use
- The driver and personnel of the waste service provider shall wear proper PPE and be trained including emergency protocols encountered in transport
- Personnel of waste service provider are vaccinated at least against hepatitis A and B, polio, tetanus, and COVID-19

Waste collection schedules should be arranged with the service provider so that timing of the collections is separate to the delivery of other goods to the facility. The collection vehicle should be disinfected at the conclusion of all collections each day. All waste management staff should be trained on safe waste handing techniques and provided with appropriate PPE. Monitoring of the proper treatment and disposal of COVID-19 wastes is both a responsibility of the waste service provider and waste generator (health facility). A record of all collections must be provided and this to include details such as:

- Date/time of collection
- Name of service provider and their representative undertaking the collections
- Types and volumes of waste collected
- Destination for treatment or disposal

This can be done through a consignment system and the Hazardous Waste Manifest System of the DENR-EMB[8]. The waste transporter shall maintain a completed consignment note or manifest of all HCW for treatment or disposal and an updated transport permit from the DENR. The transporter and generator shall separately maintain a copy of the consignment note (manifest).

For the used vaccine vials, reverse logistics shall be conducted based on DOH DM 2021-0031 – “Interim Guidelines on the Management of Health Care Wastes Generated from COVID-19 Vaccination" and the Memorandum on the “Clarification regarding reverse logistics of COVID-19 Vaccination Wastes."

4.5 COVID-19 Waste Treatment and Disposal

All COVID-19 wastes generated in the facilities, especially infectious wastes from catering to possible, suspected, probable, and confirmed COVID-19 patients, must be properly treated with the applicable technology. The purpose of the treatment process is to eliminate the wastes’ potential to cause disease or adverse environmental impact through physical, biological, or chemical changes.

For COVID-19 wastes which cannot be treated inside the health facility, the services of a Treatment, Storage, Disposal (TSD) facility registered with the DENR-EMB shall be contracted. All treated infectious waste can be disposed of in a sanitary landfill, but must not be mixed with the municipal waste, or the non-hazardous wastes such as general office waste, packaging, and leftover food.

[8] DENR EMB Memorandum Circular no. 2020-20 – Provisional Guidelines on the Hazardous Wastes Management during the Extended Enhanced Community Quarantined Period

The following are key aspects in managing the treatment and disposal of healthcare wastes:

- COVID-19 waste should be treated before disposal
- No healthcare waste should be disposed of to a landfill without being immediately covered
- Disposal of ash must be undertaken to prevent it from “blowing” into the environment
- Chemicals should not be disposed of via the drains
- Pharmaceuticals should be incinerated or encapsulated prior to disposal

Given the highly infectious nature of laboratory cultures and stocks, it is recommended to autoclave the specimens in the laboratory rather than transporting contaminated waste elsewhere for disinfection. The following are some guidelines to be observed for COVID-19 related wastes:

- Inactivate microbial levels to those specified in the facility’s operating conditions
- Render the waste residue unrecognizable suitable for appropriate disposal
- Result in minimum levels of hazardous or toxic by-products within standards
- Have automatic controls and built-in failsafe mechanisms
- Ensure that the waste cannot bypass the treatment process
- Meet relevant workplace health and safety standards

The treatment of infectious wastes, with disinfection at the minimum, involves five basic processes including thermal, chemical, irradiation, biological and mechanical. Reference to Chapter 8 of the DOH HCWM Manual (2020) should be made for details on these treatment technologies.

The following is a summary of the advantages and disadvantages of waste treatment technologies:

Table 4.5.1. Advantages and disadvantages of waste treatment technologies

Technology	Advantage	Disadvantage	Health and Environmental Impact
Autoclave	Low environmental impact No hazardous residues Complies with Stockholm Convention Some treated wastes can be recycled	Reliable solid waste collection required Reliable water and electricity connection needed Water needs to be of certain quality to protect the equipment Temperature resistant waste bin or bags needed Residue recognizable, can	Environmentally- friendly Low-heat thermal processes produce significantly less air pollution than incineration No specific pollutant emission limits Air evacuated from the treatment chamber needs to be filtered and the condensate decontaminated to prevent occupational health hazards

		cause injuries (e.g., sharps)	
Autoclave with Integrated Shredding	Low environmental impact No hazardous residues Complies with Stockholm Convention Reduction of volume Residue is unrecognizable	Reliable water and electricity connection needed Water needs to be of certain quality to protect the equipment Higher cost and maintenance Requires skilled operator	Low-heat thermal processes produce significantly less air pollution than incineration No specific pollutant emission limits System needs to be completely enclosed to prevent emitting aerosols during shredding process
Batchwise Microwave	Low environmental impact No hazardous residues Complies with Stockholm Convention	Reliable solid waste collection and electricity connection needed Waste needs minimum humidity or water needs to be added Special waste bins needed	Environmentally- friendly Wastewater is decontaminated Air emissions minimal No pollutant emission limits
Continuous Microwave	Low environmental impact No hazardous residue Residue is unrecognizable Reduction of waste volume Complies with Stockholm Convention	Reliable electricity connection needed Waste needs minimum humidity or water needs to be added Higher cost and maintenance	Environmentally- friendly Wastewater is decontaminated Air emissions minimal No pollutant emission limits System needs to be completely enclosed to prevent emitting aerosols during shredding process
Incineration	Reduction of volume Residue is unrecognizable	High environmental and health impact (air emissions and risk of burns) if has no flue gas treatment	Releases wide variety of pollutants, including dioxins and furans, into the atmosphere Pollutants vary according to the composition of the waste

	Fully destroys infectious and sharps wastes Applicable to some pharmaceutical and chemical wastes	Bottom and fly ash is potentially hazardous Not in accordance with Stockholm Convention if has no flue gas treatment	Bottom ash residues are also generally contaminated with dioxins, leachable organic compounds, and heavy metals and must be treated as hazardous waste Ash should be disposed in sites designed for hazardous wastes, e.g., designated cells at engineered landfills, encapsulated and placed in specialized monofill sites, or disposed in the ground in ash pits

Source: DOH HCWM Manual 2020

The health facility should assess its capacity whether to utilize and maintain an in-house waste treatment or solely rely on outsourced treatment services, with the ultimate goal of reducing the risk of COVID-19 wastes to the public and the environment. Below are the aspects for consideration on the treatment technology and facility- specific factors:

Table 4.5.2. Factors to consider in choosing treatment technology based on technology features and facility aspects

Technology- Specific	Health Facility- Specific
▪ Types and quantity of waste for treatment and disposal/capacity ▪ Treatment efficiency ▪ Volume and mass reduction ▪ Occupational health and safety ▪ Environmental soundness ▪ Infrastructure and space requirements ▪ Locally- available treatment options for final disposal ▪ Training requirements for operations ▪ Cost of operation and maintenance ▪ Location and surroundings of the treatment and disposal facility ▪ Regulatory requirements ▪ Social and political acceptability ▪ Cost of transport and disposal of treated waste ▪ Cost of decommissioning	▪ Quantity of HCWs produced daily ▪ Availability of appropriate sites for waste treatment and disposal ▪ Space available at the HCF ▪ Location of treatment technology, i.e., possibility of treatment in central facility or treatment facility within reasonable distance ▪ Rainfall and level of groundwater (as precautions against flooding of burial pits) ▪ Availability of reliable transportation ▪ Compliance with national policies and standards ▪ Availability of equipment and manufacturers in the country or region ▪ Social acceptance of treatment and disposal methods and sites ▪ Availability of resources (human, financial, material) ▪ Estimate of capital and operating cost

The TSD Facility operators shall clearly explain to their clients (health care facilities) which types of wastes they can treat with their available treatment technologies. If a TSD facility cannot effectively treat specific wastes, the TSD facility operator shall advise the client on how they will manage these wastes. A list of certified TSD Facility per region is enumerated in Appendix F.

4.6 Infection Prevention and Control (IPC)

As risks associated with infectious COVID-19 wastes cause significant harm to humans, wildlife, and the environment, it is vital to mitigate these risks through effective infection prevention and control (IPC) measures especially in view of the COVID-19 pandemic. The DOH prescribes IPC measures through administrative, engineering, and environmental controls[9] found below. Detailed discussions on COVID-19 waste segregation, collection, storage, transport, treatment, and disposal will be in the next chapter.

A. Patient- Related Interventions

Infection prevention and control measures for patients which must be observed in all HCFs include:

1. Standard mandatory safety measures
    a. Physical distancing of at least one (1) meter or 3-feet between individuals in all areas including waiting area and cafeterias at all times
    b. Wearing of face mask by patients and visitors within the facility premises
    c. Active body temperature and symptoms screening for all individuals prior to entrance to the facility with proper advice for symptomatic persons
    d. Provision of safety precautions for vulnerable populations such as the elderly, pregnant, children, and persons with disability such as priority lanes, separate waiting areas, etc;
    e. Restricting visitors for suspect, probable, or confirmed COVID-19 patients
    f. Limiting companions and visitors for non-COVID-19 patients for outpatient care, emergency care and admission to private rooms and wards
2. Use of telemedicine when feasible to reduce contact and limit patients in the HCF

B. Health Care Worker- Related Interventions

1. Use of appropriate personal protective equipment (PPE)
2. Implement administrative controls to strengthen IPC measures in the workplace such as limiting number of personnel, use of online platforms for trainings and meetings, reporting of symptoms and exposure, laundry of used uniforms, and accommodation arrangements
3. Ensure health care worker safety and mental health
4. Designation of Infection and Prevention Control (IPC) Officer or creation of active and functional IPC Committee/Team
5. Assignment of dedicated healthcare workers to specific stations to limit and control movement of personnel around the HCF
6. Promotional and/or educational materials on the following are posted in appropriate places and within visible range in the HCF which may include but are not limited to handwashing, PPE per zone and donning and doffing, respiratory etiquette, and social distancing

[9] DOH Department Memorandum no. 2020-0268 – Interim Guidelines on Health Facilities in the New Normal

Figure 4.7.1. IEC material on proper handwashing
Source: DOH, 2015.

C. Infrastructure and Maintenance Interventions

1. Engineering Controls

a. Installation of hand washing facilities or sanitizing stations in common areas and other strategic places such as walkways, entrances and exits, information desks, waiting areas and dining areas and ensure 24/7 availability of soap and running water or alcohol-based sanitizers
b. Designation of dedicated areas in triage, emergency department, patient wards, and operating room theater, for the use of COVID-19 and non-COVID-19 Patients.
c. Establish clear workflow and foot traffic as follows:
    i. Separate entrance and exit for patients and healthcare workers
    ii. After initial screening and triage, patients will follow the dedicated walkway for COVID-19 and non-COVID-19 set by the facility
    iii. Unidirectional flow/ foot traffic when moving from one area to another for suspect, probable, and confirmed COVID-19 patients and non-COVID-19 patients
    iv. Placement of signages, floor markers, or physical barriers to reinforce physical distancing and direct pathways in HCFs
d. Implement the prescribed zoning[10] in areas where suspect, probable and confirmed COVID-19 patients are cared for
    i. The zones prescribed include:
        a) Contaminated Zone – serves as the area where patients admitted are contained

[10] DOH Department Memorandum no. 2020-0208 – Interim Guidelines on Enhancing the Infection Prevention and Control Measures through Engineering and Environmental Controls in All Health Facilities and Temporary Treatment and Monitoring Facilities during the COVID-19 Pandemic

b) Buffer Zone (Potentially contaminated area) – serves as an area for PPE donning and doffing, decontamination, and hand hygiene
c) Sterile Zone (Clean area) – serves as holding area and entrance for health care workers
   ii. Each zone shall be divided by glass and steel. If not feasible, drywall and translucent material for patient viewing window may be used.
   iii. Buffer zone shall have negative pressure ventilation to ensure air flow from clean to contaminated area. If not feasible, dilution ventilation may be utilized with air exhausted to area with no people

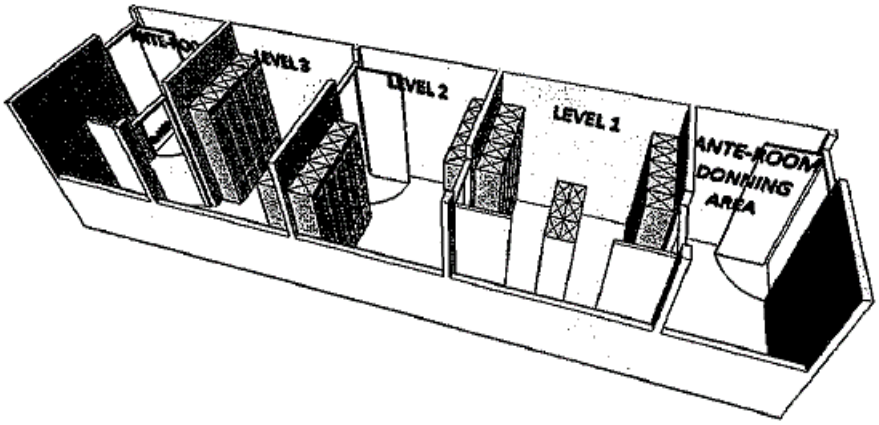


Figure 4.7.2. Buffer zone diagram
Source: DOH DM 2020-0208, 2020.

   iv. The buffer zone shall be divided into three levels separated by partitions such as polycarbonate sheets, drywall, plywood or any available material. The donning and doffing of PPEs will utilize 2 separate pathways with corresponding procedures per level:

Table 4.7.1. Areas for donning and doffing of PPEs

Level/ Area	Donning	Doffing
1	Change from outside clothes to uniform	Disinfection, removal and disposal of gloves and gown
2	Hand hygiene	Hand hygiene, removal of masks and goggles
3	Wearing of complete PPE	Change from uniform to outside clothes

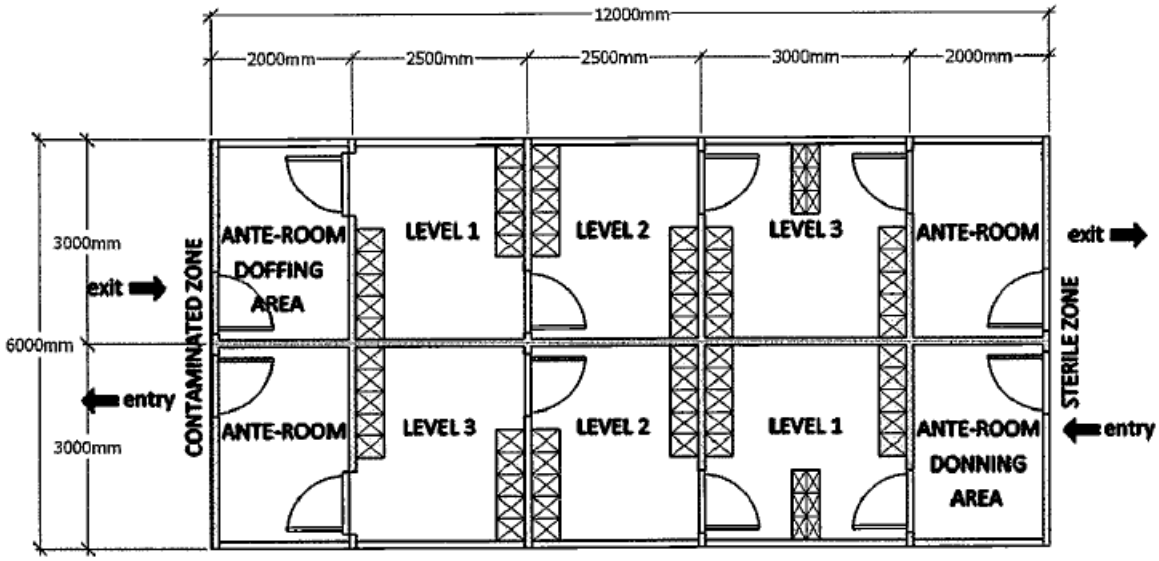


Figure 4.7.3. Donning and doffing pathways through the buffer zone
Source: DOH DM 2020-0208, 2020.

v. Footbath shall be used in transition areas from highly infectious to less, to be placed between doffing and clean areas, and at the exits of HCFs.

e. Improve ventilation in all HCFs
   i. Increase passage of natural ventilation in all parts of the facilities
   ii. Use a dilution ventilation system for patient rooms and wards, e.g., use of unidirectional electric fans to direct airflow
   iii. Use a mechanical ventilation system to induce negative pressure for isolation rooms and Intensive Care Unit

f. Ensure appropriate patient placement standards are followed
   i. Suspect, probable, and confirmed COVID-19
   ii. Patients shall follow patient placement in accordance with DOH-DM no. 2020-0062 – Guidelines on the Standard of Airborne Infection Isolation Room and Conversion of Private Rooms and/or Wards into Temporary Isolation Rooms for the Management of Patients Under Investigation and its Amendment
   iii. Beds are placed at least 1 meter (3-feet) apart with partitions to ensure privacy

g. Installation of a non-porous barrier (e.g., acrylic sheets, polycarbonate sheets, clear corrugated sheets, or glass) between patients and health facility staff in administrative areas

2. Environmental Controls

a. Conduct of visual preliminary site assessment in a methodical systematic manner, ensuring that appropriate materials and disinfectants are used
b. High contact surfaces such as buttons, switches, handrails, ete shall be disinfected as least once every two hours using disinfectant solution or wipes
c. Areas where suspect, probable, and confirmed COVID-19 patients receive care (e.g., rooms, observation units, etc.) shall be cleaned and disinfected using the recommended disinfectants at least once a day, and after a patient is discharged
d. For other areas, routine cleaning may be performed with detergent or disinfectant solution or wipes at least once a day or when visibly dirty

e. Toilets should be cleaned and disinfected at least twice a day or more frequently as the need arises
f. Proper collection, storage, transfer, treatment, transport and disposal of infectious waste from healthcare facilities and COVID-19 treatment units shall be done in accordance with (a) DOH Department Memorandum 2021-0031 – Interim Guidelines on the Management of Health Care Wastes Generated from COVID-19 Vaccination, (b) DOH Department Memorandum 2020-0170 – Interim Guidelines on the Management of Health Care Waste in Health Facilities, Community quarantine Units, and Temporary Treatment and Monitoring Facilities with Cases of Coronavirus Disease 2019 (COVID-19), and (c) DOH Department Circular 2020-0191 – Circulation of the Health Care Waste Management Manual 4th Edition

4.7 Disinfection

Cleaning environmental surfaces and patient care equipment with water and is an effective and sufficient procedure. The preferred routine cleaning process should involve either a:

a. 2-step clean. Physical cleaning with detergent followed by disinfection with a hospital-grade disinfectant with activity against viruses (according to product label/information) or a chlorine-based product such as sodium hypochlorite

b. 2-in-1 clean. A physical clean using a combined detergent and hospital-grade disinfectant with activity against viruses (according to label/product information) or a chlorine-based product such as sodium hypochlorite, where indicated for use, i.e., a combined detergent/disinfectant wipe or solution.

The recommended disinfectants[7] include (a) 70% ethyl alcohol for disinfecting small surface areas and equipment between uses and (b) sodium hypochlorite at 0.1% (1000 ppm) for disinfecting surfaces and 0.5% (5000 ppm) for disinfection of blood or bodily fluids spills.

To prepare a 0.5% sodium hypochlorite solution (1:10 solution) for surface disinfection[11], commercially available household bleach at 5% active chlorine should diluted, with 1 part bleach to 9 parts clean water. Chlorine powder/ granules/tablet at 60-70% may also be used, dissolving 1 tablespoon or 10 grams chlorine to 2 liters of clean water with continuous mixing. To prepare a 0.05% (1:100 solution) sodium hypochlorite solution for handwashing, 1 part of the 0.5% solution of household bleach may be used to mix with 9 parts of clean water, e.g., 100 mL or 7 tablespoons of chlorine solution in 1 liter of water. Chlorine solutions must be prepared fresh daily to ensure effectiveness and prevent wastage[8].

The proper storage of chlorine should be observed[8]. Chlorine in liquid or powder form should be put in air- tight, non- metallic containers in well- ventilated areas and sealed tightly after use. The solution must be placed away from heat, sunlight, humidity, water, acid, fuel, detergents, food, organic, and flammable materials.

Non-critical items[12] in HCFs may include environmental surfaces, linens, paper- based health records, electronic devices, and medical items such as but not limited to blood

[11] DOH Department Memorandum no. 2020-0157 – Guidelines on Cleaning and Disinfection in Various Settings such as an Infection Prevention and Control Measure against COVID-19
[12] DOH Department Memorandum no. 2020-0167 – Interim Guidelines on the Proper Handling and Disinfection of Non-critical Items Used in the Management of COVID-19 Patients in All Health Facilities and Temporary Treatment and Monitoring Facilities

pressure cuffs, bed pans, emesis basin, crutches, wheelchairs, and food trays[13]. For non-critical items, the following disinfection standards should be observed:

A. Medical Items

All facilities that handle suspect, probable and confirmed COVID-19 patients shall disinfect non-critical medical items based on methods and disinfectants prescribed by manufacturer and HCF.

B. Environmental Surfaces

Environmental surfaces should be kept clean at all times, removing visible dirt and disinfecting frequently touched surfaces such as door knobs, bed rails, and light switches at regular schedule. For surfaces or walls with blood or bodily fluids, the disinfectant should be allowed to sit for 30 minutes. Cleaning materials such as mops and cloths shall be cleaned every after use and dried thoroughly.

C. Linens

All linens including bed covers and patient gowns shall be handled, transported, processed, and stored in a manner that will prevent contamination of surroundings.

D. Paper- Based Health Records

All health workers managing suspect, probable and confirmed COVID-19 patients shall document only at nurses' station or designated areas and shall practice hand hygiene before and after documentation. Hand hygiene supplies such as soap, water, and alcohol- based handrubs shall be available and accessible to the health workers. Disinfectant machines may also be used for decontamination of health records. All decontaminated records shall be placed in designated plastic containers prior to the use of the health records office.

E. Electronic Devices

Electronic devices shall be cleaned and disinfected through methods recommended by manufacturer or using alcohol-based wipes or spray with at least 70% alcohol while unplugged or disconnected. Surfaces shall be air- dried thoroughly before use.

4.8 Personal Protective Equipment (PPE)

Personal protective equipment or PPEs are specialized clothing or equipment worn for protection against hazards such as injuries and potential exposure to infectious materials. PPE is one of the key elements in preventing the spread of communicable diseases to healthcare workers and communities. General work clothes, e.g., uniforms, pants, shirts, are not intended to function as protection against hazards and thus, are not considered as PPEs.

Adequate and appropriate PPE shall be provided to HCF workers who are exposed to hazardous waste. The type of PPE depends on the extent to which the staff is exposed to risks related to COVID-19 waste. This includes protection for the whole body – head, face, body, arms, legs, and feet.

[13] DOH Department Memorandum no. 2020-0072 – Interim Guidelines for 2019 Novel Coronavirus Acute Respiratory Disease (2019-nCOV ARD) Response in Hospitals and Other Health Facilities

For waste handlers, the following are the minimum PPEs required:

- Medical mask
- Gowns or coveralls
- Industrial aprons
- Heavy duty gloves (waste handlers)
- Disposable gloves (medical staff)
- Eye protection
- Closed industrial boots or work shoes
- Face shield or safety goggles
- Helmet (depending on type of operation)

Unless the waste handlers are at risk from aerosols from the management of wastes, there is no need to provide N95 or equivalent masks. It should be noted that wastes should never be compacted. The following illustrate the PPEs that should be provided to waste management staff with consideration on the type of activities to be undertaken, comfort, temperature and humidity, and availability:

Gloves

Shoe Covers or Rubber Boots

Masks

Eye Protection and Face Shields

Gowns/Overalls

A summary of the PPEs required for each personnel based on their roles are provided below:

Staff Roles	Clinical staff – caring for suspected or confirmed COVID patient	Non-clinical staff	Waste handlers
 Hand Hygiene	✓	✓	✓
 Gloves	✓	X	✓
 Shoe Covers or Rubber Boots	✓ Shoe covers	X	✓ Rubber boots
 Gown	✓	X	✓
 Surgical Mask	X	✓	✓
	✓	X	✓

N95 Mask	If undertaking aerosol generating procedures		If undertaking aerosol generating procedures
 **Eye Protection (Face shield)**	✓	✓	✓
PPE Donning and Doffing Requirements	**Don** ▪ Eye protection and mask when in ward ▪ Gown and gloves in designated donning areas **Doff** ▪ Gown and gloves in designated doffing areas ▪ Eye protection if contaminated ▪ Eye protection and mask every 4 hours Upon leaving the ward or department	Review other requirements if approaching patients	

The PPE used in healthcare is effective. However, healthcare workers should be aware that it is still possible for their uniforms or personal apparel to become contaminated. Even under normal circumstances, it is good practice to change uniform/work clothes after finishing work and launder these clothes daily on the warmest appropriate water setting for the items and dry them completely (either air dry or tumble dry as appropriate for the item). Compliance with processes for donning and doffing of PPE is critical to staff safety.

The access to materials for hand hygiene such as soap, water, and alcohol is important to prevent spread of COVID-19. The proper disposal of used PPEs should also be observed, following the DOH guidelines[14] and treating these PPEs as infectious wastes.

[14] DOH Department Memorandum no. 2020-0167 - Interim Guidelines on the Proper Handling and Disinfection of
Non-critical Items Used in the Management of COVID-19 Patients in All
Health Facilities and Temporary Treatment and Monitoring Facilities

4.9 Personnel Capacity Building

All personnel working with hazardous wastes must be fully capacitated with training measures and risk awareness through education. They must be knowledgeable on policies, health and environment impacts, roles and responsibilities, work procedures and importance of conformance to the requirements.

To have a fully functioning HCWM system, trainings and continuing education must be an integral part to sustain and improve good waste management system in an institution. With this, personnel who are aware of waste management become conscious of the risks in their work activities, advocates for best practices and guides in enhancing the waste management system.

The overall objective of training are to:

a. Prevent occupational and public health exposures to the hazards associated with HCW;
b. Raise awareness of the health, safety, and environment issues relating to HCW;
c. Ensure that health care personnel are knowledgeable about best practices and technologies for HCWM and can apply them in their daily work; and
d. Foster Responsibility among all health care workers for HCWM.

A. Training of Health Care Workers

Training is vital in an HCF so health care workers will be aware of the hazards involved in HCW and their respective roles. So, all HCF workers must receive initial and annual training depending in their function inside the HCF. Personnel who should undergo separate training activities are HCF mangers and administrative staff responsible for implementing regulations on HWCM, medical doctors, nurses and assistant nurses and cleaners, porters, auxiliary staff and waste handlers.

Basic education program for HCF workers shall include:

- Information and justification for all aspects of the HCW policy;
- Information on the role and responsibilities of each HCF worker in implementing the policy; and
- Technical instructions, relevant for the targe group, on the application of waste management practices.

B. Integrating Public Education on Risk Awareness

All HCFs, the DOH and the EMB-DENR must coordinate with each other in promoting safe and sensible waste handling and disposal. These government authorities are responsible in keeping a clean environment to maintain a healthy community. Moreover, it is the right of every HCF worker and the community to be informed about the potential health hazards associated with HCW.

To prevent serious public health consequences and adverse effects on environmental health protection, the aforementioned authorities must be responsible in developing information, education, communication (IEC) programs and materials. The objectives of these IEC programs are:

- to transmit the basic skills and knowledge in establishing healthy, secure, and safe environment for HCW and the general public;

- to inform the public about risks linked to HCW, focusing on people either living or working near or visiting the HCF, families of patients being treated at home and scavengers on waste dumps;
- to foster responsibility among hospital patients and visitors to HCF regarding hygiene and HCWM;
- to prevent exposure to HCW and related health hazards, this exposure may be voluntary in the case of scavengers or accidental as a consequence of unsafe disposal methods;
- to increase awareness of the impact of HCW on environment and ecology; and
- to influence behavior of patients, watchers, HCF workers to implement proper HCWM.

Some of the training package suggestions for each target group is listed in the table below.

Table 4.9.1. Suggested Training Package for HCWM Target Groups

Target Groups	Suggested Training Package
Personnel Providing Health Care	This training module must include an overview of the waste management policy, underlying rationale, information on practices relevant to trainees' responsibilities and proper waste segregation.
Waste Handlers	Some of the topics for waste handlers are waste management policy, health hazards, on-site transportation, storage, safety practices and emergency response. It is also prescribed to have periodic refresher course for staffs who routinely handle HCW.
Health Care Waste Management Operators	The training course shall include: • information of the risk associated with the handling of HCW; • procedures for dealing with spillage and other accidents; and • correct use of protective clothing.
Staff who Transports the Waste	The transport staff shall be able to carry out all procedures for: • handling, loading, and unloading of waste bags and bins; • dealing with spillage or accidents; • use of PPE; and • documentation and recording of HCW
Treatment Plant Operators	Topics that must be included in the training package are: • general operations of the treatment facility; • health, safety, and environmental implications of treatment operations; • technical procedures for plant operations; • emergency response, in case of equipment failures and/or alarms; • maintenance of the plant and record keeping; and

	• surveillance of the quality of emissions and discharges, according to the specifications.
Orientation Module for Patients	For the HCF to admit the patients and watchers, they must be oriented on the following: • policies on HCWM relevant to patients and watchers such as the ban of styrofoam and non-reusable plastic food containers, proper segregation of waste; and • impact of improper segregation.

C. Methods of Communication and Training

Various methods can be used to promote public education on HCW. Commonly used approaches include the following:

- Graphics and audio-visuals in the form of brochures, posters, display boards, video tapes, slides, CD/DVDs, flyers, flip charts, leaflets, etc.
- Use of tri-media such as announcements or commercial ads featured in radios, movies, television, newspaper, magazines and the internet.
- Orientation-re-orientation seminars, training and workshops; community health teachings for hospital patients, watchers and other clients using IEC materials and didactic exercise.
- Issuance of written HCF policies to disseminate the information and awareness among HCF workers. There shall be corresponding sanctions to be implemented for non-compliance with issued policies.

5 Management of COVID-19 Wastes in Non-Health Care Facility (HCF) Setting

After dealing with COVID-19 wastes in HCFs, this chapter discusses the proper handling of COVID-19 wastes from segregation to collection in residentials, offices, and commercial establishments to transportation and treatment in waste treatment facilities. This chapter involves guidelines from DOH, DENR and DILG which focuses waste treatment outside HCFs. Furthermore, Philippine environmental policies which focus on the proper management of infectious wastes on land, water and air are included in this section.

5.1 General Preventive Measures

All individuals in residential, domestic premises as well as workplaces and commercial establishments are encouraged and/or required to obey the following to prevent further spread of COVID-19:

a. Practice personal cleanliness such as proper respiratory etiquette and hand hygiene.
b. Maintain a distance of at least 1 meter away, avoid mass gatherings or crowded places and seek alternatives to physical meetings like telecommunication or video conferences.
c. Frequently clean and disinfect the surfaces which are commonly touched and common areas.
d. Public areas must have available dispensers containing alcohol-based hand rub.

Healthcare facilities and/or Public Health Units should advise members of the community as to safe and correct waste management should there be a need to isolate at home as a result of having suspected or confirmed COVID-19.

Personal hygiene (e.g., handwashing), and isolating from non-infected members of the family are essential points to provide advice on.

If there is a suspected or confirmed COVID-19 case in a household or people are in quarantine, then waste must be considered potentially contaminated and handled with care. The waste container should be sealed, temporarily stored, and collected by municipal waste service providers at the first opportunity to prevent the risk of spread of the disease.

To reduce direct contact with medical waste, any bag liner should be sealed before the bag is 70% filled. Waste handlers should ensure they wash hands thoroughly after sealing any bags. For extra safety, the bag can be put in another bin liner.

For the conditions in which the household waste collection vehicle has a compaction system, this process can cause the spread of contained air, if the wastes were provided by a home of an infected person, in a worst scenario. In particular, the spread of the coronavirus may be increased by the inadequate waste management, highlighting poor handling conditions associated with inappropriate use of personal protective equipment and other unfavourable conditions.

5.2 Identification of COVID-19 Wastes in Non-HCF Setting

According to DENR DAO 2013-22 and R.A. 6969, pathogenic or infectious wastes are considered as hazardous wastes which present unreasonable risk and/or injury to health and safety and to the environment. However, it also states that wastes from households and domestic premises like workplaces and commercial establishments are exempted from the list of hazardous wastes which clearly does not apply while the country is facing threats posed by COVID-19.

All are required to observe minimum public health standards such as wearing of masks and face shields. Disposable masks and face shields are possible sources of COVID-19 that is why wastes from households, offices, industrial and commercial establishments must be treated and properly disposed like hazardous wastes.

Infectious waste is a type of health care waste suspected to contain pathogens (bacteria, viruses, parasites, or fungi) in sufficient concentration or quantity to cause disease in susceptible hosts.

COVID-19 positive patients can generate infectious wastes that can come from residentials and domestic premises like workplaces and commercial establishments face masks, face shields, tissues, disposable utensils, food scraps and all other wastes.

5.3 Waste Generators for Non-HCF Setting and Management Responsibility

Waste generators are individuals, group of individuals, or organization who generate or produce hazardous wastes through any institutional, commercial, industrial or trade activities. They are responsible for the proper management of hazardous wastes from the time it is generated until it is rendered non-hazardous as certified by EMB-registered hazardous waste treater or recycler.

In general, waste generators are classified into large, medium, and small depending on the volume of waste generated. The table below shows the volume and classification for M501 wastes.

Table 5.3.1. Classification of infectious waste generator.

Type of Waste Generator	Volume of Infectious Waste Generated (kg/yr)
Large Generator	> 10,000[a]
Medium Generator	5,000 – 10,000
Small Generator	< 5,000

Note: a - Based on less than 50 kg/day hence round off to 10,000 kg/yr.
Source: EMB DENR, 2013.

In the case of an establishment who generates two types of waste, this establishment is already classified as a large generator. The Environmental Management Bureau (EMB) of DENR updates the classification of the waste generator once data becomes available.

5.4 Compliance Requirements per Category of Waste Generators

As indicated in DENR AO 2013-22, requirements that must be complied were set for all hazardous waste generators regardless of size. The table below cites the requirements for all categories of waste generators.

Table 5.4.1. Compliance Requirements of Waste Generators

Compliance Requirements	Category of Waste Generators		
	Large Quantity	Medium Quantity	Small Quantity
Registration	Yes	Yes	Yes
Designation of PCO	Full-time	Full-time	Full-time
Reporting	Quarterly	Semi-annual	Annual
Storage and Labeling	Yes	Yes	Yes
Storage Time Limit	6 months	1 year	1 year
Manifest System	Yes	Yes	Yes
Contingency Planning	Yes	Yes	Yes
Training	Yes	Yes	Yes

Note: PCO – Pollution Control Officer

From the table above, it is required for the management generator to designate a full-time PCO who will be responsible for the daily management of wastes generated in the facility. Furthermore, the PCO must have the appropriate competency to manage wastes through his/her educational background, experience, and training. This is similar with all other personnel working directly with hazardous wastes.

5.5 Requirements for Proper Waste Management

The following waste management requirements must be observed by waste generators, regardless of size.

a. Waste generators must comply to the proper storage and labeling requirements as follows as stated in Section 5.10.

b. In pre-transporting of hazardous wastes, the waste generators must comply to the following depending on the wastes being transported:

   1. Appropriate packaging and labeling requirements;

   2. Preparation of a spill response plan which involves immediate reporting to EMB-DENR, securing or containing the affected area and cleaning up spilled or leaked hazardous wastes;

   3. Providing copy of the spill response plan to the designated waste transporter and ensure the waste transporter understood the plan; and

   4. Ensure that the waste transporter has the necessary spill response equipment as indicated in the plan.

c. Avail services of duly registered waste transporters and TSD facilities by EMB Central Office whose permits are valid within the period that the wastes are being transported and treated, stored, or disposed of.

d. Comply with Hazardous Waste Manifest System in transporting wastes outside the premises; and

e. Secure the original copy of Certificate of Treatment issued by the TSD facility within 45 days after the wastes are received for treatment.

6 Summary of Requirements for COVID-19 Waste Management in HCFs and Non-HCF Setting

Processes in HCW Management	HCFs	Non-HCF Setting
Waste Segregation	Waste bins or containers and/or plastic liners serve as receptacles with signages, color coded and proper labels are used for segregation of HCW. The type and color of receptacle depend on the type of HCW. Similarly, the specifications of the receptacle such as thickness or covering depend on the size or volume of HCW.	There is a wide range of wastes that can come from non-HCF setting. Waste bins are not properly managed, especially those that are not inside a facility which encourage waste segregation. Waste generators must identify first which of the wastes are infectious wastes and segregate majority of the wastes that classifies as non-hazardous wastes or general wastes before storing it in its proper container.
Onsite Collection and Transport	A scheduled plan or intervals on collection and transport must be in place in HCF. Replacement bins or other receptacle must be available upon waste collection. Wheeled trolleys or bins are used for transporting HCW to the onsite storage while following the transport route plan which is different from the foot traffic in the facility. Waste bins and trolleys are cleaned and disinfected afterwards.	Household wastes are collected and transported to a treatment facility by municipal waste collectors with very minimal supervision on waste segregation. Collection and transport is done every day. Wastes from workplaces, industrial and commercial establishments have staffs who collect and transport waste on their storage facilities. Waste segregation has medium supervision in these facilities. Wheeled waste bins are commonly used for transportation. Collection and transport are scheduled at the end of the day or shift in the establishment.
Onsite Storage	COVID-19 wastes should be stored in a designated area where it is only accessible to authorized persons, waste handlers or collectors, protected from environmental impacts, distant from public areas and an enclosed structure with sturdy construction materials.	Onsite storage for non-HCF setting can be metal drums, plastic or metal containers or containment building or warehouse. The drums or containers must be leaked proof and securely covered by lids, caps or plastic. For containment building or warehouse, it must be an enclosed structure with complete walls, roof,

		floor, adequate lighting, and ventilation.
Onsite Treatment	Several HCFs decided to have onsite treatment for HCW. This involves small-range TSD technologies for the HCW that can be treated by the HCF. Other wastes that cannot be treated by using their available HCFs are collected and transported in registered TSD facilities.	Onsite treatment for non-HCF setting are quite rare, especially household wastes. A few percent of household practice treatment which is recycling of wastes. In workplaces, industrial, and commercial establishments, onsite treatment is possible considering that these establishments are large waste generators. Recycling and composting are the possible methods for an onsite treatment.
Offsite Collection and Transport	Registered waste collectors and transporters are already in contract with HCFs. Waste transporters expect to receive HCW in proper packaging and puts these wastes in metal or plastic containers. Containers must be puncture-proof, made of HDPE, chemical-resistant, leak-proof, color-coded, labelled, and completely sealed. This process must be administered by the Sanitary Officer or Engineer of the HCF.	Majority of wastes from non-HCF setting are collected and transported to a TSD facility by municipal waste collectors. The manner of collection and transport is scheduled everyday to prevent accumulation of wastes especially in establishments considered as large waste generators. Proper packaging of wastes is expected from waste generators before these wastes are collected by registered waste collectors and transporters. Containers must be securely sealed, color-coded, labelled, and leak-proof. This whole process must be supervised by a certified Pollution Control Officer.
Offsite Treatment and Disposal	Health care facilities most likely already have contracted TSD facility. There are some cases that HCFs can also treat and dispose their own HCW. Waste treatment being performed to handle HCW are autoclave, autoclave with integrated shredding, batchwise microwave, continuous microwave, and incineration. The type of waste treatment technology will depend on the type of HCW and its size or volume.	Infectious wastes are separated from the majority of the non-hazardous or general wastes generated from non-HCF setting. These wastes are now treated in a TSD facility categorized as E.5 which chemically treats infectious wastes then it is placed in its disposal facility or transported to another TSD facility which disposes treated wastes.

7 COVID-19 Waste Management Audit

All healthcare facilities should undertake ongoing risk assessments to ensure that all wastes and specifically wastes generated from COVID-19 suspected or confirmed patients are managed safely and correctly.

An audit will help illustrate areas with good practice, deficiencies as well as opportunities for improvement. Periodic check-ups ensure the facility is on target and provide the ability to adjust programs appropriately in order to meet goals related to waste management.

Ongoing monitoring and reporting back to the Waste Management Committee is vital to ensure that any issues are corrected. The cleaners and waste management staff coupled with a waste assessment/audit program are two processes for ongoing and effective monitoring.

The outcome of audits is to be reported to and monitored by the waste management committee. Action plans should be put in place for any non-compliance.

7.1 Overview on Waste Assessments and Audits

Two tools that can be used for this are waste assessments and the more comprehensive waste audits. A schedule of waste assessments for individual departments should be developed.

An audit of the health care waste management practices is done ideally every quarter. These audits will provide detailed information on the Hospital's performance against long term goals as well as identify any further resource minimisation initiatives that could be undertaken.

7.2 Waste Audits

The waste audit:

- defines sources, quantities and types of waste generated;
- identifies where, when, how and why these wastes are generated;
- identifies areas of wastage and waste problems; and
- establishes targets and priorities for waste reduction.

A waste audit is a systematic analysis of where and what wastes are produced, why it was produced and finally by whom it was produced.

The audit should enable the organisation to be able to state what they are doing in relation to waste generation, and in particular ensure that it is in compliance with government regulations, guidelines, and policies. Questions can be asked such as, is there potential to do things better (or in the case of waste generation, do things less) and can it be done cheaper and what more can be done.

The analysis of audit results will tell you where wastes are produced and in what volumes or weights. This information can be used to:

- Identify trends, eg., are waste generation rates rising and from which departments;
- Identify what recycling services can be instituted and where;
- Ascertain the effectiveness of education programs; and

- Observe if waste segregation occurs correctly.

However, simply analysing the waste data will not tell why the wastes are produced. To determine this, you will need to conduct a site analysis. You may also need to conduct interviews with key personnel or conduct focus group sessions to get to the real reason for waste generation.

The information gained from an effective waste audit will assist the organisation to realise the following benefits:

- Reduction in waste generation;
- Reduction in resource use and therefore costs;
- Reduction in waste collection, treatment and disposal costs;
- Improved working conditions;
- Improve safety of workers;
- Better meets community expectations;
- Ensure regulatory compliance;
- Ensure compliance with internal policies; guidelines and other business requirements;
- Develop base-line data for future benchmarking or measurement; and
- Evaluate alternatives to minimise wastage of resources.

7.3 Waste Assessments

Waste assessments need to be conducted monthly on a rotating basis for wards and departments.

The waste assessment involves a visual analysis of the waste and recycling containers, storage areas, management procedures and other aspects of the waste management system. The waste assessment may and generally does take place on several occasions. It will be supported by a review of documentation and a site analysis.

The waste assessment provides a reasonable indication of the issues facing the organisation in relation to their waste. It is a good tool where a full physical analysis of the waste is not practical.

The waste assessment is conducted to ascertain such issues as:

- Levels of contamination
- Types of contamination
- Location of waste/recycling containers
- Compliance with contractual and regulatory obligations
- Opportunities for waste avoidance and improved diversion rates
- Waste handling issues
- Costs of waste management

The waste assessment as indicated shall be conducted so that all wards/departments are assessed at least once per annum. The Self- Assessment- Compliance Audit Checklist and Monthly Ward/Department Review Compliance Statement which should ideally be accomplished by the HCFs are in the Annexes.

7.4 Audit/Assessment Outcomes

Outcomes from audits will be used to:

1. Determine a baseline from which improvements can be measured
2.
3. Develop a plan of action to improve environmental practice

A report outlining a range of issues pertaining to waste management should be provided to senior management on an annual basis.

This report is to be prepared by the staff member who is responsible for waste management with advice and assistance from the Waste Management Committee. The report should be submitted to the Chief Executive Officer (through normal reporting lines), in combination with any other reports relating to environmental performance.

It is important that this report also include performance against the KPI.

The following are suggested categories that should be included in the report. These will assist in an independent assessment of performance.

a. Current data on total wastes generated and landfill diversion rates (per stream and/or material type) – specific details include:
   - Number of bins/containers collected per stream per daVolumes of each stream/material
   - Percentage “fill” of each container Comparison of benchmark units against other “like” hospitals
b. Summary of waste management programs implemented since the previous report and measured successes of these programs
   - Percentage reductions of materials
   - Specific waste reduction programs and achievements
   - Education programs implemented and attendance records
c. Assessment of current management methods
   - Are wastes being managed in the most environmentally and cost-effective manner, and in a way that reduces potential liabilities.
   - Actions improve the situation
d. Costs of waste management
   - Management costs per stream Staff costs
   - Cost/benefit analysis of alternate management systems
   - Forecasts of waste disposal charges in the future and implications for waste management
e. Legal and other liabilities
   - Details of all non-compliances and remedial actions
f. Five year forward planning
   - Projected waste generation rates - including waste minimisation objectives and implications if these are not achieved.
   - Relationship to legislation and changes that may need to be made to the current Waste Management Program.
g. Operational needs
   - Equipment needs to meet legislation and OH&S requirements.
   - Requirements to achieve waste minimisation targets.
   - Changes to staff responsibilities or purchasing policies.

7.5 Personnel-in-Charge

Cleaning and waste management staff are ideally placed to monitor individual ward/department compliance with the requirements of this Waste Management Plan.

Observations of contamination in recycling containers and/or leakage of recyclables into general waste containers are something that can be noted and reported to waste management committee.

The waste management committee needs to develop processes for this monitoring and reporting framework. In addition, process for providing feedback towards/departments shall also be developed.

8 Contingency Planning

8.1 Incident or Accident Reporting

All waste and environmental incidents must be immediately reported to the manger or supervisor by the person involved. Incident investigation and implementation of corrective actions must be undertaken.

It is important that all environmental incidents are reported, no matter how small or large. In addition, by reporting promptly and correctly, thorough investigations may be conducted to ensure that the impacts of an incident are minimised and that procedures may be revised to assist with prevention if necessary.

The Incident Report Template is included in this Sourcebook in Appendix G. An incident report shall be submitted to the respective administrative offices of the health care facility which can serve as a documentation of the incident and a commitment sheet of the proposed corrective actions. This report shall be prepared by the Safety Officer in coordination with the Sanitary or Resident Engineer of the facility. Immediate reporting shall be implemented to prevent further occupational, environmental and community health and safety impacts of the incidents. After the report has been filed, this shall be subjected to validation and monitoring until the incident or accident is resolved.

There are five types of incidents indicated in the Incident Report Template. It is significant to classify the specific incident type to address the incident appropriately and implement the accurate corrective actions. Table 8.1.1 below lists down and explains these types of incidents. On the other hand, Table 8.1.2 reports the various categories of incidents.

Table 8.1.1 Types of Incidents

Incident Types	Description
Environmental	Spillage or leakage of chemical substances, especially toxic or hazardous substances, is considered as an environmental incident. Any event that can be detrimental to the environment is considered as an environmental incident. Natural disasters such as flooding, landslides, or forest or agricultural fire are also under the environmental incidents.
Health or Medical	Any situation that has adverse effects to occupational and community health can be considered as health or medical incidents. Some samples of the health or medical incidents are biosafety hazards like disease outbreak or a pandemic.
Safety Injury	Any situation that has negative effects to the workers' health and safety causing injuries like slips, trips or falls.
Mechanical	Any incidents or accidents involving equipment or vehicular related injuries or deaths.
Administrative	Any event or condition that involves sexual harassment, violence against women and children, or gender discrimination or violence.
Others	These are the events that cannot be classified from the previous types of incidents. The Safety Officer preparing the Incident Report can indicate the specific incident.

Table 8.1.2 Categories of Incidents

Incident Categories	Description
Indicative	Indicative incidents have low probability of occurrence and low impact to its stakeholders.
Serious	Serious incidents can have high probability of occurrence but low impact or low probability of occurrence and high impact to its stakeholders.
Severe	Severe incidents have high probability of occurrence and high impact to its stakeholders. These types of incidents must be reported immediately to avoid adverse effects to the workers, environment, and community. Corrective actions are expected to be administered instantly by the Safety Officer in coordination with the Sanitary o Resident Engineer.

8.2 Contingency Planning and Emergency Preparedness

As defined by WHO, contingency planning and emergency preparedness is a long-term program which aims to strengthen the capability of a country to manage efficiently all types of emergencies. This program involves enhancement of existing activities which can bring an emergency to an orderly transition from relief through recovery and then eventually back to sustain development.

A. Emergency Management Plan

For HCFs to minimize consequences of inevitable emergencies, there must be an emergency management plan in place. In emergencies involving HCW, there are three phases that must be followed. The table below lists down these phases and its description on how to attend to such emergencies.

Table 8.2.1. Phases of Emergency Management Plan.

Phases	Description
Rapid Initial Assessment	This phase is designed to be swift and to inform emergency responders about critical and immediate needs. Some of the key points in this phase is to determine the general information, demographic data, geographical information, and the general description of the management of HCW in the affected area.
Emergency Response	From the first phase, an action plan can be implemented to attend to the emergency. The content of the action plan depends on the nature of the emergency. In an emergency involving HCWM, for example accumulation of HCW or spillage, there are minimum treatment and disposal options or spill control procedures that must be followed by the responders. Some of the minimum treatment and disposal options to lessen the accumulation of HCW are as follows:

	• On-site burial in pits as long as the specifications are strictly followed to prevent contamination of groundwater. • Burial in special cells in dumping sites if available in the affected area • Using low-cost double chamber incinerators • Encapsulation
Recovery Phase	The last phase can be characterized as a longer-term program compared to the whole emergency management plan. This is possible because there are emergencies which have big consequences affecting a community. These kinds of emergencies might experience difficulty in returning to its original state.

B. Contingency Planning and Emergency Preparedness

At the HCF level, action plans on HCWM should include temporary measures to apply during emergency situations.

The contingency plans should address the following questions:

- What standards will be used to guide a response?
- What are the current capacities of the agencies or organizations to respond?
- What initial assessment arrangements are needed?
- What actions will be taken as an immediate response to the situation?
- Who does what and when? Who is coordinating and leading?
- What resources would be needed?
- How will information flow between the various levels (local and national)?
- Have specific preparedness actions be agreed on and practiced?

Contingency planning needs to be seen as a continuing process that is regularly reviewed and updated to ensure that all partners are familiar with their various roles, responsibilities, and actions to be undertaken. Contingency plans should be in line with existing national policies and legislation.

C. Pandemic as an Emerging Issue

1. Nature of the Pandemic

a. Periodically occurs.

b. Catalyzed by factors such as increase in international travel and movement of populations or disease vectors.

c. Mode of transmission is a significant factor. If it is spread by contact, even general wastes are potentially contaminated and must be classified as infectious HCW.

d. Increase in HCW if it needs immediate emergency medical operations and other treatments.

2. Solution to the Pandemic

a. Provision of vaccines to health care workers

b. Provision of vaccines to HCW personnel

3. Waste Generation during Pandemic

a. Quantity of sharps waste and empty vials will increase significantly.

b. Utilization and/or production of sharps and vials in underdeveloped countries might cause a HCW problem.

c. Facilitate routine injections to partially offset increase in vaccination wastes.

d. Use of HCW engineering advice, realistic transportation, and disposal arrangements to address.

8.3 Spill Management

A. General Procedure for Dealing with Spillages

1. Vacate and secure the area to prevent further exposure of other individuals.

2. Provide first aid and medical care to injured individuals.

3. Inform Waste Management Officer (WMO) who shall coordinate the necessary actions.

4. Determine the nature of the spill. Refer to the MSDS if necessary.

5. Provide appropriate clothing to personnel involved in cleaning-up.

6. Limit the spread of the spill.

7. Activate exhaust system or keep the area well-ventilated particularly if the spill is due to volatile organic solvents or corrosive agents.

8. Neutralize or disinfect the spilled or contaminated material if indicated.

9. Collect all spilled and contaminated materials except sharps which must not be picked up by hand. Suitable tools must be used in collecting spilled substances. Spilled materials and disposable contaminated items for cleaning shall be placed in appropriate waste bags or containers and properly labelled and documented before final disposal.

10. Decontaminate or disinfect the area by wiping with absorbent cloth. Do not turn the cloth during this process to prevent further spread or contamination. Work from the least to the most contaminated area. Use dry cloth for liquid and solid spillage while wet cloth for acidic, base or neutral chemicals.

11. Decontaminate and disinfect all tools used.

12. Seek medical attention if exposure to hazardous material has occurred during the operation.

13. Normal operation may continue once the disinfected area is thoroughly cleaned and dried.

B. Clean-up Kit for Spills

The clean-up kit for spills shall contain the following items:

1. One pair of latex gloves
2. N95 mask (for blood, body fluids and chemotherapeutics / cytotoxic spills)
3. Respirator with specific filter for the type of chemicals
4. Small and big zip lock bags
5. Absorbable cloth
6. Appropriate disinfectant solution for spills due to blood, body fluids and chemotherapeutics. cytotoxic
7. Neutralizing solution specific for acids or alkali
8. Eye goggles (for big spill)
9. Labeling materials
10. Small pail with putty clay at the bottom (for chemical spill)
11. Miscellaneous items which the HCF may require to meet their need

9 COVID-19 Vaccination Waste Management Plan

As an emerging public health issue, containing the spread of COVID-19 and restricting further mortality requires increase medical emergency operations. With this, vaccination drives are implemented nationwide pushing the country to generate more HCW.

A. Organization of COVID-19 Waste Team

1. The HCF shall identify members to the COVID-19 Waste Team. Existing HCWM Committee may also serve as the team.
2. The team shall develop a COVID-19 Waste Vaccination Plan and implement it. The plan shall include activities and resources needed including the budget and responsible persons or units and propose a timeline.
3. The Team shall be responsible that the vaccinators follow the guideline on the proper segregation or sorting, handling, and disposal of the waste.
4. The Team shall ensure that all collected wastes in the temporary storage area of the HCF are properly collected and disposed either onsite or offsite.

B. COVID-19 Vaccination Waste Management Plan

To ensure protection of the environment and the public, proper handling, storage, collection, and disposal of HCW shall be followed. The table below lists down the COVID-19 vaccination waste management plan.

Table 8.4.1. COVID-19 Vaccination Waste Management Plan

Processes	Description
Waste Segregation	a. COVID-19 Vaccination can generate the following HCW. 1. Hazardous wastes – sharps such as syringes and needles, infectious empty vials and blood soiled cotton 2. Non-hazardous wastes – plastic wrapper, paper, and cotton b. Empty vaccine vials and used syringe barrels shall be considered infectious. c. Sharps such as syringes and needles are place inside a puncture-proof container for temporary storage onsite. d. Follow strictly proper segregation. e. Color-coded bins and plastic liners must be used. f. The thickness of plastic liners must be 0.07mm and bags must be chlorine-free. g. Proper labeling of plastic liners must be strictly implemented. Label includes name of HCF, area of HCF, type of waste, weight of waste, date of collection on-site and name of the person accomplishing the label.

	h. Containers should be large enough for the volume or size of the HCW. Filled waste containers shall only be collected by the designated staff.
Collection and Transport within the HCF	a. There must be a general service personnel who will be assigned for the collection of wastes from the waste bins going to the on-site storage area of the HCF. b. Infectious and general wastes should be collected daily. c. Waste bags must only be ¾ filled. d. Sharp containers should be collected when ¾ full. e. Upon waste collection, the personnel must ensure that the waste bags and containers are properly labeled. f. Replacement of bags or containers should be available at each waste location. g. Wheeled trolleys/carts or wheeled bins are used to transport the collected wastes. Disinfect trolleys and bins daily using 4-5% concentration of sodium hypochlorite. h. Separately transport hazardous and non-hazardous wastes. Infectious wastes can be transported with used sharps wastes.
Central Storage	a. All collected and transported waste materials shall be stored in the designated central storage area of the HCF. Separate the storage area for hazardous and non-hazardous wastes. b. Hazardous wastes should always be stored in enclosed rooms. c. The storage place must be identifies as an infectious waste area by using the biohazard sign.
Treatment and Disposal System	a. Onsite system – The HCF may construct concrete vault within its premises to serve as the final disposal for the syringes and vials. The vault must be constructed of concrete walls and slabs with a minimum size of 1m x 1m x 1.8m. b. Offsite system – The HCF may avail the service of a DENR accredited waste transporter to transport all the hazardous waste generated during vaccination to the TSD facility.
Reporting and Recording	The estimated volume or amount of the hazardous waste must be recorded. Reverse logistics of vials must be conducted.

Source: DOH DM 2021-0031, 2021.

10 References

A. Republic Acts, Department Memorandums, Regulations, Guidelines and Issuances

DENR AO 2013-22 – Revised Procedures and Standards for the Management of Hazardous Wastes

DENR DAO 2001-34 - Implementing Rules and Regulations of RA 9003

DENR Data on List of Registered TSD Facilities and Transporters

DOH DC 2020-0039 - Reiteration of DM2020-056 Interim Guidelines on 2019 nCoV ARD Response in the Workplace

DOH DM 2020-039 – Reiteration of the Interim Guidelines on 2019 Novel Coronavirus Acute Respiratory Disease (2019-nCoV ARD) Response in the Workplace

DOH DM 2020-0072 – Interim Guidelines for 2019 Novel Coronavirus Acute Respiratory Disease (2019-nCoV ARD) Response in Hospitals and Other Health Facilities

DOH DM 2021-0031 - Interim Guidelines on the Management of HCW Generated from COVID-19 Vaccination

DOH DM 2020-0268 - Interim Guidelines on Health Facilities in the New Normal

DOH DC 2020-0286 - Observance on the New Normal in All Health Facilities

DOH DM 2020-0157 - Guidelines on Cleaning and Disinfection in Various Settings as an IPC Measure Against COVID-19

DOH DM 2020-0167 - Interim Guidelines on the Proper Handling and Disinfection of Non-critical Items Used in the Management of COVID-19 Patients in All Health Facilities and Temporary Treatment and Monitoring Facilities

DOH DM 2020 – 0170 - Interim Guidelines on the Management of Health Care Waste in Health Facilities, Community Quarantine Units, and Temporary Treatment and Monitoring Facilities with Cases of Coronavirus Disease 2019 (COVID-19)

DOH DM 2020-0176 - Interim Guidelines on the Rational Use of PPE for Coronavirus Disease 2019

DOH DM 2020-0197 - Interim Guidelines on the Optimal Use of Personal Protective Equipment (PPE) During Severe Shortage of Supplies

DOH DM 2020-0208 - Interim Guidelines on Enhancing the IPC Measures through Engineering and Environmental Controls in All Health Facilities and TTMFs during the COVID-19 Pandemic

DOH DM 2020-0268 - Interim Guidelines on Health Facilities in the New Normal

Republic Act 6969 – Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990

Department of Health. (9 March 2021). COVID-19 Immunization Program Waste Collection Point for Health Care Facilities without Waste Service Providers. Public Health Services Team, Department of Health: Republic of the Philippines.

Environmental Management Bureau. (9 September 2020). Data on List of Registered Treatment, Storage, and Disposal (TSD) Facilities and transporters for Pathological or Infectious Wastes (M501) as of July 2020. Department of Environmental and Natural Resources: Republic of the Philippines.

Joint DENR-DOH AO 2005-02 – Policies and Guidelines on Effective and Proper Handling, Collection, Transport, Treatment, Storage, and Disposal of Health Care Wastes

B. Publications, Training Modules, and Books

Asian Development Bank. (2020). Managing Infectious Medical Waste during the COVID-19 Pandemic. https://www.adb.org/sites/default/files/publication/578771/managing-medical-waste-covid19.pdf

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Centers for Disease Control and Prevention. (2019). Guideline for Disinfection and Sterilization in Healthcare Facilities. https://www.cdc.gov/infectioncontrol/pdf/guidelines/disinfection-guidelines-H.pdf

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Department of Health – Disease Prevention and Control Bureau. (2020). Training module on Health Care Waste Manual for COVID-19 Vaccination.

European Centre for Disease Prevention and Control. (2020). Infection prevention and control in the household management of people with suspected or confirmed coronavirus disease (COVID-19). https://www.ecdc.europa.eu/sites/default/files/documents/Home-care-of-COVID-19-patients-2020-03-31.pdf

Karia, R., Gupta, I., Khandait, H., Yadav, A., & Yadav, A. (2020). COVID-19 and its Modes of Transmission. SN Comprehensive Clinical Medicine. doi:10.1007/s42399-020-00498-4

Queensland Health. (2021). Interim infection prevention and control guidelines for the management of COVID-19 in healthcare settings, Version 1.20. https://www.health.qld.gov.au/__data/assets/pdf_file/0038/939656/qh-covid-19-Infection-control-guidelines.pdf

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World Health Organization. (2020). Coronavirus disease (COVID-19) cleaning and disinfecting surfaces in non-health care settings. https://www.who.int/news-room/q-a-detail/coronavirus-disease-covid-19-cleaning-and-disinfecting-surfaces-in-non-health-care-settings

World Health Organization. (2020). Laboratory biosafety guidance related to coronavirus disease 2019 (COVID-19). https://www.who.int/publications/i/item/laboratory-biosafety-guidance-related-to-coronavirus-disease-(covid-19)

World Health Organization. (2019). Overview of technologies for the treatment of infectious and sharp waste from health care facilities. https://apps.who.int/iris/bitstream/handle/10665/328146/9789241516228-eng.pdf?sequence=1&isAllowed=y

World Health Organization. (2014). Safe management of wastes from health-care activities (2nd ed). https://www.euro.who.int/__data/assets/pdf_file/0012/268779/Safe-management-of-wastes-from-health-care-activities-Eng.pdf

Appendix A – Donning and Doffing PPE

A.1 How to Put On (Don) PPE Gear

More than one donning method may be acceptable. Training and practice using your healthcare facility's procedure is critical. Below is one example of donning.

1. **Identify and gather the proper PPE to don.** Ensure choice of gown size is correct (based on training).

2. **Perform hand hygiene using either soap/water, alcohol hand rub or a hand sanitizer.**

3. **Wear the shoe covers or rubber boots.** For COVID-19 waste handlers, the upper band of the rubber boots shall be worn UNDER the pants leg of the coverall to prevent pooling of liquids inside the boot cover if the coverall does not have integrated socks. This step can be omitted if wearing a coverall with integrated socks or shoe cover for other health care personnel.

    - **Shoe covers:** Closed shoes should be covered by shoe covers for health care personnel treating confirmed or suspected COVID-19 patients.

    - **Rubber boots:** Rubber boots covering the closed shoes should be used by COVID-19 waste handlers to protect from unexpected splashes of body fluids or infectious fluids.

4. **Put on isolation gown.** Tie all the ties on the gown. Assistance may be needed by other healthcare personnel.

5. **Put on the approved type of facemask for the procedure you are undertaking (eg., NIOSH-approved N95 filtering face piece respirator or higher for aerosol generating procedures, using a facemask if a respirator is not available).** If the respirator has a nosepiece, it should be fitted to the nose with both hands, not bent or tented. Do not pinch the nosepiece with one hand. Respirator/facemask should be extended under chin. Both your mouth and nose should be protected. Do not wear respirator/facemask under your chin or store in pocket.

    - **Respirator:** Respirator straps should be placed on crown of head (top strap) and base of neck (bottom strap). Perform a user seal check each time you put on the respirator.

    - **Facemask:** Mask ties should be secured on crown of head (top tie) and base of neck (bottom tie). If mask has loops, hook them appropriately around your ears.

6. **Put on face shield or goggles.** When wearing an N95 respirator or half face piece elastomeric respirator, select the proper eye protection to ensure that the respirator does not interfere with the correct positioning of the eye protection, and the eye protection does not affect the fit or seal of the respirator. Face shields provide full face coverage. Goggles also provide excellent protection for eyes, but fogging is common.

7. **Put on gloves.** Gloves should cover the cuff (wrist) of gown.

A.2 How to Take Off (Doff) PPE Gear

More than one doffing method may be acceptable. Training and practice using your healthcare facility's procedure is critical. Below is one example of doffing.

1. **Remove gloves.** Ensure glove removal does not cause additional contamination of hands. Gloves can be removed using more than one technique (e.g., glove-in-glove or bird beak).

2. **Remove shoe cover or rubber boots.** Carefully remove shoe covers or pull off boot covers taking care not to contaminate pants legs.

3. **Remove gown.** Untie all ties (or unsnap all buttons). Some gown ties can be broken rather than untied. Do so in gentle manner, avoiding a forceful movement. Reach up to the shoulders and carefully pull gown down and away from the body. Rolling the gown down is an acceptable approach. Dispose in waste bin.

4. **Perform hand hygiene.**

5. **Remove face shield or goggles.** Carefully remove face shield or goggles by grabbing the strap and pulling upwards and away from head. Do not touch the front of face shield or goggles.

6. **Remove and discard respirator (or facemask if used instead of respirator).** Do not touch the front of the respirator or facemask.

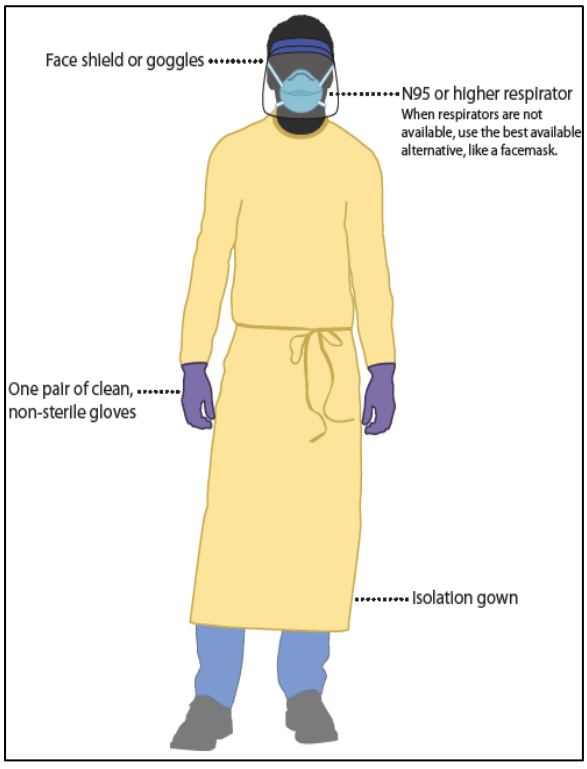
    - **Respirator:** Remove the bottom strap by touching only the strap and bring it carefully over the head. Grasp the top strap and bring it carefully over the head, and then pull the respirator away from the face without touching the front of the respirator.

    - **Facemask:** Carefully untie (or unhook from the ears) and pull away from face without touching the front.

7. **Perform hand hygiene after removing the respirator/facemask and before putting it on again if your workplace is practicing reuse.**

The following photographs have been provided by San Lazaro Hospital. These summarise the process for donning and doffing PPE.

A.3 Donning for Health Care Personnel and COVID-19 Waste Handler

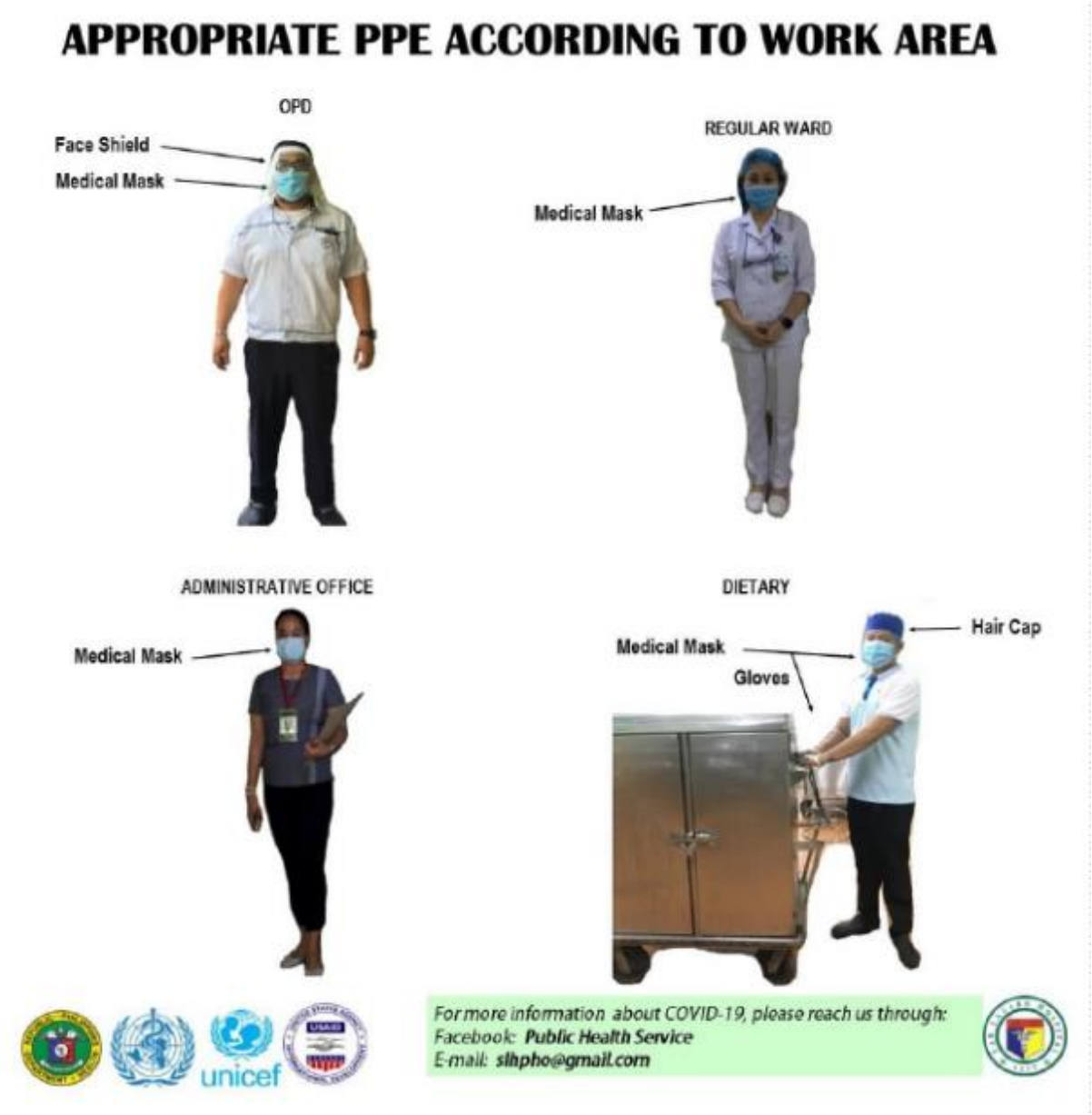


PPE for Health Care Personnel
Source: CDC, 2020.

PPE for COVID-19 Waste Handler
Source: Elebee and De Groot, 2014.

A.4 Doffing for Health Care Personnel and COVID-19 Waste Handler

Appendix B – Examples of PPE for Healthcare Staff



Source: San Lazaro Hospital, n.d.

Source: San Lazaro Hospital, n.d.

Source: San Lazaro Hospital, n.d.

Appendix C – Spill Kits

The following are the requirements for spill kits. These should be located in wards/departments where these types of waste are (or may be) generated. They should also be located in vehicles transporting these wastes and in waste storage and treatment areas.

In addition, it is recommended that safety signs (similar to those used for wet floors etc, are available to restrict access to areas where a spill has occurred.

Healthcare Waste Spill Kit

- Instructions for use.
- Personal protective equipment, disposable gown/apron, over-shoes, protective gloves, protective eyewear, respiratory protective device.
- Adequate supplies of disposable absorbent material (eg., kitty litter).
- Disinfectant containing (1%) 10,000 ppm available chlorine or equivalent, can also have disinfectant wipes.
- Disposable mop head or disposable sponges/cloths.
- Approved container for clinical spill waste (eg., 20 litre pail or bags).
- Approved container for sharps where required.
- A disposable brush and shovel.
- Absorbent towelling.
- Hazard warning tape/signs.
- Incident report form.

Source: Global Spill & Safety, n.d.

Appendix D – Audit Checklists

APPENDIX D.1. COVID-19 WASTE Management SELF-ASSESSMENT - COMPLIANCE AUDIT CHECKLIST

INTRODUCTION & OBJECTIVES

The objective of this Self-Assessment - Compliance Audit Checklist is to assist all healthcare care facilities ensure that COVID-19 waste management is safe and effective for all.

It has been designed for healthcare facilities to determine what systems and procedures have been implemented to specifically manage COVID-19 related waste. It could also be used to determine if the waste management system complies with regulatory requirements and is the "best-practice" for this sector.

Following completion of this checklist, the Department of Health will review the tools to determine which actions may be necessary to ensure that COVID-19 waste management is of the required standard.

The Department of Health "*Health Care Waste Management Manual (4th Edition 2020)*" and the Department Memorandum No. 2020-0170 – *Interim Guidelines on the Management of Health Care Waste in Health Facilities, Community Quarantine Units and Temporary Treatment and Monitoring Facilities with cases of Coronavirus Disease 2019 (COVID-19)* as well as the World Health Organization publications/guidance have been used for the development of this checklist.[15]

INSTRUCTIONS

To complete this compliance audit checklist, tick the Compliant Box if the statement is true or present. If the statements are not demonstrated or observed, tick the Non- Compliant box. A question mark should be placed if it is uncertain or could not be verified at the time of completing the audit.

For some areas, photos or short video clips will assist in determining compliance. A list of photos or videos to be submitted is provided at the end of this Checklist.

To ensure that correct responses are achieved, it may be necessary to undertake the process of completing the checklist a number of times to guarantee that the responses accurately reflect the management aspects and personnel's actions and compliance with the procedures.

All actions indicated as "non-compliant" should be rectified and be discussed with the facility's infection control and waste management committee/s to determine the corrective actions, prior to the succeeding re-evaluation using the compliance checklist.

Following completion of the Self-Assessment – Compliance Audit Checklist, it is to be forwarded to the HCF Waste Management Officer for review and submission to the Department of Health. The Healthcare Facility Compliance Statement should also be accomplished by the designated persons after completing this Checklist.

The Healthcare Facility Compliance Statement should also be accomplished by the designated persons after completing this Checklist.

[15] Reference is also made to documents published by organisations such as: The World Bank, Centers for Disease Control (CDC), European Commission, SPREP and journal articles.

Name of Healthcare Facility:	
Date:	
Name of Person accomplishing the compliance audit:	
Designation of person accomplishing the compliance audit:	
Name of Manager in-charge of Waste Management:	
Name of Person responsible for COVID-19 related waste training at the facility:	
Name of Person in-charge of ensuring 3rd party transporter is meeting regulatory requirements:	
Name of Person in-charge of ensuring waste treatment facilities meet regulatory requirements:	

MANAGEMENT SYSTEM

Note: When completing this section, it will be necessary to ensure that you observe documents as indicated, ask a number of staff whether they have been trained, and observe practices (e.g. use of PPE, cleaning etc.) at times that would normally occur – that is, not asking the staff to perform the task just to comply with the review.

Compliant	Non-Compliant	Criteria
☐	☐	A COVID-19 waste management plan or guideline/memorandum has been prepared and circulated to all relevant wards/departments and personnel
☐	☐	Instructions and procedures have been implemented to ensure that all healthcare wastes generated in all areas where COVID-19 patients (probable, suspected or confirmed) can only be disposed of via the infectious waste stream
☐	☐	All relevant staff have been trained in management of COVID-19 related waste
☐	☐	All staff are updated on COVID-19 waste management every 6 months.
☐	☐	Staff observed disposing of COVID-19 related waste correctly (note that these observations should be undertaken in all areas of the healthcare facility)
☐	☐	Proper segregation of wastes is observed in all points of generation
☐	☐	All waste bins are of the correct colour
☐	☐	If plastic liners are used, they are of the correct colour (Black container or black bag liner for non-infectious or general waste; Green container or green bag liner for non-infectious or wet / biodegradable waste; and Yellow container or yellow bag liner for infectious waste)
☐	☐	All waste bins are properly covered all the time
☐	☐	Waste bins are strategically located in wards/departments
☐	☐	Waste bins provided in other areas such as in ambulance parking
☐	☐	All waste bins are always available and maintained clean
☐	☐	All waste bins are disinfected at least daily
☐	☐	Sharps and vials are disposed in safety boxes, not mixed with other infectious wastes
☐	☐	Anatomical and pathological wastes are properly disposed
☐	☐	Signage has been placed in all areas regarding correct waste management

☐	☐	No staff compacts COVID-19 waste in a waste bin or bin liner – practices should ensure no aerosol generation
☐	☐	Hand washing area, alcohol, and/or hand sanitizer are accessible in areas where wastes are managed (wards/departments and waste storage areas)
☐	☐	All other equipment (e.g. trolleys) used for managing wastes are disinfected regularly
☐	☐	Scheduled waste collections are undertaken to ensure that bins are not overflowing
☐	☐	Waste collections are undertaken at times where there is minimal staff, patient or visitors present (i.e., periods where there is less activity and people)
☐	☐	Spill kits are available to assist in managing any spilt waste
☐	☐	Advice is provided to patients confirmed or are suspected of having COVID-19 and are isolating at home as to correct waste management practices
☐	☐	Inventory of personal protective equipment (PPE) are available
☐	☐	Inventory of cleaning supplies and materials are available
☐	☐	Cleaning materials and supplies are adequate and available at all times

The following equipment are provided to waste handlers to disinfect equipment used for waste management:

☐	☐	Disinfectant and instructions for use
☐	☐	Mops and mop buckets
☐	☐	Cleaning cloths/rags
☐	☐	Disinfection of all cleaning materials, e.g. mops and rags Indicate frequency: _____ Area where cleaning materials are disinfected: _____

HEALTHCARE FACILITY WASTE HANDLERS

Note: Observations should be made at least twice during the times waste handlers are performing their tasks.

Compliant	Non-Compliant	Criteria
Waste handlers have been provided with:		
☐	☐	Gloves
☐	☐	Masks
☐	☐	Safety glasses/face shields
☐	☐	Gowns/overalls
☐	☐	Training
Waste handlers were observed to follow correct procedures for:		
☐	☐	Hand hygiene
☐	☐	Donning of PPE
☐	☐	Removing PPE
☐	☐	Disposing of PPE
☐	☐	Bins or waste liners/bags are collected when ¾ full or at a regular schedule
☐	☐	Proper disinfecting of bins according to hospital infection control procedures
☐	☐	Emptying bins when bags are correctly tied off or sealed and there is no compaction and aerosol formation
☐	☐	Transport waste bags with a trolley or in a bin that can be sealed and wheeled
☐	☐	Waste trolleys are not used for other purposes
☐	☐	Waste trolleys disinfected after every collection of waste
☐	☐	Staff observed correctly disinfecting waste trolleys according to hospital infection control procedures
☐	☐	All other waste handling equipment disinfected at a minimum of twice daily

STORAGE

Note: Inspections of the waste storage area should be conducted twice during the day to check that all management aspects are being undertaken. For collection schedules, a review of records as to when wastes are collected should be undertaken.

Compliant	Non-Compliant	Criteria
☐	☐	COVID-19 waste storage area (or infectious waste storage area) has signage indicating the type of waste stored
☐	☐	COVID-19 waste storage area has floors and walls made of impermeable materials and covered with a roof
☐	☐	Storage area is secured with lock when not in use
☐	☐	No waste is stored prior to transport to a treatment/disposal facility longer than 48 hours
☐	☐	Storage area is disinfected twice daily
☐	☐	Storage located in an area with no or minimal access to unauthorized personnel, e.g. patients and visitors
☐	☐	Infectious waste stored in protected area and treated within a safe time period (e.g. 48 hours during the cold season and 24 hours during the hot season) – Indicate frequency of collection of waste service providers: _____
☐	☐	Storage area has accessible hand hygiene facility

TRANSPORTERS

Note: Visual observations of the process of loading the wastes in the transport vehicle and upon leaving the hospital must be undertaken. The transport contractor should be requested to provide training records and volume/weights and types of waste collected.

Compliant	Non-Compliant	Criteria
☐	☐	All staff have been trained in correct COVID-19 waste handling and management
☐	☐	Waste collection vehicle is enclosed
☐	☐	Timing for collection of infectious waste is scheduled at a different time than for other wastes and deliveries to the healthcare facility
☐	☐	Provide documentation specifying what wastes have been collected, the volume/weight and where they are intended to be treated or disposed for treatment or disposal
☐	☐	Practice proper hand hygiene and always have hand rub sanitiser/ alcohol
☐	☐	Have and properly use PPE same that of waste handlers
☐	☐	Disinfect all waste containers once emptied
☐	☐	Waste collection vehicle disinfected after each collection and deposit at the treatment/disposal facility
☐	☐	Inspection of the service provider's site to check if proper disinfection of bins and vehicles are observed – Indicate frequency of inspection: _____

TREATMENT/DISPOSAL FACILITY

Note: An inspection of the treatment/disposal facility should be undertaken to ensure that each of the points are either observed or records provided or inspected at the facility.

Compliant	Non-Compliant	Criteria
☐	☐	All staff have been trained in correct COVID-19 waste handling and management
☐	☐	Hand hygiene facility available at the treatment/disposal facility
☐	☐	The waste treatment facility is registered with the Environmental Management Bureau of the Department of Environment and Natural Resources
☐	☐	If waste is not incinerated, checks have been undertaken to ensure that waste is immediately buried in a separate area of the landfill and not with mixed other waste
☐	☐	Checks have been made to ensure that the facility operates in accordance with all regulatory and infection control guidance
☐	☐	Inspection of the treatment/disposal facility to check if proper health care waste management practices are observed – Indicate frequency of inspection: _____

Please summarise the checks/inspections that have been conducted:

_____

_____

_____

_____

_____

_____

_____

_____

REQUIRED PHOTOS OR VIDEO DOCUMENTATION

The aim of providing photos and/or short videos is to review how COVID-19 or infectious wastes are being managed so as to ensure that waste management practices are of required standard and to determine which improvements can be made to ensure that staff, patients, visitors, and the wider community will not be at risk due to improper infectious waste management. Below are the requested photos/videos:

For Photos

- Types of bins used in wards/departments and other areas
- The location/position of waste bins in the wards
- Examples of posters/signage reminding staff on proper management of COVID-19 and infectious wastes
- Waste trolleys (if applicable, i.e. if bins have no wheels)
- Central infectious waste storage areas showing floors, walls, doors, and relative location in the facility
- Vehicle used for transporting infectious wastes just before it leaves the hospital premises
- Personnel of waste service provider after collecting infectious wastes, i.e. if PPEs are removed, position of waste collector in the vehicle relative to driver, etc.

For Short Videos

- Donning and doffing of PPE of waste handlers
- Staff disposing infectious wastes into the bins
- Collection of infectious wastes from wards and transport to storage area using waste trolleys or waste bins with wheels
- Cleaning and disinfection of waste bins (where and how it is done)
- Cleaning of wards/departments, including materials used and how it is done
- Disinfection of cleaning materials (where and how it is done)
- Loading of infectious wastes in the waste collection vehicle of service provider

ACTIONS

After you have completed this audit checklist, indicate the actions needed, the actions which will be performed, the timeline, and the personnel-in-charge. For actions which cannot be performed yet, please indicate the reason:

APPENDIX D.2. COVID-19 WASTE MANAGEMENT SELF-ASSESSMENT – COMPLIANCE AUDIT CHECKLIST – FEEDBACK

Thank you for completing this self-assessment checklist. We would appreciate any comments, clarifications or suggestions to further improve the tool.

If you encountered any difficulties in completing this survey, please describe**:**

Were the instructions clear?

Are the terms used easily comprehensible? Are there any suggested changes?

Are the questions clearly stated and direct to the point?

Were there any areas/questions that you were not be able to give a response – please state which and why?

What would be the preferred format for completing this questionnaire (e.g., printed document, Google docs, online survey form, etc.)?

Any additional suggestions for improving this audit checklist?

APPENDIX D.3. COVID-19 WASTE MANAGEMENT Monthly WARD/DEPARTMENT REVIEW

This form is to be used for reviewing COVID-19 waste management system within the ward/department.

The objective of this review is to check that COVID-19 waste management is being undertaken correctly and that staff, patients, and visitors are not exposed to hazardous waste. It is for internal use only and the information will only be used by the Health Care Facility only to assist in ensuring that waste management is undertaken correctly. Information should not be communicated to an external person outside of the Health Care Facility and relevant Department of Health and World Bank staff.

This review should be undertaken monthly, be completed by each ward/department manager or their designated staff and be submitted to the Manager in Charge of Waste Management.

Name of Healthcare Facility:

Ward/Department:

Date:

Name of Person conducting the assessment:

Designation of Person conducting the assessment:

Circle YES or No for the following questions:

Yes	**No**	Staff have been reminded as to correct COVID-19 waste management weekly
Yes	**No**	Staff have been observed managing COVID-19 waste correctly
Yes	**No**	All waste bins are of the correct colour
Yes	**No**	If plastic liners are used, they are of the correct colour (Black container or black bag liner for non-infectious or general waste; Green container or green bag liner for non-infectious or wet / biodegradable waste; and Yellow container or yellow bag liner for infectious waste)
Yes	**No**	All waste bins are properly covered all the time
Yes	**No**	Waste bins are strategically located in areas where wastes are disposed
Yes	**No**	All waste bins are cleaned disinfected daily

Yes	**No**	Sharps are disposed in a safe container
Yes	**No**	Waste handlers are collecting waste regularly and no bins are overflowing Indicate frequency of collection: _____
Yes	**No**	Waste handlers are observed using the correct PPE when handling waste
Yes	**No**	No staff compacts COVID-19 waste in a waste bin or bin liner – practices should ensure no aerosol generation
Yes	**No**	Correct signage is located near all waste bins
Yes	**No**	Hand washing area, alcohol, and/or hand sanitizer are accessible in areas where wastes are disposed
Yes	**No**	PPE is available for ward/department staff when managing COVID-19 wastes
Yes	**No**	Cleaning materials and supplies are adequate and available at all times

After you have conducted the review, indicate the actions needed, the actions which will be performed, the timeline and the personnel-in-charge. For actions which cannot be performed yet, please indicate the reason:

APPENDIX D.4. COVID-19 WASTE Management HEALTHCARE FACILITY COMPLIANCE STATEMENT

The following compliance statement is to be signed by the designated persons together with the COVID-19 Waste Management Checklist. Upon completion, this should be submitted to the Department of Health.

Manager in Charge of Waste Management

I certify that I have reviewed the COVID-19 waste management checklist and have agreed to take actions to rectify any noted issues.

Name & Title:

Signature & Date _____

_____

Manager in Charge of Healthcare Facility Staff COVID-19 Waste Management Training

I certify that all relevant staff have attended a COViD-19 waste management training program.

Name & Title:

Signature & Date _____

_____

HCF Manager in Charge of 3rd Party Waste Transporter

I certify that I have audited the 3rd party waste collector/transporter and confirm that all staff have received training in COVID-19 waste management, staff utilise appropriate PPE at all times, and that all requirements for the handling and transport of COVID-19 waste are in compliance with all relevant government regulations.

Name & Title:

Signature & Date _____

_____

HCF Manager who ensures compliance with Waste Treatment/Disposal Facility

I certify that I have inspected and audited the waste treatment facility and/or landfill and confirm that staff have been trained in COVID-19 waste handling and management, have appropriate PPE, and all waste are managed in accordance with government regulations.

Name & Title:

Signature & Date _____

_____

Appendix E. Appendix E. COVID-19 Immunization Program Waste Collection Point for Health Care Facilities without Waste Service Providers

Region	Waste Collection Point	Location	Contact Details
NCR	CHD	6 Barangay Road, Walferville Compound, Barangay Addition Hills, Mandaluyong City 1550	8165-6274; 8531-0015, 8531-0026, 8531-0027, 8531-0037 chd_mm@yahoo.com
CAR	CHD	BGHMC Compound, Baguio City, Benguet 2600	(074) 442-8096, 442-7591 chd_cordillera@yahoo.com.ph
I - Ilocos	CHD	8 MacArthur Highway, Parian, San Fernando City, La Union 2500	(072) 607-6413 dohro1.rd@gmail.com mbello.chd1@gmail.com
II – Cagayan Valley	CHD	Carig Regional Center, Tuguegarao, Cagayan	(078) 304-6523 / 304-6585 chdcvdoh@yahoo.com dohregionaloffice2@gmail.com
III – Central Luzon	CHD	Regional Government Center Park, Diosdado Macapagal Regional Center, Main Road, San Fernando, Pampanga 2000	(045) 861-3425 to 29 rd@centralluzon.doh.gov.ph ard@centralluzon.doh.gov.ph
IV- A – CALABARZON	PHOs	Provincial Health Office – Cavite	(046) 419-2333 phtocavite@yahoo.com.ph

		Cavite Collaboration Center for Public Health, Gen. Emilio Aguinaldo Memorial Hospital Compound, Brgy. Luciano, Trece Martires City, 4109	pho@cavite.gov.ph phocavite_technical@yahoo.com
		Provincial Health Office – Laguna J. De Leon St., Santa Cruz, Laguna 4009	(049) 501-4716, 501-1630 phtolaguna@yahoo.comph
		Provincial Health Office – Batangas Roxas Rd, Kumintang Ibaba, Batangas 4200	(043) 575-4767, 723-3285, 723-0894 ro4a.batangaspdoho@gmail.com
		Provincial Health Office – Rizal M. Santos Street, Antipolo City, Rizal	(8) 652-5609, (02) 8 743-8301 chd4a_doh_rizaleo@yahoo.com
		Provincial Health Office – Quezon Quezon Avenue, Lucena, Quezon Province 4301	(042) 373-1514 cht.quezon@gmail.com quezon.pho@gmail.com
IV – B – MIMAROPA	PHOs	Provincial Health Office – Occidental Mindoro Old Provincial Hospital Compound, Ilaya, Calapan 5200	0918 918 5814, (043) 288-5130
		Provincial Health Office – Oriental Mindoro Mamburao, Occidental Mindoro 5106	(043) 711-1116
		Provincial Health Office – Marinduque Santol Street, Boac, Marinduque	(042) 332-0433
		Provincial Health Office – Romblon	567-5321

		Building 1, RPH Compound, Brgy. Liwanag, Odiongan, Romblon	
		Provincial Health Office – Palawan Prim Building, Peo Road, Sps Government Center, Puerto Princesa City, Palawan	(408) 434-9996
V – Bicol	CHD	Bagtang Road, Legazpi, Albay 4500	(052) 204-0040, 204-0050, 204-0090 bicoldoh@gmail.com chd_bicol@yahoo.com.ph chd5_ard@yahoo.com
VI – Western Visayas	CHD	Q. Abeto, Mandurriao, Iloilo City 5000	(033) 332-2329, 321-1036, 332-2326 dohro6rdo@gmail.com
VII – Central Visayas	CHD	Osmeña Boulevard, Cebu City	(032) 253-6355, 418-7130, 254-0109 dohro7@gmail.com
VIII – Eastern Visayas	CHD	Candahug, Palo, Leyte 6501	(053) 323-5027 xbsdoh@gmail.com doh.region08@gmail.com
IX – Zamboanga Peninsula	CHD	Labuan – Limpapa National Road, Zamboanga, Zamboanga del Sur	(062) 983-0934, 992-2745, 991-3380 dohchdzp@yahoo.com
X – Northern Mindanao	CHD	J. Seriña St. Cagayan de Oro, 9000 Misamis Oriental	(088) 858-7123, 858—2035, 22-727-400 dohro10@gmail.com

			adrian58us@yahoo.com
XI – Davao	CHD	JP Laurel Avenue, Buhangin, Davao City, Davao del Sur	(082) 305-1903, 305-1904, 305-1906, 227-4073, 227-2463 annabelle.yumang@lycos.com doh11davao@gmail.com
XII – Soccsksargen	CHD	ORG Compound, Gov. Gutierrez Ave., RH VII, Cotabato City 9600	(064) 557-4844, 4421-2373, 421-4726 doh_chd12@yahoo.com rdofficedoh12@yahoo.com
XIII – Caraga	CHD	Pizarro-Narra Streets, Butuan, 8600 Agusan del Norte	(085) 342-5208, 225-2970 dohro13caraga@gmail.com
BARMM	PHOs	Provincial Health Office – Lanao del Sur Marawi City, Lanao del Sur	0939 643 7206 jhamjoomsarip@yahoo.com
		Provincial Health Office – Lanao del Norte Pigcarangan, Tubod, Lanao del Norte Tubod, Philippines 9209	0977 624 0667, (063) 341-5241, 341-5345 information_ldn@yahoo.com
		Provincial Health Office – Maguindanao Old Provincial Capitol, Don Teodoro V. Juliano Avenue, Cotabato City	(064) 278-7014
		Provincial Health Office – Basilan Capitol Building, Isabela City, Basilan 7300	admin@basilan.gov.ph

		Provincial Health Office – Sulu Asturias St., Jolo, Sulu 7400	(085) 341-8911
		Provincial Health Office – Tawi-tawi Tubig-Boh, Tawi-Tawi, Bongao, Tawi-Tawi	tawitawikasali@gmail.com

Source: EMB, 2020.

CHD – DOH Center for Health Development / Regional Office

PHOs – Provincial Health Offices

Appendix F. Regional Treatment, Storage, and Disposal (TSD) Facilities for Health Care Waste in the Philippines

Region	TSD Facilities	Location	Type of HCW	TSD Category
NCR	Eco Safe Hazmat Treatment Inc.	Novaliches, Quezon City	M501 M503	E E
	Integrated Waste Management, Inc.	Lung Center of the Philippines Compound, Quezon City	M501	B
	Maya Med Waste Corporation	Bagbaguin, Valenzuela City	M501, M503	B
	Green Planet Management, Inc.	Punturin, Valenzuela City	M503	E
	JM Ecotech Solutions, Inc.	Kaybiga, Caloocan City	M503	E
	Trame Oil & Environmental Specialist, Inc.	Valenzuela City	M503	E
	Intercontinental Waste Disposal Systems, Inc.	Bagumbayan, Taguig City	M503	B
	Udenna Environmental Services, Inc.	Bagumbayan, Taguig City	M501 M503	E E
CAR	Lepanto Consolidated Mining Co.	Lepanto, Paco, Mankayan, Benguet	M501	A
I	Servo-Treat Philippines, Inc.	Urdaneta City, Pangasinan	M501 M503	B D
III	Udenna Environmental Services, Inc.	Hermosa, Bataan	M501 M503	F B
	Holcim Philippines, Inc.	Norzagaray, Bulacan	M503	A, B, D
	All Waste Services, Inc.	Guiguinto, Bulacan	M503	E
	Republic Cement & Building Materials, Inc.	Norzagaray, Bulacan	M503	B, D
	Total Organic Environmental Solutions, Inc.	Pulilan, Bulacan	M501	B
	Globaltec Waste Management, Inc.	Marilao, Bulacan	M503	E

	Far East Fuel Corporation	San Ildefonso, Bulacan	M501, M503	B
	Asia United Oil Industry Corporation	Meycauayan, Bulacan	M503	B
	Wacuman Incorporation	Norzagaray, Bulacan	M503	C
	Recyclephil Inc.	Bocaue, Bulacan	M503	E
	Glochem Marketing & Recycling Corp.	San Isidro, Nueva Ecija	M501 M503	B B, E
	Dolomatrix Philippines, Inc.	Bacolor, Pampanga	M503	E
	VAG Geneal Merchandise	Floridablanca, Pampanga	M503	E
	RMS Petroleum Technology & Waste Management Corp.	Mexico, Pampanga	M503	B
	Joechem Environmental Corporation	Capas, Tarlac	M503	E
	Metro Clark Waste Management Corporation	Capas, Tarlac	M501, M503	C
	Cleanway Environmental Management Solutions, Inc.	Capas, Tarlac	M501	B
	Clean Leaf International Corporation	Bamban, Tarlac	M501, M503	B
IV-A	Republic Cement & Building Materials, Inc.	Taysan, Batangas	M503	A/D
	Cleanway Environmental Management Solutions, Inc.	Silang, Cavite	M501 M503	B/F C/F
	Green Eco Techwin, Inc.	General Trias, Cavite	M501, M503	B
	Integrated Waste Management, Inc.	Trece Martirez City, Cavite	M501	B
	Jorm Trading Corporation	General Trias, Cavite	M503	D/E
	Green Resource & Environmental Management Solutions, Inc.	Bacoor City, Cavite	M503	E
	Solvtech Consultancy Resources	Silang, Cavite	M503	E

	Green Horizon Environmental Management, Inc.	Bacoor City, Cavite	M501, M503	B
	August-10 Enterprise Co.	Biña, Laguna	M503	B
	Green Resource & Environmental Management Solutions, Inc.	San Pedro City, Laguna	M503	E
	Hazchem, Inc.	Calamba City, Laguna	M501 M503	B B/E
IV-B	Pollution Abatement Systems Specialist, Inc.	Puerto Princesa City, Palawan	M501	B
VII	Pollution Abatement Systems Specialist, Inc.	Cebu City, Cebu	M501	B
	Medclean Management Solutions, Inc.	Cabancalan, Mandaue City	M501	B
	Enviro-Q Trends Corporation	Carmen, Cebu	M503	D/E
VIII	Cleanaway Philippines, Inc.	Isabel, Leyte	M503	D/E
X	Republic Cement Iligan, Inc.	Kiwalan, Iligan City	M503	B/D
	Philippine Sinter Corporation	Villanueva, Misamis Oriental	M501	A
XI	Maya Med Waste Corporation	Tugbok District, Davao City	M501, M503	B
XIII	Taganito HPAL Nickel Corporation	Claver, Surigao del Norte	M501, M503	A

Source: DENR, March 2020.

Hazardous Waste Manifest System User's Guide can be accessed at this link: https://emb.gov.ph/hazardous-waste-manifest-system-users-guide/

Appendix G. Incident Report Template

INCIDENT REPORT

Activity Prior to Incident	
Health Care Facility	
Location of Incident	
Date Reported	

A. Incident Overview

Incident Type:
☐ Environmental ☐ Health/ Medical ☐ Safety Injury ☐ Mechanical ☐ Administrative ☐ Others:
Incident Category:
☐ Indicative ☐ Serious ☐ Severe
Incident Description:
Affected Stakeholders (Name - Designation)
Preliminary Findings/ Cause of Incident

B. Proposed Immediate Action

Action	In-Charge	Timeline	Status

C. Gap Analysis and Proposed Corrective Measures

Gaps / Challenges Encountered	Proposed Corrective Action	In-Charge	Timeline	Status

D. Documentation

Action Taken to Prevent Recurrence	
Attach Photo Cross Reference	
Corrective Action Carried Out By	
Close Out By:	Close Out Date:

E. Reported by:

Safety Officer
Name:
Date:
Signature

F. Validated By:

Health Care Facility Representative
Name:
Date:
Signature