

## **DUE DILIGENCE OF THE PHILIPPINE COVID-19 IMMUNIZATION WASTE MANAGEMENT PLAN**

### **I. BACKGROUND**

1. The proposed Second Health System Enhancement to Address and Limit COVID-19 (HEAL 2) will support the procurement of safe and effective vaccine against COVID-19 through APVAX's rapid response component (RRC) in consonance with ADB's eligibility criteria. It will assist the government in implementing the National COVID-19 Vaccine Roadmap and the National Deployment and Vaccination Plan for COVID-19 Vaccines.

2. The government estimates a total cost of \$3,220.7 million (154.8 billion pesos) for its national vaccination program from 2021 to 2023; of which, \$3,111.4 million or 90.5% will be spent for the procurement of vaccines, while the remaining for non-vaccine expenditure items, e.g., logistics, vaccine campaign, risk communications, monitoring and evaluation. The procurement of vaccines is estimated at \$1,456.5 million in 2021. The government has requested a loan of \$400 million from ADB's APVAX facility and a loan of \$300 million from AIIB to help finance COVID-19 vaccine procurement.

3. The distribution and use of new vaccines will result in increased amounts of hazardous health care waste (HCW) at the point of use (i.e., local health centers and hospitals). This sudden increase in hazardous HCW can quickly overwhelm existing HCW management systems. Poor management of HCW potentially exposes health care workers, waste handlers, patients and the community at large to infection, toxic effects and injuries, and risks polluting the environment. A COVID-19 vaccination campaign will typically result in the generation of sharps waste (such as used needles and syringes) and pharmaceutical waste (such as used vials, expired vaccines, and PPE including gloves and masks) as per the hazardous HCW definition under Department of Environment and Natural Resources Administrative Order (DAO) 2013-22.

4. The purpose of this report is to document the Government of the Philippines' legal and regulatory framework, as well as current practices for medical waste management; to identify possible shortcomings in service provision that could affect the success of a COVID-19 vaccination campaign; and to review and document the government's plan to manage COVID-19 immunization waste.

5. The assessment was undertaken through meetings and interviews with the Department of Health (DOH) and its relevant bureaus and divisions and the Department of Environment and Natural Resources – Environmental Management Bureau (DENR-EMB). A meeting was also held with the World Bank to discuss the additional financing for the COVID-19 vaccination and ongoing assistance related to HCW management. The assessment also includes the review of the Philippine National Deployment and Vaccination Plan for COVID-19 Vaccines, Philippines' COVID-19 Vaccine Readiness Assessment Tool and recent regulations and programs related to HCW management in the country, particularly related to the government's response to the COVID-19 pandemic.

### **II. LEGAL AND REGULATORY FRAMEWORK**

6. The Philippines has a comprehensive and robust legal and policy framework, regulating and guiding HCW management (HCWM). The Philippines is also signatory or member state to four key international agreements and conventions of relevance to HCW management, including (i) the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and

their Disposal (1989); (ii) the Stockholm Convention on Persistent Organic Pollutants (2001); (iii) the Minamata Convention on Mercury (2013); and (iv) World Health Assembly Resolution on Water, Sanitation and Hygiene (WASH) in Health Care Facilities (2019). Relevant national regulations and requirements on HCWM are discussed in the succeeding sections:

#### **A. Republic Act No. 4226 – Hospital Licensure Act**

7. The Hospital Licensure Act (1965) requires the registration and licensure of all hospitals in the country. The law mandates the DOH to provide guidelines for hospital technical standards as to personnel, equipment and physical facilities. Medical waste management planning is an integral part of the registration and licensure requirements for hospitals. These guidelines were issued through the following: (i) Manual on Technical Guidelines for Hospitals and Health facilities Planning and Design (1994), (ii) Health Facilities Maintenance Manual (1995), (iii) Safe Hospitals in Emergencies and Disasters (2011), (iv) National Standards in Infection Control for Healthcare Facilities (2009), and (v) Guidelines in the Planning and Design of a Hospital and other Health Facilities (DOH Administrative Order 2016-0042).

#### **B. DOH Department Circular 2020-0191 – HCWM Manual (4th edition)**

8. The DOH issued Department Circular 2020-0191 on 23 April 2020 to institutionalize the implementation of the fourth edition of the HCWM Manual.<sup>1</sup> The HCWM Manual serves as a comprehensive set of guidelines on the safe management of waste generated from health care activities in the country. It incorporates the requirements of all Philippine laws and regulations governing HCWM and is aligned with international good practice as recommended by the World Health Organization (WHO).<sup>2</sup> It is a comprehensive compilation of the latest and most relevant instruments and processes designed for effective implementation of HCWM in all types of health care facilities (HCF) whether in the urban or rural setting. It provides information and guidance regarding safety, environmental regulatory requirements, and environment-friendly treatment procedures attendant to the collection, handling, storage, transport, treatment and disposal of HCW.

9. The manual classifies discarded items used in handling vaccines such as vials, or boxes with residues, gloves, and masks as pharmaceutical wastes. The manual is intended and designed for use of individuals, establishments, and other entities involved in the segregation, collection, handling, storage, treatment, and disposal of waste generated. The manual advocates the implementation of the waste management hierarchy by adopting methods of waste minimization, safe re-use, recycling and recovery, and the implementation of proper treatment and disposal for residuals. The manual also advocates the “duty of care” principle whereby every health care facility has the ethical responsibility of ensuring that there are no adverse health effects and environmental consequences resulting from the handling, collection, storage, treatment, and disposal of HCW.

10. Other DOH orders and circulars related to HCW which are still in effect and whose regulations are mentioned in the HCWM Manual are the following:

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<sup>1</sup> The main document of the HCWM Manual 4<sup>th</sup> edition was prepared through the technical assistance of the WHO and the Australian Department of Foreign Affairs and Trade.

<sup>2</sup> WHO. 2014. *Safe Management of Wastes from Health Care Activities*. Geneva; and World Health Organization. 2019. *Overview of Technologies for the Treatment of Infectious and Sharp Waste from Health Care Facilities*. Geneva.

- DOH Administrative Order No. 2007-0014 or the Guidelines on the Issuance of Certificate of Product Registration for Equipment or Devices used for Treating Sharps, Pathological and Infectious Wastes;
- DOH Circular No. 156-C, series of 1993 – providing guidelines for the segregation, treatment, collection and disposal of hospital waste; and
- DOH Department Memorandum No. 1, series of 2001 – requiring the DOH Central Office Centers for Health Development and all concerned hospitals to practice proper solid waste management.

11. DOH Administrative Order 2007-0014 applies to the licensing of devices and equipment such as autoclaves which are included in the regulated medical devices based on the Bureau of Food and Drug (BFAD) Memorandum Circular No. 7 dated 24 April 1992. The Bureau of Health Devices and Technology (BHDT) of the DOH serves as the technical arm and recommending office for approval of the Certificate of Product Registration (CPR).

**C. Republic Act (RA) 6969 – Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990**

12. The RA 6969 restricts or prohibits the disposal of chemical substances and wastes that present unreasonable risk and/or injury to health and the environment. The legal and technical requirements on hazardous waste management are defined in the implementing rules and regulations in DENR Administrative Order 1992-29 (Title III). The regulations require the registration of hazardous waste generators, transporters, and treaters with the DENR-EMB. The administrative order was further strengthened by virtue of DENR Administrative Order 36, series of 2004 and DENR Administrative Order 2013-22. The updated orders further clarified and streamlined the procedures and requirements on hazardous waste management in light of recent developments. Hazardous wastes are required to be segregated, labeled, kept in proper storage facility, transported, treated and disposed through DENR-licensed facilities.

13. Under the requirements of the RA 6969 and the DENR administrative orders, HCW from hospitals, medical centers and clinics such as pathological wastes (tissues, organs, fetuses, bloods and body fluids), infectious wastes and sharps are categorized as M501 or pathological or infectious wastes. Expired pharmaceuticals and drugs stocked at producers and retailers' facilities are classified as M503 wastes.

14. HCFs such as hospitals, medical centers and health clinics are regarded as hazardous waste generators and are required to register with the DENR-EMB and to designate a Pollution Control Officer (PCO). All HCW are to be collected and stored in designated areas onsite. The off-site disposal of HCW is permitted only through DENR-registered transporters and treaters that will issue a certification of confirmation of completion of treatment and disposal to the HCF.

15. Transporter, storage and disposal (TSD) facilities are required to have an Environmental Compliance Certificate in accordance with the requirements of Presidential Decree 1586 and registration as TSD facility based on RA 6969. Operation of the TSD facilities should conform with the emission and effluent standards of RA 8749 (Clean Air Act) and RA 9275 (Clean Water Act).

**D. DENR-DOH Joint Administrative Order No., 02, series of 2005 – Policies and Guidelines on Effective and Proper Handling, Collection, Transport, Treatment, Storage and Disposal of Health Care Wastes**

16. The provisions of the HWCM Manual anchors on the DENR-DOH Joint Administrative Order (JAO) No. 02, series of 2005 which clarifies the jurisdiction, authority, and responsibilities of the DENR and the DOH with regard to HCW management. The JAO provides the guidelines to generators, transporters and operators/owners of TSD facilities on proper handling, collection, transport, storage, treatment and disposal of HCW and harmonizes the efforts of the DENR and the DOH on HCW management.

17. HCW such as sharps waste, infectious waste, pathological and anatomical waste, pharmaceutical waste, genotoxic including cytotoxic waste, chemical waste and radioactive waste are classified as hazardous wastes and are regulated by the DENR by virtue of RA 6969 ("Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990") and DAO 2013-22 (Revised Procedures and Standards for the Management of Hazardous Wastes). These wastes are to be segregated, properly labelled, and stored in designated areas within the premises of the medical facility until they are transported for off-site treatment through a DENR-licensed hazardous waste transporter and treater. Permits for storage, transport and disposal are required based on the requirements of RA 6969.

#### **E. Republic Act 8749 - Philippine Clean Air Act**

18. Treatment options for infectious wastes are in principle limited to non-burn technologies as provided by Section 20 of RA 8749. The allowed non-burn technologies in the destruction of HCW must comply with the criteria and emission standards provided in Rule 28 of DAO 2000-81.

19. The provisions of RA 8749 were clarified by a DENR Memorandum Circular (DMC-2002-05) which: (i) states that RA 8749 does not prohibit incineration of wastes except those burning processes which emit poisonous and toxic fumes; (ii) recognizes that appropriate disposal techniques for medical and bio-medical wastes are limited; and (iii) incineration of these wastes is only permitted in state-of-the-art facilities which are proven to emit minimal air pollutants with concentrations meeting RA 8749 criteria. The phasing out of bio-medical incinerators contemplated under RA 8749 was deemed impracticable due to lack of affordable best available technology.

#### **F. Republic Act 9003 – Ecological Solid Waste Management Act**

20. The Act establishes the mechanisms for waste minimization, resource recovery, appropriate collection, transport services, environmentally sound treatment, and disposal of garbage. It also provides mandatory segregation of waste at households, commercial establishments, industries, institutions, hospitals, etc. However, solid waste excludes infectious wastes from hospitals such as equipment, utensils, laboratory wastes, pathological specimens, disposable fomites, and similar materials in accordance with Section 3(2), Article 2, and Section I of DAO 2001-34.

21. The collection and transport of segregated general wastes or non-infectious wastes are covered by RA 9003 and may be brought to a landfill for disposal. The collection and transport of infectious biomedical wastes or hazardous wastes are governed by RA 6969 and cannot be disposed in open dumps or landfill. The infectious wastes, once disinfected, may be treated similar to a general waste.

## **G. Interim Guidelines on Health Care Waste Management during COVID-19 Pandemic**

22. In response to the COVID-19 pandemic, series of interim guidelines on HCWM were issued by DOH and the DENR.

- DOH Memorandum 2021-0031 – Interim Guidelines on the Management of Health Care Wastes Generation from COVID-19 Vaccination issued on 18 January 2021
- DOH Memorandum 2020-0072 – DOH Interim Guidelines for 2019 Novel Coronavirus Acute Respiratory Disease Response in Hospitals and other Health Facilities ([https://drive.google.com/file/d/1zmXeJt\\_3kmlOzyJyt9laVXTfk6JKJsbT/preview](https://drive.google.com/file/d/1zmXeJt_3kmlOzyJyt9laVXTfk6JKJsbT/preview));
- DOH Memorandum No. 2020-0170 – DOH 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) (<https://doh.gov.ph/node/21257>);
- EMB Memorandum Circular No. 2020-14 – Interim Guidelines on Issuance of Special Permit to Transport (SPTT) for the Transport of Hazardous Waste Within the Community Quarantine Period (<https://emb.gov.ph/wp-content/uploads/2020/03/EMB-MC-2020-14-Interim-Guidelines-on-issuance-of-Special-Permit-to-Transport-SPTT-for-the-Transport-of-Hazardous-Waste-within-the-Community-Quarantine-Period-1.pdf>);
- EMB Memorandum Circular No. 2020-15 – Addendum to the Interim Guidelines on Issuance of SPTT for the Transportation of Hazardous Wastes within the Community Quarantine Period (<https://emb.gov.ph/wp-content/uploads/2020/03/EMB-MC-2020-15-Addendum-to-the-Interim-Guidelines-on-Issuance-of-Special-Permit-to-Transport-SPTT-for-the-Transportation-of-Hazardous-Wastes-within-the-Community-Quarantine-Period.pdf>);
- EMB Memorandum Circular 2020-16 – Amendment of the Interim Guidelines on Issuance of SPTT for the Transportation of Hazardous Wastes within the Community Quarantine Period (<https://emb.gov.ph/wp-content/uploads/2020/04/EMB-MC-2020-16.png>); and
- EMB Memorandum Circular 2020-20 - Provisional Guidelines on the Hazardous Wastes Management During the Extended Enhanced Community Quarantine Period (<https://emb.gov.ph/wp-content/uploads/2020/05/EMB-MC-2020-20.pdf>).

23. DOH Memorandum 2021-0031 is the guidelines specific to the management of HCW from the roll-out of the COVID-19 vaccination. It specifies the protocols for onsite and offsite disposal of wastes. It also identifies the waste collection points in areas without service providers where wastes will be collected through a DENR-licensed TSD facility that will be contracted by the DOH Central Office. DOH Memorandum No. 2020-0170 requires all HCF, community quarantine facilities, and temporary treatment and monitoring facilities to follow a waste management plan for COVID-19 health care wastes. The plan includes the proper segregation of all infectious wastes generated from the treatment of suspected, probable or confirmed COVID-19 patients such as PPEs, shoe cover, apron, long-sleeved gown, gloves, masks and goggles or face shield, other solid and liquid wastes (e.g. urine, blood, and other body fluids) using appropriate receptacles (yellow plastic bags, waste bins, sharp containers). The DOH memorandum also prescribes the requirements regarding labelling, disinfection, cleaning and allowable storage

periods at the central storage of infectious wastes. Transport and off-site disposal of the infectious wastes must conform to the rules and regulations of the DENR-EMB.

24. DOH Memorandum 2020-0072 provides interim guidelines for all health facilities on the necessary precautions, preparations of health facilities and management of suspect, probable and confirmed cases of COVID-19. All hospitals and health facilities are required to maintain an Infection Prevention and Control Committee in the health facility and to follow the National Standards in Infection Control for Healthcare Facilities (2009 edition). The memorandum includes the requirements on provision of appropriate PPE, implementation of universal precautionary measures, patient screening, isolation of patients with COVID-19 systems, notification, and clinical management.

25. DENR memorandum circulars 2020-14, 2020-15, 2020-16, and 2020-20 were issued to protect public health and safety due to the COVID-19 situation in the island of Luzon and to implement unhampered transportation of hazardous waste coming from healthcare facilities to TSD facilities due to the COVID-19 emergency. The guidelines apply to registered transporters and TSD facilities which haul, treat, and dispose HCW. The DENR-EMB requires the use of the online registration system to simplify the procedures in the issuance of Permit to Transport for HCW. Transporters are required to implement the health and environmental plan and to submit a report of compliance and completion of transport of the HCW to DENR-EMB within 24 hours after delivery to the TSD facility. Transporters with valid permits are allowed to pass-thru checkpoints to deliver HCW at TSD facilities.

## **H. Draft Administrative Orders and Guidelines on Waste Management**

26. The following presents draft guidelines and administrative orders that have been prepared by DOH/DENR to improve existing policies on waste management.

### **1. Supplemental COVID-19 Waste Management Operations Manual**

27. The DOH, with support from the World Bank Philippines Office, has initiated a supplemental update to the HCWM Manual that includes additional guidance on COVID-19 related waste management including immunization waste management. The additional guidance will also include a tool for HCF to conduct a compliance self-assessment and audit. It has been designed for HCF to determine what systems and procedures have been implemented to specifically manage COVID-19 related waste and to determine if the HCWM systems comply with regulatory requirements and adheres to international good practice.<sup>3</sup> DOH expects the additional guidance to be issued as an Administrative Order in 2021.

### **2. Amendments to DENR Administrative Order 2013-22 – Revised Procedures and Standards for the Management of Hazardous Wastes**

28. The proposed amendments include the use of mobile equipment or treatment equipment for the recycling, recovery, regeneration, reclaiming or treatment of hazardous waste. There is also a proposed provision that allows waste generators with multiple installations at various

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<sup>3</sup> The self-assessment and compliance audit tool has been piloted by DOH and the World Bank in seven hospitals in Metro Manila in 2020, and will be applied to additional 100 HCFs in Q1 2021 under the World Bank-financed Philippine COVID-19 Emergency Response Project.

locations and regions to transport hazardous waste for consolidation purposes in a designated clustered TSD facility subject to certain conditions.

### **3. Amendments to DAO 2010-06 – Guidelines on the Use of Alternative Fuels and Raw Materials in Cement Kilns**

29. The DENR-EMB is now in the process of introducing amendments to DAO 2010-06 to allow non-pathological wastes such as PPEs, aprons, dextrose, and other similar wastes to be used as alternative fuels and raw materials for clinker for cement production provided that the procedures comply with the procedures on waste segregation at source, waste delivery control, occupational health and safety, emission limits, documentation and reporting. Used syringes and vials are still not allowed in cement kilns as raw materials.

## **III. CURRENT PRACTICES IN MEDICAL WASTE MANAGEMENT**

30. The COVID-19 pandemic resulted to an increase in waste generation from hospitals, laboratories and other health facilities. Wastes generally consists of the PPEs used by medical frontliners and their patients. A complete PPE set includes coveralls, a N95 mask, gloves, head cover, shoe covers, goggles, a surgical mask, and a surgical gown. The ADB reported that Metro Manila alone would generate 280 metric tons of medical waste per day of additional waste due to the surge of COVID-19 cases.<sup>4</sup> Before the COVID-19 pandemic, Metro Manila produces only 47 metric tons per day of medical waste, with about 26% tons considered as potentially infectious.

### **A. On-site Management of Health Care Waste**

31. As part of the licensing process, HCFs are required to formulate a policy formalizing the HCF commitment to properly manage its waste; establish a formal HCWM management plan and a HCWM Committee; appoint a Waste Management Officer to supervise and coordinate HCWM planning and its subsequent implementation; and ensure compliance with the HCWM manual. DOH confirmed that all HCFs in principle comply with these requirements but acknowledges that the COVID-19 vaccination campaign may result in temporary HCWM capacity gaps at HCF.

32. DOH confirmed that vaccines are to be provided through hospitals and rural health units (RHUs) but not at community level clinics because of the preservation requirements of the vaccines. Cold storage is to be administered at hospitals only.

33. The DOH requires the waste segregation and packaging of wastes such as sharps and infectious non-sharp wastes (vials, bottles, residues, gloves, masks) from immunization activities. The following procedures should be observed by the HCF:

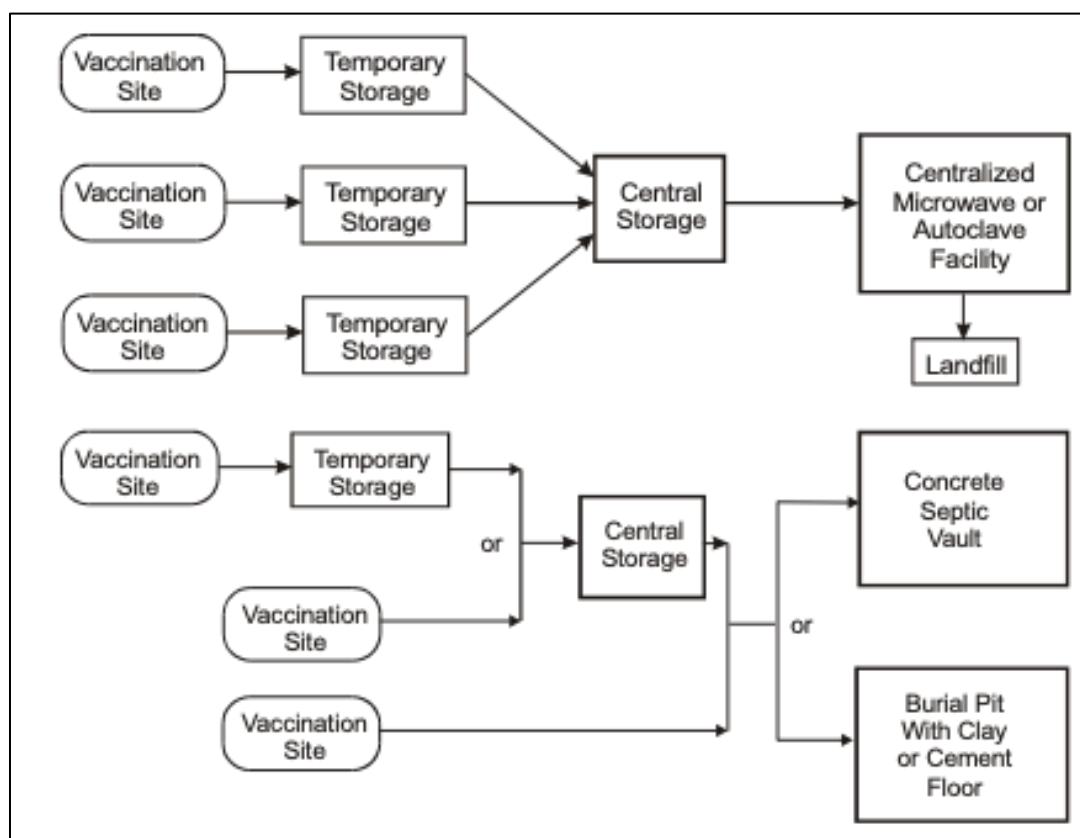
- Segregation of sharps from non-sharps;
- Discarding of syringe with needle into a safety box after use (exclude the recapping needles);
- Placing of safety boxes into plastic bags that are closed hermetically when full to avoid any leakage during transportation; plastic bags should be clearly labelled; and
- Placing empty vials into clearly marked and sealed waste containers with plastic lining to avoid leakage.

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<sup>4</sup> ADB. 2020. *Managing Infectious Medical Waste during the COVID-19 Pandemic*. Manila.

34. In the Philippines Follow-up Measles Elimination Campaign in 2004, an estimated 19.5 million syringes were collected in 162,000 safety boxes, amounting to about 810,000 liters or 130,000 kilograms (kg) of sharps wastes. There were also about 740,000 liters of 72,000 kg of empty vaccine vials and ampoules, syringe wrappers, empty vitamin capsules, cotton swabs, syringe caps, and packaging.<sup>5</sup> Storage safety boxes were used to collect used auto-disabled syringes. Filled safety boxes were sealed and labelled at the end of each day. There was little or no problems encountered regarding the implementation of the process on storage of safety boxes, as well as in the transport to the temporary storage areas or central storage facilities. From several vaccination locations, the filled safety boxes were transported to a central storage site, either hand-carried or using bicycles/motorcycles, jeeps, vans, trucks, boats, horses, cars, ambulances, and other vehicles used to deliver vaccination supplies. HCFs with access to autoclaves or microwaves sterilize the sharps to destroy the pathogens. Many rural and coastal areas used concrete vaults either built inside the premises of health facilities, in landfills or in cemeteries. The concrete vaults and waste pits have cement floor or bottom clay layers to minimize groundwater contamination. There were some communities that decided to dispose of their safety boxes in communal latrine/septic tanks.<sup>6</sup>

**Figure 1: Waste Treatment and Disposal System Used during the Philippines Follow-up Measles Elimination Campaign in 2004**



Source: Joint Report by Health Care Without Harm and the Department of Health. 2004. *Waste Management and Disposal During the Philippine Follow-up Measles Campaign*. Manila.

<sup>5</sup> Joint Report by Health Care Without Harm and the Department of Health. 2004. *Waste Management and Disposal During the Philippine Follow-up Measles Campaign*. Manila.

<sup>6</sup> WHO, West Pacific Region. 2015. *Status of Health-care Waste Management in Selected Countries of the Western Pacific Region, 2008-2013*. Manila.



35. In general, HCWM capacities in DOH-hospitals and larger private hospitals are adequate. In such facilities, HCW is segregated, and a management and administrative system exists. In urban areas, licensed waste disposal companies are available that are collecting, treating and disposing of HCW (footnote 6). HCWM remains a systemic issue in primary health care services. A survey conducted in 2014 by the World Bank concluded that a quarter of RHUs did not have the infrastructure in place for storage and safe disposal of sharps, and 35% of RHUs were unable to safely dispose of infectious materials, with no significant disparities between regions.<sup>7</sup>

36. The DOH allows on-site burial within the HCFs for treated infectious waste, sharps, pathological and anatomical waste, small quantities of encapsulated/inertized solid chemical and pharmaceutical wastes. The HCWM Manual recommends safe burial as a transitional, interim solution only and is allowed if the HCF is (i) located in a remote and far-flung area; (ii) does not have access to TSD facilities; (iii) located in a local government unit (LGU) with an income classification of 5<sup>th</sup> or 6<sup>th</sup> class; (iv) located in 1<sup>st</sup> to 4<sup>th</sup> class LGU with available area within the HCF premises but only pathological, anatomical, expired drugs and sharps waste can be buried; and (v) safe burial within the premises is the only viable option such as in temporary camps.

37. In the more recent monovalent oral poliovirus vaccination campaign of the DOH, there has been significant improvement in the system to manage immunization wastes. The hospitals and RHUs implement the on-site management of immunization wastes in accordance with the requirements of the HCWM Manual on proper waste segregation and packaging, labelling, and safe storage in septic vaults. A reverse logistics system was implemented whereby a DENR-registered third party TSD service provider was commissioned by DOH to collect the immunization wastes from regional hubs or collection points of the DOH for treatment. These regional collection points are where the CHDs/RHUs transport the safety boxes containing the immunization wastes.

38. An assessment is currently ongoing through the World Bank-financed Philippine COVID-19 Emergency Response Project to evaluate the existing health care waste management system in 100 HCFs covered by the project. This is being done using COVID-19 waste management self-audit tools developed by DOH with World Bank support. The World Bank also provided support to DOH in developing the draft operations manual and training design on the self-audit tools to determine gaps and needs of HCFs on the management of wastes. It is expected that the training and self-audit tools will provide better information for DOH on the shortcoming and resources needed by the HCFs towards the effective implementation of the HCWM manual and in ensuring safe disposal of HCW.

## **B. Off-Site Transport and Disposal of Health Care Waste**

39. As of January 2020, there are a total 48 TSD facilities nationwide that are registered by the DENR-EMB to treat M501 and M503 wastes. Central Luzon or Region 3 has the highest number of HCW TSDs with 18, followed by Region IVA with 11. Luzon Island has the greatest number of TSDs, but these are primarily located in Metro Manila, Central Luzon, and CALABARZON. In Visayas, there are four TSDs on HCW in the provinces of Cebu and Leyte. There are also four registered TSDs for HCW in Iligan City, Misamis Oriental, Davao City, and Surigao del Norte. Six regions are without TSDs, namely, (i) Region 2, (ii) Region 5, (iii) Region 6, (iv) Region 9, (v) Region 12, and (vi) BARMM.

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<sup>7</sup> World Bank Philippines. 2014. *Supply-side Readiness of Primary Health Care in the Philippines*. Manila.

**Table 1: Registered TSD Facilities for Health Care Wastes as of January 2020**

Region	Number of TSDs
Cordillera Administrative Region	1
National Capital Region or Metro Manila	8
Ilocos (Region 1)	1
Cagayan Valley (Region 2)	-
Central Luzon (Region 3)	18
CALABARZON (Region 4A)	11
MIMAROPA (Region 4B)	1
Bicol (Region 5)	-
Western Visayas (Region 6)	-
Central Visayas (Region 7)	3
Eastern Visayas (Region 8)	1
Zamboanga Peninsula (Region 9)	-
Northern Mindanao (Region 10)	2
Davao (Region 11)	1
SOCCSKSARGEN (Region 12)	-
CARAGA (Region 13)	1
BARMM	-
<b>TOTAL</b>	<b>48</b>

BARMM = Bangsamoro Autonomous Region in Muslim Mindanao; CALABARZON = Batangas, Cavite, Laguna, Quezon and Rizal; CARAGA = Agusan del Norte, Agusan del Sur, Dinagat Islands, Surigao del Sur; MIMAROPA = Marinduque, Occidental Mindoro, Oriental Mindoro, Palawan, Romblon; SOCCSKSARGEN = Sarangani, South Cotabato, Sultan Kudarat, Cotabato; TSD = transporter, storage and disposal.

Source: DENR-EMB. 2020. [List of Registered TSD Facilities](#). Manila.

40. There are 15 TSDs that are able to treat both M501 and M503 HCW. Majority of the 24 TSDs cater only to M503 wastes, while the rest (9) treat only M501 wastes. Based on the list of registered TSDs for HCW, majority fall under Category B and uses thermal treatment for HCW such as pyrolysis. The TSD is evaluated and monitored by EMB to check compliance with the requirements of DMC-2002-05. There are also three cement kilns and two steel mills that are able to treat M503 wastes. Table 2 presents the DENR category of TSDs and the number of TSDs for HCW per DENR category.

**Table 2: Category and Method of Treatment of Health Care Waste TSD Facilities**

Category	Description of Treatment Method	Number of TSDs on HCW
A	Onsite treatment and disposal facilities	5
B	Thermal treatment facilities (either burn or non-burn) such as pyrolysis, autoclave (hydroclave/pyroclave) for M501, thermal decomposition (thermolysis), thermal evaporation	26
C	Disposal facilities (sanitary landfill, surface impoundments) that accept only inert or treated hazardous wastes for final disposal in a dedicated cell, hazardous wastes for final disposal such as solidified, encapsulated wastes	3
D	Recycling facilities that recover valuable materials (i.e., used or waste oil, solvents, acids, alkalis, metals, etc.), use hazardous wastes as input materials or alternative fuel for industrial processes, remediate contaminated soil thru physical, chemical or biological treatment.	8
E	Chemical treatment facilities that accept and treat hazardous wastes, which are not generated or produced at the facility using chemical immobilization, polymeric filtration, chemical decomposition, solvent extraction	17

Category	Description of Treatment Method	Number of TSDs on HCW
F	Storage facilities for hazardous wastes, which were not generated from the facility awaiting transport for treatment, disposal or export such as Material Recovery Facilities, Buildings that store containers, vessels, or tanks containing hazardous wastes, and Built tanks that store liquid hazardous wastes	2

TSD = transporter, storage and disposal.

Note: A TSD may employ more than one type of treatment methods.

Source: DENR-EMB. 2020. [List of Registered TSD Facilities](#). Manila.

41. The DENR confirms that there is a surge in the volume of HCW since the start of the COVID-19 pandemic. The DENR is able to monitor activities of the transporters and treaters through the permitting system that is established for every movement of wastes from generators. Most of the wastes are treated in the TSD facilities located in the more urban areas in Luzon, but the other regions still lack these treatment services. The DENR suggests the opening of opportunities for more investments for the establishment of HCW treatment facilities in other regions. The regulations are already in place, and the DENR continues to use the online system of registration to help facilitate the movement of HCW until its safe treatment and disposal at TSD facilities.

42. In order to manage and help address the increase in HCW, the EMB has drafted the administrative order that will open opportunities on waste-to-energy treatment systems in cement kilns as an additional option for destruction of non-pathological HCW. The order has been subjected to review and consultations to seek comments from various stakeholders. The DENR expects to issue the amendment of DAO 2010-06 in the first quarter of 2021.

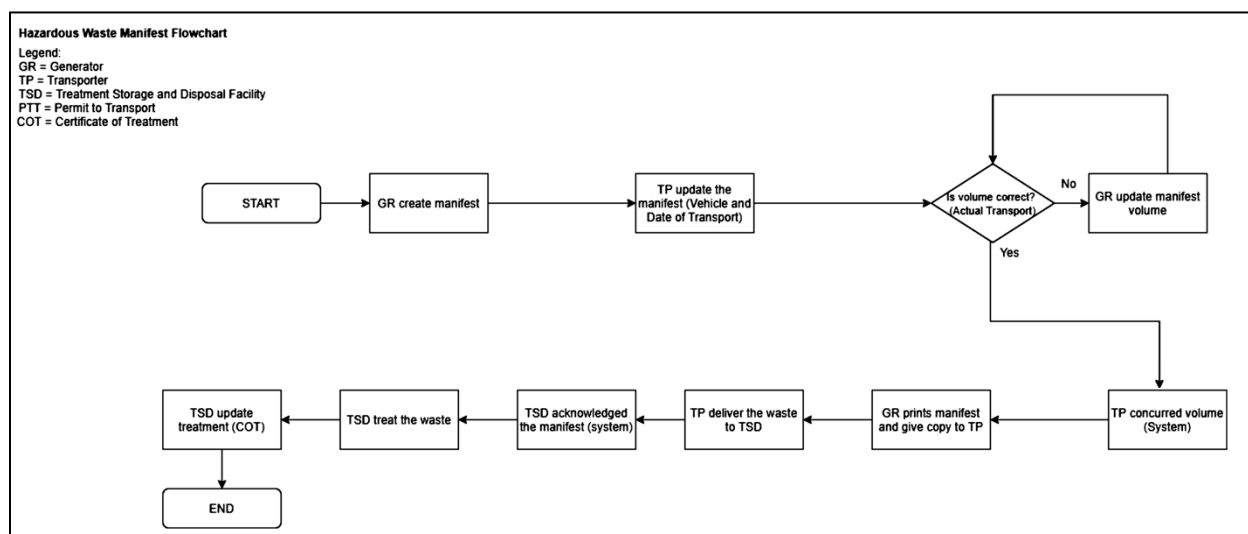
### C. Monitoring of Health Care Wastes

43. The movement of wastes once removed from the HCF follows a rigorous system of monitoring through the DENR's Hazardous Waste Manifest system as stipulated in RA 6969 and its implementing rules and regulations. Only DENR-registered transporters are allowed to collect hazardous waste from a generator. As required by the DENR-EMB, the transporter should have an emergency and contingency plan and drivers and helpers should be certified on waste management and emergency preparedness and response. The transport vehicle should have warning signs and markings on the waste identification, classification, and symbols, and safety data sheet. Workers transporting the wastes are required to wear personal protective equipment. The requirements are also outlined in the DOH's HCWM Manual which follows the Technical Guidelines on Transport of Infectious Clinical Wastes (UN 3291).

44. The manifest is first prepared by the waste generator and is forwarded to the transporter and then the treater until a Certificate of Treatment (COT) is issued by the treater ascertaining the safe treatment and disposal of the wastes. This process follows the "cradle to grave" concept on waste management as required in the implementing rules and regulations of RA 6969 (Figure 2).

45. The DENR-EMB is able to monitor the quantities of HCW transported through the approved Permit to Transport that are issued from the EMB regional offices. Reports from the EMB regional offices are sent on a daily basis to the EMB central office and then submitted to the Inter-Agency Task Force for the Management of Emerging Infectious Diseases.

**Figure 2: Hazardous Waste Manifest System**



Source: DENR-EMB.

#### D. Regulatory Compliance of Hospitals and RHUs

46. In terms of regulatory compliance, the health sector is still faced with challenges in complying with the requirements of the DENR with regards to the off-site treatment and disposal of HCW. According to DENR-EMB, most of the RHUs are still not registered with the bureau as waste generators in accordance with the requirements of RA 6969. Without the waste generator registration, it becomes illegal for HCFs to transport HCW off-site. As such, the options left for HCFs is to disinfect wastes and then bury the infectious wastes within the HCF site in septic vaults.

#### E. Government's Plan to Manage COVID-19 immunization waste

47. The Government of the Philippines, through the DOH, has developed a robust plan to manage COVID-19 immunization waste. The DOH, with support from the United Nations Children's Fund (UNICEF) and the WHO, developed the COVID-19 Vaccine Introduction Readiness Assessment Tool (VIRAT) in November 2020 which looks at four core activities: (i) planning and management; (ii) supply and distribution; (iii) program delivery; and (iv) supporting systems and infrastructure. The VIRAT is updated monthly, and assessments feed into the country's COVID-19 vaccine roadmap. Key indicators related to the management of wastes from the immunization program are captured in the VIRAT, including: (i) waste management protocols for COVID-19 vaccination, both hazardous and non-hazardous, including development and dissemination of practices and guidelines for disposal routes, (ii) appropriate waste management systems in all relevant sites, and adequately trained human resources, and (iii) properly-licensed waste management providers (especially hazardous waste storage, transportation and disposal) are identified and will be mobilized.

48. The Government's COVID-19 National Vaccination Roadmap provides the strategic guidance in the implementation of the deployment and vaccination program. **The Philippine National Deployment and Vaccination Plan for COVID-19 Vaccines** contains guidelines on the procurement of vaccines, shipment and storage, distribution and deployment, implementation

of nationwide vaccination, and assessment evaluation and monitoring. The plan also defines clear requirements related injection safety, the management of HCW, and the reverse logistics concept of HCW management.

49. Based on the plan, vaccines and other immunization supplies will be delivered from the national level to the Centers for Health Development (CHDs) and to the Ministry of Health at the BARMM at the regional level, and then through the local COVID-19 Vaccination Operations Center (VOC) at the local government unit (LGU) level. The CHDs and the LGUs as well as those that will be identified as recipients of these immunization commodities will develop their distribution plan with mapping of vaccination workforce, implementing units and vaccination sites/posts. All staff are to receive training relevant to their roles in the team and service.

50. The plan requires that throughout the implementation of COVID-19 vaccination plan, infection prevention and control measures must be practiced and that HCW generated at the HCF after vaccination are properly managed. The plan refers to the waste classification guidelines of the DENR, i.e., pathological or infectious waste as M501 and pharmaceuticals and drugs as M503.

51. Following the lessons and experience from past vaccination programs, the DOH will implement an on-site management of immunization wastes by implementing the provisions of the HCWM Manual on proper waste segregation and packaging, labelling, and safe storage in septic vaults. The HCWM manual is currently being used for routine and regular immunization programs in terms of managing HCW in various types of HCF in the country.

52. Under the Philippine National Deployment and Vaccination Plan for COVID-19 Vaccines, a HCF or implementing unit must identify personnel as part of the COVID-19 vaccine waste team that will ensure all HCW generated from the vaccination activities are properly collected and disposed either on-site or offsite. Volume or amount of waste generated must be recorded.

53. In line with the roll-out of the COVID-19 vaccination plan, the DOH issued **DOH Memorandum No. 2021-0031** on 18 January 2021 that provides the interim guidelines to all Centers for Health Development (CHD), DOH Bureaus, medical centers, hospitals, sanitarium, institutes, and health care facilities on the proper management of health care wastes generated from the COVID-19 vaccination activities. The memorandum requires the segregation of the different infectious wastes such as empty vaccine vials, syringes/sharps, PPEs, cottons, tissues, and other materials at the point of generation in designated puncture-proof container bags, waste bins with cover, and then labelled properly. It also outlines the requirements for waste collection, storage within the HCF, as well as the offsite waste transport and disposal. Under the memorandum, the DOH will facilitate the Special Permit to Transport with the DENR. It has identified the waste collection points at CHDs and Provincial Health Offices (PHOs) for areas without hazardous waste service providers where the wastes can be collected and treated by DENR-accredited TSD facilities that will be contracted by the DOH Central Office.

54. In general, the government's immunization waste management plan (covered through the Philippine National Deployment and Vaccination Plan for COVID-19 Vaccine and DOH **DOH Memorandum No. 2021-0031**) includes the following key elements:

55. **Immunization waste segregation at point of waste generation:** The plan requires HCFs to place sharps such as syringes and needles in a safety collection box for temporary storage onsite and filled with chemical disinfectant when  $\frac{3}{4}$  full. Empty vaccine vials and used

syringe barrels will be placed in separate waste bins with cover lined with yellow plastic band with label.

**56. Immunization waste collection and transport at site:** General service personnel will be assigned for the collection of wastes from the waste bins to a designated on-site storage area of the HCF using wheeled trolleys/carts or wheeled bins. Hazardous and non-hazardous wastes are to be transported separately; infectious waste can be transported together with the used sharps wastes to the temporary onsite-storage area. Trolleys used for the transport of wastes are to be disinfected after every use. At the end of the vaccination period, accounted empty/opened vials will be kept safe in the HCF while waiting for pickup by the CHD for further processing. A form has been developed to record all used and unused vials at the end of each vaccination period to enable DOH to monitor the distribution and utilization of the vaccines and the vaccine wastage rate.

**57. Immunization waste treatment and disposal:** Onsite disposal at the HCF may include concrete vault within the HCF premises. Such concrete vaults must be designed and installed in accordance with the HCWM Manual. DOH will contract a third-party TSD service provider that is registered by the DENR for the collection (at regional CHDs), off-site treatment and disposal of immunization waste. Unopened unusable vials will remain safely stored at required temperature while unaccounted vials will be reported to the supervisor of the vaccination team and investigated in coordination with the LGUs. All used and/or opened vials should be inactivated either through autoclaving, boiling, chemical inactivation, encapsulation, incineration or through destruction in an a TSD facility. The destruction process to be employed should be in accordance with the national regulations. This reverse logistics model will follow the system implemented for the recent DOH immunization program for monovalent oral poliovirus vaccine, in which the DOH commissioned the services of Integrated Waste Management Incorporated (IWMI), a private company that is registered with DENR, to pick-up used vials from regions for treatment and disposal at its TSD facility in Cavite. The DOH has submitted a request to the DENR-EMB for a Special Permit to Transport to allow movement of immunization wastes from the vaccination sites to the regional CHDs/RHUs where the wastes will be collected by the third-party TSD service provider for treatment at its facility. A Terms of Reference (TOR) has been prepared by DOH for the contracting of TSD services. DOH has allocated budget for the TSD services which will be procured through a competitive bidding process. Budget for COVID-19 immunization waste management had been allocated by DOH.

**58 Training on HCWM:** The DOH has conducted the cluster-based Training of Trainers for the regional officers for five identified clusters (North Luzon, South Luzon, Visayas, North Mindanao, and South Mindanao) in preparation to the implementation of the COVID-19 vaccination program including the waste management plan. The training includes HCW management and reverse logistics. Meetings with the regional environmental and health coordinators are ongoing to coordinate the trainings and implementation of the waste management requirements. The DOH will continue the training on the updated HCWM manual starting in February 2021. The supplemental operations manual on COVID-19 waste management and the self-audit screening tool (para 27) will help DOH and the HCFs in determining further needs to manage wastes properly.

**59 Immunization waste monitoring and recording:** Following the reverse logistics guidelines of the DOH, all empty and unopened vials should be returned daily and properly accounted and documented by the vaccination team using a prescribed “End of Vaccination Permit Distribution and Utilization Report (DUR)”. The disposal of the vaccine vials should follow a detailed vial collection and destruction plan to be developed by the CHDs and the LGUs.

60. All immunization wastes once removed from the HCF requires compliance with the requirements of the DENR based on Republic Act 6969 until the wastes are safely disposed. In order to comply with the transport requirements of RA 6969, the DOH has requested DENR to grant a Special Permit to Transport of the immunization wastes so that the wastes can be transported to the central temporary storage at the regional CHDs and collected by a DENR-licensed TSD facility. Movement of wastes will be monitored through the DENR's Hazardous Waste Manifest system where quantities of HCW transported through the approved Permit to Transport and the volume of wastes disposed/treated by the TSD facility are reported. Information from the EMB regional offices are sent on a daily basis to the EMB central office and then submitted to the Inter-Agency Task Force for the Management of Emerging Infectious Diseases to properly account the waste generation rate and its safe disposal.

#### IV. CONCLUSION

61 The Philippines has established a comprehensive and robust policy framework in regulating HCWM through laws and regulations that are being implemented by the DOH and the DENR. The 4th edition of the Health Care Waste Management Manual of the DOH presents a comprehensive set of guidelines on the safe management of waste generated from health care activities in the country. The manual incorporates the requirements of all Philippine laws and regulations governing HCWM, including immunization waste, and is aligned with international good practice as recommended by the WHO.<sup>8</sup>

62 The Philippine National Deployment and Vaccination Plan for COVID-19 Vaccines and DOH Memorandum 2021-0031 – Interim Guidelines on the Management of Health Care Wastes Generation from COVID-19 Vaccination clearly define the immunization waste management requirements and guidelines to be observed by the HCFs and the regional offices to address issues of immunization waste management.

63 The DOH's proposed plan of action confirms the government's commitment to ensure that incremental immunization waste will be managed by the HCFs through the "duty of care" policy. The roll-out by DOH of the trainings for implementers and the planned mobilization of a third-party DENR-licensed TSD service provider for the collection, treatment and disposal of immunization waste indicate the agency's commitment and readiness to increase its immunization waste management capacity in view of the implementation of COVID-19 vaccination program.

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<sup>8</sup> World Health Organization. 2014. *Safe Management of Wastes from Health-care Activities*. Geneva; and World Health Organization. 2019. *Overview of Technologies for the Treatment of Infectious and Sharp Waste from Health Care Facilities*. Geneva.

**Appendix A: Regional distribution of registered TSD Facilities for Health Care Waste in the Philippines**

Region	Name of TSD Facility	Location	Type of HCW	TSD Category
CAR	Lepanto Consolidated Mining Co.	Lepanto, Paco, Mankayan, Benguet	M501	A
NCR	Eco Safe Hazmat Treatment Inc.	Novaliches, Quezon City	M501 M503	E E
NCR	Integrated Waste Management, Inc.	Lung Center of the Philippines Compound, Quezon City	M501	B
NCR	Maya Med Waste Corporation	Bagbaguin, Valenzuela City	M501, M503	B
NCR	Green Planet Management Inc.	Punturin, Valenzuela City	M503	E
NCR	JM Ecotech Solutions, Inc.	Kaybiga, Caloocan City	M503	E
NCR	Trame Oil & Environmental Specialist, Inc.	Valenzuela City	M503	E
NCR	Intercontinental Waste Disposal Systems, Inc.	Bagumbayan, Taguig City	M503	B
NCR	Udena Environmental Services, Inc.	Bagumbayan, Taguig City	M501 M503	E E
1	Servo-Treat Philippines, Inc.	Urdaneta City, Pangasinan	M501 M503	B D
3	Udena Environmental Services, Inc.	Hermosa, Bataan	M501 M503	F B
3	Holcim Philippines, Inc.	Norzagaray, Bulacan	M503	A, B, D
3	All Waste Services, Inc.	Guiguinto, Bulacan	M503	E
3	Republic Cement & Building Materials, Inc.	Norzagaray, Bulacan	M503	B, D
3	Total Organic Environmental Solutions, Inc.	Pulilan, Bulacan	M501	B
3	Globaltec Waste Management, Inc.	Marilao, Bulacan	M503	E
3	Far East Fuel Corporation	San Ildefonso, Bulacan	M501, M503	B
3	Asia United Oil Industry Corporation	Meycauayan, Bulacan	M503	B
3	Wacuman Incorporation	Norzagaray, Bulacan	M503	C
3	Recyclephil Inc.	Bocaue, Bulacan	M503	E
3	Glochem Marketing & Recycling Corp.	San Isidro, Nueva Ecija	M501 M503	B B, E
3	Dolomatrix Philippines, Inc.	Bacolor, Pampanga	M503	E
3	VAG General Merchandise	Floridablanca, Pampanga	M503	E
3	RMS Petroleum Technology & Wastre Management Corp.	Mexico, Pampanga	M503	B
3	Joechem Environmental Corporation	Capas, Tarlac	M503	E
3	Metro Clark Waste Mabagement Corporation	Capas, Tarlac	M501, M503	C
3	Cleanway Environmental Management Solutions, Inc.	Capas, Tarlac	M501	B
3	Clean Leaf International Corporation	Bamban, Tarlac	M501, M503	B



4A	Republic Cement & Building Materials, Inc.	Taysan, Batangas	M503	A/D
4A	Cleanway Environmental Management Solutions, Inc.	Silang, Cavite	M501 M503	B/F C/F
4A	Green Eco Techwin, Inc.	Gen. Trias, Cavite	M501, M503	B
4A	Integrated Waste Management, Inc.	Trece Martirez City, Cavite	M501	B
4A	Jorm Trading Corporation	General Trias, Cavite	M503	D/E
4A	Solvtech Consultancy Resources	Silang, Cavite	M503	E
4A	Green Horizon Environmental Management Inc.	Bacoor City, Cavite	M503	E
4A	Integrated Waste Management, Inc.	Trece Martirez City, Cavite	M501, M503	B
4A	August-10 Enterprise Co.	Biñan, Laguna	M503	B
4A	Green Resource & Environmental Management Solutions, Inc.	San Pedro City, Laguna	M503	E
4A	Hazchem, Inc.	Calamba City, Laguna	M501 M503	B B/E
4B	Pollution Abatement Systems Specialists, Inc.	Puerto Princesa City, Palawan	M501	B
7	Pollution Abatement Systems Specialists, Inc.	Cebu City, Cebu	M501	B
7	Medclean Management Solutions, Inc.	Cabancalan, Mandaue City	M501	B
7	Enviro-Q Trends Corporation	Carmen, Cebu	M503	D/E
8	Cleanaway Philippines, Inc.	Isabel, Leyte	M503	D/E
10	Republic Cement Iligan, Inc.	Kiwalan, Iligan City	M503	B/D
10	Philippine Sinter Corporation	Villanueva, Misamis Oriental	M501	A
11	Maya Med Waste Corporation	Tugbok District, Davao City	M501, M503	B
13	Taganito HPAL Nickel Corporation	Claver, Surigao del Norte	M501, M503	A

CAR = Cordillera Administrative Region, NCR = National Capital Region, TSD = treatment, storage and disposal.  
Source: DENR-EMB. 2020. [List of Registered TSD Facilities](#). Manila.