

**Federal Government of Nigeria
Federal Ministry of Health
Nigeria Centre for Disease Control**



**UPDATED REDISSE HEALTHCARE WASTE
MANAGEMENT PLAN**

For

**Nigeria COVID-19 PREPAREDNESS AND RESPONSE
PROJECT ADDITIONAL FINANACING (P177076)
Nigeria CoPREP**

FINAL REPORT

August 2021

**UPDATED REDISSE HEALTH CARE
WASTE MANAGEMENT PLAN
(HCWMP)**

FOR

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RESPONSE PROJECT ADDITIONAL
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Nigeria CoPREP**

DRAFT FINAL REPORT

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ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
COVID-19	Corona Virus Disease 2019
DSNO	Disease Surveillance Notification Officer
ECOWAS	Economic Community of West African States
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EOC	Emergency Operation Centre
ESCP	Environmental and Social Commitment Plan
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental Social Standards
EVD	Ebola Virus Disease
FAO	Food and Agriculture Organization
FCT	Federal Capital Territory
FEPA	Federal Environmental Protection Agency
FMARD	Federal Ministry of Agriculture and Rural Development
FME _{env}	Federal Ministry of Environment
GoN	Government of Nigeria
HCW	Health Care Waste
HCWMP	Health Care Waste Management Plan
ICWMP	Infection Control and Waste Management Plan
IPMP	Integrated Pest Management Plan
LUTH	Lagos University Teaching Hospital
NCDC	Nigeria Centre for Disease Control
NESREA	National Environmental Standards and Regulations Enforcement Agency
NAFDAC	National Agency for Food and Drug Administration Control
NVDP	National Vaccination and Deployment Plan
NRL	NCDC Reference Laboratory
Nigeria CoPREP	Nigeria COVID 19 Preparedness and Response Project
NPHCDA	National Primary Healthcare Development Agency
OIC	Officer In Charge
OP	Operation Policy
OHS	Occupational Health and Safety
PAD	Project Appraisal Document
PCU	Project Coordinating Unit
PDO	Project Development Objective
PHEOC	Public Health Emergency Operation Centre
PPE	Personal Protective Equipment
SEP	Stakeholders Engagement Plan
SEPA	State Environmental Protection Agency or Authorities
SPCU	State Project Coordinating Unit
SOP	Series of Interdependent Projects (SOP).
SSO	State Surveillance Officer
VAC	Vaccine Approval Criteria
WHO	World Health Organization
WVAO	Ward Vaccine Accountability Officer

EXECUTIVE SUMMARY

ES 1: Introduction

The Government of Nigeria (GoN) through the Ministry of Health and Nigeria Centre for Disease Control with support from the World Bank is implementing the Nigeria COVID-19 Preparedness and Response Project (CoPREP)– P173980 (referred to as Parent Project). The Parent project became effective in March 15, 2021, although field implementation is yet to commence. The GoN is currently seeking an Additional Financing (AF) of US\$ 400 million equivalent and a restructuring of the Parent project to provide upfront financing to help the government purchase and deploy COVID-19 vaccines that meet the Bank's vaccine approval criteria (VAC) and strengthen relevant health systems that are necessary for a successful deployment and to prepare for the future.

The project development objective of the CoPREP Projects; Parent Project, Additional Financing and the Restructuring Project is to prevent, detect, and respond to the threat posed by COVID-19 at state level in Nigeria.

The CoPREP Projects is implemented by the Nigeria Centre for Disease Control (NCDC) with support from the National Primary health Care Development Agency (NPHCDA) for the vaccine component. The CoPREP Projects would be implemented in the 36 states in Nigeria and the Federal Capital Territory (FCT).

This Health Care Waste Management Plan (HCWMP) has been updated to outline the Infection Control and Waste Management Plan (ICWMP) resulting from Nigeria's COVID-19 Preparedness and Response activities. The measures for mitigating the identified potential adverse impacts including ensuring better development outcomes are also highlighted.

The project is implemented in accordance with the World Bank Environmental and Social Standards (ESSs). The Environmental and Social Commitment Plan (ESCP) sets out material measures and actions, any specific documents or plans, as well as the timing for each of these. The Health Care Waste Management Plan (HCWMP) is one such document and its overall objective is to prevent and/or mitigate the negative effects of infection and medical waste on human health and the environment. All the health facilities and health services supported through the World Bank project are to have appropriate procedures and capacities in place to manage medical waste. The plan includes good practices and procedures for the waste packaging and storage, segregation, transportation, treatment and disposal.

A monitoring program has been developed including indicators to address potential negative impacts of the medical waste and to ensure that unforeseen impacts are detected, and the mitigation measures implemented efficiently. The monitoring plan includes indicators for the storage, segregation, transportation and disposal of the medical waste.

Proposed New Activities (P 177076)

An additional project has been introduced based on the request for restructuring and additional financing from the parent project, few activities have been adjusted increasing the sub-components to six from four with the PDO retaining its status quo.

Component 1: Emergency COVID-19 Response (US\$504.28 million). This component would provide immediate support to break the chain of COVID-19 local transmission and limit the spread of COVID-19 in Nigeria through containment and mitigation strategies.

Subcomponent 1.4 (COVID-19 Vaccine deployment US\$ 76 million) will fund needed activities geared towards the deployment of COVID-19 vaccines at the subnational levels to ensure that the COVID-19 vaccines are available in the country and are deployed safely, timely, effectively and without wastages in all administrative wards in Nigeria. The activities include development of micro plans for vaccination, training and retraining of health workers on microplanning and vaccine implementation, advocacy communication and social mobilization, monitoring and supervision of vaccination, pharmacovigilance, AEFI kits and data tools, payment to personnel involved in deployment of vaccines, procurement of cold boxes, carriers and PPE for vaccination teams and transport and logistics costs for vaccines within the states. Vaccination teams that will be paid a stipend include members of the Nigeria Police Force and Nigeria Civil Defence Corps for their role in maintaining law and order at vaccination sites and providing escort services for movement of vaccines. This subcomponent will be partly funded from a reallocation of US\$ 33.5 million of existing funds from Component 1.2 (Direct Support to States for COVID-19 Emergency Preparedness and Response) of the parent project and from an addition of US\$ 42.5 million from new resources from the AF.

Sub-component 1.3 and 1.4 will be managed by NPHCDA but still under the same disbursement category as Component 1.2 to allow some flexibility in the states' reallocation of funds for more traditional response activities (subcomponent 1.2) such as surveillance, testing, case management, etc., and the newly introduced vaccine deployment activities (subcomponent 1.4) during implementation without restructuring.

This HCWMP was previously prepared for the REDISSE project but now updated to accommodate the CoPREP project activities. The update involved project description of the CoPREP project and inclusion of vital specific issues of CoPREP concerns and activities and waste components into the existing medical waste management plan

The table below shows an indicative budget breakdown and responsibility of the cost for implementing the HCWMP. The cost is estimated at **Two Hundred and Twenty-Seven Thousand, One Hundred Dollars only (\$227,100)**

Item	Responsibility	Cost Estimate in Us Dollars
		(US\$)

Mitigation/Management (Incineration and others)	SPCUs, Program Officers, from LGAs (LIOs), FMEnv/SEPA, HCFs	Cost covered in Sub-component 1.2
Capacity Building	SPCUs, Program Officers from LGAs (LIOs), Immunization managers, HCWs	14,500
Monitoring	NPHCDA/SPHCDA, SPCUs, LIOs, FMEnv/SEPA	110,000
Public Awareness	NPHCDA/SPHCDA, FMEnv/SEPA, States, LGAs, HCFs	82,000
Sub- Total		206,500
Contingency (10%)		20,600
Total		227,100

Steps in Implementing HCW Plan

Step One: Waste Segregation and Collection

- At the point of generation, waste should be identified and segregated. Non-hazardous waste, such as paper and cardboard, glass, aluminum and plastic, should be collected separately in strong black nylon and recycled if possible.
- Infectious and / or hazardous wastes should be identified and segregated according to its category using a color-coded system. If different types of waste are mixed accidentally, waste should be treated as hazardous
- All those who handle health-care waste should wear appropriate PPE (boots, long-sleeved gown, heavy-duty gloves, mask, and goggles or a face shield) and perform hand hygiene after removing it
- Collection of medical waste should be from key sites (e.g. within nursing stations, mobile and fixed units), followed by transfer to the designated point(s) for segregation and/or treatment
- Waste should be collected daily at the same time (or as frequently as required) and transported to the designated central storage/treatment site.
- No bags should be removed unless they are labelled with their point of production (health unit/center) and contents.
- Bags or containers should be replaced immediately with new ones of the same type.
- There should be enough buckets provided to ensure an appropriate number of clean buckets in rotation. Buckets should be washed and disinfected before reuse.
- Seal and replace waste bags and containers when they are approximately three quarters
- Full bags and containers should be replaced immediately;
- Identify and label waste bags and containers properly prior to removal

Steps Two: Transport

- Waste buckets should be transported with their lids securely in place to prevent spillage

- When many containers need to be transported, a cart or trolley should be used to prevent back injury
- The waste should be placed in rigid or semi-rigid and leak-proof containers.
- Transport waste to storage areas on designated trolleys / carts, which should be cleaned

Step Three: Waste Storage

- Biomedical waste other than sharps and bulk liquids must be packaged in sealed in bags which are leak-proof and rip-resistant.
- Store medical/infectious waste in a designated area located at or near the treatment site or the waste pickup point.
- Areas used to store medical/infectious waste should be durable, easily cleanable, impermeable to liquids, and protected from vermin and other potential mechanisms that might spread infectious agents.
- The manner of storage should maintain the integrity of the containers, prevent leakage of waste from the container, provide protection from the weather, and maintain the waste in a non-putrescent, odorless state (this may require refrigeration).
- Storage areas should have adequate ventilation systems and disinfected regularly;
- Waste storage areas should be located within the facility and sized to the quantities of waste generated, with the following design considerations:
 - o Hard, impermeable floor with drainage, and designed for cleaning / disinfection with available water supply
- Storage times between generation and treatment of waste should not exceed the following: Temperate climate: 72 hours in winter; 48 hours in summer; Warm climate: 48 hours during cool season, 24 hours during hot season

Step Four: Disposal

In facilities that have a waste zone, this is the final disposal site of the medical waste. A fully functional waste zone should have the following components:

- An incinerator or burner for treatment of soft waste.
- An ash pit for disposal of residues from the incinerator or burner and a covered pit with a hatch lid.
- A sharps pit for disposal of sharps containers. A sealed, covered pit with a 1m length of pipe incorporated in the top to prevent access to the contents.
- An organics pit for disposal of human tissue and other biological waste.
- An infiltration facility or sewer for the disposal of liquids.

Chapter One: Introduction

1.1 Project Context

The Government of Nigeria (GoN) through the Ministry of Health and support from the World Bank is implementing the Nigeria COVID-19 Preparedness and Response Project (CoPREP)– P173980 (referred to as Parent Project). The Parent project of CoPREP will address immediate critical country needs for preparedness and response for COVID-19. The Parent project became effective in March 15, 2021, although field implementation is yet to commence. The GoN is currently seeking an Additional Financing (AF) of US\$ 400 million equivalent and a restructuring of the Parent project to provide upfront financing to help the government purchase and deploy COVID-19 vaccines that meet the Bank’s vaccine approval criteria (VAC) and strengthen relevant health systems that are necessary for a successful deployment and to prepare for the future.

1.1.1 The Project Development Objective

The project development objective of the Parent Project, Additional Financing and the Restructuring Project is to prevent, detect, and respond to the threat posed by COVID-19 at state level in Nigeria.

The CoPREP Projects is implemented by the Nigeria Centre for Disease Control (NCDC) with support from the National Primary health Care Development Agency (NPHCDA) for the vaccine component. The CoPREP Projects would be implemented in the 36 states in Nigeria and the Federal Capital Territory (FCT).

The NCDC is the implementing agency for the project and serves as the Project Coordinating Unit (PCU)¹, responsible for the day-to-day management of the project. This arrangement is mirrored at the state level with the State steering Committees, chaired by the State Commissioners of Health and the State Coordinating Units headed by the State Epidemiologist.

The implementation of the CoPREP Project activities will generate additional medical waste—including used vials, syringes, safety boxes, cold boxes, chemicals, contaminated PPE and equipment, and lab testing kits from healthcare facilities—will need to be safely stored, transported, and disposed of effectively. While the project generates contaminated medical waste, waste management, in general, is a binding constraint in Nigeria due to inadequate capacity for handling and disposal, especially at the state level.

The NCDC is the national public health institute with the mandate to lead the preparedness, detection and response to infectious disease outbreaks and public health emergencies. Since the outbreak of the COVID-19 pandemic, the NDCC through the National Emergency Operations Centres (EOC) has continued to lead the national public health response in Nigeria with oversight of the Presidential Task Force on COVID-19 (PTF-COVID-19). The NCDC is also working closely with all states of the Federation to support their response activities to the pandemic. The support provided by the World Bank will further augment the response to the pandemic through support in emergency response and preparedness and equitable distribution of vaccines using the Nigeria Deployment Vaccination Plan. During these activities, there is potential for increase in medical waste generated.

1. **1 This is the same PCU for the REDISSE II project, though expanded and strengthened to take on the additional responsibility of implementing the Nigeria CoPREP operations.**

1.1.2 Project location/ Scope of work

The Nigeria CoPREP will be implemented in the 36 states and the FCT with respect to the project components. However, about 12 states (Adamawa, Anambra, Bauchi, Cross River, Enugu, Imo, Kwara, Lagos, Kano, Katsina, Kebbi, Rivers) would be selected for the rehabilitation of Isolation and treatment centres, equipping and refurbishment of medical laboratories, provision of emergency water supply (boreholes) and provision of personal protective equipment. The project is dynamic and may evolve during the project lifecycle as the COVID 19 is novel and also dynamic.

This section provides information on the Parent, Additional Financing (AF) and Restructured Project component and sub-components.

1.1.3 The Parent Project Components

The parent project (Nigeria CoPREP P173980) consists of two components and four sub-components as seen below:

Component 1: Emergency COVID-19 Response (USD\$104.28 million)

This component would provide immediate support to break the chain of COVID-19 local transmission and limit the spread of COVID-19 in Nigeria through containment and mitigation strategies. It will support COVID-19 emergency operations nationally, with a focus on states. It will support enhancement of institutional and operational capacity for disease detection capacities through provision of technical expertise, and supporting coordination, detection, and case management efforts of Nigeria's COVID-19 response, consistent with the WHO guidelines in the Strategic Response Plan. The Nigeria CoPREP will have a strong complement of surge federal support needed for coordination and management. In addition, the federal-level subcomponent will finance high-value procurements that will go to states, to leverage on economies of scale and take advantage of the different procurement opportunities being provided through UN agencies, the World Bank-facilitated procurement (BFP) and through use of emergency procurement procedures. The states may undertake low level procurements in line with unique state needs.

o Subcomponent 1.1) on Federal Support and Procurement for COVID-19 Emergency Preparedness and Response

This subcomponent will provide immediate support to Nigeria at the federal level for the COVID-19 preparedness and response. This subcomponent will finance federal procurements of COVID-19-related commodities including medical equipment, Laboratory tests, and medicines for COVID-19 emergency response to be distributed to the states based on the need to ensure there is no wastage, keeping in mind the emergent global supply chain challenge. Additionally, this subcomponent will complement REDISSE II's strengthening of disease surveillance and response systems, and short-term emergency support to national IAP to fill surge financing gaps for POE surveillance, case detection, confirmation, contact tracing, recording, and case management, including handwashing and sanitation activities.

This subcomponent will also support national level activities aimed at COVID-19 vaccine deployment, such as development of micro-plans for vaccination, training and retraining of health workers on microplanning and vaccine implementation, advocacy communication and social mobilization, monitoring and supervision of vaccination, payment to personnel involved in deployment of vaccines, procurement of devices such as syringes, cold boxes and carriers and transport and logistics costs.

o Subcomponent 1.2: Direct Support to States for COVID-19 Emergency Preparedness and Response

This subcomponent will support establishment, activation, and operationalization of EOCs in states, state vaccination deployment and provide financing support to all

states and the FCT through the NCDC for the implementation of State COVID-19 IAPs. This subcomponent, through the approved IAPs, will finance implementation of state activities within the plan, including, among others, (a) the development and dissemination of plans and standard operating procedures for case management, IPC, and so on; (b) establishment and operationalization of state EOCs as needed; (c) epidemiological investigations and contact tracing; (d) strengthening of risk assessment; (e) strengthening of public health emergency management and community and event-based surveillance; (f) provision of on-time data and information for guiding decision-making and response and mitigation activities; (g) RDT testing at Points of Entry (POE); (h) provision of additional support to Laboratories for early detection and confirmation; (i) identification of training needs; (j) equipping, furnishing, and renovation of isolation and treatment centers including community support centers and equipping and setting up of holding area at Points of Entry (POE); (k) improvement in patient transfer systems through financing of ambulances and training as needed; and subnational level activities in support of COVID-19 vaccine deployment.

- Subcomponent 1.3: Health System Strengthening. This subcomponent will support activities geared toward:

Sub-component 1.3.1: Strengthening Laboratory detection, Surveillance, Coordination for COVID-19: this activity will be supported by (i) strengthening disease surveillance systems, public health Laboratories, and epidemiological capacity for early detection and confirmation of COVID-19 cases and other epidemic threats; (ii) strengthening of the sample transfer system at a national and county level; (iii) EOC operations and monitoring of pandemic; (iv) establishment of two satellite Laboratories in prioritized counties to support the National Reference Laboratory (NRL), and ensure that the links between NRL and satellite Laboratories are strengthened; (v) training of Laboratory staff and support Laboratory surge capacity; (vi) procurement of Laboratory equipment, consumables and Laboratory tests (including COVID-19 testing kits and reagents); (vii) active contact tracing; (viii) epidemiological investigations; (ix) monitoring of outbreak trends; (x) training on case investigations; (xi) calling cards and communication needs for contact tracing and epidemiological investigations; (xii) operational cost of EOC; and (xiii) on-time data and information for guiding decision-making and response and mitigation activities. Additional support could be provided to strengthen health management information systems to facilitate recording and on-time virtual sharing of information. This will also cover Point of Entry (PoE) activities, including but not limited to: (i) commodities and infection prevention and control (IPC) materials needed at PoE; (ii) surge staff and personnel for surveillance at PoEs; (iii) training; (iv) temporary holding areas (portacabins) at Domestic airports and ground crossings for screening; (v) logistics and operational support such as fueling of ambulances, etc.

Sub-component 1.3.2: Case Management and clinical care. The Project would also finance (i) procurement of COVID-19 specific medical supplies and commodities, medical equipment, infection prevention and control (IPC) materials, PPEs for healthcare personnel; (ii) assessments and development of guidelines and protocols; (iii) training and capacity building of health care workers and support personnel on case management, and personal protection, WASH, and infection control; (iv) scaling up of triage capacity triage at all points of access to the health system, including primary health centers, clinics, hospital emergency units, and ad hoc community settings; (v) deployment and equipping of satellite and mobile clinics; (vi) repurposing of structures for provision of surge response; (vii) rehabilitation, renovation, and equipping of select health care facilities for scaling up ICU capacity; (viii) support to operational expenses such as those related to mobilization of health teams and salaries, hazard/indemnity pay consistent with the Government's applicable policies; (ix) strengthening of cold chain capacities; (x) coordination and training activities with private sector, including private sector consortium, private health

sector and Laboratories; (xi) provision of GBV training, including psychosocial first aid, for frontline workers; (xii) provision of psychosocial services to family members and patients among others. The project will work in synergy with the Nigeria Electrification Project (NEP) to ensure provision of energy for critical treatment centers, Laboratories for COVID-19 response.

Sub-component 1.3.3: Water Sanitation and Hygiene (WASH). The Project will work with the Water global practice of the World Bank to support safe water and basic sanitation in health facilities to ensure safe water supply and sanitation and hygiene services in health care facilities and temporary isolation centers. Rapid assessments will be conducted by local officials as these facilities are identified or established to document existing service gaps and promptly escalate any WASH needs such that they can be addressed through the project. It will finance such activities as: (1) emergency support to water supply and sanitation utilities to ensure continuity of water supplies; (2) emergency provision of safe water and hygiene materials to poor and vulnerable populations; and (3) the pursuit of strategies and partnerships with the private sector to incentivize increased production and provision of hygiene materials. Emergency support will be provided to water and sanitation utilities who are the mandated service providers to develop and implement Pandemic Emergency Response Plans that ensure continuity of water supplies. Given that the majority of Nigerians lack access to water on premises, most poor and vulnerable communities will require additional assistance in accessing water supply for use and handwashing given increasing financial constraints and social distancing and mobility restrictions, either through improvement and strengthening of existing water supply systems or provision of new water services and storage.

Subcomponent 1.4. Communication Preparedness: Community Mobilization and Risk Communication and advocacy. This sub-component will support a comprehensive behavior change and risk communication intervention to support the reduction of the spread of COVID-19 by working with private, public and civil society actors to support the development of messaging and materials including support to development and implementation of a strategy to prevent gender based violence during epidemics and information dissemination on GBV at community level and in multiple ways in order to reach those who are most vulnerable or without access to technology. This subcomponent will be linked to and implemented with coordination with Stakeholder Engagement Plan (SEP) of the project.

The subcomponent will also support social distancing measures to prevent contracting a respiratory virus such as COVID-19. These measures would be to limit, as possible, contact with the public such as: school closings, escalating and de-escalating rationale, backed up by a well-designed communication strategy.

Component 2: Project Management, Coordination, Monitoring and Evaluation (US\$10 million)

This component will support program coordination, management and monitoring, operational support and logistics, and project management. This will include support for the COVID-19 Incident Management System Coordination Structure; operational reviews to assess implementation progress and adjust operational plans; and provide logistical support. To this end, the project will also support technical assistance, rapid surveys as needed, and operating costs.

- Subcomponent 2.1: Project Management and Coordination. This subcomponent will support the strengthening of public structures for the coordination and management of the individual COVID-19 project which will be provided, including central and local (decentralized) arrangements for coordination of activities, financial management and procurement. The relevant structures will be strengthened by the recruitment of additional staff/consultants responsible for overall administration,

procurement, and financial management under country specific projects. To this end, project will support costs associated with project coordination.

- Subcomponent 2.2: Monitoring and Evaluation. This component would support monitoring and evaluation of emergency preparedness and response, building capacity for clinical and public health research, including veterinary, and joint learning across and within countries. This sub-component would support training in participatory monitoring and evaluation at all administrative levels, evaluation workshops, and development of an action plan for M&E and replication of successful models. The sub-component could also finance among other things: (i) support to COVID-related research; (ii) Simulation exercises and After-Action review and post-epidemic learning phase of the national plan to adapt approaches for future epidemics.

1.1.4 Proposed New Activities (P 177076)

Based on the request for restructuring and additional financing from the parent project, few activities have been adjusted increasing the sub-components to six from four with the PDO retaining its status quo.

Component 1: Emergency COVID-19 Response (US\$504.28 million). This component would provide immediate support to break the chain of COVID-19 local transmission and limit the spread of COVID-19 in Nigeria through containment and mitigation strategies. The allocation for this component will be increased from US\$ 104.28 to US\$ 504.28 to accommodate the newly introduced subcomponents on vaccine acquisition and deployment.

Subcomponent 1.1: Federal Support and Procurement for COVID-19 Emergency Preparedness and Response (US\$14.28 million) will be retained as originally designed.

Subcomponent 1.2: Direct Support to States for COVID-19 Emergency Preparedness and Response. The scale of activities and allocation will be reduced from US\$ 90 million to US\$ 56.5 million. The scale down in activities under this subcomponent is in recognition of the fact that some of the initially conceived activities have been implemented using other sources since the parent project is yet to start disbursing IDA resources, as well as a recalibration of the scale of some activities given implementation experience and newly available information.

Subcomponent 1.3 (COVID-19 Vaccine acquisition US\$ 357.5 million) will fund the acquisition of COVID-19 vaccines and related costs from AVATT to cover an additional 18.4 percent of the population on top of the COVAX grant of 20 percent population coverage. The related cost includes UNICEF handling charges as procurement agency, legal fees, provision for No Fault Compensation Scheme, Commission charged on guarantee provided by Afrexim Bank to Johnson & Johnson, Afrexim Bank Down Payment Advance and Freight to point of Entry. This subcomponent will be funded purely from new resources from the AF.

Subcomponent 1.4 (COVID-19 Vaccine deployment US\$ 76 million) will fund needed activities geared towards the deployment of COVID-19 vaccines at the subnational levels to ensure that the COVID-19 vaccines are available in the country and are deployed safely, timely, effectively and without wastages in all administrative wards in Nigeria. The activities include development of microplans for vaccination, training and retraining of health workers on microplanning and vaccine implementation, advocacy communication and social mobilization, monitoring and supervision of vaccination, pharmacovigilance, AEFI kits and data tools, payment to personnel involved in deployment of vaccines, procurement of cold boxes, carriers and PPE for vaccination

teams and transport and logistics costs for vaccines within the states. Vaccination teams that will be paid a stipend include members of the Nigeria Police Force and Nigeria Civil Defence Corps for their role in maintaining law and order at vaccination sites and providing escort services for movement of vaccines. This subcomponent will be partly funded from a reallocation of US\$ 33.5 million of existing funds from Component 1.2 (Direct Support to States for COVID-19 Emergency Preparedness and Response) of the parent project and from an addition of US\$ 42.5 million from new resources from the AF.

Sub-component 1.3 and 1.4 will be managed by the National Primary Healthcare Development Agency (NPHCDA) but still under the same disbursement category as Component 1.2 to allow some flexibility in the states' reallocation of funds for more traditional response activities (subcomponent 1.2) such as surveillance, testing, case management, etc., and the newly introduced vaccine deployment activities (subcomponent 1.4) during implementation without restructuring.

Component 2: Project Management, Coordination, Monitoring and Evaluation (US\$10.00 million) is retained as originally designed. It will continue to support coordination, monitoring, operational support and logistics, and project management. This will include operational support to the national EOC; support to the COVID-19 Incident Management System (IMS) Coordination Structure; operational reviews, routine monitoring, and rapid surveys to assess implementation progress and inform adjustments to operational plans; and project management. Its Subcomponent 2.1: Project Management and Coordination (US\$5.00 million) and Subcomponent 2.2: Monitoring and Evaluation (US\$5.00 million) will also be retained.

1.1.5. Stakeholders Consultation

At this stage, only few of the affected key stakeholders were consulted. Given the emergency nature of this operation and the transmission dynamics of COVID-19, consultations have been limited to telephone and virtual meetings with relevant government officials. Consultations were done in-house for ten days from 13-23 July, 2021 with members of the PCU while virtual consultations were carried out on 30th, July 2021 with State Epidemiologists. Letters were sent on the 30th of July 2021 to the key MDAs: Ministry of Health, NPHCDA and NAFDAC. As at the time of compiling this report, they were yet to confirm their availability.

Summary of Consultation

Name of Stakeholder	Key Issues	Response
CoPREP Liaison Officer	<ul style="list-style-type: none"> The State Ministry of Health Reporting line is not in tandem with the proposed reporting structure for the project, such would cause unnecessary delay. The project needs full support of the Governors from inception. Delay in disbursement 	<p>It was advised and agreed that the proposed State Steering Committee meeting should explain the Bank's requirement.</p> <p>The Bank procedures should also be communicated through the ESMF and PIM to the Governors during the proposed meeting with the Nigerian Governors' Forum</p>
CoPREP M&E	Continuous delay in internal disbursement of funds for contractors for REDISSE II which	The PCU has designated different persons to handle the account for CoPREP

Name of Stakeholder	Key Issues	Response
	is likely to reoccur in Nigeria CoPREP.	
Benue State Epidemiologist	<ul style="list-style-type: none"> • Points of Entry are not adequately equipped • Laboratories for COVID 19 test are only visible in the State Capital and few towns • Waste management is poor as Makurdi is the main centre for burning waste using a makeshift facility • Internal displaced persons are over 1 million • Social issues are resolved through traditional means • Numerous urgent needs for HCF 	<p>All these issues should be captured in the State Incident Action Plan</p> <p>The ESMF and Updated HCWMP would outline the necessary mitigation steps with regards to waste management and social issues</p>
Ebonyi State Epidemiologist	<ul style="list-style-type: none"> • Most of their HCF do not have direct water supply as they have to rely on boreholes • Vehicles are hired to move HCW from collection centres to disposal area. This takes time and increases potential rate of infection 	All these issues should be captured in the State Incident Action Plan
Ekiti State Surveillance Officer representing the State Epidemiologist	<ul style="list-style-type: none"> • HCW is disposed on dumpsite after collection from holding areas for days. 	The project would consider looking into this, as the position of DSNO is critical in reporting disease outbreak

Chapter 2: Healthcare Waste and Legal Provision

2.1 Definitions of Healthcare Waste in Nigeria

According to the Basel Convention: “Environmentally sound management of hazardous waste or other wastes” means taking all practicable steps to ensure that hazardous wastes or other wastes are managed in a way which will protect human health and the environment against the adverse effects which may result from such wastes.

Hazardous healthcare waste is of primary concern, due to its potential to cause disease or injury. Precise definitions of types of healthcare waste (HCW) must take into account the associated hazards and should be incorporated into Nigeria healthcare waste management (HCWM) legal, regulatory, technical, and information documents.

The hazardous nature of HCW may be due to the following properties:

- It contains infectious agents
- It contains sharps
- It is cytotoxic or genotoxic
- It contains toxic or hazardous chemicals or pharmaceuticals
- It is radioactive

Healthcare Waste (HCW) is all waste generated by health-care establishments (human or veterinary), including research facilities and laboratories. It can include waste generated in the course of healthcare in homes. HCW includes:

(1) Non-risk (General) healthcare waste: includes all waste that has not been contaminated with infectious materials or other hazardous materials. UNEP recommendations include in this category all items such as gloves, gauze, dressings, and swabs that have been used for medical care but are visually not contaminated with blood or body fluids of the patient. This waste category is considered domestic waste and can be managed by municipal waste services.

(2) Hazardous healthcare waste:

a) **Infectious waste:** comprises all healthcare waste known or clinically assessed by a medical or healthcare practitioner, public health officer or Environmental health officer to have the potential of transmitting infectious agents to humans or animals.

b) **Pathological Waste:** includes all organs (including recognizable body parts and placentas), tissues as well as blood and body fluids.

c) **Chemical waste, waste with high contents of heavy metals and pressurized containers:** includes gaseous, liquid and solid chemicals, waste with a high content of heavy metals such as pressurized containers, photographic fixing and developing solutions, halogenated or non-halogenated solvent.

d) **Pharmaceutical Waste:** includes medicines, expired, adulterated/fake drugs and vaccines. Not all the pharmaceutical wastes are hazardous. Because the Federal Ministry of Health has initiated specific measures to reduce the wastage of drugs, healthcare facilities should only need to dispose of small quantities of pharmaceutical waste.

e) **Mercury Waste:** includes wastes from mercury containing devices such as batteries, dental amalgam, thermometers, blood-pressure gauges and fluorescent tubes.

(3) Highly hazardous healthcare waste:

a) **Sharps** are all objects and materials that pose a potential risk of injury and infection due to their puncture or cutting properties. Sharps are considered as one of the most hazardous categories of waste generated during medical activities and must be managed with the utmost care.

b) **Highly infectious waste** includes all viable biological and pathological agents artificially cultivated in significant elevated numbers. Cultures and stocks, dishes and devices used to transfer, inoculate and mix cultures of infectious agents belong to this category of waste.

c) **Radioactive Waste:** includes liquids, gas and solids contaminated with radionuclide whose ionizing radiations have genotoxic effects. Table

Table 1: Major Categories of Medical Waste

Waste type	Description
1. Infectious waste	Infectious wastes are susceptible to contain pathogens (or their toxins) in sufficient concentration to cause diseases to a potential host. Examples include discarded materials or equipment, used for the diagnosis, treatment and prevention of disease that has been in contact with body fluids (dressings, swabs, nappies, blood bags etc). It also includes liquid waste such as faeces, urine, blood or other body secretions.
2. Pathological and anatomical waste	Pathological waste consists of organs, tissues, body parts or fluids such as blood. Anatomical waste consists in recognizable human body parts, whether they may be infected or not.
3. Hazardous pharmaceutical waste	Pharmaceutical waste includes expired, unused and contaminated pharmaceutical products, drugs and vaccines. This category also includes discarded items used in the handling of pharmaceuticals like bottles, vials and connecting tubing.
4. Hazardous chemical waste	Chemical waste consists of discarded chemicals (solid, liquid or gaseous) that are generated during disinfecting procedures. They may be hazardous (toxic, corrosive, flammable or reactive) and must be used and disposed of according to the specification formulated on each container.
5. Waste with a high content of heavy metals	Waste with high contents of heavy metals and derivatives are highly toxic (e.g. cadmium or mercury from thermometers or manometers).
6. Pressurized containers	Pressurized containers consist of full or emptied containers or aerosol cans with pressurized liquids, gas or powdered materials
7. Sharps	Sharps are items that can cause cuts or puncture wounds (e.g. needle stick injuries). They are highly dangerous and potentially infectious waste. They must be segregated, packed and handled specifically within the HCF to ensure the safety of the medical and ancillary staff.

8. Highly infectious waste	This includes microbial cultures and stocks of highly infectious agents from medical laboratories. They also include body fluids of patients with highly infectious diseases.
9. Genotoxic/cytotoxic waste	Genotoxic waste includes all the drugs and equipment used for mixing and administration of cytotoxic drugs. Cytotoxic drugs or genotoxic drugs are drugs that have the ability to reduce the growth of certain living cells and are used in chemotherapy for cancer.
10. Radioactive waste	Radioactive waste includes liquids, gas and solids contaminated with radio nuclides whose ionizing radiations have genotoxic effects. These include x- and g-rays as well as a- and b- particles.

Source: Safe Management of Wastes from Health-Care Activities, WHO 1999

2.2 Baseline Assessment of HCWM Practices in Nigeria

In general, HCW is poorly managed in Nigeria. Normally, it is estimated that between 10% and 25% of healthcare waste generated by medical institutions are hazardous in nature. However, this is much higher in Nigeria due to the poor HCWM practices (poor segregation at source of generation, poor transportation mechanisms, poor storage). In a Medical Waste Management survey conducted by Aliyu, 2006 in sampled health institutions in the Federal Capital Territory (FCT), it was found that 26.5% of the healthcare waste to be hazardous. This figure is expected to be much higher in the states and local governments.

The study results also indicated that 18% of healthcare institutions incinerate their solid wastes in locally built brick incinerators without adequate protection to the environment; 36.3% of the institutions simply dispose of their medical wastes into the Abuja municipal dumpsite. These health care wastes were found not to be treated before dumping into the dustbin at the dumpsite; 9.1% buried their solid wastes; while another 36.3% had their waste burnt off in open pits. Liquid medical wastes were disposed directly into the municipal sewer system by all the institutions surveyed. Waste segregation and non-thermal waste disposal techniques such as autoclaving were not used for HCWM by any of the selected healthcare institutions surveyed.

A cross-sectional survey of injection safety and HCWM practices in Nigeria (FMoH and MMIS, 2004) detected equally weak HCWM systems in healthcare facilities at all levels. Safety boxes were not used in 63% of facilities and there were no sharps boxes in 69% of all injections delivery points. Only 29% of providers placed the needle and syringe in a closed container immediately after injection. After vaccinations, 63% of providers placed used injection equipment in over-flowing, pierced or open containers. Injection equipment was found in containers other than safety boxes or in open or overflowing containers in 83% of all survey sites. Used sharps were found on the grounds of 65% of all healthcare facilities visited. Unsupervised open dumping was found in 22% of facilities. Burning in a pit or an enclosure was found in 14% of HCFs and; open burning on the ground was performed in 12% of HCFs visited during this assessment.

2.2.1 Current Assessment of HCW Management in Few HCFs

Existing waste management facilities differ among hospitals, it consists mostly of: Incinerators built with primary and secondary burners, and in some cases, drum incinerators, which do not have air pollution abatement facilities; Autoclaving; Chemical disinfection; Controlled Open Burning; Open ditches; Dumpsites; Landfills; Pit latrines and Septic tanks. In August 2020, waste assessment was conducted in

some selected HCFs responding to COVID-19 outbreak and some of the gaps are highlighted below

Table 2: Field Assessment of HCF

S/No	HCF	Findings
1.	University of Abuja Teaching Hospital Gwagwalada, FCT	<ul style="list-style-type: none"> ➤ Improper waste transport and handling within the facility ➤ Backlog of waste ➤ Fair provision of PPEs for waste handlers ➤ Irregular training ➤ Presence of small waste conveyer truck <p>No dedicated marked waste route</p>
2.	NCDC Reference Laboratory (NRL), Gaduwa	<ul style="list-style-type: none"> ➤ Hazardous solid waste is autoclaved before incinerating ➤ Wastewater is pre-treated onsite before releasing into the environment, although wastewater is not analyzed ➤ Existing medical waste incinerator is not functioning ➤ Partial open burning of HCW ➤ The alternative waste disposal method is grossly inadequate and environmentally unfriendly ➤ Presence of waste manifest and PPEs ➤ Absence of air emission monitoring ➤ Disposal of ash is not well managed <p>Good OHS signage</p>
3	Federal Medical Centre, Airport Road, Abuja	<ul style="list-style-type: none"> ➤ Waste is collected onsite and transported to NRL ➤ Absence of waste manifest ➤ PPEs adequate <p>Improper label of waste</p>
4	International Conference Centre (ICC) COVID 19 Sample Collection Centre	<ul style="list-style-type: none"> ➤ Waste is collected onsite and regularly transported to NRL ➤ Adequate PPEs and waste management procedure <p>No dedicated marked waste route</p>
5	National Hospital Abuja	<ul style="list-style-type: none"> ➤ The Waste management facility is over-burdened ➤ The Incinerator is usually overwhelmed with back-log of wastes due to inflow of waste from external health facilities <p>Dense and dark air emitting from the air stack chamber</p>
6	Central Public Health Laboratory, Yaba	<ul style="list-style-type: none"> ➤ Open burning of HCW ➤ Waste is pre-treated through autoclave ➤ Absence of incinerator ➤ Air emission from open burning, absence of waste manifest <p>No defined route for waste transport</p>
7	Nigeria Institute of Medical Research (NIMR)	<ul style="list-style-type: none"> ➤ Poor state of medical waste incinerator; ➤ Issues of Air pollution

S/No	HCF	Findings
		<ul style="list-style-type: none"> ➤ Backlog of waste due to COVID 19 sample collection and treatment ➤ The waste is pre-treated through autoclave ➤ Inadequate PPEs <p>Improper waste treatment and ash disposal</p>
8	LUTH	<ul style="list-style-type: none"> ➤ Poor state of medical waste incinerator; ➤ Inappropriate disposal of ash ➤ Littered waste around the incinerator <p>Dense and dark air emitting from the air stack chamber</p>

Source: Field work

Some of these challenges would be addressed as follows

- Specific training for HCW workers are highlighted in section 7.3
- The need to refurbish or procure incinerators are embedded in the Parent Project under Sub-component 1.2. However, this depends entirely on the Incident Action Plan from Implementing States.

2.3 Risks Associated with Health Care Waste

Health care waste management is an integral part of hygiene and infection control within a health care facility and safe HCWM will help control infections and occupational hazards. All individuals exposed to HCW are potentially at risk of being injured or infected. These individuals include:

- Medical staff: doctors, nurses, pharmacists, laboratory scientists, etc;
- In- and out-patients and their visitors;
- Workers in support services such as laundries, waste handling, maintenance personnel, cleaning staff, and transportation staff;
- Workers in waste disposal facilities, including scavengers;
- General public, including children playing with hazardous items that they find in the waste outside the health care facilities (HCF) when it is made accessible through improper HCWM.

The general public can be infected by HCW either directly or indirectly through several routes of contamination. Dumping HCW in open areas is a practice that can have major adverse effects on the population. Reuse of improperly disposed injection equipment is another route of infection by HCW. WHO estimates that over 20 million infections of hepatitis B, C and HIV occur yearly due to unsafe injection practices (reuse of syringes and needles in the absence of sterilization). Furthermore, there is a risk for public health as regards the sale of recovered drugs in the informal sector and the lack of controls.

The dumping of HCW in uncontrolled areas can have a direct environmental effect by contaminating soils and underground waters. During improper burning or incineration of HCW, air can also be polluted causing illnesses to the nearby populations. This has to be taken into consideration when choosing a treatment or a disposal method.

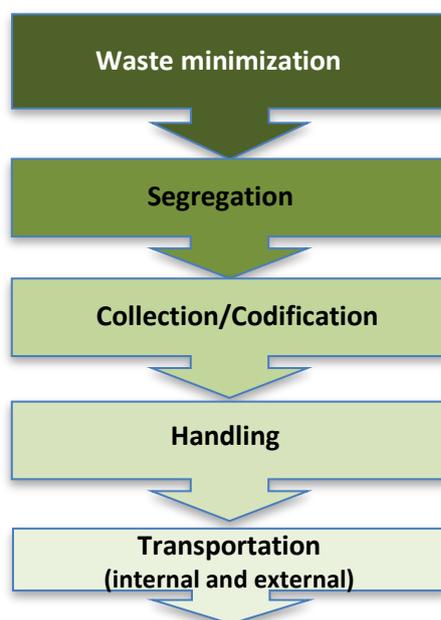
2.4 The Healthcare Waste Management Process

Below are some critical steps that must be considered when managing healthcare waste.

Table 3: Steps in Managing HCW

Waste Management Component	Key Elements for Safe and Effective HCWM
Generation	<ul style="list-style-type: none"> • Identification & classification of HCW material • Segregation of HCW at source based on categories (general wastes, sharps, infectious wastes, highly infectious wastes, pharmaceuticals) • Cleaning & Disinfection of personnel and surfaces that have come in contact with hazardous HCW
Collection	<ul style="list-style-type: none"> • Handling and Storage based on Colour Coding
In-Facility Storage	<ul style="list-style-type: none"> • Separate storage facility • Appropriate storage temperature • Waste not to be stored for more than 48 hours • Documentation and Assessment of the waste quantity • Packaging and Labelling • Monitoring
Transport	<ul style="list-style-type: none"> • Monitoring during Transportation • Documentation
Off-Facility Storage	<ul style="list-style-type: none"> • Separate Storage Facility • Documentation and Assessment of waste quantity • Monitoring
Treatment and Disposal	<ul style="list-style-type: none"> • Appropriate treatment using appropriate and affordable technology option

A schematic representation of the ideal situation is shown below.



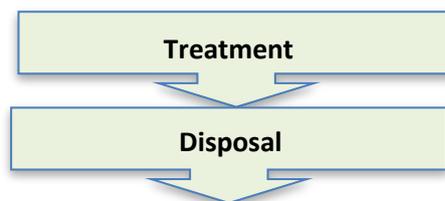


Figure 2.0: Schematic Representation of Health Care Waste Management

2.5 Legal and Regulatory Framework

This section reviews the current legal provisions for HCWM in Nigeria. There are a number of relevant Government Policies at Federal and State levels that are related to giving direction towards a safe and healthy environment which depends largely on the effective management of healthcare waste in the country. However, they are scattered and there is no particular legislation specifically dealing with healthcare waste management in Nigeria as of today.

Although currently there is no specific legislation, regulations or bye-laws for the Health Care Waste Management in Nigeria, there are relevant laws and regulations pertaining to the protection of the environment and health:

- **Decree no 58** of 1988 establishes the Federal Environmental Protection Agency with:
 - the responsibility to monitor and help enforce environmental protection measures;
 - the duty to co-operate with Federal and State Ministries, Local Government Councils and Research Agencies on matters and facilities relating to environmental protection;
 - the powers to establish standards, inspect, search, seize and arrest offenders.
- **Decree no 42** of 1988 Harmful Waste (Special Criminal Provisions, etc) prohibits the carrying, depositing and dumping of harmful wastes (injurious, poisonous, toxic or noxious substance) and prescribes penalties for those found guilty of improper practices.
- **Decree no 86** of 1992 sets out the procedures and methods for Environmental Impact Assessments on both public and private projects and states that the “construction of incineration plants” requires an environmental assessment.
- **Act no 11** of 31st July 2007 sets up National Environmental Standards and Regulation and Enforcement Agency to enforce compliance laws, guidelines, policies and standards on environmental matters in the country.

These regulations dealing with environmental issues have been identified including:

- **S.I. 8 National Effluent Limitation** of 1991 which makes it mandatory for industrial facilities to install anti-pollution equipment and make provision for effluent treatment. It also prescribes maximum limits of effluent parameters allowed for discharge.
- **S.I. 9 National Pollution Abatement in industries and facilities generating wastes** of 1991 imposes restrictions on the release of toxic substances and stipulates **requirements** for monitoring of pollution to ensure that permissible limits are not exceeded.
- **S.I. 15 Management of Solid and Hazardous Wastes Regulation** of 1991 deals with facilities that generate solid and hazardous waste. It also covers

hazardous waste treatment and disposal facilities and indicates requirements for such facilities including contingency planning, emergency procedures etc. Part 12 of this regulation provides for the tracking of wastes from their point of generation to the final disposal with specific details regarding HCW.

- **National Environmental Health Practice Regulations 2007** issued by the Federal Ministry of Environment
- **National Guidelines on Environmental health practice in Nigeria 2007**, issued by the Environmental Health Officers’ Registration Council of Nigeria

Nigeria’s National Policy on Environment was first published in 1989 and revised in 1999. It describes strategies for achieving the policy goal of sustainable development. Sanitation and waste management as well as toxic and hazardous substances are presented. No specific mention is made of HCW, although a number of points can be applied to hazardous substances.

There are several Legislation policies, guidelines, plans and blueprints that are applicable to HCWM in Nigeria. They are as follows:

	National Health-Care Waste Management Policy	2013
Summary.	This document presents the national policy on waste management in Nigeria taking into account three (3) sections-(i) General consideration and institutional mechanism in policy implementation at national level, (ii) Requirements for management of HCW in the medical institutions including regulation and definition of institutional Health Care Waste Management Plans.	
Definition.	The policy stipulates that HCW generated by both public and private medical institutions in Nigeria must be safely handled and disposed of by these medical institutions.	
Comments.	This document contains specific formulated policies presently been used as well as a laid down framework of lines of responsibilities for all parties involved.	
Suggestions.	There would certainly be the need for these policies to be formulated in the context of the present situation thus giving for a realistic implementation and adherence by all medical institutions involved to obtain effective results.	

	National Health-Care Waste Management Guidelines	2013
Summary	This comprehensive document presents guidelines and strategies for the sustainable management of HCW taking into account waste generation, waste types and waste treatment technologies. Also highlighting a number of critical areas and possible solutions.	
Definition	Hazardous HCW is of primary concern in Nigeria, due to its potential to cause diseases and/or injuries. Hazards associated with HCW should be incorporated into Nigeria’s HCWM legal, regulatory, technical and informational documents.	
Comments	HCWM is constitutionally the responsibility of the FMEEnv and SEPAs, with necessary input and support from the health ministries. Formulation and	

	implementation of HCWM policies and regulations rest with the FMEEnv in collaboration with FMOH.
Suggestion .	There is certainly the need for HCWM planning, formulating and implementing bodies to take into consideration the challenges procuring pragmatic and affordable HCWM disposal technologies.

	National Health-Care Waste Management Plan	2013
Summary.	This document presents strategies for the management of HCW taking into account the technical, financial and legal aspects, as well as public awareness, discussing also responsibility of the different levels of government (Local, State and Federal) and furthermore highlighting critical areas and possible solutions.	
Definition.	A NHCWM plan looks at practical steps to ensure that hazardous and non-hazardous medical wastes are managed properly to protect humans and the environment against the adverse effects which may occur as a result of indiscriminate handling of such wastes.	
Comments.	This document provide basic information about the development and implementation of HCWM plans as well as HCW types, treatment and disposal methods, also thus defining duties and responsibilities of staffs for different categories of HCFs in Nigeria.	

	Blueprint on Municipal Solid Waste Management in Nigeria	2000
Summary	This comprehensive document presents strategies for the sustainable management of municipal waste which take into account technical, legal and financial as well as public awareness issues. It discusses the responsibilities of the different levels of authority (Local Government, State and Federal, pp. 14-16) and highlights a number of critical areas and proffers possible solutions.	
Definition	An integrated municipal solid waste management strategy is advocated. It is made up of a series of steps that comprise, source reduction, recycling, incineration and land filling.	
Comment	Solid Waste Management is constitutionally the responsibility of the Local Government Councils which in many instances do not have the means of enforcing current regulations. This situation will have to be addressed.	
Suggestions	There will most certainly be the need for harmonizing laws/bylaws or existing regulations within each state and ideally at national level so as to avoid potential inter-state movements of certain wastes.	

	Blueprint: Handbook on Hazardous Waste Management	2000
Summary	This document provides a number of definitions and strategies regarding hazardous waste management as well as a categorization scheme based on the Basel Convention on Control of the Trans-boundary Movements of Hazardous Waste and their Disposal, signed and ratified by Nigeria.	
Definition	see handbook for details	
Comment	A few examples of industries which have adopted environmentally cleaner production practices are given, demonstrating that an ecological approach can also be economically interesting.	

	Blueprint on Environmental Enforcement, a Citizen's Guide	2000
Summary	This document aims at defining who the enforcers are (FMEnv, SEPA, LGA); how compliance, monitoring and inspections are conducted as well as types of enforcement actions and tools available. Citizens are encouraged to play an active role both by complying with environmental laws/rules at home and on the job as well as signalling any suspect activities they may notice.	
Definition	No specific definitions in relation with HCWM issues provided	
Comment	Suggests informing the general public about their duties and rights regarding environmental issues. To get the message across, it will nevertheless be necessary to conduct information campaigns within schools and with the use of the media.	

	Blueprint on compliance monitoring inspections	2000
Summary	This guide provides some basic information about the different types of inspections and how to carry them out.	
Definition	No specific definitions in relation with HCWM issues provided	

2.6 Review of Hospital Health Care Waste Regulations

The proper management of HCW depends to a large extent on strong HCFs administration and organisation. HCFs should have well organized HCWM procedures with explicit HCWM rules. These resources must be made readily available as a written document to all personnel of the facility. HCWM regulations for hospitals must demand that financial and material resources are made available so that HCWM procedures can be safely and routinely practiced. Nigeria now has a National Waste Management Plan. This will be used in addition to this project-specific Medical Waste Management Plan (MWMP).

2.7 Need for Regulation and Plan for Handling of Wastes from Vaccination and Routine Immunization for Polio Management

Although a well-defined Environmental Assessment legal system (EIA Act, Cap EI2LFN2004) for safeguarding the environmental aspect of the project exists as well as the recently approved National Strategic Healthcare Waste Management policy, including National Strategic Healthcare Waste Management Plan and Guideline for 2013 -2017 by the GoN, the operators, especially at facility levels do not seem to be aware of these hence inadequate health care waste management and thus poor implementation or utilization of the instruments.

Considering the potential risks posed by wastes generated by vaccination and routine immunization that generate healthcare waste such as expired vaccines and sharps there is an urgent need for a regulation and plan on handling wastes emanating from vaccination and routine immunization for Polio management.

2.8 Applicable International Agreements

At an international level, Nigeria has ratified the *Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal* (1992). It is also party to the *Stockholm Convention on Persistent Organic Pollutants* (2002) and Rotterdam Convention on prior informed consent on certain industrial chemicals and pesticides international trade.

2.9 World Bank Environmental and Social Framework

The Environmental and Social Framework demonstrate the World Bank's commitment to sustainable development, through a set of Environmental and Social Standards (ESSs) that are designed to support projects, with the aim of ending extreme poverty and promoting shared prosperity.

Five standards are applicable to the project as follows:

- ESS 1: Assessment and Management of Environmental and Social Risks and Impacts;

- ESS 2: Labour and Working Conditions;
- ESS 3: Resource Efficiency and Pollution Prevention;
- ESS 4: Community Health and Safety;
- ESS 10: Information Disclosure and Stakeholder Engagement

2.10 Review of Nigeria's National Healthcare Waste Management Plan, Guideline and Policy

Nigeria has demonstrated its commitment to mitigating adverse social and environmental impacts in the implementation of a range of World Bank projects. There are adequate legal and institutional frameworks in the country to ensure compliance with World Bank safeguards policies.

On September 4, 2013, the Nigerian Federal Executive Council (FEC) approved a new National Strategic Healthcare Waste Management policy, including National Strategic Healthcare Waste Management Plan and Guideline for the country. However, the prayer of the joint task group that prepared the reports was for the Government of Nigeria to pass the Health Care Waste Management Bill into law to establish legal controls and permit the regulatory bodies responsible for the safe disposal of healthcare waste to apply pressure for their implementation. Since 2013, the Bill has been with the National Assembly and yet to receive their assent. In terms of inter-sectoral commitment and cooperation, the fact that Ministers of Environment and Health jointly presented the memo seeking Council's approval for the adoption of the National Healthcare Waste Management policy, underscores the high level of the commitment of the Government toward improving the situation of the sector.

Generally, Nigeria is considered to have a fairly complete set of regulations and legal instruments. Passage into law of the proposed HealthCare Waste Management Bill is critical to implementation and enforcement of standards that improve medical waste management.

Chapter Three: Analysis of Healthcare Waste

3.1 Introduction

An analysis of the current situation across Nigeria with respect to medical waste generation segregation, collection, transportation, and disposal was reviewed. Medical wastes includes infectious wastes such as; swabs, syringes, blades, gloves are mostly mixed with municipal waste and disposed in open dumps where they are either burnt or left to decay.

Existing waste management facilities differ among hospitals, it consists mostly of:

- Incinerators built with primary and secondary burners, and in some cases, drum incinerators, which do not have air pollution abatement facilities;
- Autoclaving;
- Chemical disinfection;
- Microwave irradiation;
- Open ditches; sanitary landfills;
- Pit latrines and soak-away;
- Transportation of medical waste to off-site disposal sites; and
- Use of public drainage for infectious liquid disposal.

In urban areas, unregulated practices by both public, private hospitals and private waste collectors has resulted in dumping of medical waste (infectious and sharps) at municipal dump sites. Scavenging at these disposal sites pose severe public health risks. Possibilities of infections are very high considering the fact that scavengers do not wear any form of personal protection

3.2 Medical Waste Handling Practices

Medical waste handling is critical in minimizing health care associated risks to human health and the environment. The most significant risk occurs during transportation, this highlights the need for regulations and control measures to control segregation.

However, the disposal practise for sharps and used medical supplies are incinerated, disposed in pits or in the open, collected by specialized firms, mixed with general waste with the risk of infections at community level, exposure of garbage workers to infection

In this respect, the following are necessary:

- **Segregation of Medical Waste**

Segregation of wastes (infectious, non-infectious, sharps, anatomical parts) generated within hospitals helps in identifying the categories of waste and significantly reduces the risk associated with waste handling. At some teaching hospitals, wastes are segregated into various components.

- Sharps are systematically stored in separate sharp containers;
- Infectious wastes are stored in yellow-coloured containers,
- Anatomical wastes are stored in red coloured containers
- Other medical wastes are collected together into a variety of labelled waste bins and covered.

This practice is however not followed in some other health care institutions where all wastes are dumped in the same waste bin.

- **Injection Safety**

The disposal of sharps is unsatisfactory in many public HCFs. This poses significant risk to patients, health workers and the surrounding communities. Safe disposal of injection is a major cause of concern with respect to the spread of communicable diseases like hepatitis B and HIV/AIDS.

- **Waste Collection**

Few hospitals have treatment facilities (about 15%) for the health care wastes generated; hence most of the facilities transport waste off-site for disposal. Where there are disposal sites, the wastes are not removed on schedule and are not properly transported to the disposal site. At some private hospitals, collection of waste is limited to once a day when the cleaner comes in the morning to clean the entire facility. Storage and collection were observed to be most organized at general and teaching hospitals.

- **Waste Transportation**

Some facilities gather the wastes in bags and cartons and then transported off-site in secure trucks. In the rural areas, the wastes are often buried or burnt within the facility. In some urban areas, sharps and other wastes are transported to a private landfill for burial while anatomical and pathological wastes are buried.

- **Waste Disposal**

Current disposal practices varied depending on the category of the facilities, and type of disposal facilities available. All categories of infectious wastes are usually burnt except placenta and other anatomical wastes that are buried.

The scenario is different at some of the secondary, primary and private health centers. At the private clinics located in the semi-urban and rural areas, there are no significant differences in the way the medical waste and sharps are disposed.

3.3 Responsibility for Medical Waste Management

Responsibilities for waste management are not well defined in most HCFs except in tertiary and secondary HCFs. Most institutions do not have Environmental Health Officers and have delegated this duty to administrative staff.

In tertiary and secondary HCFs, Medical Waste Management Committees should be constituted and should include:

- Chief Medical Officer;
- Head of Hospital Departments;
- Chief Pharmacists;
- Radiation Officer;
- Financial Controllers;
- Senior Nursing Officer/ Head Matron; and
- Hospital Administrator.

In Primary HCFs (Rural and Urban), Medical Waste Management Committees should be constituted and should include:

- Senior Nursing Officer/Matron
- Hospital Administrator
- Nurses

Employers have a number of legal responsibilities which include:

- developing and maintaining a safe work environment and safe work practices;
- ensuring that hospital activities comply to state and national environmental standards; and
- providing staff training and education for the safe handling of health care waste.

Employees also have responsibilities which include:

- complying with safety instructions and the use of safe work practices for their own protection and for the protection of other staff and the public;
- actively supporting environmental initiatives introduced by the waste management committee; and
- comply with the requirements for the handling of chemical substances according to Material Safety Data Sheets (MSDS).

Chapter Four: Infection Control and Medical Waste Management Plan (ICMWMP)

The safe and sustainable management of medical waste is a public health imperative and a responsibility of partners working in the health sector. Improper management of medical waste poses a significant risk to patients, health-care workers, the community and the environment. This problem can be solved. The right investment of resources and commitment will result in a substantive reduction of disease burden and corresponding savings in health expenditures.²

The effective management of medical waste is an integral part of a national health-care system, and as such needs to be integrated in this project. A holistic approach to medical waste management should include a clear delineation of responsibilities, occupational health and safety programs, waste minimization and segregation, the development and adoption of safe and environmentally-sound technologies, and capacity building.

Medical waste refers to the entirety of waste generated by health care and medical research facilities and laboratories. Though only 10-25% of medical waste is considered hazardous, posing various health and environmental risks, it is essential that a comprehensive plan be developed to prevent and mitigate these risks.³

Best practices for safely managing health-care waste should be followed in COVID-19 treatment units, which includes assigning responsibility and sufficient human and material resources to segregate and dispose of waste safely. There is no evidence yet that direct, unprotected human contact during the handling of health-care waste has resulted in the transmission of the COVID-19 virus. All health-care waste is considered to be infectious (infectious, sharps and pathological waste) which is produced during patient care, including those with confirmed COVID-19 infection, and should be collected safely in clearly marked lined containers and sharp safe boxes. This waste should be treated, preferably on-site, and then safely disposed. It is critical to know where and how this waste will be treated and safely disposed if its transported off-site⁴

4.1 Objective of the ICMWMP

The plan's overall objective is to prevent and/or mitigate the negative effects of medical waste on human health and the environment. This must be managed in a safe manner to prevent the spread of infection and reduce the exposure of health workers, patients and the public to the risks from medical waste. The plan includes advocacy for good practices in medical waste management and is to be used by health, sanitary and cleaning workers who manage medical waste in mobile and fixed units, as well as health centers that are included in the project. All the health facilities and health services supported through the World Bank project are to have appropriate procedures and capacities in place to manage medical waste.

4.2 Management Measures

Measures to Enhance Infection Prevention/Reduce Exposure to Infections Or Diseases

Health care providers and personnel are exposed to infections particularly COVID-19 and other infections such as blood-borne pathogens, and other potential infectious materials (OPIM) during care and treatment, as well as during collection, handling,

² http://www.who.int/water_sanitation_health/facilities/waste/hcwprinciples.pdf?ua=1;

³ Yves Chartier, Jorge Emmanuel, Ute Pieper, Annette Prüss, Philip Rushbrook, Ruth Stringer, William Townend, Susan Wilburn, Raki Zghondi, eds, *Safe management of wastes from health-care activities* (Malta: World Health Organization, 2014), page 3.

⁴ <https://www.who.int/publications/i/item/water-sanitation-hygiene-and-waste-management-for-the-covid-19-virus-interim-guidance>

treatment, and disposal of health care waste. The following measures are recommended to reduce the risk of transferring infectious diseases to health care providers:

- Formulate an exposure control plan for COVID-19;
- Provide staff members and visitors with information on infection control policies and procedures;
- Establish Universal/Standard Precautions to treat all COVID-19 and other potentially infectious materials with appropriate precautions, including:
 - Use of standardized PPEs such as gloves, masks, and gowns
 - Adequate facilities for hand washing. Hand washing is the single most important procedure for preventing infections (e.g. nosocomial and community). Hand washing should involve use of soap / detergent, rubbing to cause friction, and placing hands under running water. Washings of hands should be undertaken before and after direct patient contacts and contact with patient blood, body fluids, secretions, excretions, or contact with equipment or articles contaminated by patients. Washing of hands should also be undertaken before and after work shifts; eating; smoking; use of personal protective equipment (PPE); and use of bathrooms. If hand washing is not possible, appropriate antiseptic hand cleanser and clean cloths / antiseptic towelettes should be provided. Hands should then be washed with soap and running water as soon as practical
 - Procedures and facilities for handling dirty linen and contaminated clothing, and preparing and handling food
 - Appropriate cleaning and waste disposal practices for the health care workplace
 - Availability of disinfection and cleaning supplies
- The following recommendations should be implemented when using and handling of needles / sharps:
 - Use safer needle devices and needleless devices to decrease needle stick or other sharps exposures.
 - Do not bend, recap, or remove contaminated needles and other sharps unless such an act is required by a specific procedure or has no feasible alternative
 - Do not shear or break contaminated sharps
 - Have needle containers available near areas where needles may be found
 - Discard contaminated sharps immediately or as soon as feasible into appropriate containers
 - Used disposable razors should be considered contaminated waste and disposed of in appropriate sharps containers
- Establish policies to exclude animals from facility property.

4.3 Medical Waste Management Procedures

As highlighted by WHO recommendations⁵, the first step in medical waste management is to minimize waste. To this end, a standardized assessment tool should be developed to identify gaps in the management process, including occupational health issues. Though all staff are responsible for managing waste, to ensure optimal waste management, it is recommended to establish a facility-based Waste Management Committee and designate a single waste management project lead. The project lead should coordinate the medical waste management system and be supported by the health facility management. In addition, the roles and responsibilities

⁵ http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf

of key personnel engaged in waste management activities should be defined during all phases (i.e. generation, segregation, transportation and final disposal) and a waste-management committee should be established.

4.3.1 Medical Waste Segregation, Collection, and Transport

Waste generated in waiting areas of health-care facilities can be classified as non-hazardous and should be disposed in strong black bags and closed completely before collection and disposal. All those who handle health-care waste should wear appropriate PPE (boots, long-sleeved gown, heavy-duty gloves, mask, and goggles or a face shield) and perform hand hygiene after removing it. The volume of infectious waste during the COVID 19 outbreak is expected to increase, especially through the use of PPE. Therefore, it is important to increase capacity to handle and treat this health-care waste. Additional waste treatment capacity, preferably through alternative treatment technologies, such as autoclaving or high temperature burn incinerators, may need to be procured and systems may need to be put in place to ensure their sustained operation. A programmed routine for biomedical waste collection should be established as part of the medical waste management plan. Waste should be separated into categories and placed in designated containers (i.e., covered buckets) as soon as it is generated in the treatment room or department. Health care workers are responsible for appropriately disposing of the waste. The number of places where patients and visitors can dispose of waste should be minimized (e.g. using designated containers in communal areas). WHO recommends that small amounts of chemicals can be collected with infectious waste.

Large amounts of hazardous chemicals should be packed in chemical resistant containers and be sent to specialized treatment facilities (if available).

Waste buckets should be transported with their lids securely in place to prevent spillage. When many containers need to be transported, a cart or trolley should be used to prevent back injury.

Offsite transport of hazardous waste should be subject to national regulations. If there are none, then the 'Recommendations on the transport of dangerous goods' published by the UN may be referred to. Certain recommendations should be followed by the sanitary workers and cleaners:

1. Collection of medical waste should be from key sites (e.g. within nursing stations, mobile and fixed units), followed by transfer to the designated point(s) for segregation and/or treatment
2. Waste should be collected daily at the same time (or as frequently as required) and transported to the designated central storage/treatment site.
3. No bags should be removed unless they are labelled with their point of production (health unit/center) and contents.
4. Bags or containers should be replaced immediately with new ones of the same type.
5. There should be enough buckets provided to ensure an appropriate number of clean buckets in rotation. Buckets should be washed and disinfected before reuse.
6. The waste should be placed in rigid or semi-rigid and leak-proof containers.

4.3.2 Waste Segregation Strategies

At the point of generation, waste should be identified and segregated. Non-hazardous waste, such as paper and cardboard, glass, aluminum and plastic, should be collected separately and recycled. Food waste should be segregated and composted. Infectious and / or hazardous wastes should be identified and segregated according to its

category using a color-coded system. If different types of waste are mixed accidentally, waste should be treated as hazardous. Other segregation considerations include the following:

- Avoid mixing general health care waste with hazardous health care waste to reduce disposal costs;
- Segregate waste containing mercury for special disposal.
- Management of mercury containing products and associated waste should be conducted as part of a plan involving specific personnel training in segregation and clean up procedures;
- Segregate waste with a high content of heavy metals (e.g. cadmium, thallium, arsenic, lead) to avoid entry into wastewater streams;
- Separate residual chemicals from containers and remove to proper disposal containers to reduce generation of contaminated wastewater. Different types of hazardous chemicals should not be mixed;
- Establish procedures and mechanisms to provide for separate collection of urine, feces, blood, vomits, and other wastes from patients treated with genotoxic drugs. Such wastes are hazardous and should be treated accordingly
- Aerosol cans and other gas containers should be segregated to avoid disposal via incineration and related explosion hazard;
- Segregate health care products containing PVC to avoid disposal via incineration or in landfills

4.3.3 On-site Handling, Collection, Transport and Storage

- Seal and replace waste bags and containers when they are approximately three quarters
- Full bags and containers should be replaced immediately;
- Identify and label waste bags and containers properly prior to removal;
- Transport waste to storage areas on designated trolleys / carts, which should be cleaned and disinfected regularly;
- Waste storage areas should be located within the facility and sized to the quantities of waste generated, with the following design considerations:
 - Hard, impermeable floor with drainage, and designed for cleaning / disinfection with available water supply
 - Secured by locks with restricted access
 - Designed for access and regular cleaning by authorized cleaning staff and vehicles
 - Protected from sun, and inaccessible to animals / rodents
 - Equipped with appropriate lighting and ventilation
 - Segregated from food supplies and preparation areas
 - Equipped with supplies of protective clothing, and spare bags / containers.
- Unless refrigerated storage is possible, storage times between generation and treatment of waste should not exceed the following:
 - Temperate climate: 72 hours in winter, 48 hours in summer
 - Warm climate: 48 hours during cool season, 24 hours during hot season.
- Store mercury separately in sealed and impermeable containers in a secure location;
- Store cytotoxic waste separately from other waste in a secure location;

- Store radioactive waste in containers to limit dispersion, and secure behind lead shields.

4.3.4 Waste Handling Safety Measures

1. All personnel handling infectious medical waste shall wear gloves and additional protective medical clothing and personal protective equipment (PPE) appropriate to the level of risk they encounter and shall remove any protective medical clothing used prior to leaving the work area and to place it in a designated area or container. When performing procedures where splashing is not expected, gloves are the minimum PPE that may be worn;
2. Protective medical clothing and PPE should not be submitted for laundering unless sterilized;
3. When performing procedures where splashing may occur or when infectious medical waste bags or containers may contact more than the worker's hands and wrists, the following medical protective clothing and PPE is required in addition to gloves;
 - Appropriate protective medical clothing should be of material that does not permit infectious medical waste from penetrating and reaching workers clothes or skin;
 - Eye protection, surgical face masks, and face shields when personnel may reasonably anticipate facial exposure to infectious medical waste.
 - Implement immunization for staff members, as necessary (e.g. vaccination for hepatitis B virus, tetanus immunization).

4.3.5 Medical Waste Storage and Packaging

1. A temporary waste storage area, inside the waste zone, should be set aside to store soft waste until it can be incinerated. Storage of medical waste should be for the minimum possible time, 24-48 hours in hot countries, 48-72 hours for cold countries (WHO).
2. Biomedical waste other than sharps and bulk liquids must be packaged in sealed in bags which are leak-proof and rip-resistant.
3. Sharps shall be placed in rigid leak and puncture resistant containers.
4. Bulk liquids to be transported off-site shall, in addition to the above requirements, be placed in rigid containers.
5. All medical waste must be stored in a secure area designated for this material.
6. Pathological waste, stored anywhere for more than 24 hours must be refrigerated. Storage of biomedical wastes may need to be stored at the facility of origin until a large enough quantity is accumulated to warrant on-site treatment, or until transport to an offsite treatment facility is scheduled.

The following general guidelines apply to typical medical waste storage, transfer, and collection areas:

1. Store medical/infectious waste in a designated area located at or near the treatment site or the waste pickup point.
2. Areas used to store medical/infectious waste should be durable, easily cleanable, impermeable to liquids, and protected from vermin and other potential mechanisms that might spread infectious agents.
3. The manner of storage should maintain the integrity of the containers, prevent leakage of waste from the container, provide protection from the weather, and maintain the waste in a non-putrescent, odorless state (this may require refrigeration).
4. Storage areas should have adequate ventilation systems.

5. Access should be securely controlled and limited. Due to the hazardous nature of some medical wastes, appropriate methods of storing waste will help to prevent accidents and infections. Storage locations should be accessible, exclusive, secure, hygienic and sanitary, located as far as possible from patient treatment areas. Storage locations should be integrated with the physical and architectural infrastructure of the healthcare facility.

4.3.6 Transport to External Facilities

1. Transport waste destined for off-site facilities according to the guidelines for transport of hazardous wastes / dangerous goods in the General EHS Guidelines;
2. Transport packaging for infectious waste should include an inner, watertight layer of metal or plastic with a leak-proof seal. Outer packaging should be of adequate strength and capacity for the specific type and volume of waste;
3. Packaging containers for sharps should be puncture-proof;
4. Waste should be labeled appropriately, noting the substance class, packaging symbol (e.g. infectious waste, radioactive waste), waste category, mass / volume, place of origin within hospital, and final destination;
5. Transport vehicles should be dedicated to waste and the vehicle compartments carrying waste sealed.

4.3.7 Disposal of Contaminated Waste

In facilities that have a waste zone, this is the final disposal site of the medical waste. A fully functional waste zone should have the following components:

1. An incinerator or burner for treatment of soft waste.
2. An ash pit for disposal of residues from the incinerator or burner and a covered pit with a hatch lid.
3. A sharps pit for disposal of sharps containers. A sealed, covered pit with a 1m length of pipe incorporated in the top to prevent access to the contents.
4. An organics pit for disposal of human tissue and other biological waste.
5. An infiltration facility or sewer for the disposal of liquids.

The waste zone should be kept locked at all times. The waste manager has the responsibility for its correct management. Kitchen waste and general waste from patients and visitors is not classified as medical waste. Types of medical wastes are in Annex 1.

4.3.8 Best Practice for the Disposal of Liquid Contaminated Wastes

Liquid contaminated waste (e.g. human tissue, blood, feces, urine and other body fluids) requires special handling, as it may pose an infectious risk to healthcare workers with contact or handle the waste. Steps for the disposal of liquid contaminated wastes are the following:

- Wear PPE (utility gloves, protective eyewear and plastic apron)
- Carefully pour wastes down a utility sink drain or into a flushable toilet and rinse the toilet or sink carefully and thoroughly with water to remove residual wastes. Avoid splashing.
- If a sewage system doesn't exist, dispose of liquids in a deep, covered hole, not into open drains. This should be located at a safe distance from water sources.
- Decontaminate specimen containers by placing them in a 0.5% chlorine solution for 10 minutes before washing them.

- Remove utility gloves (wash daily or when visibly soiled and dry).
- Wash and dry hands or use an antiseptic hand rub as described above.

Acids and alkalis should be diluted; pH neutralized and disposed of to the sewer with water. Neutralization can be done with lime, which is cheap and effective.

In cases where wastewater is not discharged to sanitary sewage systems, HCF operators should ensure that wastewater receives on-site primary and secondary treatment, in addition to chlorine disinfection. Techniques for treating wastewater in this sector include source segregation and pretreatment for removal / recovery of specific contaminants such as radio isotopes, mercury, etc.; skimmers or oil water separators for separation of floatable solids; filtration for separation of filterable solids; flow and load equalization; sedimentation for suspended solids reduction using clarifiers; biological treatment, typically aerobic treatment, for reduction of soluble organic matter (BOD); biological or chemical nutrient removal for reduction in nitrogen and phosphorus; chlorination of effluent when disinfection is required; dewatering and disposal of residuals as hazardous medical / infectious waste.

Additional engineering controls may be required for (i) removal of active ingredients (antibiotics and miscellaneous pharmaceutical products, among other hazardous constituents), and (ii) containment and treatment of volatile constituents and aerosols stripped from various unit operations in the wastewater treatment system.

Wastewater generated from use of wet scrubbers to treat air emissions should be treated through chemical neutralization, flocculation, and sludge settling. Sludge should be considered hazardous, and may be treated off-site in a hazardous waste facility, or encapsulated in drums with mortar and landfilled. Sludge treatment should include anaerobic digestion to ensure destruction of helminths and pathogens. Alternatively, it can be dried in drying beds before incineration with solid infectious wastes.

The most contaminated wastewater will come from the mortuary, showers, laundry, and kitchen washing area. Wastewater from this area must, therefore, be disposed of in soak pits possibly after first going through grease traps (so that the soak pit does not become clogged). Soak always must be located at least 30 meters from any groundwater source and the bottom of any soak away pit is at least 1.5 meters above the water tables.

Annex 3 shows the treatment and disposal methods for categories of health care waste

4.3.9 Best Practice for the Disposal of Solid Contaminated Wastes

Solid contaminated waste (e.g. surgical specimens, used dressings and other items contaminated with blood and organic materials) may carry microorganisms. Remember:

- Never use hands to compress waste into containers
- Hold plastic bags at the top
- Keep bags from touching or brushing against the body while lifting or during transport

Steps for the disposal of solid contaminated wastes are:

- Wear heavy-duty or utility gloves when handling and transporting solid wastes.
- Wearing glasses if you are working with material that may splash into your face or eyes
- Dispose of solid wastes by placing them in a plastic or galvanized metal

- container with a tight-fitting cover. Never recap needles after use.
- Collect the waste containers on a regular basis and transport the burnable ones to the incinerator or area for burning.

If incineration is not available or waste is non burnable, bury it. Remove utility gloves (wash daily or when visibly soiled and dry).

- Wash and dry hands or use an antiseptic hand rub as described above.
- Disposing of waste into designated containers as soon as it is generated
- Wearing boots, overalls, glasses and gloves when disposing of waste
- Using adequate tools to avoid contact with waste (brush, shovel)

It should be mentioned that properly designed and operated sanitary landfills will protect against air and groundwater contamination. Disposal of waste into open dumps is not considered good practice and should be avoided. Pre-treatment of waste prior to land disposal may involve encapsulation (filling containers with waste and an immobilizing material and sealing the containers).

4.3.10 Incineration

Incineration is a high-temperature process that reduces the volume and weight of waste. This process is usually selected to treat waste that cannot be recycled, reused or disposed of in a sanitary landfill or dumpsite. Medical waste produced under this project will be incinerated at health facilities that are equipped with incinerators. In facilities with no incinerators, wastes will be properly collected and safely transported to bigger facilities with incinerators.

Types of Incinerators

Incinerators can range from extremely sophisticated, high-temperature ones to very basic units that operate at much lower temperatures. All types of incinerators, if operated properly, eliminate micro-organisms from waste and reduce the waste to ashes. Four basic types of incinerators are used for treating waste:

- a) Double-chamber, high-temperature incinerators are designed to burn infectious waste.
- b) Single-chamber, high-temperature incinerators are less expensive and are used when double chamber incinerators are not affordable.
- c) Rotary kilns operate at high temperatures and are used for destroying cytotoxic substances and heat-resistant chemicals.
- d) Drum or brick (clay) incinerators operate at lower temperatures and are less effective, but can be made locally using readily available materials.

Types of Waste That Should Not Be Incinerated

While it is possible to incinerate soft waste, the below items SHOULD NOT be incinerated:

- Pressurized gas containers (aerosol cans)
- Large amounts of reactive chemical waste
- Silver salts and photographic or radiographic wastes
- Plastic containing polyvinyl chloride (blood bags, IV tubing or disposable syringes)
- Waste with high mercury or cadmium content, such as broken thermometers, used batteries and lead-lined wooden panels

- Ampoules or vials, as molten glass will cause the grate to block up and vials can explode.
- Bottles of chemicals and reagents due to risk of explosion and formation of toxic gases.
- Needles due to the risk of needle stick injury from the metal ash.
- Expired drugs.
- Kitchen waste as this is wet, does not burn and will lower the efficiency.

Solid wastes that should not be incinerated will be packaged, transported to and disposed of in Government recognized landfill. Annex 3 shows the treatment and disposal methods for categories of health care waste.

4.3.11 Waste Minimization, Reuse, and Recycling

Facilities should consider practices and procedures to minimize waste generation, without sacrificing patient hygiene and safety considerations, including:

- Source reduction measures:
 - Consider options for product / material substitution to avoid products containing hazardous materials that require the product to be disposed as hazardous or special waste (e.g. mercury or aerosol cans), and preferring products with less packaging or products that weigh less than comparable products that perform the same function
 - Use of physical rather than chemical cleaning practices (e.g. using microfiber mops and cloths), where such practices do not affect disinfection and meet relevant standards for hygiene and patient safety.
- Waste toxicity reduction measures:
 - Consider options for product / material substitution for equipment containing mercury or other hazardous chemicals; products that may become hazardous waste when disposed; products made of polyvinyl chloride (PVC6); halogenated compounds; products that off-gas volatile organic compounds (VOCs), or products that contain persistent, bio -accumulative and
 - toxic (PBT) compounds; products that contain substances which are carcinogenic, mutagenic or reproductive toxins (CMR)
 - Use of efficient stock management practices and monitoring (e.g. for chemical and pharmaceutical stocks), including:
 - Small / frequent orders for products that spoil quickly and strict monitoring of expiry dates
 - Complete use of old product before new stock is used.
- Maximization of safe equipment reuse practices, including:
 - Reuse of equipment following sterilization and disinfection (e.g. sharps containers)

Open Burning

Open Burning is not recommended because it is dangerous, unsightly and the wind will scatter the waste. If open burning must be done, burn in a small, designated area, transport waste to the site just before burning and remain with the fire until it is out.

Burying Waste

Only contaminated and hazardous waste needs to be buried. In healthcare facilities with limited resources, safe burial of wastes on or near the facility may be the only option available for waste disposal. To limit health risks and environmental pollution, some basic rules are:

1. Access to the disposal site should be restricted (Build a fence around the site to keep animals and children away).
2. The burial site should be lined with a material of low permeability (e.g. clay), if available.
3. Select a site at least 50 meters (164 feet) away from any water source to prevent contamination of the water table. The site should have proper drainage, be located downhill from any wells, free of standing water and not in an area that flood.
4. Large quantities (over 1 kg) of chemical (liquid) wastes should not be buried at the same time; burial should be spread over several days. Safe on-site burial is practical for only limited periods of time (1–2 years), and for relatively small quantities of waste. During the interval, staff should continue to look for a better, permanent method for waste disposal.

Annex 3 shows the treatment and disposal methods for categories of health care waste

Cost of Implementing the Medical Waste Management Plan

The cost associated with the implementation of the arrangements, practices and measures suggested in this plan is built in the sub-component 1.2 of the Parent Project No special requirements are needed for implementing this plan.

Suggested incinerators at small scale health facilities

Double Chamber Rotary Kiln incinerator model is considered as a suitable option of waste disposal. The incinerator is actually a double chambered refractory structure having metal components in the form of waste loading door, ash removal door, and chimney. The incinerator operates on burning of medical waste in specific temperature range from 900^o C to 1500^oC. The temperature range should be monitored by a high temperature digital thermometer mounted with the main structure. Close monitoring of the controlled burning reduces the emission of dioxin and furan which are the main objectionable environmental pollutants of incineration. Waste is loaded from waste loading door after pre heating using kerosene oil as supplementary fuel. The temperature is maintained in the desired range by waste loading frequency. After burning of infectious waste in the primary combustion chamber the toxic gases find passage in the secondary combustion chamber where further oxidation reduces the amount of dioxin and furans as a result atmosphere receive less polluting flue gases. This WDU will effectively get rid of approximately 6-7 kg of infectious waste per hour and can be operated for two hours daily five days a week following the best operation practices.

4.4 Standard Operating Procedures from NDVP

Step 1: Establishment/reactivation of waste management and vial destruction committee

Each state and LGA will establish or reactivate waste management committee before the implementation. The state and LGA waste management committee should lead the development of waste management plans which will include the following among others; identifying holding point for waste, incineration facilities in the state, and identifying the flow of waste from vaccination posts to holding points, and then to incineration sites. The state waste management committee must collate and review the waste management plans for all the LGAs/sites at least 2 weeks to the implementation of the COVID-19 vaccination.

Members of state level Waste Management Committee

- Executive Secretary SPHCDA/B
- Director Disease Control/Director Immunization/Director PHC

- SIO and SLO/SCCO
- SC NPHCDA
- NAFDAC
- Ministry of Environment (State Environmental Officer)
- Ministry of Information
- Partners and other relevant stakeholders

The SEO would relate all information to the National Safeguard Team

Members of the LGA level Waste Management Committee

- LGA secretary /Director PHC/Med Officer of Health
- LIO and LCCO
- LGA Health Educator/Head of LGA Environment and sanitation
- Partners

Members of the Ward level Waste Management Committee

- Ward Focal Person
- Officer-In-Charge (OIC) of Health Facility
- Ward Vaccine Accountability Officer (WVAO)

Step Two: Careful planning at the ward and LGA levels

Identify waste disposal sites (Incinerators), establish collection plan, assign responsibilities to all personnel involved in waste management, develop an efficient waste disposal work plan, daily monitoring to ensure immediate corrective actions are taken, and develop a final evaluation of waste disposal. Each day, the Vaccination Post Supervisor must carry used safety boxes, empty vials and partially filled/punctured vials to the WVAO for accountability. The WVAO will mark all used – filled safety boxes, empty and partially used/punctured vials and carry them to the LGA for central collation and transportation to the state for incineration or burn and bury.

Step Three: Destruction of wastes at State level

State waste management committee is responsible for the deactivation/destruction of all empty vials of COVID-19 vaccines and filled safety boxes. Injection devices must be incinerated, while empty vials may be destroyed by any of the below methods,

- Incineration is carried out at a temperature of ≥ 1100 °C for safe destruction of glass vials
- Boiling and Crushing: This method was one of the effective methods explored by some states during mOPV2
- Encapsulation: This method involves filling containers three-quarters full of vials, adding an immobilizing material (such as sand, cement or clay) and burying.
- boil and bury: this will require transportation to disposal site for destruction

After the destruction, the waste handler should fill the destruction form, sign and transmit to the state within 3 days after the destruction. The ESO should have a copy and transmit same to the National PCU within one week.

Chapter 5: Emergency Preparedness and Response

Emergency incidents occurring in a HF may include occupational exposure to infectious materials, accidental releases of infectious or hazardous substances to the environment, medical equipment failure, failure of solid waste and wastewater treatment facilities and fire. These emergency events are likely to seriously affect medical workers, communities, the HF's operation and the environment.

Health-care waste management plans include provision or the continuous monitoring of workers health and safety to ensure that correct handling, treatment, storage, and disposal procedures are being followed. Healthcare worker's exposure risk assessment tool is being prepared and will be rolled out to all healthcare facilities for assessing the gaps and essential occupational health and safety measures include the following:

- proper training of workers;
- provision of equipment and clothing for personal protection;
- establishment of an effective occupational health programme that includes immunization, post exposure prophylactic treatment, and medical surveillance.

Training in health and safety is part of the capacity building program to ensure that workers know of and understand the potential risks associated with health-care waste and the importance of consistent use of personal protection equipment. Workers at risk include health-care providers, hospital cleaners, maintenance workers, operators of waste treatment equipment, and all operators involved in waste handling and disposal within and outside health-care establishments.

5.1 Emergency Response

One person will be designated as responsible for the handling of emergencies, including coordination of actions, reporting to managers and regulators, and liaising with emergency services, and a deputy will be appointed to act in case of absence. In health-care establishments, spillage is probably the most common type of emergency involving infectious or other hazardous material or waste. Response procedures are essentially the same regardless of whether the spillage involves waste or material in use, and should ensure that:

- the waste management plan is respected;
- contaminated areas are cleaned and, if necessary, disinfected;
- exposure of workers is limited as much as possible during the clearing up operation;

The impact on patients, medical and other personnel, and the environment is as limited as possible. Health-care personnel are being trained for emergency response, and the necessary equipment will be provided to handle and readily available at all times to ensure that all required measures can be implemented safely and rapidly. Written procedures for the different types of emergencies were drawn up. For dangerous spills, the clean-up operation will be carried out by designated personnel specially trained for the purpose.

5.1.1 Response to Injuries

A programme of response will be established in all hospitals with COVID-19 treatment units that prescribes the actions to be taken in the event of injury or exposure to a hazardous substance. All staff who handle health-care waste will be trained to deal with injuries and exposures. The programme includes the following elements:

- immediate first-aid measures, such as cleansing of wounds and skin, and irrigation (splashing) of eyes with clean water;

- an immediate report of the incident to a designated responsible person; retention, if possible, of the item involved in the incident; details of its source for identification of possible infection; additional medical attention in an accident and emergency or occupational health department, as soon as possible;
- medical surveillance;
- COVID-19 tests, blood or other tests if indicated;
- recording of the incident;
- investigation of the incident, and identification and implementation of remedial action to prevent similar incidents in the future.

In case of a needle stick injury, bleeding of the wound should be encouraged and the area should be washed under clean running water. The remaining elements of the accident response plan should then be followed.

The purpose of incident reporting should not be seen as punitive; active support by managers should encourage prompt and accurate reporting.

5.1.2 General procedures in Case of Spillages

The actions listed below provide an example of typical measures that could/should be taken in case of accidental spillages of healthcare waste.

- Evacuate the contaminated area.
- Decontaminate the eyes and skin of exposed personnel immediately.
- Inform the designated person who should coordinate the necessary actions.
- Determine the nature of the spill.
- Evacuate all the people not involved in cleaning up.
- Provide first aid and medical care to injured individuals.
- Secure the area to prevent exposure of additional individuals.
- Provide adequate protective clothing to personnel involved in cleaning-up.
- Limit the spread of the spill.
- Neutralize or disinfect the spilled or contaminated material if indicated.
- Collect all spilled and contaminated material. [Sharps should never be picked up by hand; brushes and pans or other suitable tools should be used]. Spilled material and disposable contaminated items used for cleaning should be placed in the appropriate waste bags or containers.
- Decontaminate or disinfect the area, wiping up with absorbent cloth. The cloth (or other absorbent material) should never be turned during this process, because this will spread the contamination. The decontamination should be carried out by working from the least to the most contaminated part, with a change of cloth at each stage. Dry cloths should be used in the case of liquid spillage; for spillages of solids, cloth impregnated with water (acidic, basic, or neutral as appropriate) should be used.
- Rinse the area, and wipe dry with absorbent cloths.
- Decontaminate or disinfect any tools that were used.
- Remove protective clothing and decontaminate or disinfect it if necessary.
- Seek medical attention if exposure to hazardous material has occurred during the operation.

5.1.3 Reporting Accidents and Incidents

All waste management staff will be trained in emergency response and made aware of the correct procedure for prompt reporting. Accidents or incidents, including near-misses, spillages, damaged containers, inappropriate segregation, and any incidents involving sharps will be reported to the Waste Management Officer (if waste is involved) or to another designated person. The report should include details of:

- the nature of the accident or incident;
- the place and time of the accident or incident;
- the staff who were directly involved;
- any other relevant circumstances like exposure to COVID-19 patients.

The cause of the accident or incident will be investigated by the Waste Management Officer (in case of waste) or other responsible Officer, who will also take all possible action to prevent recurrence. The records of the investigation and subsequent remedial measures will be kept.

Chapter Six: Monitoring And Evaluation

Monitoring is required to follow-up on decisions made to intervene in various activities of health care waste management in order to protect human health and the environment. This can be achieved through periodic internal and external processes of monitoring and evaluation on a continuous basis, at all institutional levels. In this way management will be able to assess compliance with regulatory requirements at national, state and local levels.

To ensure that objectives of the Additional Financing for the Nigeria Polio Eradication Support Project HCWMP are achieved, the implementation of the plan has to be monitored by both internal and external bodies including the Federal and State Ministries of Health and Environment as well as the National and State Primary Health Care Development Agencies. These MDAs will determine their respective monitoring tools and will work jointly within the monitoring and evaluation mechanism of the proposed project.

6.1 Monitoring and Evaluation Objectives

The aim of the M&E is to establish appropriate criteria to address potential negative impacts of HCWMP and to ensure that unforeseen impacts are detected and the mitigation measures implemented at an early stage. Specific objectives of the monitoring plan are to:

- ensure that any additional impacts are addressed appropriately;
- check the effectiveness of recommended action plans and mitigation measures;
- ensure that the proposed mitigation measures are appropriate;
- demonstrate that health care waste management is being implemented according to plan and existing regulatory procedures; and
- provide feedback to implementing agencies in order to make modifications to the operational activities where necessary.

6.2. Monitoring Indicators

The following will be used to monitor progress in implementing the health care waste management plan, this should be measured in percentage progress:

- Enactment of necessary legislation governing, regulating and creating community awareness campaigns addressing health care waste concerns;
- Development of relevant institutional arrangements to plan and implement policies for addressing health care waste concerns;
- Development of human resource capacity in all health care facilities;
- Development of an Management Information System (MIS) on health care waste generation;
- Development of collaborative mechanisms with private sectors and development partners to finance health care waste treatment/disposal facilities; and
- Development of database for inventorying the types of waste and volume generated by health-care institutions nationwide.

The monitoring of environmental effects is necessary to ensure that predicted impacts are addressed effectively and efficiently through the mitigate measures indicated. Specific monitoring indicators for consideration include the following:

Internal Packaging and Storage

- Separation of waste (at point of generation)
- Storage bins / bags
- Frequency of removal

External Packaging and Storage

- Segregation of waste
- Storage area
- Frequency of waste removal
- Amount of waste generated per day

Transportation

- Identification of waste management contractor (accredited or certified)
- Conditions for transportation
- Equipment/vehicles (to prevent scattering, spillage, odour nuisance and leakage).

Treatment and Disposal

- Incineration
- Sterilisation by Heat
- Disinfection by steam
- Chemical disinfection
- Sanitary Landfill

Administration

- Establishment / functioning of a Waste Management Committee
- Availability of waste management plans
- Collection and Analysis of data

6.3 Monitoring Plan

An effective control of health care waste and monitoring of facilities should be carried out regularly, in order to maintain and improve management of the waste. Measures should be adopted to ensure that problems and risks involved are identified while enhancing safety and preventing the development of future problems.

Compliance and enforcement with legislation shall be ensured through co-coordinating and regulatory bodies. These bodies should include NPHCDA, FMEnv, SEPAs, and SPHCDA. They shall undertake regular monitoring of these facilities, with the aim of establishing long-term sustainability in health care waste management. The bodies shall ensure compliance with the following:

- Segregation i.e. sharps, pathological, hazardous and radioactive waste from other waste. Picture stickers shall be used in rural areas for identification;
- Collection routines including packaging and labelling;
- On-site treatment procedures like sterilisation, disinfection and incineration. It should be ensured that the incinerator plant continually burns its materials at a temperature of 1200°C and above to eliminate the release of dioxins.
- Storage into appropriate, labelled and adequate containers for both internal and external storage.
- Transportation i.e. needs and conditions including certification.

- Worker safety measures
- Disposal at sanitary landfills, cemetery or crematorium.

To ensure effective record keeping, each health institutions shall keep records on:

- The type and volume or weight of health care waste generated
- The means of transportation, type and volume transported
- Commissioned waste contractor (company name, type of license, treatment and disposal.
- Disposal method - volume incinerated, volume treated and disposed

Table 4: Monitoring Plan

S/No	What is being monitored	Why	When	How	Institution Responsible	Cost (USD\$)
1.	HCWM Monitoring and Evaluation program	To check effectiveness and compliance	Quarterly	Verification of monitoring and evaluation program reports	MoH, NPHCDA/SPHCDA/LGAs World Bank	20,000
2.	HCWMP implementation i) Trainings ii) Use of SOPs iii) Health and Safety in waste mgt iv) incinerator installations and operations v) Treatment, transport and disposal of healthcare wastes	To verify if HCWMP is being implemented, and to check implementation progress.	Every 6months	Organized supervisory missions; see COVID-19 guidance on consultations presented in appendix 11	MoH, NPHCDA/SPHCDA, /LGAs World Bank, contractors and consultants.	50,000
4.	Compliance to World Bank Environmental and Social Standards	Comply with the ESS 3	During and after the commencement of activity.	Environmental and Social Audit	World Bank, E&S consultant	20,000
5.	Social accountability and community perceptions	To ascertain social accountability.	Quarterly	Organized supervisory missions;	World Bank, E&S consultant	20,000
	Total					110,000

Chapter 7: Institutional Arrangement and Capacity Building

7.1 Institutional Arrangements

The CoPREP project is to be implemented through an arrangement of institutions. Table 5 below gives an overview of these institutional arrangements.

Table 5: Institutional Arrangement

S/No	INSTITUTIONAL ARRANGEMENT	ROLES AND RESPONSIBILITIES
1.	<p>National Steering Committee (NSC) Chairman: Honorable Minister of Health Members: Honorable Minister of Finance, 1 representative of State Governors, PS FMOH, DG NCDC, ED NPHCDA, ES NHIS, NC of the PTF, Director IERD FMoFBNP, Selected DPs as observers. Secretariat: CoPREP PCU</p>	<p>Oversight responsibilities Ultimately responsible for overall project direction, guidance and achieving the PDO Approve eligibility criteria for disbursement of project funds to states (one-off)</p>
2.	<p>National Technical Committee (NTC) Chairman: DG, NCDC Members: ED NPHCDA, ES NHIS, NC PTF, Directors of Health Planning, Research & Statistics, Public Health, Hospital Services and Port Health Services – FMOH, Directors of Laboratory, Surveillance & Epidemiology, Health Emergency Preparedness & Response and Prevention Programmes & Knowledge Management – NCDC, Nominee of NGF, Director IERD FMoFBNP, Two representatives of the Commissioners of Health Forum and invited DPs Secretariat: CoPREP PCU</p>	<p>Confirm that States meet eligibility criteria Approve the State IAPs and budgets Review progress reports to ensure agreed performance targets and timelines are met Oversee PCU to ensure timely implementation of the project Ensure that financing from Nigeria CoPREP complements financing from other sources as guided by the National Steering Committee The committee will not be involved in the day-to-day implementation of the approved plan.</p>
	<p>Project Coordinating Unit (PCU) The REDISSE PCU doubles as the Nigeria CoPREP PCU. Expanded & strengthened with additional officers: -Case Management Officer (from Dept. Hospital Services at FMOH) -Risk Communication Officer (from NCDC) -State Liaison Officer (from HEPR at NCDC)</p>	<p>Coordination and management of project funds. Procurement, monitoring, evaluation and reporting functions; including the transfer of project funds and monitoring of use of credit proceeds by States and Federal implementing entities. Day-to-day and activity-by-activity implementation of approved work plan.</p>

	<p>-WASH Officer (from Min. Water Resources) -Project Communication Officer (from Min. of Information)</p>	<p>Review and recommendation of State IAP for approval of NTC & WB</p>
	<p>State Project Steering Committee (SPSC)</p> <p>Chairman: Commissioner for Health Members: Commissioners of Finance, Budget & Planning, Water Resources and Information, Representative of State COVID-19 Task Force, PS SMOH, EOC IM, ES SPHCDA, ES SSHIA, invited DPs Secretariat: State Project Coordinating Unit (SPCU)</p>	<p>Oversee project implementation at State-level Review and approve State IAP for onward transmission to PCU Review progress reports to ensure agreed performance targets and timelines are met Oversee SCU to ensure timely implementation of the project Ensure that financing from Nigeria CoPREP complements financing from other sources and are efficiently utilized The committee will not be involved in the day-to-day implementation of the approved plan- which is the responsibility of the SPCU The State Commissioner for Health will monitor and report on progress on implementation of the State IAP to the State EXCO/Governor at least twice a year</p>
	<p>State Coordinator: State Epidemiologist Members: Program officer (Deputy State Epidemiologist where applicable) Procurement officer, Finance officer (Chartered Accountant deployed from PFMU as designated Project Accountant). SCU will work closely with: State EOC incident manager Environmental safeguard desk officer (State Ministry of Environment) Social safeguard desk officer (State Ministry of Women Affairs/Humanitarian Affairs, Disaster Mgmt & Social Development) WASH officer (State Ministry of Water Resources) Health Communication Officer (Risk Comm., State Ministry of Health) Vaccine Deployment Officer (SPHCDA) Pillar Leads</p>	<p>Coordination and management of project funds Procurement, monitoring, evaluation and reporting functions including incurring expenditure from project funds and monitoring the use of funds Coordinate and supervise implementation of approved IAP activities by Pillar Leads Financing and Procurement: CoPREP financing arrangement at the State-level is same as with the ₦100 million grant from REDISSE Procurement may be pooled at the National where applicable and conducted centrally for efficiency and timeliness. State-level procurement will follow Bank procurement guidelines</p>

7.2 Training Needs Assessment

Correct attitudes for effective health care waste management result from knowledge and awareness regarding the potential risk of health-care and administrative procedures for handling the waste. Apart from a general understanding of the requirements of health care waste management, each category of personnel (doctors, nurses, ward attendants, cleaners, administrative staff, waste transporters, dumpsites, hospitals etc.) needs to be trained. For the training to be successful and to lead to the desired objective, participants must become aware of the risks linked to medical waste management.

The principal groups involved in waste generation and management are:

- Primary group: (i) management and administrative staff; (ii) medical and laboratory staff; (iii) ward attendants, caretakers, ground workers and other support staff; and
- Secondary group: patients, visitors, scavengers and the local communities, waste collectors/transporters, disposal site operators etc.

The training needs identified based on interview of the categories of actors involved are presented below:

Health Care Staff

Administrative staff

- Information on potential risks and advice about health and security;
- Basic knowledge of procedures of medical waste collection, storage, transportation, treatment and final disposal including the management of risks;
- Use of protection and security equipment;
- Medical waste management guidelines; and
- Financial resources to be allocated to waste management.

Doctors, nurses, midwives, etc.

- Information on the risks; advice about health and security;
- Basic knowledge about procedures of HCWM waste collection, storage, transportation, treatment and final disposal including the management of risks;
- Use of protection and security equipment (protective clothes);
- Strategies to control and ensure that used disposable equipment/materials are placed in appropriate disposal and collection facilities and to ensure that all patients are safe from injury or hazards resulting from health care waste;
- HCW segregation at source;
- Staff orientation on the guidelines for health care waste management; and
- Good practices on health care waste

Cleaners, ward attendants, grounds attendants, other personnel in touch with health care waste, etc.

- Information on the risks; advice about health and security;
- Basic knowledge about procedures of medical waste collection, storage, transportation, treatment and final disposal including the management of risks;
- Collection and transportation of waste containers;
- Use of protection and security equipment (protective clothes); and
- Good practices on health care waste

Waste Management Company Personnel

Waste Management Operators

- Information on the risks; advice about health and security;
- Basic knowledge about procedures of wastes handling, including risk management;
- Use of protection and security equipment;

Waste Transportation Staff

- Risks linked with waste transportation;
- Procedures for waste handling: loading and unloading;
- Equipment such as vehicles for health care waste transportation;
- Protection equipment.

Treatment Systems Operators

- Treatment and operating process guidelines;
- Health and security related to the operating system;
- Procedures in emergency cases and help;
- Technical and maintenance procedures;
- Control of health care waste production;

Disposal Managers

- Information about health and security
- Control of scavenging activities and recycling of used instruments;
- Protection equipment and personal hygiene;
- Secure procedures for the management of wastes at the disposal site;
- Measures concerning emergency cases and help.

Others

Patients and visitors

- Advice on basic health care waste management; and
- Proper use of health care waste containers

7.3 Training Strategy and Plan

The training strategy shall operationalize the HCWMP in all health-care facilities by promoting the emergence of professionals in health care waste management; raising the sense of responsibility of healthcare personnel; and safeguarding health and security of health staff and waste handlers. Table 8.0 below gives indicative training courses for Mid-Level Management (MLM) training and personnel needed.

The training plan shall be structured around the following principles:

- Train-the-trainers: this involves training the senior Public Health Officers at the states who in turn will roll out training courses in their states.
- Training health-care staffs: already trained senior Public Health Officers will train other HCFs staff. These training sessions will be held in each local government area (LGA); and
- Training medical waste management supporting staffs in health centers (Cleaners, transporters, incinerator operators and waste handlers. These

training sessions will be held in every healthcare facility and will be conducted by already trained hospital staff.

Table 6: Training and Schedule for Staff and Support Staff of HCF

Capacity Needs	Content	Target Participant	Duration	Resource Person	Estimated Cost (USD)
Basic knowledge about medical waste	Waste categories Hazardous potential of certain waste categories Transmission of hospital acquired infection Health risk for health care personnel	State Immunization Officers (SIO); Program officers (Local Immunization Officers-LIO) etc	8 hours	NPHCDA /partners	2000
Proper behaviour of waste generators	Environmentally sound handling of residues; Waste avoidance and reduction possibilities; Identification of waste categories; Separation of waste categories; Knowledge about appropriate waste containers	State Immunization Officers (SIO); Program officers (Local Immunization Officers-LIO) etc	7 hours	NPHCDA/ partners	2500
Proper handling of health care waste	Adequate waste removal frequency; Safe transport containers and procedures; Recycling and re-use of waste components; Safe storage of wastes; Cleaning and maintaining of collection, transportation and storage facilities; Cleaning and maintenance of sanitation facilities, drains and piping.; Handling of infectious laundry; Handling of chemical and	State Immunization Officers (SIO); Program officers (Local Immunization Officers-LIO) etc	7 hours	NPHCDA and partners	5000

	radioactive waste, outdated drugs; Maintenance of septic tanks and other sewage treatment facilities; Maintenance and operation if incinerator for infectious wastes; Maintenance and operation of waste pits and landfill site; Safety regulation in waste management, protective clothing.; Emergency regulation in waste management				
Establishment of a health care waste management system	Establishment and implementation of a waste management plan.; Sampling of waste quantities, monitoring, and date collection.; Monitoring and supervision of waste management practices; Cost monitoring of waste management; Establishment of a chain of responsibilities; Set-up of occupational safety and emergency regulations; Interaction with city assemblies or private sector waste handling structures; Public relation and interaction with local community.	State Immunization Officers (SIO); Program officers (Local Immunization Officers-LIO) etc	7 hours	NPHCDA and partners	5000
Total					14,500

Chapter Eight: Public Awareness and Consultation

To ensure the successful implementation of this plan, the, MoH, NPHCDA, and SPHCDA as well as the SIOs and LIOs have responsibilities to effectively engage stakeholders (; see COVID-19 guidance on consultations presented in appendix 11) in achieving its objectives for the benefit of all. The implementation of the plan depends on the meaningful participation of all stakeholders for success. The public awareness process will be focused on informing the general public and scavengers about potential dangers associated with health care waste handling. The scope of this Public Awareness Plan includes the entire participating states of the proposed project where the plan will be implemented. It describes the avenues that will be used to convey the plan implementation information to the public

8.1 Objectives of Public Awareness

This public awareness/consultation plan provides a framework for achieving effective stakeholder involvement and promoting greater awareness and understanding of issues so that the plan can be effectively implemented on-time to the satisfaction of all concerned.

To ensure effective implementation of this plan, the MoH NPHCDA/SPHCDA, SIOs/LIOs shall be committed to the following principles:

- promoting openness and communication;
- ensuring effective stakeholder involvement in the development of the project;
- increasing public knowledge and understanding of the project implementation process;
- using all strategies and techniques which provide appropriate, timely and adequate opportunities for all concerned parties to participate; and
- evaluating the effectiveness of the engagement plan in accordance with the expected outcomes.

8.2 Potential Stakeholders

The potential stakeholders in the implementation of this plan include the following:

- Ministry of Health, Director Public Health
- NPHCDA/SPHCDA – Disease Control and Immunization
- NAFDAC – Drug Evaluation and Research
- 36 State Epidemiologist
- Ministry of Interior
- Security Agencies (Nigerian Army, Nigerian Air force, Nigerian Navy, Nigerian Police, NSCDC)
- National health organizations, CSOs, CBO, FBOs and UN agencies
- Media and other interest groups, including social media and the Government Information Department;
- NGOs for vulnerable groups
- The public at large

8.3 Consultation Strategies

The focus of this public involvement program/plan is to inform the public and invite input relating to the plan and its implementation. As elements of the plan proceed from planning into execution, the NPHCDA objective will be to maintain the public awareness and understanding of the plan. The implementing agencies shall execute a program comprising seven strategic elements to accomplish the public awareness objective. A comprehensive public awareness program will include the following:

- Develop and distribute a project newsletter;
- Develop presentations and organize seminars and workshops;
- Develop and maintain a project web site;
- Develop radio and television adverts;
- Establish and maintain a project telephone information line;
- Prepare project press releases; and
- Prepare posters and erect billboards.

The objective of the public awareness program is to convey information to the public and interested groups. By utilizing a multi-faceted approach to convey information, the success of the effort is optimized. The Public Awareness Plan describes the general approach and specific benefits of each element of the program.

- *Newsletters*

Newsletters will be written in all major Nigerian languages to include project progress and information, calendars of events, telephone numbers, and information about the web site, location maps, and photographs of ongoing efforts. The newsletters will be printed and distributed quarterly throughout the implementation period. Newsletters differ from press releases in that a newsletter will have a smaller audience, greater depth of reporting, and more issues presented than a press release. Each newsletter will explain how to provide input into the plan. Newsletter shall be distributed through the 36 states and the federal capital in hospitals and other HCFs. Newsletter distribution points will be identified on the project web site, and via press releases distributed to the local media. Although the primary method of distribution will be at established distribution points, newsletters will be mailed out upon specific request.

- *Seminars and Workshops*

Seminars and workshops will offer the public an opportunity to listen to the experts on different aspects of the plan. These meetings will be broadcasted on local television and radio stations. This will offer the public a convenient opportunity to take advantage of this information.

Newsletters, website, and press releases will advertise the schedule of seminars and workshops. Workshops shall be conducted annually throughout the period of the plan implementation. Other presentations will also be made throughout the plan implementation period on as need basis but will be limited to a reasonable number.

- *Radio and Television Adverts*

Radio jingles and TV adverts/announcements shall be developed and aired in all the states of the federation in all major languages. Pertinent information will be offered at intervals to maintain viewers' interest on the topic. Two radio jingles and two TV announcements shall be broadcasted in English and the major languages every month.

- *Posters and Billboards*

Posters and billboards shall be pasted and installed in strategic places to make them accessible to the general public. The public awareness plan would be effective since several medium would be used as part of a coordinated program. Although some strategies may be more effective than other elements, combining several techniques and different media in conveying plan/project information to the public would create an optimal approach

8.4 Cost for Implementing HCWMP Awareness

Media	Frequency per annum	No of Messages	Tertiary HCF Cost per Annum (\$)	Secondary HCF Cost per Annum (\$)	Primary HCF (Urban) Cost per Annum (\$)
Radio and TV	2 per month	All major Languages in the state	2,000	2,000	2,000
IEC/BCC	2 per month	All the Languages in the states	12,000	12,000	12,000
Newsletter	2 per month	3 (Hausa, Yoruba and Igbo) languages	6500	6500	6500
Total Cost for Public Awareness					82,000

Chapter Nine: Summary

This HCWMP was developed based on the Standard Operating Procedures within the National Deployment and Vaccination Plan. All the steps outlined in this document should be strictly adhered to prevent transmission of infectious diseases.

Annex

Annex 01: Technical Note 1

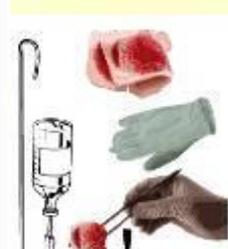
To reduce the amount of hazardous HCW generated at Primary and Secondary healthcare facilities in Nigeria;

- The use of recyclable materials and products should be encouraged;
- Encourage a preference for oral alternatives in place of injections in treatment when appropriate;
- ensure good management and control practices especially in the purchase and use of pharmaceuticals; and,
- enforce a rigorous and careful segregation of HCW at source.

Segregation

Correct waste segregation is the fundamental first step for efficiently and effectively managing HCW. Proper segregation of waste at source will also reduce the quantity of waste requiring treatment prior to final disposal.

SEGREGATION OF MEDICAL WASTE

Non-Infectious Waste	Infectious Waste	Highly Infectious Waste	Sharp Waste
<ul style="list-style-type: none"> • Paper/Packaging material • Food  <div style="text-align: center; border: 1px solid black; background-color: black; color: white; padding: 5px; width: 60px; margin: 10px auto;">BLACK</div>	<ul style="list-style-type: none"> Gauze/Dressing Blood/IV fluid lines Gloves  <div style="text-align: center; border: 1px solid black; background-color: yellow; padding: 5px; width: 60px; margin: 10px auto;">YELLOW</div>	<ul style="list-style-type: none"> Anatomical Waste Teeth Placenta Pathological Waste Spulum container Test tubes containing specimens  <div style="text-align: center; border: 1px solid black; background-color: red; color: white; padding: 5px; width: 60px; margin: 10px auto;">RED</div>	<ul style="list-style-type: none"> Intrusion sets Broken slides Broken vial Broken ampules Lancet Retractables Scalpels Blades Needles  <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="font-size: small;">If using a needle remover, cut off needle and discard syringe in a safety box.</p>  </div>

IT IS THE RESPONSIBILITY OF HEALTH PERSONNEL TO SEGREGATE WASTE IMMEDIATELY ACCORDING TO TYPE

Courtesy: JSI/MMIS

Infectious and other hazardous waste must be segregated at source and put in appropriate colour –coded containers/bags as recommended by the National HCWM Guidelines. In particular, sharps must be segregated from other HCW at their point of generation.



Important elements specific to the segregation of sharps include:

- Sharps boxes, should be used strictly for sharps. Where there is a difficulty in getting sharps boxes, the use of recycled cardboard boxes is acceptable if it is puncture resistant, securely in place, easy to insert sharps, contains sharps without risk of spillage, and is well labelled.
- No healthcare waste other than sharps should be deposited in sharps containers. When a disposable syringe is used, the packaging should be placed in the general waste bin and the used syringe in the sharps container.

- Syringes and needles must be discarded immediately following use without needles being removed from syringe, recapped, bent or broken before disposal (except where the healthcare facility has appropriate needle cutters/removers in place).
- The whole combination must be inserted into the safety box directly after use. If removal of the needle is required, special care must be taken.

Colour Coding

The colour coding system for HCW as recommended by the Nigeria National Healthcare Wastes Management Guidelines document is black, yellow and red in primary healthcare facilities, and black, yellow, red, and brown in secondary and tertiary healthcare facilities, and is one of the efficient ways of achieving segregation of waste and for sorting out items such as paper, plastic, glass and metal for recycling.

- Colour coding for plastic bags should correspond or match whenever possible the waste containers.



Recommended segregation and colour coding system in Nigeria

It is essential that clinical and related wastes are properly segregated, packaged, labelled, handled and transported to minimise risk to waste handlers and the community, such as needle stick injuries and transmission of infectious diseases.

Recommended colour coding system for primary HCFs in Nigeria

Black	Yellow
✓non-risk waste of category	✓infectious waste and highly infectious waste ✓sharps collected in yellow, puncture-proof containers

Recommended colour coding system for secondary HCF in Nigeria	Black	Yellow	Red	Brown
✓non-risk(domestic) waste		✓infectious waste ✓sharps collected in yellow, puncture-proof containers	✓highly infectious waste	✓pharmaceutical waste, some chemical waste, heavy metal wastes

Class	Labelling	International symbols
2	« Danger! Hazardous infectious waste »	 Yellow background
3	« Danger! Contaminated sharps, do not open »	 Yellow background
4	« Danger! Anatomical waste, to be incinerated or deeply buried »	 Red background
5	« Danger! To be discarded by authorized staff only »	 Brown background
6	« Danger! Highly infectious waste, to be pre-treated »	 Yellow background
7	« Danger! Radioactive waste »	 Yellow background

Courtesy: Draft National Healthcare Waste Management Guidelines for Nigeria

- All waste bags or containers should be labelled with basic information in English and the local language of the area where the HCF is located. Basic label information should include type of waste in the container; name of the ward/facility, date of collection and, warning of hazardous nature.
- Provide Colour-coded refuse bags & bins (Black, yellow and red for the primary healthcare facilities) and (black, yellow, brown and red for the General Hospitals).



- Ensure the provision of Sharps boxes to the healthcare facilities, and these must be available at the points of wastes generation.
- Introduce segregation code of practice to be followed in each hospital.
- Training - Continuous training of staff.
- Reinforce on-job training and supervision.

10.2 HCW Collection

After proper segregation is performed, it is important that routine collection of waste is conducted. Health care waste collection must be performed on a regular schedule by designated personnel and carried out along well-defined routes within the HCF.

- When full, all health care waste containers must be sealed to prevent spilling during handling and transportation
- Bins/boxes and collection receptacles must not be overfilled and must be transported in carts well fitted to prevent spillages.

- Sanitary staff and cleaners should always wear Personal Protective Equipment (PPE) including, as a minimum, overalls or industrial aprons, nose mask, heavy duty gloves, and safety boots.
- Regulations and supervisory arrangements must be set in-place to ensure that personnel utilize PPE when on duty.
- No bags should be removed unless they are labelled with their point of production (hospital and ward or department) and contents.
- The bags or containers should be replaced immediately with new ones of the same type.
- A supply of fresh collection bags or containers should be readily available at all locations where waste is produced.
- Containers for waste collection should meet the following requirements:
 - a. Non-transparent;
 - b. Impervious to moisture;
 - c. Sufficient strength to prevent easy damage during handling or use;
 - d. Leak resistant;
 - e. Close-fitted lids;
 - f. Fitted with handles for easy manipulation;
 - g. Light weight and convenient;
 - h. Designed to minimize physical contact.
- Nursing and other clinical staff should ensure that waste bags are tightly sealed when three-quarters full by tying the neck or sealing tag. Bags should not be closed by stapling.
- Sealed sharps containers should be placed in a labelled, yellow infectious health-care waste bag before removal from the hospital ward or department.
- Wastes should not be allowed to accumulate at the point of production.
- Routine programmes for waste collection should be established as part of the hospital's waste management plan (daily or as frequently as is necessary) and should be transported to a central storage site or treatment site.
- Collection carts should be easy to load and unload, have no sharp edges that could damage waste bags or containers, and be easy to clean.
- Water and hand-wash materials must be readily available for healthcare waste handlers to wash their hands after handling HCW.

10.3 HCW Waste Storage

Storage is the time lapse between the productions of the waste until collection for final disposal. Consideration for storage must be based on the classification or type of waste being dealt with and the potential risk of infection to health-care workers, waste disposal staff, and the public.

The following rules should be observed for proper storage of HCW in Nigeria:

- Initial packaging should take place where HCW is generated.
- Non-risk HCW should always be stored in a separate location from the infectious / hazardous HCW in order to avoid cross-contamination.

The Nigeria National Guidelines for HCWM recommends the under-listed characteristics for infectious and hazardous waste storage facilities for health-care waste:

- Impermeable, hard-standing floor with good drainage;
- easy to clean and disinfect, with a water supply;
- easy access for staff in charge of handling the waste;
- locked to prevent access by unauthorized persons;
- easy access for waste-collection vehicles;
- protected from the sun;
- for storage periods more than 24 hours, temperature must not exceed +10 degrees Celsius. (The storage of biological waste might require much lower temperatures);
- inaccessible for animals, insects, and birds;
- good lighting and at least passive ventilation;
- outside the proximity of fresh food stores or food preparation areas; and,
- Convenient to a supply of cleaning equipment, protective clothing, and waste bags or containers.
- Provide secured storage with adequate chambers for infectious, non-infectious, and food waste

10.4 HCW Waste Handling/Internal Transport

Health-care waste should be transported by the quickest possible route, which should be planned before the journey begins.

- Every effort should be made to avoid unnecessary handling of HCW;
- Hazardous HCW must be packaged in a closed yellow or red bag, tied and placed into sturdy container
- Waste that has the potential to leak must be double bagged
- all waste bags should be in-place and intact at the end of transportation;
- Provide dedicated trolleys/ trolley bins for on-site transport.
- Personnel handling/transporting HCW must wear PPE (i.e. gloves, lab coat, etc.)
- Have spill clean-up material available or, at minimum, know where it is (i.e. absorbent pads, bleach solution, etc.)

Off-site Transport

When transporting waste off-site, it is important that:

- Vehicles should be kept locked at all times, except when loading or unloading;
- when transporting hazardous waste, vehicles and containers must be cleaned and disinfected daily with an appropriate disinfectant;
- waste bags should be placed in containers (e.g. cardboard boxes or wheeled, rigid, lidded plastic or galvanized bins), before being placed directly into the transportation vehicle;
- any vehicle used to transport health care waste should fulfil the following design criteria:
 - a) Suitable size for the amount of waste;
 - b) designed such that the load is retained even if the vehicle is involved in a collision;
 - c) include a system for securing the load during transport;
 - d) possess a separate compartment in the vehicle for spare plastic bags, suitable protective clothing, cleaning equipment, tools, disinfectant, and “spill,” and,
 - e) able to be easily cleaned and have no sharp edges to damage waste containers.
- Provide securely designed transport vessel for off-site transport

10.5 HCW Waste Treatment

Proper treatment and disposal of healthcare waste is necessary to ensure that its impact on the environment and human health is minimized or eliminated. Unfortunately, environmental-friendly, safe and affordable options for treatment and disposal are not readily available for every situation in Nigeria.

The first step in HCWM is to ensure that all non-risk (general) waste is safely sent to the municipal waste management system. The remaining fraction of hazardous and highly hazardous health care waste should be treated and disposed appropriately to meet the following objectives:

- destruction of viable infectious organisms
- destruction/transformation of used or expired pharmaceuticals and chemicals
- destruction of sharps and other materials capable of causing physical injuries
- decomposition of radioactive waste materials
- final disposal / destruction of body parts, tissues, blood and other organic material
- avoidance or minimisation of secondary impacts from the disposal system

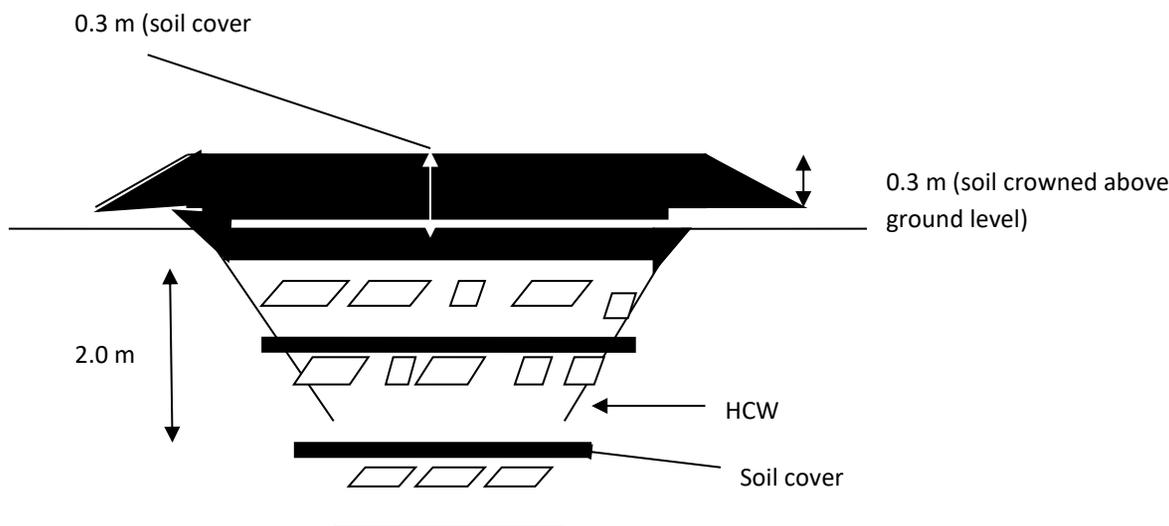
Decisions regarding treatment technology should be made at hospital level; however responsible personnel for waste management in the hospital should be in close contact with the regulatory/supervisory authority.

- All non-hazardous HCW not designated for recycling should be collected and managed with the general *municipal waste*.
- Burning in low temperature incinerators, preferably a well- designed, constructed and managed-**Double Chamber Rotary Kiln**) –is satisfactory whenever this can be made available for a primary health centre and even for some secondary healthcare facilities. However, this option is not satisfactory environmentally, and should only be considered a short-term solution to HCW treatment.

A De-Montfort Waste Disposal Unit

Disposal in Burial Pit

- *Burying HCW in specially constructed pits (lined with impermeable materials such as clay) is for the present moment probably the most affordable and acceptable options for Primary HC facilities. This option has the advantage that it can be made available immediately, is cheap to provide, and the personnel can be easily trained on how to manage it in an environmentally sound manner. Of course it has its drawbacks – pollution of air, soil and water; spread of diseases by rodents and insect vectors (when soil-cover is not appropriately utilised); trespass by human beings and animals. A guideline on the safe construction and operation of a HCW burial pit (as designed by the consultant) has been added as an appendix to this HCWM plan document.*



Centralized Incineration

- Treatment in a centralized Rotary Kiln Incinerator with good emissions management system, situate in a Tertiary or big secondary healthcare facility (or run by a private waste management firm/Public-Private partnership arrangement) in the region; with HCW collection by a HCWM contractor or public collection system in the opinion of the Consultant, would be the ideal option for the management of HCW from primary and secondary healthcare facilities in Nigeria. This approach would reduce health and environmental pollution risks that would arise from several inefficiently managed and run incinerators or burning pits/burials pits. The major drawback of this approach is that it will take some time to put in place, is expensive to set-up, and will require a transportation infrastructure that is well organized. But once the initial problems associated with setting up the system are overcome, it should run smoothly, especially if a public-private arrangement for the management of the incinerator is achieved

Waste Treatment in Secondary Healthcare Facilities: Treatment in a Centralized Incinerator

- As with primary healthcare facilities above, sending the HCW from a secondary healthcare facility for treatment in a centralized dual chamber, semi-pyrolytic (preferably a rotary kiln) incinerator, operating at temperatures above 1000°C in the primary chamber and 1200°C in the secondary chamber and incorporating a good emissions management system, situate in a Tertiary or big secondary healthcare facility (or run by a private waste management firm/Public-Private partnership arrangement) in the region would be the ideal option.

The advantages in choosing off-site centralized HCW treatment solutions are:

- **financial:** greater cost-effectiveness can be achieved in larger units unless the running costs for waste collection and transportation remain too expensive;
- **technical:** efficient operation and maintenance of units is easier to ensure in a centralized facility than in several plants where financial and human resources may not be readily available;
- **legal compliance:** conformance to environmental norms are easier to achieve, thanks to the use of more sophisticated/ expensive technology and by the reduced number of facilities that need to be monitored by environmental surveillance authorities.

Treatment in an On-site Incinerator

- Waste treatment in an on-site, high temperature, dual chamber, semi-pyrolytic incinerator– (which operate at temperatures of over 800°C in the primary chamber, and 1000°C in the secondary chamber), with a good emissions management system is recommended for larger secondary healthcare facilities that is in a region where there is no secondary or tertiary healthcare facility with a good quality incinerator installed. This incinerator should be used to manage HCW from other healthcare facilities in the region, especially by utilizing specialized private HCW managers for waste collection, and whose standards of operation would be supervised by the relevant environmental regulatory authorities.

Note: An Environmental & Social Impact Assessment (ESIA) would be carried out prior to the installation of incinerators in line with the existing laws in Nigeria and World Bank safeguards Policies.

Treatment in a De-Montfort WDU

- As with the primary healthcare facilities, burning in low temperature incinerators, such as a well designed, constructed and managed-**Montfort Waste Disposal Unit (DWDU)** –would be satisfactory. However, as noted

above, this option is not satisfactory environmentally, and should only be considered a short-term solution to HCW treatment in a secondary healthcare facility.

Treatment in a Burial Pit

- Burying of the HCW in specially constructed pits (lined with impermeable materials such as clay) as described above for treatment of HCW in primary healthcare facilities would be acceptable for use in secondary healthcare facilities where incinerators are unavailable.

10.6 Final Disposal of HCW

To fulfil Best Environmental Practices (BEP), an Environmental and Social Impact Assessment (ESIA) will precede commencement of any civil works aimed at installation of incinerators in both primary and secondary healthcare facilities.

10.7 Disposal Procedural Steps

- Provide secured appropriately lined pits for final disposal of incineration ash.
- Transportation of incineration ash and non-hazardous and treated hazardous waste (that has been rendered non-infectious) to engineered designated (sanitary) land fill sites.

10.8 Resources & Human Capacity Development

- Ensuring mandatory budgeting for HCWM by Healthcare Facilities
- Development of the capacity of healthcare personnel, HCW waste handlers, and HCW waste treatment personnel to appropriately manage HCWM
- Regular trainings and re-trainings of personnel on HCWM techniques
- Provision of awareness materials on HCWM in healthcare facilities and ensuring that they are put in strategic locations in the healthcare facility, and at the points of HCW generation.
- Ensuring that HCWM Committees are setup in healthcare facilities and that they carry out their functions effectively (the Chief Medical Officer of the facility must be the leader of this committee)
- Ensuring that all healthcare facilities appoint/designate a specific officer to be in-charge of HCWM
- Development of supervisory capacity and monitoring mechanism for the implementation of a well developed HCWM Plan for healthcare facilities (including records keeping mechanisms)
- Awareness creation and capacity development in the communities on the dangers associated with improper HCW handling and disposal
- Support and development of mechanisms for private institutions to be involved in HCW collection, transport, treatment and disposal process
- Standardization of transport facilities for the management of HCW

10.9 Recordkeeping

- The HCWM Officer must have a fully completed internal HCW manifest ready before transporting the waste to the designated disposal location.
- All details (type, weight, quantity, etc) of the HCW must be filled prior to movement of the wastes for disposal
- A copy of the HCW manifest must be kept at the HCF a copy by the HCW Officer.

10.10 Recordkeeping

Spills should be cleaned-up if:

- The supplies to absorb and bag the spilled material is available
- Use Bleach, diluted to 1:10 with water: to decontaminate the spill area and to clean/decontaminate equipment used in spill response. Cover the spilled area with absorbent pad or paper towels and then pour diluted bleach over the towels; let to stand for 30 minutes and the clean-off
- To reduce the number of employees at risk of exposure: Restrict access to the area of the spill; Provide warnings of hazards and advice about special requirements
- Proper PPE must be worn whilst cleaning spills

Procedures for Reporting and Tracking Spillages

- Inform the immediate supervisor of the unit if any personnel are involved in a spill or cleanup.
- The supervisor must immediately maintain restriction to the area of the accident.
- Information of the spill should be passed to all personnel in a calm and organized manner.
- Personnel of the unit in which the accident occurred should implement appropriate clean-up. It is recommended that health care facilities be provided with US EPA Mercury Clean-up Kits (one of the most effective mercury clean-up kits; containing procedures for best handling of spills and environmentally sound disposal of broken chemical containers).
- The incident should be finally communicated to the records department of the health facility for documentation and lessons learned.

Note: If it is a larger chemical or non-chemical spill there will be a required increase in personnel assistance for clean-up and a more organized clean-up approach.

Prevention of Spillage

Containers and items should be placed in secure areas and marked “breakable handle with care” behavioural patterns are a factor of good or ineffective safety practices. Personnel need hospital chemical safety trainings and educated on the use of material safety data sheets (MSDS) for the identification of chemical in their facilities.

This guideline is applicable for both primary and secondary healthcare facilities.

10.11 Post Exposure Prophylaxis Guidelines for Occupational Exposure

Definition of an occupational exposure

An occupational exposure that may place a worker at risk of infectious diseases is a percutaneous injury, contact of mucous membrane or contact of skin (Especially when the skin is chapped, abraded or afflicted with dermatitis or the contact is prolonged or involving an extensive area) with blood, tissue or other body fluids to which universal precaution apply.

Occupational exposure to viral pathogens

- needle stick injuries
- cuts from other sharps
- contact of eye, nose, mouth or skin with blood or body fluids or excrements

Factors affecting transmission

- amount of blood in the exposure
- amount of virus in patient's blood
- whether P.E.P. taken or not

Average risk of HIV infection after an occupational exposure

Risk increases if patient has high viral load as in patients with acute HIV

Infection or patient near death prevention of occupational exposure

Standard precautions (universal work precautions) and safe practices

- Wash hand after patient contact, removing gloves.
- Wash hands immediately if hands contaminated with body fluids.
- Wear gloves when contamination of hands with body substances anticipated
- Protective eyewear and masks should be worn when splashing with body substance is anticipated
- All health care workers should take precautions to prevent injuries during procedures and when cleaning or during disposal of needles and other sharp instruments.
- Needle should not be recapped
- Needles should not be purposely bent or broken by hand
- Not removed from disposable syringe nor manipulated by hand
- After use disposable syringes and needles, scalpel blades and other sharp items should be placed in a puncture resistant container.
- Health care workers who have exudative lesions or dermatitis should refrain from direct patient care and from handling equipment
- All needle stick injuries should be reported to infection control officer.
- Handle and dispose of sharps safely
- Clean & disinfect blood / body substances spills with appropriate agents
- Adhere to disinfection and sterilization standards
- Regard all waste soiled with blood/body substance as contaminated and dispose of according to relevant standards
- Vaccinate all clinical and laboratory workers against hepatitis B
- Other measures double gloving changing surgical techniques to avoid "exposure prone" procedures use of needle-less systems and other safe devices.

Body fluids to which universal precautions apply

- Blood

- Other body fluids containing visible blood
- Semen
- Excrements
- Vaginal secretions
- Cerebrospinal fluid (CSF)
- Synovial fluid
- Pleural fluid
- Peritoneal fluid
- Pericardial fluid
- Amniotic fluid

Body fluids to which universal precautions do not apply

The risk of HIV transmission is extremely low or negligible But possibly high risk of COVID-19 transmission

Use of protective barriers

- Protective barriers reduce the risk of exposure of the HCWs skin or mucus membrane to
- potentially infective materials

These Include:

- Nasal secretions
- Sputum
- Sweat
- Tears
- Urine
- Vomits
- Saliva

Protective barriers include gloves gowns, masks, protective eye wears.

Selection of protective barriers

- The use of double gloves is not recommended. Heavy duty rubber gloves should be worn for cleanings instruments, handling soiled linen or when dealing with spills

What to do on exposure to HIV infected blood?

Prompt measures

- Do not Panic
- Do not put cut / pricked finger into your mouth

Post-HIV exposure management / prophylaxis (PEP)

It is necessary to determine the status of the exposure and the HIV status of the exposure source before starting post-exposure prophylaxis (PEP)

Immediate measures:

- wash with soap and water
- see COVID-19 infectious disease control measures for details

Next step:

- prompt reporting
- post-exposure treatment should begin as soon as possible
- preferably within two hours
- not recommended after seventy -two hours
- late PEP? may be yes
- Is PEP needed for all types of exposures? NO

Type of exposure Examples Protective barriers

Low Risk

- contact with skin with no visible blood
- injections
- Minor wound dressing

Protective Gear

- Gloves helpful and essential for COVID-19

Medium Risk

-probable contact with blood

-splash unlikely

- vaginal examination,
- insertion or removal of intravenous canual
- handling of laboratory specimens
- large open wounds dressing
- venepuncture ,spills of blood

Protective Gear

- Gloves
- Gowns and
- Aprons may be necessary

High Risk

-probable contact with blood, splashing, uncontrolled bleeding, major surgical procedures, particularly in orthopaedic surgery and oral surgery; vaginal delivery

Protective Gear

- Gloves
- Water proof
- Gown or Apron
- Eye wear
- Mask

OTHER INFORMATION

1. Post exposure Prophylaxis:

The decision to start PEP is made on the basis of degree of exposure to COVID-19, HIV and the HIV status of the source from whom the exposure/infection has occurred.

2. Determination of the Exposure Rate (ER)

3. Exposure Code (EC)

4. Determination of PEP Recommendation

5. Testing and Counselling

The health care provider should be tested for HIV as per the following schedule

- i) Base-line HIV test - at time of exposure
- ii) Repeat HIV test - at six weeks following exposure
- iii) 2nd repeat HIV test - at twelve weeks following exposure

On all three occasions, healthcare workers/personnel must be provided with a pre-test and post-test counselling. HIV testing should be carried out on three ERS (Elisa/ Rapid/ Simple) test kits or antigen preparations. The healthcare worker/personnel should be advised to refrain from donating blood, semen or organs/tissues and abstain from sexual intercourse. In case sexual intercourse is undertaken a latex condom should be used consistently. In addition, female healthcare worker/personnel should not breast -feed their infants

This guideline is applicable for both primary and secondary healthcare facilities.

10.12 Handling of Liquid Wastes Streams form Healthcare Facilities

All liquid wastes must be adequately treated for safe, permitted discharge to public sewers. Pharmaceuticals should not be discharged to the sewer system but collected for separate treatment or sent to the National Agency for Food and Drug Administration and Control (NAFDAC) to be treated and disposed of in the agencies laboratories or to the National Institute for Pharmaceutical Research and Development (NIPRD) under a formal Memorandum of Understanding (MoU).

Cleaning wastewater and storm water from storage rooms and loading docks where waste is handled between transportation modes is to be regarded as health care wastewater and managed as such.

Wastewater pre-treatment

Wastewater from laboratories must be neutralized, detoxified and undergo removal of heavy metals as appropriate. Wastewater from X-ray development shall be neutralized and treated for removal of silver. Kitchens must be equipped with grease traps and main laundry facilities shall have lint traps/fine screens. Wastewater from wet treatment of incineration flue gas shall be treated for neutralization and removal of heavy metals.

Discharge for off-site treatment.

Wastewater from health care facilities may be discharged to off-site sewerage and the associated treatment system if the owner and operator approve such a discharge in writing. The accepting entity must confirm in writing that the systems (sewerage and treatment) have adequate capacity and provide quantitative documentation demonstrating permitted performance. The treatment works must be capable of ensuring continuous compliance with national liquid effluents standards as described by the National Environmental Standards and Regulations Enforcement Agency (NESREA). Health care facilities discharging wastewater for offsite treatment must further ensure that external handling and treatment can be managed without compromising the health and safety of workers responsible for operating and maintaining the sewer system and treatment facility. Pre-discharge disinfection of health care facility wastewater and a separate sewer to the treatment plant may be required.

Note: Certain Genotoxic pharmaceuticals may only be destructed by incineration at a temperature of 1200 °C.

Discharge to surface waters

Wastewater discharged directly to surface waters shall have undergone treatment and disinfection and complies with the limits in the table on the page following.

Table 10.1: Liquid effluent concentration limits for health care facilities

Parameter	Unit	Limit
ph		6-9
Biochemical oxygen demand (BOD5)	mg/l	50
Chemical oxygen demand (COD)	mg/l	250
Oil and Grease		
Total suspended solids (TSS)	mg/l	20
Cadmium (Cd)	mg/l	0.1
Chromium (Cr)	mg/l	0.5
Lead (Pb)	mg/l	0.1
Mercury (Hg)	mg/l	0.01
Chlorine, total residual	mg/l	0.2
Phenols	mg/l	0.5
Fecal Coliform MPN/100	mg/l	400
Dioxins and furans	mg/l	0.3

This is applicable primarily to secondary and tertiary healthcare facilities who have the capacity to implement the above. Management personnel of primary healthcare facilities are to safely store collected pharmaceutical wastes which should be sent to secondary healthcare facilities alongside other wastes. Other liquid wastes generated in primary healthcare facilities can be disposed of in-facility, provided sewage pipe line networks, soak-away and septic tanks are constructed.

Assignment of Responsibilities

The proper management of health-care waste in the course of the implementation of the Nigeria Polio Eradication Project will be achieved if it is ensured that there is good administration and organization in the HCFs participating in the program. Adequate financing for HCWM, as well as active participation by trained and informed staff must be guaranteed by the NPHCDA.

The Head of the institution should form a **health care waste management team (HCWMT)** to develop a health care waste management plan.

A **Waste Management Officer** – Each healthcare facility should have an Environmental Health Officer with the overall responsibilities for the development of the hospital waste management plan and for the subsequent day-to-day operation and monitoring of the waste disposal system.

Development of a waste management plan

The waste management plan should be developed in close consultation with all members of the Waste Management Team. The plan should analyse existing practices in the HCF and its development should be based on the National HCWM guidelines. It should as a minimum consider the following:

- Quantities of waste generated;
- Possibilities for waste minimization, reuse, and recycling;
- Waste segregation, on-site handling, transport, and storage practices;
- Identification and evaluation of waste treatment and disposal options (on- and off-site);
- Training;
- Estimation of costs relating to waste management (actual situation and proposed options);
- Strategy for the implementation of the plan

Implementation of the waste management plan

Implementation of the WMP is the responsibility of the Chief Health Officer in each HCF. It involves the following steps:

- Interim measures, to be introduced as a precursor to complete implementation of a waste management system should be developed by the Waste Management Officer (WMO), in collaboration with the Waste Management Team (WMT), and be appended to the plan;
- The Head of Hospital appoints personnel to the posts with responsibility for waste management. Notices of these appointments should be widely circulated and updates should be issued when changes occur;
- The Infection Control Officer should **organize and supervise training programmes** for all staff, in collaboration with the WMO and other members of the WMT. Initial training sessions should be attended by key staff members, including medical staff, who should be urged to be vigilant in monitoring the performance of waste disposal duties by non-medical staff;
- The WMT should review the WMP annually and initiate changes necessary to upgrade the system

Activities	Environmental components	Potential E&S Issues and Risks	Proposed Mitigation Measures	Responsibilities
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Table ICWMP

<p>1.Delivery and storage of specimen, samples, reagents, pharmaceuticals and medical supplies</p> <p>2.HCF operation – transboundary movement of specimen, samples, reagents, medical equipment, and infection materials Emergency events</p> <p>3.Onsite waste treatment and disposal</p>	Soil	<p>Soil contamination from detergents and laboratory chemicals</p>	<p>1. Use appropriate waste drainage systems leading to septic tanks or public sewerage facilities; as provided by contractor</p> <p>2. Conduct mobile health clinics and x-rays at health centers with appropriate drainage and waste disposal facilities</p>	<p>REDISSE, State ministry of Health</p>
		<p>Contamination from resulting from careless acts</p>	<p>1. Conduct civic education and public health meetings</p>	<p>REDISSE/CoPREPP State ministry of Health</p>
		<p>Contamination from wastes during transportation and disposal</p>	<p>1. Transport waste in properly sealed and approved containers 2. Dispose liquid waste in proper drainage system 3. Provide controlled air incinerators for treatment and disposal of sputum and wastes 4. Collect and transport ash from incineration in sealed and approved bags with a biohazard label 5. Dispose incinerator ash in approved landfill sites</p>	<p>REDISSE/CoPREPP State ministry of Health</p>
		<p>Land degradation and soil contamination</p>	<p>1. Follow the given specification for digging pit and burying wastes 2. Rehabilitate the land after burying of wastes 3. The site for burying wastes must be properly marked or fenced 4. Ensure that there is complete incineration of the wastes</p>	<p>REDISSE/CoPREPP State ministry of Health</p>
	Surface and ground water quality	<p>1.Water pollution from detergents and chemicals used in the laboratory</p> <p>2.Infectious wastewater and contaminated blood</p>	<p>1.Use appropriate waste drainage systems leading to septic tank or public sewerage facilities as provided by contractor</p>	<p>REDISSE/CoPREPP State ministry of Health</p>

	Air Quality	Air pollution from smoke from incinerators	<p>Position the incinerators on a leeward side or in such that the direction of wind is away from habited areas</p> <ol style="list-style-type: none"> 2. Sort the waste to ensure only organic and combustible waste goes into incinerators 3. Train staff on how to operate the incinerators 4. Regularly maintain the incinerators to ensure they are working properly 5. The laboratory staff should be oriented to the ICWMP, especially segregation at source and colour coded waste management 	<p>REDISSE/CoPREPP</p> <p>State ministry of Health</p>
	Health and Safety	Spread of COVID -19 from infected persons	<ol style="list-style-type: none"> 1. Develop Laboratory Standard Operating Procedures (SOPs) and good practice and emergency manuals 2. Provide adequate ventilation in laboratories and treatment areas 3. Provide appropriate protective equipment for handling COVID-19 specimen and ensure they are used 4. Sensitize the communities to regularly wash hands after visiting patients in hospital, as well as after taking care of patients at home 5. Encourage communities to rush to the hospitals with suspected cases 6. Provide adequate and appropriate protective clothes to health workers 7. Health workers must attend to one suspected case or confirmed case and change clothes or disinfect before attending to another person 8 Staff must be oriented to and follow the ICWMP; 9. Burials of dead patients must be conducted by trained health workers 	<p>REDISSE/CoPREPP</p> <p>State ministry of Health</p>

		Risk of exposure to infectious specimen during collection and transportation of sputum from collection points to laboratories	<ol style="list-style-type: none"> 1. Provide protective gear to staff and ensure they are used to handle s infectious wastes 2. Package sputum in right containers that can be sealed tight and cannot break 3. Transport sputum containers in appropriate boxes 4. Ensure that staff know and use the recommendations in the ICWMP 	<p>REDISSE/CoPREPP</p> <p>State ministry of Health</p>
		Accidents and risks of fire in the laboratory	<ol style="list-style-type: none"> 1. Provide fire-fighting equipment 2. Raise awareness on staff about accidents and fire risks 	
	Social	Discrimination of suspected or confirmed cases and persons declared COVID -19 free	<ol style="list-style-type: none"> 1. Sensitize communities on Ebola and preventive measures 	<p>REDISSE/CoPREPP</p> <p>State ministry of Health</p>
		Difficult terrain is a barrier to access health services	Reach local people through innovative means e.g. strengthening work relationships under PPP	

I. Infection and Prevention Control Protocol

(adapted from the CDC Interim Infection Prevention and Control Recommendations for patients with confirmed COVID-19 or persons under investigation for COVID-19 in Healthcare Settings)

HEALTH CARE SETTINGS

1. Minimize Chance of Exposure (to staff, other patients and visitors)

- Upon arrival, make sure patients with symptoms of any respiratory infection to a separate, isolated and well-ventilated section of the health care facility to wait, and issue a facemask
- During the visit, make sure all patients adhere to respiratory hygiene, cough etiquette, hand hygiene and isolation procedures. Provide oral instructions on registration and ongoing reminders with the use of simple signs with images in local languages
- Provide alcohol-based hand sanitizer (60-95% alcohol), tissues and facemasks in waiting rooms and patient rooms
- Isolate patients as much as possible. If separate rooms are not available, separate all patients by curtains. Only place together in the same room patients who are all definitively infected with COVID-19. No other patients can be placed in the same room.

2. Adhere to Standard Precautions

- Train all staff and volunteers to undertake standard precautions - assume everyone is potentially infected and behave accordingly
- Minimize contact between patients and other persons in the facility: health care professionals should be the only persons having contact with patients and this should be restricted to essential personnel only
- A decision to stop isolation precautions should be made on a case-by-case basis, in conjunction with local health authorities.

3. Training of Personnel

- Train all staff and volunteers in the symptoms of COVID-19, how it is spread and how to protect themselves. Train on correct use and disposal of personal protective equipment (PPE), including gloves, gowns, facemasks, eye protection and respirators (if available) and check that they understand
- Train cleaning staff on most effective process for cleaning the facility: use a high-alcohol based cleaner to wipe down all surfaces; wash instruments with soap and water and then wipe down with high-alcohol based cleaner; dispose of rubbish by burning etc.

4. Manage Visitor Access and Movement

- Establish procedures for managing, monitoring, and training visitors
- All visitors must follow respiratory hygiene precautions while in the common areas of the facility, otherwise they should be removed
- Restrict visitors from entering rooms of known or suspected cases of COVID-19 patients Alternative communications should be encouraged, for example by use of mobile phones. Exceptions only for end-of-life situation and children requiring emotional care. At these times, PPE should be used by visitors.

- All visitors should be scheduled and controlled, and once inside the facility, instructed to limit their movement.
- Visitors should be asked to watch out for symptoms and report signs of acute illness for at least 14 days.

CONSTRUCTION SETTINGS IN AREAS OF CONFIRMED CASES OF COVID-19

1. Minimize Chance of Exposure

- Any worker showing symptoms of respiratory illness (fever + cold or cough) and has potentially been exposed to COVID-19 should be immediately removed from the site and tested for the virus at the nearest local hospital
- Close co-workers and those sharing accommodations with such a worker should also be removed from the site and tested
- Project management must identify the closest hospital that has testing facilities in place, refer workers, and pay for the test if it is not free
- Persons under investigation for COVID-19 should not return to work at the project site until cleared by test results. During this time, they should continue to be paid daily wages
- If a worker is found to have COVID-19, wages should continue to be paid during the worker's convalescence (whether at home or in a hospital)
- If project workers live at home, any worker with a family member who has a confirmed or suspected case of COVID-19 should be quarantined from the project site for 14 days, and continued to be paid daily wages, even if they have no symptoms.

2. Training of Staff and Precautions

- Train all staff in the signs and symptoms of COVID-19, how it is spread, how to protect themselves and the need to be tested if they have symptoms. Allow Q&A and dispel any myths.
- Use existing grievance procedures to encourage reporting of co-workers if they show outward symptoms, such as ongoing and severe coughing with fever, and do not voluntarily submit to testing
- Supply face masks and other relevant PPE to all project workers at the entrance to the project site. Any persons with signs of respiratory illness that is not accompanied by fever should be mandated to wear a face mask
- Provide handwash facilities, hand soap, alcohol-based hand sanitizer and mandate their use on entry and exit of the project site and during breaks, via the use of simple signs with images in local languages
- Train all workers in respiratory hygiene, cough etiquette and hand hygiene using demonstrations and participatory methods
- Train cleaning staff in effective cleaning procedures and disposal of rubbish

3. Managing Access and Spread

- Should a case of COVID-19 be confirmed in a worker on the project site, visitors should be restricted from the site and worker groups should be isolated from each other as much as possible;
- Extensive cleaning procedures with high-alcohol content cleaners should be undertaken in the area of the site where the worker was present, prior to any further work being undertaken in that area.