

NEMA/PR/5/2/24/44

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT PROJECT REPORT

**FOR
THE PROPOSED CONSTRUCTION AND INSTALLATION OF A MEDICAL
WASTE TREATMENT INCINERATOR AT
HOLA COUNTY REFERRAL HOSPITAL**

**Located Within the Hola County Referral Hospital Compound in Hola Town,
Kibuyu Sub-Location, Zubaki Location, Galole Sub- County of Tana River County**

GPS Coordinates:

1°29'49.06"S 40° 1'45.66"E

PSR 39 518

PROJECT: KENYA COVID-19 HEALTH EMERGENCY RESPONSE PROJECT

PROJECT ID NO. 173820

CREDIT NO: IDA 65980



January 2023

**Proponent
Ministry of Health
P. O. BOX 30016 - 00100
Nairobi KENYA**



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NEMA/PR/2/2023/144

1.1.1.CERTIFICATION OF DOCUMENT

We, the under signed, hereby approve that all information given here in this report is accurate and true to the best of our knowledge and understanding.

PRELIMINARY PROJECT DETAILS

Location of Project: Within the Holla County Referral Hospital Compound in Hola Town, Kibuyu Sub-Location, Zubaki Location, Galole Sub- County of Tana River County

GPS Coordinates: 1°29'49.06"S 40° 1'45.66"E

Neighbours: Government Offices, Residential Facilities and Commercial Establishments (Hotels)

Nature of Activity: Construction of a Shelter, Procurement, and Installation of a Medical Waste Incinerator.

Name of Health Facility: Hola County Referral Hospital (HCRH)

Land Registration Number: TRC/312/2014/09

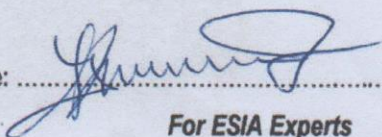
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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT EXPERTS

This Environmental and Social Impact Assessment (ESIA) Report was prepared by a Firm of Experts in accordance with the World Bank Environmental and Social Framework (ESF), World Bank Group (WBG) Environment, Health and Safety (EHS) guidelines and the Government of Kenya policies and regulations for Environmental Assessments:

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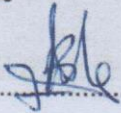
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For ESIA Experts

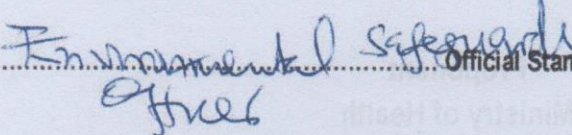
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ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
CDE	County Director of Environment
CEP	Community Engagement Plan
C-HERP	COVID -19 Health Emergency Response Project
CLO	Community Liaison Officer
CPHO	County Public Health Officer
CPP	Consultation and Public Participation
DOSH	Directorate of Occupational Safety and Health
E&S	Environment and Social
EA	Environmental Assessment
EHS	Environmental Health and Safety
EHSGs	Environmental, Health, and Safety Guidelines
EMCA	Environmental Management and Coordination Act
ESF	Environment and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plans
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FP	Family Planning
GBV	Gender-Based Violence
GHG	Green House Gases
GIIP	Global International Industry Practice
GoK	Government of Kenya
GPS	Geographical Positioning System
GRM	Grievance Redress Mechanism
HAIs	Healthcare-Associated Infections
HCF	Health Care Facilities
HCRH	Hola County Referral Hospital
HCWM	Health Care Waste Management
HR	Human Resources
HUTLCs	Historically Underserved Traditional Local Communities
ICMWP	Infection Control and Medical Waste Management Plan
IPC	Infection Prevention and Control
MoH	Ministry of Health
NCA	National Construction Authority
NEMA	National Environment Management Authority
NMK	National Museums of Kenya
OSHA	Occupational Safety and Health Act
PHOs	Public Health Officers
PIA	Project Influence Area
PPE	Personal Protective Equipment
PWE	Public Works Engineer
SEP	Stakeholder's Engagement Plan
SHE	Safety, Health & Environment
SOP	Standard Operations Procedures
STIs	Sexually Transmitted Infections
WBG	World Bank Group
WHO	World Health Organization
WIBA	Work Injuries Benefits Act

EXECUTIVE SUMMARY

Overview

The World Bank through The Kenya COVID-19 Health Emergency Response Project (C-HERP) has provided funding to The Ministry of Health (MoH) of Kenya to construct a shelter, procure and install a medical waste treatment incinerator (MWTI) of 50kg/hour rating. The objective is to improve on management of wastes generated from the Hola County Referral Hospital (HCRH) activities as well as from other health care facilities (HCF) located in the surrounding areas of Hola Township.

The Kenya COVID-19 Health Emergency Response Project (C-HERP) is a multi-phase programmatic approach for strategic preparedness and response which aims to prevent, detect and respond to the threat posed by COVID-19 and strengthen national systems for public health preparedness. One of the components in the programme entails enhancement of medical waste management by Health Care Facilities (HCFs).

The hospital is a Level 5 HCF that provides comprehensive and specialized health care services. It was started in 1953 and currently has a 180-bed capacity. During the COVID –19 pandemic response, the Tana River County Government designated the hospital as the county isolation and treatment centre. The hospital's activities generate potentially infectious wastes which include sharps, cultures from medical laboratories or infected blood, infected wipes or masks from the quarantine, isolation and treatment center. These wastes carry a higher risk of infections and injury than any other type of wastes. Other wastes of importance are body fluids, all body parts, human tissues, placenta and radioactive wastes.

The hospital lacks proper health care waste management plans, and this exposes the patients and health care workers to risks associated with poor waste management. In addition, the hospital disposes its healthcare waste (HCW) through open burning at a site located within the hospital compound, an average of 50m from other hospital facilities. Casuals hired by the hospital collect wastes generated at various hospital facilities and transfer it to the burning site. The waste is often allowed to accumulate for about 2 to 3 days before being burnt. The site is not fenced off, hence the HCW can easily be accessed by scavenging animals such as dogs, cats and birds. The waste is also exposed to weather elements such as wind and rains, causing scattering around the site.

MWTI Design

The installation of the proposed MWTI will require construction of a shelter to house it. The shelter will provide for a temporary waste holding area, an incinerator chamber, sanitation facilities, operators' changing rooms, material/equipment store room, operators' office, an emergency response system and a fire suppression system. There will also be the actual installation of the 50kg/hour MWTI and construction of a perimeter fence to secure and control movement into and out of the waste management designated area. The estimated total area needed for MWTI and all support facilities is approximately 220m². The project is also estimated to cost Kshs. 23,000,000.

Project Alternatives

Project alternatives considered in relation to implementation of the proposed project included:

- Relocating the proposed project to an alternative site. This was found not to be a viable option because the proposed installation of a MWTI is meant to assist in the efficient management of HCW from the operations of the hospital.
- The "No Project Alternative", meaning that the status quo is maintained. Despite the fact that this is the best alternative in terms of ensuring that the current environmental and social set up is not disturbed, this alternative is the least preferred in the long run from a public health, socio-economic and environmental perspective. Absence of the MWTI will only lead to intensification of the already existing challenges in the treatment and disposal of HCW at the hospital. Maintaining the status quo by poor handling of the HCW and the continued use of the old burning chamber will aggravate atmospheric, soil and ground water pollution.
- Disposal of wastes in a sanitary landfill: Properly constructed and operated landfill sites offer a relatively safe disposal route for most wastes including HCW. However, this method requires an expansive site as well as specialized machines for compaction of each day's waste. A sanitary landfill is also expensive to construct and maintain, beyond the ability of the HCF.
- Autoclaving of the waste: This entails steam treatment of the waste in a metal chamber sealed by a charging door and surrounded by a steam jacket. Autoclaves are expensive to install and maintain, and the technology

does not render waste unrecognizable. It also does not reduce the volume of treated waste unless a shredder or grinder is added.

- Incineration of waste: Incineration is a high-temperature dry oxidation process that reduces organic and combustible waste to inorganic, incombustible matter and results in very significant reduction of waste volume and weight. Incineration enables disposal of the greatest variety of waste, results in significant volume reduction, sterilizes wastes completely, and the treated waste is unrecognizable as ash.

Need for ESIA

The construction and installation of a MWTI at Hola County Referral hospital is likely to cause environmental and social impacts. To proceed with the implementation of this project without causing adverse impacts on the environment and social fabric, the MoH with guidance from the World Bank has undertaken this ESIA. Based on the nature of works of the CHERP project, as well as magnitude of anticipated environmental and social impacts likely to arise from its implementation and operations, the project was initially rated at the risk category of “High” in accordance with the World Bank’s Environmental and Social Framework (ESF). However, following the overall improvement of the project performance i.e., the gradual improvement in preparedness and the capacity of HCFs to respond to COVID-19 infections and the engagement of environment and social (E&S) specialists to support in management of E&S risk among other improvements, the current project risk rating has been adjusted to “Substantial”.

The MoH appointed Devlink Resources Consultants to carry out the Environmental and Social Impact Assessment (ESIA) of the proposed incinerator project in line with the World Bank’s Environment and Social Framework (ESF) as well as project specific environmental and social safeguards instruments, which include the Environmental and Social Management Framework (ESMF), the Infection Control and Waste Management Plan (ICWMP), the Labour Management Procedures (LMP), the Security Management Plan (SMP) and the Stakeholders Engagement Plan (SEP). The ESIA was also developed in light of a number of national and international policies, procedures, regulations, laws and statutes, some of which are discussed in detail in Chapter 4 of this report.

ESIA has been recognized as a crucial practice for forecasting and assessing the potential environmental and social impacts of a proposed project, assessing alternatives, planning appropriate mitigation, management, and monitoring measures. Early identification of possible development impacts to the environment and human populations enhances and promotes environmental sustainability as anthropogenic factors are balanced with natural environmental needs.

Policy, Legal and Institutional Framework

The administrative and legal framework relevant to the proposed MWTI Project in terms of relevant and applicable Policy Framework (Table 1), Legal Framework (Table 2), Institutional Framework (Table 3), Social Statutes (Table 4) including World Bank Environment and Social Standards (ESS) (

Table 5: World Bank5) and World Bank Group EHS Guidelines and other relevant Good International Industry Practice (GIIP) (Chapter 4) have been reviewed in relation to implementation of the project and presented in this ESIA.

ESIA Methodology

The ESIA was carried out using a combination of methods, which included; ground surveys and a public consultative meeting. In addition, existing literature on legislative and other requirements were studied. The potential environmental and social impacts identified are classified into different categories including impacts on air resources, water resources, ecological resources, biodiversity and socio-economic issues. The key aspects comprised dust generation, noise generation, health and safety issues, waste management issues, fire and chemical hazards. These impacts are site specific and none is irreversible with mitigating measures that have been proposed in this report. Therefore, recommendations have been made to prevent, minimize, mitigate, or compensate for the adverse impacts and improve on the project’s environmental and social performance and acceptability. This is geared towards avoiding, preventing and mitigating undue harm to people and their environment in the project design, planning, implementation, operationalization and decommissioning process.

Stakeholder Consultation

With regard to stakeholder consultations for the proposed project, the ESIA team organized a public meeting on the 16th December 2020 for stakeholders identified as per the requirement of the Constitution of Kenya (2010), the Environmental Management and Coordination Act, 1999 as amended in 2015, the Environmental (Impact Assessment and Audit) Regulations of 2003, and in reference to the provisions of the Project's Stakeholder Engagement Plan (SEP) guidelines. The stakeholders from the project area reached were 13. These are persons who may be affected by the proposed project. Those present included the area assistant chief, area Catholic Church priest, business people, county and hospital PHOs and political representatives of the area. All the stakeholders agreed that the project should go on as planned given that it is located within an operational hospital and that it will assist the hospital in ensuring effective HCWM which in turn will lead to protecting public and environmental health of Hola town and its environs.

Presently, the HCRH Grievance Redress Mechanism (GRM) involves lodging of complaints by aggrieved stakeholders or submission of comments from hospital staff, patients, neighbours or community members through a suggestion box located in the hospital's premises or registering it with the hospital. The proponent (MOH) shall establish GRM specifically for the proposed project to ensure that all issues pertaining the proposed project are addressed as they arise. The contractor shall be required to adopt the GRM requirements provided for in the Project Stakeholder Engagement Plan (SEP) for the establishment of complaints structures, channels, documentation and reporting arrangements. Similarly, the Facility GRM will continue to be strengthened and operationalized at the minimum as guided in the SEP and should be linked to the Contractor GRM.

Findings of the ESIA

The findings of the ESIA indicate that the potential environmental and social impacts generated during construction, installation, operation and decommissioning phases can be addressed effectively by the hospital management through specific mitigation measures that are proposed in environmental and social management and monitoring plans for the project.

The potential positive impacts associated with implementation and operations of the proposed project include: employment opportunities, additional infrastructure to the hospital, improved HCWM, source of income from sale of construction materials and capacity building for the hospital human resource.

Possible deleterious impacts during construction phase of the proposed project include: Interference with the Physical Setting of the area including the loss of vegetation, increased noise and vibration, air / dust emission, increased waste generation, accidental spillages, increased use and extraction of construction materials, possible encounter with physical cultural resources, occupational safety and health (OSH) risks, which may result to health and safety risks due to truck movements in and out of the HCF, fire hazards, spread of communicable diseases and other infections including COVID-19, increase in HIV/AIDS prevalence and other sexually transmitted infections (STIs), labour influx, cases of human rights violation and gender inequalities. There is also a possibility of having cases of conflict and insecurity, sexual exploitation and abuse, work and community related grievances.

Potential negative impacts during operation phase include improper HCWM, fire risk, OSH risks for healthcare workers, air pollution from inefficient operation of the MWTI and uncollected/ undisposed wastes, community health risk from improper HCWM, OSH risk to HCW handlers and the MWTI operators, increased water and energy use, and liquid waste generation by the MWTI, and generation and potential mismanagement of ash from the MWTI.

This ESIA report outlines appropriate mitigation measures for the anticipated negative environmental and social impacts such as re-vegetation of open patches of the project site, putting in place proper drainage channels for discharge of storm waters, rain water harvesting, restricted vegetation clearance to minimize vegetation loss, sprinkling of water on bare/open surfaces to suppress dust. Detailed mitigation measures for all the potential impacts are summarized on Table 8 (ESMP) and the monitoring options have been suggested on Table 9.

From the field studies there are no known archaeologically protected monuments and cultural properties in the proposed project area and therefore, there will be no impacts on them. However, should any archaeological or culturally important artefact be discovered during the construction/excavation process, the contractor will implement a *Chance Find Procedure* (CFP). The CFP will be incorporated into the main contractor's contract and monitored by the Public Works Engineer (PWE).

Presently, the Hola County Referral Hospital does not have a documented Grievance Redress Mechanism (GRM). Complaints or comments from hospital staff, patients, neighbours or community members are deposited in a suggestion box located in the hospital's premises, or registered it with the hospital. There is no system to review, address and/or provide feedback to the originators of the grievances/comments. The proponent (MOH) shall establish a GRM specifically for the proposed project to ensure that all issues pertaining to the proposed project are addressed as and when they arise. The contractor shall be required to adopt the GRM by the MoH for addressing all grievances during the construction phase of the project. On the other hand, once the contractor hands over the facility to MOH, the project level GRM may cease to function. The HCF will be encouraged to develop a hospital level GRM that can address grievances arising from the operations of the MWTI, besides the other hospital activities.

Project Implementation and Monitoring Arrangements

The role of monitoring and supervision of project environmental and social compliance is the responsibility of Tana River County Government health department since they have the mandate enshrined in the County Government Act, 2012. Key players in the monitoring of compliance in the project will include:

- i. MoH (E&S Specialists, Hola Medical Superintendent, Hospital Administrator and Public Health Officer)
- ii. The contractor
- iii. Public Works Engineer (PWE)
- iv. External monitoring from Tana River County Government staff including
 - County Director for Environment
 - County Director for Physical Planning,
 - Labour Officer
 - Community Development Officer
 - County Social Development officer
 - Physical Planner
 - County Public Health officer
 - Occupational Health and Safety Officer

Conclusion

- i. The proposed project does not pose any serious environmental and social concerns, other than those of a moderate scale that accompany similar projects;
- ii. The positive impacts associated with the implementation and operationalization of the proposed project far outweigh the probable negative ones, which will be adequately mitigated by following the prescribed environmental and social impact management and monitoring plans;
- iii. The MWTI project is highly needed to address the breaches in medical waste treatment in Hola County Referral Hospital; and
- iv. As such, as per the above analysis on the aspects of both positive and negative environmental and social impacts of the project development and operations, we, the experts found no significant negative impacts that could pose adverse effects to the extent of barring the proposed project from being implemented, provided that the project is designed, constructed, monitored and operated in compliance with all applicable design and ESHS requirements

Recommendations

The following are recommended going forward with the project:

- a. Though the anticipated negative environmental and social impacts of the project sub-components are considered moderate, localized and can be easily mitigated. The ESMP needs to be operationalized to ensure sustainable delivery of this project.
- b. Institutional framework for the delivery of the project needs to be operationalized to effectively follow up compliance as per their mandates.
- c. The project should earmark some resources for supporting the optimal operation of the MWTI and its operators to benefit from continuous capacity building especially on aspects of safety and emergency preparedness.

1 INTRODUCTION

1.1 Introduction of the Project

The Government of Kenya (GoK) through the MoH has received financing from the World Bank Group (WBG) towards implementation of the Kenya COVID -19 Health Emergency Response Project (C-HERP). The Project is a multi-phase programmatic approach for strategic preparedness and response which aims to prevent, detect and respond to the threat posed by COVID-19 and strengthen national systems for public health preparedness. The C-HERP project entails eight components¹ among them being **Component 4-Medical Waste Management**: This component will ensure the safe management of waste generated by healthcare activities.

This ESIA falls under Component 4 - Medical Waste Management, because it is for the construction of a shelter, procurement, installation and commissioning of a Medical Waste Treatment Incinerator (MWTI) of 50kg/hour rating. The MWTI is proposed with the objective of ensuring the safe management of waste generated by laboratory and healthcare activities supported by CHERP at the Hola County Referral Hospital (HCRH).

Infection Control and Waste Management

HCW is defined as “all waste generated by healthcare establishments (human or veterinary), including research facilities and laboratories. It can include waste generated in the course of healthcare in homes. Hazardous healthcare waste is of primary concern, due to its potential to cause infections, disease or injury. Infection Prevention and Control (IPC) are evidence-based practices and procedures that are applied consistently in healthcare settings to prevent or reduce the risk of transmission of micro-organisms to healthcare providers, clients, residents and visitors. Therefore, either at healthcare or community setting, IPC is concerned with interventions relating to health and environment. According to the WHO, about 15-25% of total health-care waste is infectious waste, and improper handling of healthcare waste can cause serious health problems for workers, community and environment.

IPC strategies to prevent or limit transmission in healthcare settings as per the WHO IPC in healthcare settings especially those handling COVID-19 cases include ensuring triage, early recognition, and source control (isolating patients with suspected COVID-19); applying standard precautions for all patients; implementing empiric additional precautions (droplet and contact and, whenever applicable, airborne precautions) for suspected cases of COVID-19; implementing administrative controls and using environmental and engineering controls.

1.1 Problem Statement

Infection prevention and control (IPC) and waste management challenges are numerous and a salient feature in the County. The Project Influence Area (PIA) is no different with the local community attesting to challenges in waste disposal in the locality. Potentially infectious wastes generated by the hospital are sharps, cultures from medical laboratories or infected blood, infected wipes or masks from quarantine, isolation wards. These carry a higher risk of infections and injury than any other type of wastes. Other wastes of importance are body fluids, all body parts, human tissues, placenta and radioactive wastes. The absence of proper HCWM exposes the patients, health care workers and the surrounding community.

The status of HCWM at HCRH is that the hospital has been using open burning of generated wastes. The open HCW burning site is located within the hospital compound, an average of 50m from other hospital facilities. The site is not fenced off, hence the HCW can easily be accessed by scavenging animals such as dogs, cats and birds. Casuals hired by the hospital collect waste from all the hospital HCW generating points and transfer it to the burning site where it is stored for 2 to 3 days before being burnt. The burning site has no lining, soil cover or gas control thus there is potential risk of air, soil and ground water pollution and contamination. It is recommended that the open disposal and burning of HCW at the HCRH is discontinued with immediate effect. The hospital management should contract a service provider to appropriately manage its waste until the MWTI is operationalized. Apart from being exposed to scavenging animals, the waste is also exposed to weather and/or other environmental aspects such as wind and rain, which causes scattering and pollution of the surrounding area.

1.2 The Proposed Solution

Through the technical support of CHERP in early 2021, HCRH developed an ICWMP for the financial year 2021/2022. The ICWMP covers: roles and responsibilities including a designated waste management officer, and

¹ See Appendix 2 on the 8 Components of CHERP

waste classification (including quantities of waste generated). Other aspects covered by the ICWMP include: waste minimization; reuse and recycling; waste segregation; onsite handling, transport and storage practices (including containerization, color coding, labeling and signage); waste-treatment and disposal options (onsite and offsite); record keeping and documentation, training and monitoring; costs relating to waste management, including capital, operational and maintenance costs.

One of the components of the ICWMP was the installation of a MWTI to ensure the effective treatment of HCW at the hospital as well as assist other HCFs in the County to manage their wastes. The proposed MWTI will have a capacity to treat 50 kg of waste per hour, and therefore the ability to treat 400 kg/day of waste if operated for 8 hours per day. The MWTI capacity is adequate to treat the infectious and highly infectious waste generated by the HCFs, which is the main focus of the support.

The MWTI will require periodic maintenance and checks such as monitoring of emissions to ensure appropriate waste treatment. Waste segregation and sorting will also be carried out from the source and at the waste treatment point. The hospital has been practicing the disinfection of its wastes with 0.5% chlorine solution before the wastes are delivered to the existing burning chamber. This practice is expected to continue when the hospital will be transferring waste from highly infectious units to the MWTI

1.2.1 Capacity Building for Healthcare Waste Management at LSCH

HCRH has a designate waste management officer, who is the Public Health Officer (PHO) responsible for waste management, sanitation among other hospital environmental health and public health duties. The PHO was trained on waste management and on the development of the facility Infection Control and Waste Management Plan (ICWMP) for the financial year 2021/2022. The Plan is will be reviewed to reflect activities expected to be accomplished in the 2022/2023 financial year.

The PHO is expected to cascade the training to those working under the officer, who are yet to get trained. Those not trained include waste handlers and waste treatment equipment operators among other support staff. A refresher training and orientation of the public health officer and biomedical engineer is also planned as soon as the new MWTI is installed.

1.2.2 Project Objective

The objective of the proposed project is to facilitate safe healthcare waste management (HCWM) at HCRH and build capacity for sound and sustained management of highly infectious waste.

1.3 Justification of the Project

There is need for this Project because the continued infectious diseases' management function coupled with the hospital's routine operation requires appropriate and effective treatment of the healthcare waste generated. The MWTI will treat wastes generated by the HCF and other health facilities within Hola. This will contribute or enable the HCRH and the County Government of Tana River to meet their waste management objectives, and the protection of the health of communities and the environment.

1.4 ESIA Scope

The scope of this consultancy entailed the preparation of an ESIA report for the Designing and Planning of the MWTI Project, civil works (construction of the MWTI shelter), installation and operation of the MWTI that will take place at HCRH. The aim was to identify the potential environmental and social impacts and risks associated with the proposed project and recommend appropriate environmental and social mitigation measures for integration in all phases of the project cycle (planning and design, construction and commissioning, operation and decommissioning).

1.5 Terms of Reference (ToRs)

The terms of reference of this ESIA are:

- i. To identify and assess potential positive and negative environmental and social impacts associated with the proposed civil works and installations;
- ii. To recommend appropriate environmental, social, health and safety mitigation measures for integration in all phases of the project's cycle;
- iii. To determine how far the activities that relate to the civil works and installation at the sub-project sites as well as

- their operation comply with sound environmental health and safety management practices;
- iv. Undertake project alternative analysis;
 - v. Identify potential design opportunities and appropriate measures to have a sustainable MWTI facility in place;
 - vi. Conduct a Consultation and Public Participation (CPP) process as described in the Stakeholder Engagement Plan (SEP), and in conformity with the provisions of the Constitution of Kenya (2010), the EMCA 1999 as amended in 2015, and its subsidiary legislation.
 - vii. Generate an Environmental and Social Management and Monitoring Plan (ESMMP) that describes in detail the mitigation measures to be carried out, scheduling and responsibility of such measures, and a detailed monitoring process and its schedule; and
 - viii. Prepare an ESIA report compliant to the requirements of the relevant authorities.

1.6 Justification for Preparation of Safeguards Instruments

The C-HERP aims to assist the country in ensuring the safe management of waste generated by healthcare activities such as the case in HCRH. Such cannot be guaranteed without having in place the appropriate HCWM equipment such as incinerators. Thus, the proposed installation of a MWTI at HCRH is an initiative required not only in HCRH but in Kenya as a whole looking at the detriments associated with poor HCWM. Under the provisions of the EMCA, 1999 as amended in 2015 and its subsidiary legislation, it is a requirement that an ESIA is undertaken prior to construction and commissioning of a medical waste treatment facility. In addition, the C-HERP project is prepared under the World Bank ESF, whereby the Environmental and Social Risk associated with the proposed project was initially classified as “High” based on the nature of works of the CHERP project, as well as magnitude of anticipated environmental and social impacts likely to arise from its implementation and operations. However, following the overall improvement of the project performance i.e., the gradual improvement in preparedness and the capacity of HCF to respond to COVID-19 infections and the engagement of environment and social (E&S) specialists who support in management of E&S risk among other improvements, current project risk rating has been adjusted to “Substantial”. As a result of this risk rating, six of the ten ESSs of the WB’s ESF have been screened as relevant to the Project as stated below:

- i. ESS1: Assessment and Management of Environmental and Social Risks and Impacts;
- ii. ESS2: Labour and Working Conditions;
- iii. ESS3: Resource Efficiency and Pollution Prevention and Management;
- iv. ESS4: Community Health and Safety;
- v. ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities (HUTLCs); and
- vi. ESS10: Stakeholder Engagement and Information Disclosure².

1.7 Definition and Purpose of the ESIA

ESIA is a process for predicting and assessing the potential environmental and social impacts of a proposed project, evaluating alternatives and designing appropriate mitigation, management and monitoring measures. Through ESIA, the World Bank Group requires the borrower to provide sufficient information about the potential environmental and social risks and impacts of a proposed project. It is during the ESIA that a CPP should be carried out to inform the public and stakeholders about the proposed project and its activities. As set out in ESS10 (Stakeholder Engagement and Information Disclosure) and under the provisions of the Legal Notice Number 31 and 32 of 2019, such disclosure should be done in a timely manner, in an accessible place, and in a form and language understandable to project-affected and interested parties, so that they can provide meaningful input into the project design and mitigation measures³.

1.8 Methodology of ESIA

For the purpose of the assessment and preparation of the ESIA project report, the following approaches and methodologies were employed:

- i. **Desktop studies:** This involved review and analysis of literature for acquisition of secondary data;
- ii. **Environmental and social screening:** This was carried out following the requirements as specified in the C-HERP ESMF. The classification of the sub-project is as per the provisions of the Laws and Regulations applicable in the country. Therefore, the project was categorized as among those requiring ESIA under the 2nd Schedule of

² Environmental and Social Screening Report (MoH,2020)

³ The World Bank Environmental and Social Framework-2016

the EMCA, 1999.

- iii. **Environmental and Social Scoping:** This provided the key environmental and social issues to be investigated in relation to implementation of the proposed project;
- iv. **Physical inspection of the site and surrounding areas;**
- v. **Consultation and Public Participation:** CPP for collection of primary data. This promotes open governance whereby everybody is granted equal opportunity to voice their opinion/ views with regard to the proposed project of installing a medical waste treatment incinerator;
- vi. Identification of potential impacts and preparing an ESMP;
- vii. **Reporting:** Confirmation and sharing of findings with the project proponent.

2 PROJECT DESCRIPTION AND LOCATION

2.1 Proposed Location

The proposed project will be located within the HCRH compound in Hola Town, Kibuyu Sub-Location, Zubaki Location, Galole Sub-County of Tana River County. The site, HCRH is a public hospital owned by the GoK. Consequently, there are no issues related to land acquisition on the proposed project. The land registration number (LRN) is TRC/312/2014/09. The hospital has been allocated 8.75 hectares as per the attached part development plan attached to this report (Appendix 9b).

Currently, the site designated for the construction and installation of the MWTI neighbours the waste management site and where a structure had been constructed in readiness for installation of a MWTI, which has never been realized. Neighbouring the site are the newly constructed maternity wing which is approximately 100m away to the South East, a tarmacked public road to the East, Government offices, commercial and residential properties to the West, a school which is 500m away to the East and River Tana 1km further East. The GPS coordinates for the proposed new incinerator site are 1°29'49.06"S 40° 1'45.66"E



Figure 1: Location of HCRH in relation to the Hola Town (Source: www.earth.google.com)



Figure 2: The Project Site within HCRH compound (Source: www.earth.google.com)



Figure 3: The project site showing the constructed structure to the far left and open HCW disposal site to the right (Source: Field work)

2.2 Project Description

The proposed project will involve the construction of a shelter, procurement, installation and commissioning of a 50kg/hour rating MWTI at an estimated cost of Ksh.23, 000,000.

The MWTI will be sheltered in a permanent structure designed to ensure that there is adequate ventilation (See *Appendix 10 on plans and designs for the proposed incinerator shelter*). Elements of the shelter will have the following specifications:

- Walling-natural building blocks;
- The Roofing-metallic trusses, iron sheets;
- Metallic grills (for ventilation);
- A Burglar proof metallic door; and
- Cemented floor.

The MWTI will include various components that complement each other to ensure that wastes are incinerated as per the desired levels and as per the design of the incinerator. The components are:

- Manual loading door
- Main/Primary and Secondary combustion chambers
- After burning emission control chamber/Gas Scrubber
- Discharge chimney
- Control panel
- Fuel storage

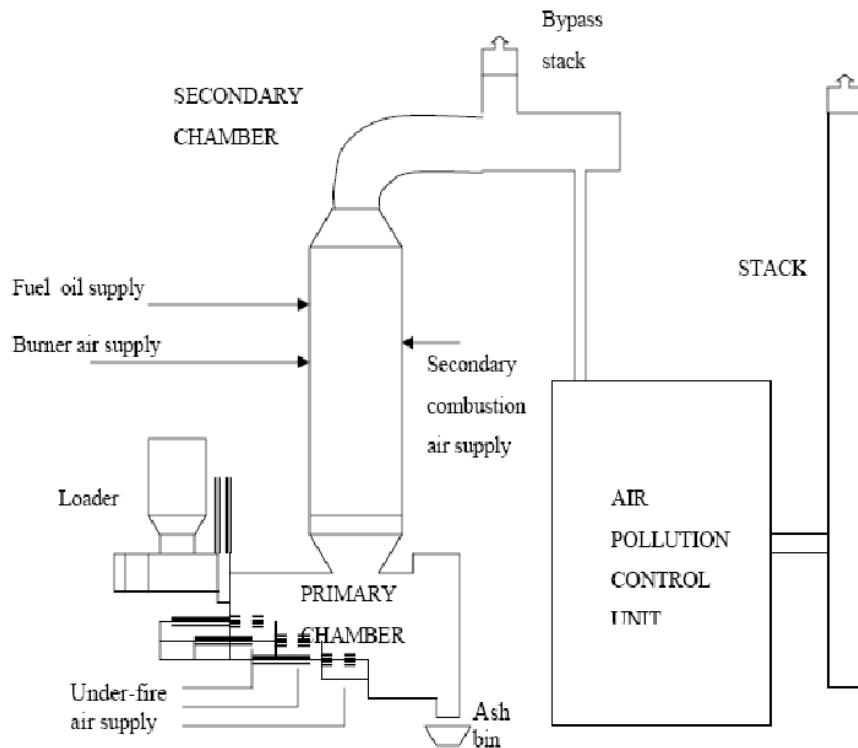


Figure 4: A schematic cross section of a modern MWTI showing its different components
 (Source: https://www.researchgate.net/figure/The-schematic-diagram-of-a-clinical-waste-incinerator_fig1_23749959)

a) Manual Loading Door

This is the inlet where solid waste will be fed to the incinerator.

b) Primary Chamber

This is where combustion of the solid wastes will take place. The chamber is cylindrical in shape and will horizontally be fitted along the floor of the incinerator shelter.

c) Secondary Chamber

The products of combustion from the primary chamber exhaust will be loaded into the secondary chamber located directly above the primary chamber for treatment. Within the secondary chamber additional heat and air will be added to promote combustion in the gaseous phase, thus ensuring complete combustion of the volatile and solid particulate.

d) Gas Scrubber/Emission Control Chamber

Treated gases will exit the secondary chamber, directly into the emission control chamber (scrubber). The gas scrubber/ washer is designed to suck all particulate matter from gases emanating from the burning chambers. Particulate matter from the combustion process will be entrained within the spray of water which also will cool the gases to below 450°C.

e) Control Panel

The control panel is fitted with various control knobs that are used to operate the incinerator. The control panel entails controls for time and temperatures.

f) Fuel Storage

The fuel (diesel) used in burning the wastes will be stored in a 200L metallic tank raised above the main machine. The tank will be fitted with a level gauge, feeder, fill pipes and a breather.

g) Plant Duty and Design Parameters

- i. Design Burn rate: Up to 50Kg/Hour in batch loads/ Up to 400kg range per 8-hour day
- ii. Duration of Operation: Nominally 8 hours/day 310 days/annum (Up to a maximum of 14hrs/day)
- iii. Waste: General / Medical

- iv. Moisture content of waste: 20-50%
- v. Weight of ash residue: 10%-12% (Subject to waste profile)
- vi. Volume of ash residue: 5-7% (Subject to waste profile)
- vii. Auxiliary fuel: Diesel
- viii. Maximum Noise level: 82dB (A) at 1m
- ix. Ambient operating condition: -5°C to 50°C
- x. Energy – ignition and after burners maximum power rating 450 KW/hr Ignition diesel consumption average of 3 ltrs and after burner consumption average of 6 ltrs and connected to 3 phase 415 V at 50/60 Hz
- xi. Water supply – requires adequate water supply
- xii. Waste water management – MWTI to be connected to the hospital waste water system

2.3 Project Design Considerations

Normal operations at the health facility will not be disrupted during the implementation of the project as the proposed site is at one of the extreme ends of the health facility, where a different access route should be created for the MWTI shelter construction workers. The installation of the proposed MWTI unit at the Hospital will require the following activities to be undertaken to make it fully operational:

- i. Construction of a shelter to house the MWTI. As per the design, the total area required is 220m².
- ii. The incinerator will be sheltered in a permanent structure designed to ensure that there is adequate ventilation. The shelter will be made up of:
 - Walling-natural building blocks;
 - The roofing-metallic trusses, iron sheets;
 - Metallic grills (for ventilation);
 - A burglar proof metallic door; and
 - Cemented floor.
- iii. Auxiliary facilities will include the provisions a bathroom, a toilet, office space, temporary waste storage area, a store for working equipment, and escape exit, fire suppression system and an emergency alarm communication system, as well as a new ash pit. (*See annexure plans and designs for more information on the proposed incinerator shelter*).
- iv. Installation of the MWTI with primary and secondary burning chambers, control panel and fitted with an air scrubber;
- v. An ash pit designed as per the data on HCW generation from the HCRH and other HCF expected to deliver their HCW at the MWTI for incineration.
- vi. Construction of perimeter fence around the waste management area so as to secure and control movement into and out of the waste management designated area, and
- vii. Construction of a paved path connecting the MWTI with other hospital facilities for easy delivery of HCW.

The proposed project site was deemed appropriate based on the layout of the hospital and hospital operations. This is considering that it is approximately 100m away from the nearest hospital facility and at least 100m away from the nearest external community facility.

2.4 Project Activities

2.4.1 Planning and Design Phase

This is a purely preparatory stage of the project with minimal physical activities at the project site. The activities entail mostly boardroom consultations/ meetings, site visits, desktop works, stakeholders and public consultations and participation. This will entail the design and drawing of the specific architectural plans for the MWTI shelter, applying for approvals from the Tana River County Development control section, getting into collaborative agreements with key stakeholders and undertaking the ESIA and seeking NEMA approvals

2.4.2 Construction Phase

Activities applicable during the construction of the MWTI shelter and subsequent installation of the MWTI will entail;

- i. Recruitment of construction and installation staff and their induction on environmental and social safeguards requirements. The number of staff needed may be about 20
- ii. Establishment of a store for materials storage and handling,

- iii. Transportation of building materials;
- iv. Site clearance and fencing,
- v. Excavation of foundations, civil works/construction works and connection of utility services such as water, electricity; installation of the medical waste treatment incinerator; external works.
- viii. Construction of an ash pit. The ash pit is the final disposal point of healthcare waste. It should therefore be carefully constructed to avoid possible underground water contamination, be about 1.5m above the water table and its wall lined to prevent contamination of underground water, as well as positioned to reduce exposure to flood risks. The pit should be secured with a lock to prevent access by unauthorized persons/ avoid accidents.

2.4.3 Operation Phase

Upon commissioning, the MWTI will be utilized in ensuring proper treatment of HCW generated from the healthcare activities within the hospital and other HCFs located within Tana River County. Workers will be employed onsite including the operators who will be operating the MWTI. Maintenance activities will include facility cleaning, routine checks and other necessary repairs.

During the operation of the MWTI, the hospital management through the Hospital Public Health office will continue to engage stakeholders as relevant, ensure adequate security arrangements of the MWTI, train and provide adequate PPEs for workers operating the Waste treatment equipment and manage any complaint that may arise from the project operations.

The waste stream recommended to be treated by the MWTI include contaminated sharps, hemodialysis waste, plastic material, glass material including used or damaged vaccine vials, single use surgical instruments and Materials, PPE Material, Liquid bio-hazardous waste, blood bags, urine bags, anatomical and pathological waste including placenta.

Volatile and semi volatile organic compounds, chemotherapeutic waste, mercury, other hazardous chemical waste and radiological waste will not be treated in the MWTI. This kind of special waste if liquid, shall be appropriately diluted before disposal into the hospital main sewerage management system. Solid wastes shall be managed according to available guidance specific to the kind of waste. Radiological waste shall be collected for proper disposal by the contracted radiological material suppliers. All such processes must be in line with available MOH guidelines and NEMA waste management Regulations 2006.

If waste streams are not properly segregated to prevent hazardous chemicals from being fed into the primary combustion chamber, toxic contaminants can be released into the air, condensate, or in the treated waste. To minimize problems relating to bad incineration practices, the operation of the MWTI should strictly follow the operation procedures highlighted here below.

Maintenance activities for the incinerator shall include facility cleaning, routine checks for quality assurance and other necessary repairs following the standard operating procedures (SOPs).

a. Incineration Ash Management

The implementation of the MWTI is expected to provide for an ash pit next to the MWTI, but within the perimeter wall of the MWTI.

b. Effluent and Wastewater Management

The hospital has a septic tank system that serves to dispose wastewater and sewage from the entire hospital. It is expected that all wastewater and sewage to be generated by the operations of the MWTI will be safely disposed via connection to the said internal wastewater system. There is currently no pre-treatment of the waste water before its release into the internal waste water management system. The HCF has also not carried out any waste water sampling, testing and analysis, thus it cannot be ascertained whether the HCF has complied with applicable waste water and effluent discharge limits. Furthermore, the HCF does not have any records on quantity of daily wastewater discharges.

c. Cleaning and Disinfection

The proponent will be responsible for ensuring regular washing and cleaning of the incinerator shelter and compound. Cleaning and disinfection operations will involve the use of substantial amounts of water, disinfectants, detergents

etc. The volumes of such wastewaters will depend on the cleaning frequencies

d. Expected Operation Procedures of the Incinerator

The following are the expected operation procedures during incineration of HCW.

i. Ash Removal

Start-up of the incinerator begins with removal of the ash generated from the previous operating cycle. The following are guidelines for good operating practice:

- In general, allowing the incinerator to cool overnight is sufficient for the operator to remove the ash safely. This cooling can take as long as 8h.
- The operator should open the ash cleanout door slowly both to minimize the possibility of damage to the door stop and seal gasket and to prevent ash from becoming entrained.
- The operator should exercise caution since the refractory may still be hot and the ash may contain local hot spots, as well as sharp objects.
- The ash and combustion chamber should not be sprayed with water to cool the chamber because rapid cooling from water sprays can adversely affect the refractory.
- A flat blunt shovel, not sharp objects that can damage the refractory material, should be used for clean-up.
- Avoid pushing ash into the under-fire air ports.
- Place the ash into a non-combustible heat resistant container, i.e., metal. Dampen the ash with water to cool and minimize fugitive emissions.
- Once the ash has been removed and prior to closing the ash cleanout door, the operator should inspect the door seal gasket for frayed or worn sections. Worn seal gaskets should be replaced.
- To prevent damage to the door seal gasket, the operator should close the ash cleanout door slowly and should not over tighten the door clamps.
- Over tightened door clamps may cause the seal gasket to permanently set and allow infiltration of outside air around the door face.

ii. Waste Charging

The operator has the option of selecting which items are included in a particular charge. Waste properties which should be considered when the waste is segregated into charges include the heating value; the moisture content; the plastics content, and the quantity of pathological wastes. The heating value and moisture content of waste affects the performance of an incinerator. A charge of waste with a very high heating value may exceed the thermal capacity of the incinerator. The result is high combustion temperature, which can damage the refractory of the incinerator and can result in excessive emissions. Similarly, a charge of waste with very high moisture content will not provide sufficient thermal input, and the charge will require the use of more auxiliary fuel than usual. Plastic items are an example of materials with high heating values. Large quantities of plastic, which may contain polyvinyl chloride, should be distributed through many waste charges, not concentrated in one charge, if possible. When sorting loads of waste to be incinerated, the operator should try to create a mixture of low, medium, and high heating value wastes in each charge, if possible, to match the design heat release rate of the incinerator. In general, lighter bags and boxes will contain high levels of low-density plastics which burn very fast and very hot. Heavier containers may contain liquids (e.g., blood, urine, dialysis fluids) and surgical and operating room materials which will burn slowly. As a general rule for segregating waste into charges, the operator may mix light bags and heavy bags to balance the heating value of each charge. If several different types of waste, (i.e., red-bag, garbage and trash) are being charged to the incinerator, charging the incinerator with some of each waste type is better than charging it with all of one waste type. Special care should be taken to avoid overcharging the incinerator (beyond its intended use) with anatomical wastes. Prior to initiating charging, operation of the combustion air blowers and ignition and secondary burners should be checked following the manufacturers' recommendations. The proper operation of the primary and secondary burners is best achieved by observing the burner flame pattern through the view ports in the incinerator wall or in the burner itself as well as the control panel.

The incinerator is charged cold and because the waste units generally are small, they are usually loaded manually. The waste is loaded into the ignition/primary chamber, which is filled to the capacity recommended by the manufacturer. Typically, it is recommended to fill the incinerator completely, but not overstuffing the chamber.

Overstuffing can result in blockage of the air-port to the combustion chamber and in premature ignition of the waste and poor performance (i.e., excess emissions) during start-up. Overstuffing also can result in blockage of the ignition burner port and damage to the burner. After charging is completed, the charge door seal gasket is visually checked for irregularities. The door is then slowly closed and locked. The charge door seal gasket should then be inspected for any gaps that would allow air infiltration into the primary chamber. Once operation is initiated, no further charges should be made until the next operating cycle is initiated, i.e after cool down and ash removal.

iii. Waste Ignition

Prior to ignition of the waste, the secondary combustion chamber should be preheated to a predetermined temperature by igniting the secondary burner. A minimum secondary chamber temperature of 1200°C is recommended prior to ignition of the waste. After the secondary chamber is preheated, the secondary combustion air blower is turned on to provide excess air for mixing with the combustion gases from the primary chamber. The primary chamber burner is ignited to initiate waste combustion. When the primary chamber reaches a pre-set temperature, mostly 600°C (i.e., the minimum operating temperature for the primary chamber) and the waste combustion is self-sustaining, the primary burner is shutdown. The primary combustion air and secondary combustion air are adjusted to maintain the desired primary and secondary chamber temperatures. (Typically this adjustment is automatic and can encompass switching from high to low settings or complete modulation over an operating range.) During operation, the primary burner is reignited if the ignition chamber temperature falls below a pre-set temperature. Similarly, the secondary burner is reduced to its lowest firing level if the secondary chamber rises above a pre-set high temperature setting. Again, control of the burners, like the combustion air, is typically automated.

As per the MOH specifications, the initial and after burn ignition requires that the MWTI shall fully have packaged oil type, complete with electric ignition and flame failure controls, wired with continuous running fan and complete with all valves, fan and motor, if the incinerator is diesel fired type. The ignition burners shall be arranged for on/off operation. The burners will be expected to have a maximum rating of at least 450kW/hour with average and maximum diesel consumption of between 3 to 9 liters per hour. The specifics on the consumption are contained in the MOH incinerator's specifications.

iv. Special Considerations

If pathological waste is being burned, the ignition burner should be set to remain on until the waste is completely burned. Further, the volume of waste charged needs to be significantly reduced. The time required to burn an equivalent volume of such waste will be extended, since the waste contains high moisture and low volatile content. To destroy pathological waste efficiently, the waste must be directly exposed to the burner flame; consequently, piling pathological waste in a deep pile (e.g., filling the entire chamber) results in inefficient combustion.

v. Burn down

After the waste burns down and all volatiles have been released, the primary chamber combustion air level is increased to facilitate complete combustion of the fixed carbon remaining in the ash. The temperature in the primary chamber will continue to decrease indicating combustion is complete. During the burn down period, the primary burner is used to maintain the primary chamber temperature at the predetermined minimum level of the operating range. The length of time required for the burn down period depends on the incinerator design, waste characteristics, and degree of burnout desired. A typical burn down period is 2 to 4h. When combustion is complete, the primary and secondary burners are shutdown. Shutdown of the secondary burner which initiates the cool down period usually is automatically determined by a pre-set length of time into the cycle. The combustion air blowers are left operating to cool the chambers prior to subsequent ash removal. The blowers are shutdown when the chambers are completely cooled or prior to opening the ash door for ash removal. Cool down typically lasts 5 to 8h. The final step in the cycle is examination of ash burnout quality. Inspection of the ash is one tool the operator has for evaluating incinerator performance. The operator should look for fine grey ash with the consistency of ash found in the fireplace at home or in the barbeque grill. Ash containing large pieces of unburned material (other than materials which are not combustible, such as cans) shows that incinerator performance is poor. It may be necessary to return these large pieces of material to the incinerator to be re-burned. Ash colour also is an indicator of ash quality. White or grey ash indicates that a low percentage of carbon remains in the ash. Black ash indicates higher carbon percentages remaining. Although carbon remaining in the ash indicates that available fuel has not been used and combustion has not been complete, the fact that carbon remains in the ash is not in itself an environmental concern or an indicator that the ash is not sterile. Nonetheless, ash colour can be used to assist the operator in evaluating burnout and

incinerator performance.

2.4.4 Decommissioning Phase

In case of the incinerator completely breaks down or should the need arise to discontinue operations of the incinerator, it should be decommissioned by either demolishing the facility including dismantling the incinerator machine or carrying out major renovation and redesigning its shelter. Should there be need for decommissioning the project; the following will have to be considered.

a. Demolition Works

Upon decommissioning, the facility will be demolished with a likelihood of producing a lot of solid waste, which could be reused or if not reusable, disposed of appropriately by a licensed waste disposal company.

b. Dismantling of Equipment and Fixtures

If the equipment is completely dismantled and removed from the site on its decommissioning, priority should be given to reuse of the equipment parts. This being an infectious waste management facility, all materials/ machines deemed fit for further use MUST be disinfected thoroughly before being put into any other use.

c. Site Restoration

Site restoration is achieved through replenishment of the topsoil and re-vegetation using indigenous plant species. This is usually done once all the waste resulting from demolition and dismantling works is completely removed from the site. Across all the project phases, measures should be put in place to ensure prevention and mitigation against environmental and social risks associated with the activities at the various stages of the project.

2.4.5 Project Cost

The Project is estimated to cost KES 27,500,000 including the construction of the shelter, procurement, installation and commissioning of the MWTI. The estimated construction period up to commissioning of the MWTI is 6 months.

3 ENVIRONMENT AND SOCIAL BASELINE INFORMATION

3.1 Introduction

Baseline information is very important because it establishes the current biophysical conditions against which the performance of environmental and social strategies will be evaluated. The expected environmental, social and economic gains from the proposed project must be weighed in light of possible negative impacts on the surrounding environment and social fabric and tenable measures that have been proposed to mitigate against such impacts.

3.2 Project location

The project under assessment is located within the HCRH, which is in Hola town. Hola is the headquarters of the Tana River County. Neighbouring the site is the newly constructed maternity wing which is approximately 100m away to the South East; a tarmacked public road to the East, then Government offices, commercial and residential properties to the West, a school which is 500m away to the East and river Tana 1km away to the East.

3.3 Physical Environment

3.3.1 Physical and Topographic Features

The general project area is characterised by undulating terrain that is interrupted in a few places by low hills at Bilibil (around Madogo) and Bura. The land in Tana River County generally slopes south eastwards with an altitude that ranges between 0m and 200m above sea level. The project site is flat with sandy clay soils thus incidences of flooding and water logging is common just as witnessed during the ESIA scoping phase.

3.3.2 Climatic Conditions

The proposed site being in Tana River County has a hot and dry climate. Average annual temperatures are about 30°C with the highest being 41°C around January-March and the lowest being 20.6°C around June-July. Rainfall is low, bimodal, erratic and conventional in nature. The total annual rainfall ranges between 280mm and 900mm with long rains occurring in April and May, short rains in October and November with November being the wettest month.

3.4 Biological Environment

3.4.1 Flora and Fauna

The dominant woody vegetation type within and around the project site is the *Prosopis juliflora* (Mathenge). Apart from insects and rodents that inhabit the area, there was no evidence of existence of large mammals around the project site.



Figure 5: The general project site as at the ESIA scoping phase (Source: Field Work)

3.5 Social and Economic Baseline

3.5.1 Demography and Hospital Catchment

Hola County Referral Hospital is situated in Tana River County with population of 315,943 as at 2019. It is the largest public health facility in Tana River County, hence serving patients from all over the County.

3.5.2 The Hospital Capacity and Services Offered

The hospital which was started in 1958 has a 157-bed capacity. It attends an average of 300 patients in a day, hence an average of 9000 patients per month. HCRH offers diverse healthcare services to the public such as the following:

- Anti-Retroviral Therapy (ART)
- Community Integrated Management of Childhood Illness (C-IMCI)
- Family Planning (FP)
- Home Based Care (HBC)
- Inpatient Department (IPD) among others.

The hospital has facilities such as wards for male and female, mortuary, 1 pharmacy which serves both inpatient and outpatient, radiology services, 1 laboratory, kitchen, casualty among others.

3.5.3 Health Facility Personnel and Staffing

The hospital has a total of 102 staff. The personnel at the hospital are on different forms of employment contracts. A section of the staff is from the national government and has permanent and pensionable contracts. Majority of County staff have 3-year contracts, while a few have permanent and pensionable contracts. Others are casuals with 3 months contracts.

The proportion of female to male is 70% to 30% respectively. Galole Sub County where the facility is located is said to have other 15 HCFs. Medical Waste Management is under the Public Health department where we have the County Public Health Officers and the Hospital Public Health Officer. At the time of scoping, there was only one public health officer deployed to man the hospital waste management among other hospital environmental health and safety duties.

3.5.4 COVID- 19 Information and Containment Measures

As of February 2nd 2022 Kenya had 321,671 cumulative confirmed cases of COVID-19. The number of fatalities were at 5,593 while the recoveries were 295,433 cases. Hola County Referral Hospital reports to have cumulatively handled 35 positive cases of COVID 19 while cumulative suspects were 12 cases. The positive cases of children below 12 years were a total of 8. The fatalities reported of suspects were zero and of confirmed cases were four. As at the time of the visit there were no patients at the isolation ward which has a bed capacity of 46 patients, 24 males and 22 females. The isolation wards are separate for males and females with separate toilets and bathrooms for males and females. A team of five personnel has been dedicated to this isolation centre with alternating week shifts and not allowed to offer their services in the other parts of the hospital.

The notable containment measures being undertaken by the hospital are that no unauthorized persons are allowed entry into the hospital without a mask, hand washing stations been placed at designated points within the hospital compound, social distancing being observed, fumigation and spraying of the wastes from the isolation ward with 0.5% sodium hypochlorite before being taken to the burning site, on job training of the hospital staff, vaccination of all hospital staff and temperature monitoring at the main gate.

3.5.5 Health, Safety and Security

The hospital has no standalone health and safety plan. Noted is that issues of occupational health and safety are the responsibility of the public health department and the infection prevention and control committee. This means these responsibilities are supposed to be part of the hospital infection control and waste management planning. The security of the facility is under the responsibility of the hospital administrator. While appreciating that the HCF does not have standard reporting for OHS accidents and incidents, it was found that there was no serious OHS accidents or worker deaths recorded in the last 4 years.

The hospital is secured with a chain-link fence with two points of entry manned by contracted guards to ensure safety of the hospital property. There are no CCTV cameras installed within the hospital.

3.5.6 Fire Safety and Fighting

The hospital lacks fire emergency response plans and facilities such as fire extinguishers.

3.5.7 Water Supply

The hospital's main source of water is the Hola Water Services Company. The hospital has adequate water storage facilities which include a 100 m³ underground water tank, 10m³ plastic water tanks, and an elevated 60m³ steel reservoir. There is no rain water harvesting at the HCF because of the use of asbestos on the roofs.



Figure 6: The elevated metallic water tank serving the hospital (Source: Field Work)

3.5.8 Storm Water Drainage and Sewer Networks

The hospital has no proper drainage channels with cases of stagnated waste water witnessed during the ESIA scoping phase. The hospital is served by a septic tank system for the management of its waste water and sewage.

3.5.9 Power Supply and Distribution

The PIA is well covered by grid power supply. The hospital in general is connected to a 3-phase power supply from the national grid and two diesel power backup generators.

3.5.10 Transport and Communication

There is good network of roads serving the project area with major access to the hospital. The road connecting the hospital is tarmacked and is in good condition. The project site touches the tarmac road; hence a direct access can be developed. Most drive and walk ways within the hospital are paved and in good condition. Communication is highly efficient in the County with good coverage of the 4G mobile telephone networks.

3.5.11 Land Ownership and Local Land Uses

The hospital sits on an average of 20 acres and is located in a peri-urban set up. Approximately 50% of the hospital land is covered by constructed facilities such as the wards, mortuary, hospital administration block, maternity wing, staff houses and roads/walk ways.

Proximal to the proposed project site is a structure built previously by the County Government and the hospital management to house an incinerator. The facility was however not completed, and open burning of HCW is practiced instead.

The surrounding land use neighboring the hospital includes residential settlements, businesses premises and offices.

3.5.12 Cultural and Historic Sites

There were no sites of cultural or historic importance identified within the PIA. It is important to note that HCRH is

located in a peri-urban setup that is fairly developed with little or no space reserved for cultural or historic establishments. However, if during the excavation for construction of the incinerator shelter any cultural or historic importance is found, the chance find guidance (see Appendix 3) provided for in the ESMF should be applied diligently as reports are made to the National Museums of Kenya (NMK).

3.5.13 Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities

There were no indigenous people identified within the project influence area. In addition, there are no historically underserved traditional local communities living within the project influence area. This is largely attributed to the fact that the local communities are cosmopolitan in nature and the project area is fairly urbanized/ developed.

3.5.14 Gender Based Violence/ Sexual Exploitation and Abuse

The hospital has a gender-based recovery centre managed by a clinical officer. The gender policy has been enshrined in the operations of the hospital and this has seen the increase of women working in the hospital with a ratio of 70 to 30. Gender based issues in the hospital are currently addressed through the normal administrative mechanisms.

3.5.15 Child Protection

The hospital does not have a documented policy on children, but it has ensured that no children are employed within the premises. The hospital also does not allow any child to be subjected to suffering within the hospital. The privacy of children is also of paramount importance to the hospital's administration and management and a lot of confidentiality is pursued in handling child cases such as defilement.

3.5.16 Disability considerations

The hospital has disability friendly facilities such as the new maternity building. Renovations are also being done in the hospital to include disability-friendly facilities such as ramps and sanitary facilities. The hospital also has an office that deals with all disability cases by giving them identification, registering them on a data base, and assisting disabled patients with equipment such as wheel chairs. There are no specific orthopaedic wards within the facility that helps handle disability issues.

3.5.17 Grievance Redress Mechanism

A GRM was initiated through the Transforming Health System Universal Care Project (THS UCP) implemented by MOH with funding from World Bank and similar GRM arrangements as C-HERP. The facility has a GRM Focal Person and an office in charge of handling grievances from patients and workers. HCRH has a service charter which has been a channel of communication for anybody visiting the hospital, a complain register and a customer care desk which directs client concerns to respective departments.

4 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

This section describes the administrative and legal framework relevant to the C-HERP Project in terms of relevant and applicable policies (including World Bank Environment and Social Standards and World Bank Group EHS Guidelines), legal instruments and, stakeholder institutions as summarized in subsections: Policy Framework (**Error! eference source not found.**), Legal Framework (**Error! Reference source not found.**), Institutional Framework (**Error! Reference source not found.**), Social Statutes (**Error! Reference source not found.**) and WB ESF (

Table 5: World Bank5) and other relevant good international industry practice.

4.1 Policy Framework

Table 1: Policy Framework

#	Policy	Provision	Relevance
1.	National Environmental Policy, 2013	The policy promotes the use of Environment assessment tools such as ESIA/EA necessary to ensure environmental quality and resource productivity on long term basis. Further it calls for management in use of hazardous and toxic chemicals as well as radiation regulations.	The Policy requires a project which is likely to have significant environmental and social impacts to undergo ESIA in order to establish sound environmental management practices.
2.	The National OSH Policy, 2012	The Policy seeks to reduce the number of work-related accidents and diseases, and equitably provide compensation and rehabilitation to those injured at work or who contract occupational diseases.	The policy requires the provision of appropriate and adequate PPE, avail First Aid services on site as well as development of Safety and Health Emergency (SHE) Contact at the project site and workplace registration.
3.	Kenya Health Policy 2012 – 2030	The Policy aim is to achieve this goal through supporting provision of equitable, affordable and quality health and related services at the highest attainable standards and minimize exposure to health risk factors to all Kenyans.	The Policy calls for the provision and distribution of healthcare services to all people that is commensurate with that of a middle-income country without segregation.
4.	National Plan on Healthcare Waste Management 2016-2021	Provides a viable technical and management options as well as a roadmap for the domestication of the National HCWM Strategic Plan 2015 -2020. Strategic planning for HCWM covers waste handling, storage, transportation, treatment, and disposal, capacity-building and awareness creation. This prevents, reduces and mitigates the likely risks of transmission of infections.	The hospital having an isolation ward has potential to generate more infectious waste posing danger to the workers and public; thus, the critical need for proper handling and management of waste associated with COVID-19 project.
5.	National Guidelines for the Management of COVID -19 Wastes, 2020	The Environmental Management and Coordination (Waste Management) Regulations of 2006, has clear provisions on the management of Biomedical waste. The provisions relate to segregation of biomedical waste, securing, packaging, storage and disposal of all generated medical waste within the country, to ensure proper waste disposal the main methods used are incineration, shredding, and chemical disinfection. To help implement the regulations, NEMA developed the guidelines to manage COVID-19 wastes.	The increased use of the safety materials against COVID-19 has led to massive generation of waste that can be considered as infectious waste (15%). The protective and safety materials used within the hospital especially the face masks are single use resulting in increased waste generation which if not well addressed could pose both cross infections and environmental risk.

4.2 Regulatory Framework

Table 2: Regulatory Framework

#	Legislation	Provision	Relevance
1.	The Constitution of Kenya, 2010	Article 42 of the Bill of Rights of the Kenyan Constitution provides that 'every Kenyan has the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures. Part 2 of Chapter 5 is dedicated to Environment and Natural Resources where Article 69 in Part 2 provides that the state shall; (v) Establish systems of environmental impact assessment, environmental audit and monitoring of the environment; In addition, Article 43 (1 provides that every person has the right to the highest attainable standard of health, which includes the right to health care services, including reproductive health care, accessible and adequate housing, and to reasonable standards of sanitation and to clean and safe water in adequate quantities.	The project should ensure compliance with the Constitution on issues of environment protection, and safeguard of public health through provision of more comprehensive health services to every citizen. The implementation of the MWTI is a way of safeguarding the environment and its resources against pollution from HCW
2.	National IPC Guidelines for Health Care Services, 2015	Provides comprehensive standardized information regarding the prevention and control of transmissible infections. It acts as a central reference for all health care facilities and healthcare workers. The guideline is intended to provide administrators and	The guidelines are a reference for all HCFs and workers on the necessary information and procedures of managing which include segregation, handling treating, transporting and

	(revised 2018)	Health Care Workers with the necessary information and procedures to implement Infection Prevention Control (IPC) core activities.	disposal of HCW to avoid risk of infections and contamination of environment. The installation and operationalization of the MWTI will help address such risks as well as serve to reduce the volume of untreated infectious wastes left in the open at Hospital.
3.	EMCA, 1999 (Amendments 2015)	The Act empowers the National Environment Management Authority (NEMA) to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of government in the implementation of all policies related to the environment. The Second Schedule to the Act specifies the projects for which an ESIA or environmental audit must be carried out.	The project shall comply with the provisions of this regulation on issues related to, environmental assessment, solid waste and wastewater management, aerial emissions, noise and vibrations among others.
4.	Environmental (EIA and EA) Regulations, 2019	This regulation provides guidelines to govern the conduct of Environmental Assessment and Audits in Kenya. Section 3 indicates that the regulations apply to policies, plans, programs, projects and activities specified in Part IV, Part V and 2nd schedule of the Act	Environmental Assessment is being carried out for the project and appropriate mitigation measures shall be proposed commensurate with the scale of the project E&S aspects.
5.	EMCA (Waste Management) Regulations, 2006	The regulations provide guidelines on waste management (handling, storage, transportation, treatment and disposal) of various waste streams including: domestic waste, industrial waste, hazardous and toxic waste, pesticides and toxic substances, biomedical wastes; and radioactive wastes.	The hospital must observe this law strictly in the management of HCW generated from the COVID -19 designated health facilities as well as in its operation of the MWTI by applying for the necessary licenses to operate it
6.	EMCA (Air Quality) Regulations, 2014	Provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air. Part II sections 5 to 9 prohibits compromise of the ambient air quality levels specified in the first and third schedules of the regulations. Section 11 of the regulations prohibits offensive emissions into controlled areas (national parks, schools, hospitals, residential areas and populated urban centres). Section 33 prohibits any person from causing/allowing emissions of particulate matter during demolition of structures while section 34 prohibits any person from allowing stock piling of material to cause effect to ambient air quality. Further, section 35 prohibits operators of the incinerators to cause emission of air pollutants as set out in second schedule in excess of mass emission rates indicated in third schedule of the Regulations.	The project contractor during the construction of incinerators will abide with sections 33, 34 & 35 of these regulations. The Management of the Hospital will apply for the license to own and operate a MWTI. During operational phase of the MWTI, no waste will be left for long at the waste treatment area so as to start producing bad odour and the hospital will also undertake periodic stack emission audits and change scrubbers installed on a periodic basis.
7.	Environmental Management and Coordination (Water Quality) Regulations, 2006	The regulation provides guidelines for the protection of sources of water for domestic use, water for industrial use and effluent discharge as well as water for agricultural use. Part II section 6 prohibits any person from discharging effluent from sewerage works, industry or other point sources into aquatic environment, abstract ground water near lakes, rivers, streams, springs and wells that is likely to have any adverse impact on quality and quantity of the water without an environmental impact assessment license.	The proponent will ensure that the appropriate measures to prevent pollution of underground water and surface water sources are implemented in all project phases such as channelling all wastewater effluent from the waste treatment area to the sewer system and undertaking periodic monitoring of the waste effluent from the health facility to ensure compliance with the acceptable standards. Necessary water supply or wastewater discharge permits, and compliance with such permits shall also be sought.
8.	EMCA (Noise and Excessive Vibration Pollution) Regulations, 2009	Part II section 3(l) of these Regulations states that: no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment and section 3(2) states that in determining whether noise is loud, unreasonable, unnecessary or unusual depends on; (i) the time of the day, (ii) proximity to residential area (iii) whether the noise is recurrent/constant, level/intensity of noise.	The contractor will be required to take into consideration monitoring of the noise and vibrations levels within the project site during construction period to ensure compliance.
9.	Public Health Act (Cap 242) revised 2012	Part III of the Public Health Act provides for the protection of human health through prevention and guarding against introduction of infectious diseases into Kenya from outside, to promote public health and prevention, limitation or suppression of infectious, communicable or preventable disease within Kenya. The Public Health (Prevention, Control and Suppression of COVID-19) Rules, 2020 provides additional regulatory impetus to this part.	The construction activities at the hospital will have both direct and indirect implication to the health workers and neighbouring communities especially with regard to the movement of labour and associated COVID-19 threats. The contractor is required to abide by the provisions of the Public Health Act throughout the project cycle. COVID-19 Prevention, Control and

			Suppression measures shall be adhered to by all the workers.
10.	The <i>Health Act, 2017</i>	An Act of Parliament to establish a unified health system, to coordinate the inter-relationship between the national government and county government health systems, to provide for regulation of health care service and health care service providers, health products and health technologies and for connected purposes including the provision of emergency and specialized care. The Act requires that the national health system ensures that measures for managing environmental risk factors to curtail occurrence and distribution of diseases are put in place and implemented. The Act also requires the state to ensure access to healthcare services for vulnerable groups by making clear the state's obligation to provide these for women, the aged, persons with disabilities, children, youth, and members of minority or marginalized communities The Act also requires the National Government Department of Health to formulate national strategic and operation policies that provide for measures that include strengthening infection prevention and control systems including health care waste management in all health facilities;	The project management, the benefitting facility and the contractor shall ensure part VIII sections 68 to 72 of the Act which relates to the promotion and advancement of public and environmental Health are adhered to during the project implementation. In addition, the collaboration between MoH and the County Government of Tana River in the implementation of the MWTI is well within the provisions of this Act. All interests of the aged, women, children and PLWD should be observed in the implementation and operation of the project via the provision of PLWD friendly facilities, protecting the welfare of children, respecting women and the aged. The MWTI is being developed in support of policies and plans to strengthen infection prevention and control systems, particularly HCWM.
11.	Physical and Land Use Planning Act of 2019	The County Governments are empowered to prohibit or control the use and development of land and buildings in the interest of proper and orderly development of an area.	The Hospital Management is required to seek development approval from the County Physical planning departments for the construction activities.
12.	Occupational Safety and Health Act, 2007	This is an Act of Parliament to provide for the safety, health and welfare of all workers and all persons lawfully present at workplaces. It applies to all workplaces where any person is at work, whether temporarily or permanently	All Safety and Health measures should be in place to ensure workers and the neighbouring communities are not exposed to Safety and Health risks during project construction, operational and decommissioning phases namely: provision of appropriate PPE, training of workers on OSH, appointing health and safety committees and safety advisor where there are civil works, keeping incident logs and reporting to DOSHS and WB, registering work place and screening off active construction site.
13.	Work Injuries Benefits Act, 2007	This Act provides for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes.	The contractor and the management of the Hospital shall comply with part II of this Act with regard to obligations of the employer including Compensation for temporary total or partial disablement, treatment as well as provision of first Aid Services to workers at all times.
14.	HIV/AIDs Prevention and Control Act, 2006	Part 11 Section 7 requires HIV and AIDs education in work places; specifically, provision of basic information and instruction on HIV/AIDS prevention and control	During construction/ installation phase, the contractor is expected to create awareness to the employees and local community on issues related to HIV/AIDs.
15.	The County Government Act No. 17 of 2012	Part II of the Act empowers the county governments to be in charge of planning by coordinating and ensuring integrated planning within the county.	The Hospital Management is required to seek development approval from the Tana River County Physical planning departments for the construction and MWTI installation activities.
16.	NCA, 2011	The National Construction Authority Act 2011 seeks to regulate the construction industry and coordinate its development	The Hospital Management shall liaise with NCA to ensure only licensed contractors are the ones to be awarded contract to construct the MWTI shelter.
17.	The National Council for Disability Act, 2003	An Act to provide for the establishment of a National Council for Disability, its composition, functions and administration for the promotion of the rights of persons with disabilities set out in international conventions and legal instruments, the Constitution and other laws, and for other connected matters.	Implementation of the project should take into consideration the interest of People Living With Disability (PLWD) by including ramps, friendly ablution and WASH facilities, as well as ensuring fair access to employment and healthcare services.
18.	The Employment Act 2007	The Act stipulates that no person shall use or assist any other person, in using forced labour. The Act further states that it shall be the duty of the Cabinet Secretary/ Minister, Labour officer, the National Labour Court and the subordinate labour courts to; Promote equality of opportunity in employment in order to	The proponent, contractor and the employees to be engaged in the proposed project stands guided on labour relations that at times have negative and detrimental impacts on project implementation if poorly handled.

		eliminate discrimination in employment Promote and guarantee equality of opportunity for a person who, is a migrant worker or a member of the family of the migrant worker lawfully within Kenya. Other clauses include the right and Duties of employment including the basic minimum and condition of contract including the Maternity Leave.	
19.	The climate Change Act, 2016	The Acts provide for a regulatory framework for enhanced response to climate change; to provide for mechanism and measures to achieve low carbon climate development, and for connected purposes.	The MWTI would be operated in a manner that ensures complete combustion as well as being fitted with an air scrubber. The MWTI will be subjected to periodic stack emission testing and analysis for advice on what rectifications will be needed to control air pollution. Its implementation will help the hospital desist from open burning of HCW which causes a lot of air pollution.

4.3 Compliance to Applicable Kenya EHS Regulatory Requirements

While noting that the HCF has not been fully compliant with applicable Kenya EHS regulatory requirements, there is need to ensure that the HCF adheres to the full extent of all applicable EHS regulatory requirements as laid out in the Environmental Management and Coordination Act, 1999 as amended in 2015, the Occupational Safety and Health Act of 2007 and other sectoral laws. Important also to note is that the Proponent will be required to ensure that this ESIA ESMP forms part of the contract document and the main contractor prepares a contractor specific Environment and social management plan and includes adequate measures to promote safety and health of workers and community during the construction phase of the proposed project. The contractor is expected to handle environmental, occupational health and safety and community health and safety issues especially during construction phase of the project.

4.3.1 Specific EHS Permits/Authorizations Needed for the MWTI Construction and Installation Project

- ESIA License from NEMA
- Certificate of Registration of the site as a Workplace with DOSHS;
- Registration of the project with the National Construction Authority
- Development approval/permits from the Tana River County Physical planning departments for the civil works (construction activities).

4.3.2 Specific EHS Permits/Authorizations/Reporting Needed for the Operation of the MWTI

- A license to own and operate the MWTI from NEMA
- An annual environmental audit of the waste disposal site
- Periodic stack emission testing and analysis as provided for by the Air Quality Regulations of 2014

4.4 Institutional Framework

Some of the institutions relevant to the proposed project are presented on Table 4 below:

Table 3: Institutional Framework

#	Institution	Provision	Relevancy
1.	National Environment Management Authority (NEMA)	The responsibility of NEMA is to supervise and co-ordinate all matters relating to the environment and to be principal instrument of government in the implementation of policies relating to the environment.	The construction /installation is a regulated development activity which requires the undertaking of an ESIA. The ESIA report shall be submitted to NEMA for review, approval and facilitate issuance of License. NEMA also has the mandate for solid waste management, as well as the licensing of the operation and use of the incinerator.
2.	Ministry of Health	The proposed project is under the Ministry of Health and it shall be the primary role of the Ministry to monitor and measure the progress of implementation of the social and environmental safeguards.	The Ministry, through the hospital management shall prepare periodic reports, which shall be submitted, to the World Bank for review and further action where necessary.
3.	County Government of Tana River	The County Government has powers to control or prohibit all businesses, factories and other activities including the proposed project which by reason of smoke, fumes, gases, dust, noise or other cause, maybe or become a source of	The County Government shall supervise project roll out by use of the technical team to ensure no activity being implemented may become a source of danger, discomfort or annoyance to the neighbourhood.

		danger, discomfort or annoyance to the neighbourhood and to prescribe conditions subject to which such activities shall be carried.	The relevant county departments will be responsible in the issuance of the approvals (architectural design and drawings) and necessary permits for the proposed project activities.
4.	DOSHS	The mandate of the Directorate is to ensure compliance with the provisions of the Occupational safety and health Act 2007, WIBA, 2007 and promote safety and health of workers.	The Hospital shall need approval from DOSHS. Note that the hospital is already in use and it has the occupation certificate for the premises. The contractor will be required to register the work site with DOSHS and obtain the required permits
5.	NCA	The NCA is responsible for issuing permits to construction sites and advising the government of Kenya on construction.	The Hospital Management shall liaise with NCA to ensure licensed contractors are the ones to be awarded contract to construct and install the incinerator at the hospital.
6.	The World Bank	The Bank in line with the Project Environment and Social Commitment Plan and other environment and social instruments prepared for the project including the ESMF, LMP and SEP, is duty bound to undertake periodic monitoring of the project implementation.	The Bank's implementation support mission shall be periodically done to ascertain the level of implementation of the project.

4.5 Relevant Social Statutes

The key social aspects of this project include inclusion, including the GBV/SHEA prevention, stakeholder engagement and feedback mechanism including GRM.

Table 4: Relevant Social Statutes

Social element	Legal/Regulatory framework	Institutional framework	Relevance
Gender-based violence and SEA	<ul style="list-style-type: none"> - Sexual Offences Act, 2006 - Penal Code - HIV/AIDS Prevention and Control Act 2000 - Protection Against Domestic Violence Act, 2015 - Prohibition of Genital Mutilation Act, 2011 - National Gender and Equality Act, 2011 	<ul style="list-style-type: none"> - The State Departments of Gender in the Ministry of Public Service and Gender - National Gender and Equality Commission (NGEC) 	Abuse by workers (both foreign and national), normalization of GBV and lack of interest, stigma leads to non-reporting, poverty forces women/girls to engage in transactional sex Lack of access to services to address SEA, stigma, corruption.
Public participation and consultations	<ul style="list-style-type: none"> - CoK, 2010, Article 10(2) a, b - County Public Participation Guidelines⁴ 	<ul style="list-style-type: none"> - Every state actor is required to apply the national values and principles whenever they formulate, implement or interpret laws and policies - A complementary right is the right to access information in Article 355 	The project will put measures in place to consult communities on the project. The use of alternative means of consultation such as call-in will be used to engage communities CoK 2010 confers all the sovereign power to the people of Kenya and it is exercised through delegated power by the State actors ⁶
Grievance redress mechanism	<ul style="list-style-type: none"> - -Employment Act in Part XII - -Employment and Labour Relations Court Act - -Labour Relations Act 	<ul style="list-style-type: none"> - State Department of Labor (MLSP) - National Employment Authority - Kenya National Labor Board - Wages Council(s) - Directorate of Occupational Safety and Health Services - National Council for Occupational Safety and Health (NACOSH) - Commission for the Administration of Justice - Ministry of Health 	There is need have an elaborate GRM that will allow the PMT to manage grievances related to the project especially for the workers. However, in case the complainant is dissatisfied with the decision made, he/she can make use of any of other institutions with a mandate to address disputes.
Inclusivity	<ul style="list-style-type: none"> - Disability Act 2003 - National Gender and Equality Act, 2011 	<ul style="list-style-type: none"> - National Council for Persons with Disabilities - Department of Social Development - National Gender and Equality Commission 	There is need to ensure that construction works are sensitive to the accessibility rights for PLWDs
Child protection	<ul style="list-style-type: none"> - The Children's Act - Constitution of Kenya (Art 53 (b) and Art. 260) 	<ul style="list-style-type: none"> - The Department of Children Services - Department of Labour 	There is need to verify people's ages for contractor works to ensure prevention of child labour risks in the project

⁴ County Public Participation Guidelines, pg. (vii)

⁵ Article 35(1)(a) and (b)

⁶ Article 1 of the Constitution of Kenya

4.6 World Bank Environmental and Social Standards (ESSs)

The World Bank ESSs will help to manage the risks and impacts of the projects, and improve their environmental and social performance, through a risk and outcomes-based approach. This will ensure that proposed programs are environmentally and socially sustainable, and thus improve decision-making. These relevant Environment and Social Safeguards to the project are outlined in Table 5 below:

Table 5: World Bank Environmental and Social Standards (ESSs) relevant to the project

#	ESSs	Relevant		Reason
		No	Yes	
1.	ESS1: Assessment and Management of Environmental and Social Risks and Impacts		X	<p>Environmental Assessment (EA) is used in the WB to identify, avoid, and mitigate the potential and actual negative environmental impacts associated with Bank lending operations. Environmental and Social risk associated with the project was initially classified as “High” since Kenya has limited experience in managing infectious medical wastes, however, based on overall improvement of project performance, the risk is currently rated as ‘Substantial’.</p> <p>Healthcare associated infections due to inadequate adherence to OSH standards can lead to illness and death among health and laboratory workers.</p> <p>Failure to undertake the necessary precautionary measures will lead to more infections and it is general knowledge that COVID-19 causes irreversible health conditions and deaths in the worst eventuality. It is therefore appropriate for all the potential social and environmental risks and impacts to be identified and the necessary mitigation measures formulated prior to the implementation of the proposed construction/installation of the MWTI because it is meant to manage HCW from the entire hospital operations.</p> <p>Environmentally and socially sound healthcare waste management will require adequate provisions for minimization of OSH risks, proper management of hazardous waste and sharps, use of appropriate disinfectants, proper quarantine procedure for COVID-19, appropriate chemical and infectious substance handling.</p> <p>This informs the reason of carrying out the ESIA so as to identify potential environment, social and OSH impacts and risks early and formulate their best mitigation measures</p>
2.	ESS2: Labor and Working Conditions		X	<p>Most activities supported by the project will be conducted by health workers, i.e., civil servants employed by the GoK as well as the contracted workers for the construction. All workers will have orientation on and sign a CoC on expected behaviour and safety standards including GBV/SHEA risks. In line with ESS2 as well as the Kenyan law, the use of child labour and forced labour is prohibited in the project, both for construction and operation of healthcare facilities.</p> <p>The project will also ensure a basic, responsive GRM to allow workers to quickly inform their immediate management of labor issues, such as a lack of PPE and unreasonable overtime as well as to the national grievance hotline to the MoH.</p> <p>OHS risks related to medical waste management including; thermal injuries while operating incinerators, sharps-inflicted injuries & disease infections are expected. The waste handlers and incinerators operators will be provided with adequate and appropriate personal protective equipment, provision of sanitation facilities (toilets and wash areas), provision of fire-suppression equipment guidance on operation and maintenance of the equipment, training and capacity building on OHS measures, infection prevention and control and medical waste management to healthcare workers, waste handlers and MWTI operators</p>
3.	ESS3: Resource Efficiency and Pollution Prevention and Management		X	<p>Handling of HCW can have significant impact on environment and human health. Waste that may be generated from the hospital may include liquid contaminated waste, chemicals and other hazardous materials, and other waste from labs including of sharps, used in diagnosis and treatment.</p> <p>This ESIA has been prepared and identified the possible ways to prevent and mitigate the potential pollution to the environment see Table 7 (ESMP).</p>
4.	ESS4: Community Health and Safety		X	<p>In line with safety provisions in ESS2, it is equally important to ensure the safety of communities from COVID-19 infection. HCW from the hospital has a high potential of carrying micro-organisms that can infect the community at large if they are not properly disposed of. The disposal of masks and gloves at the hospital will need to be managed adequately to avoid contamination.</p> <p>The project will ensure the avoidance of any form of SEA and all forms of Abuse by relying on the WHO Code of Ethics and Professional conduct for all workers in the waste treatment facility as well as the provision of gender-sensitive infrastructure such as well-lit segregated toilets.</p> <p>The project will also ensure via the above noted provisions, including stakeholder engagement, that isolation wards at the hospital is operated effectively without aggravating potential conflicts between host communities and patients.</p>
5.	ESS10: Stakeholder Engagement and Information Disclosure		√	<p>The project is being implemented by the MoH which has established a structured approach to engagement with stakeholders that is based upon meaningful consultation and disclosure of appropriate information, considering the specific challenges associated with COVID-19.</p> <p>Stakeholder engagement was done during the preparation of this ESIA that brought together all key</p>

#	ESSs	Relevant		Reason
		No	Yes	
				stakeholders and the outcome was positive with regard to supporting the improvement of the HCWM at the hospital through the installation of the MWTI (see chapter 5 stakeholder consultations).

4.6.1 World Bank Guidelines - General Environment Health and Safety Guidelines

The WBG general EHS guidelines contain performance levels and measures for development of projects and are considered to be achievable in facilities at reasonable costs by existing technology. WBG guidelines apply to specified project components such as the construction and installation of the MWTI. Among the applicable guidelines, the following points provide a summary:

4.6.1.1 EHS Guidelines - Waste Management,

These guidelines apply to both non-hazardous and hazardous waste. They advocate for waste management planning where waste should be characterized according to: composition, source, types, and generation rates. This is essential for the hospital in relation to operation of the incinerator project since there is a need to segregate the different categories of waste generated at the overall hospital level. These guidelines call for implementation of a waste management hierarchy that comprises prevention, recycling/reuse; treatment and disposal. The guidelines require segregation of conventional waste from hazardous waste streams and if generation of hazardous waste cannot be avoided; its management should focus on prevention of harm to health, safety, and environment, according to the following principles:

- i) Understanding potential impacts and risks associated with management of any generated hazardous waste during its complete life-cycle,
- ii) Ensuring that people handling, treating and disposing of hazardous waste are reputable and legitimate enterprises, licensed by the relevant regulatory agencies and following good international industry practice,
- iii) Ensuring compliance with applicable regulations.

The hospital generates various quantities of hazardous and non- hazardous waste and the Guidelines recommend monitoring activities to include:

- i. Regular visual inspection of all waste storage, collection and storage areas for evidence of accidental releases and to verify that wastes are properly labelled and stored,
- ii. Regular audits of waste segregation and collection practices,
- iii. Tracking of waste generation trends by type and amount of waste generated, preferably by facility departments, and
- iv. Keeping manifests or other records that document the amount of waste generated and its destination.

4.6.1.2 EHS guidelines- Air Emissions and Ambient Air quality,

These guidelines are meant for all types of projects with “significant” emissions, sources of air emissions, and potential for significant impacts to ambient air quality to prevent or minimize impacts by ensuring that emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards. In addition Kenya, currently has an Environmental Management and Coordination (Air Quality) Regulations, 2014 applicable to this project. Air emissions from incineration depend on the specific waste composition and the presence and effectiveness of air pollution control systems. Polluting emissions may include carbon dioxide (CO₂), Carbon monoxide (CO), Nitrogen oxides (NO_x), Sulfur dioxide (SO₂), particulate matter, ammonia, amines, acids (HCL, HF), Volatile Organic Pollutants (VOCs), dioxins/furans, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), metals (Hg), and sulfides, etc., depending on the waste content and combustion conditions. The following measures are recommended to prevent, minimize, and control air emissions:

- a) Conduct waste segregation and/or presorting to avoid incineration of wastes that contain metals and metalloids that may volatilize during combustion and be difficult to control through air emission technology (e.g., mercury and arsenic);
- b) Follow applicable national requirements and internationally recognized standards for incinerator design and operating conditions, mainly rapid quenching of the flue gas after leaving all combustion chambers and before entering any dry particulate matter, air pollution control device but also combustion temperature, residence time, and turbulence. Standards for stationary incinerators which include temperature and after burner exit gas quenching (i.e. rapid temperature reduction) requirements are preferred in order to nearly eliminate dioxins and furans;
- c) Introduce wastes into the incinerator only after the optimum temperature is reached in the final combustion

chamber

- d) The waste charging system should be interlocked with the temperature monitoring and control system to prevent waste additions if the operating temperature falls below the required limits;
- e) Minimize the uncontrolled ingress of air into the combustion chamber via waste loading or other routes;
- f) Implement maintenance and other procedures to minimize planned and unplanned shut-downs;
- g) Avoid operating conditions in excess of those that are required for efficient destruction of the waste;
- h) Use flue gas treatment system/air scrubber for control of acid gases, particulate matter, and other air pollutants

4.6.1.3 EHS Guidelines: Noise

These guidelines address impacts of noise beyond the property boundary of the facilities. These guidelines are applicable during construction phase whereby construction equipment and activities are expected to emit noise. Kenyan regulation, EMCA (Noise and Excessive Vibration) Pollution Control Regulations, 2009 give permissible levels during construction works. The proponent therefore has adequate guidance to ensure noise levels are maintained as low as reasonably practicable.

4.6.1.4 EHS Guidelines: Occupational Health and safety

These guidelines guide employers and supervisors in fulfilling their obligation to implement all reasonable precautions to protect the health and safety of workers. The guidelines provide guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. Although the focus is placed on the operational phase of projects, much of the guidance also applies to construction and decommissioning activities. The guidelines also describe how facility operation workplace design should be undertaken to prevent occupational health and safety risks and hazards.

4.6.1.5 EHS Guidelines -Construction and Decommissioning.

These provide additional and specific guidance on prevention and control of community health and safety impacts that may occur during new project development, at the end of the project life-cycle, or due to construction or modification of existing project facilities.

4.6.2 World Bank Group EHS Guidelines for Healthcare Facilities

The EHS Guidelines for Health Care Facilities include information relevant to the management of EHS issues associated with health care facilities (HCF). It provides guidelines for basic infrastructure elements / activities of healthcare facilities to improve on health of patients, prevent transmission of infections among patients and staff and control impacts of environment health and safety including; maintenance of sanitary conditions and use of appropriate disinfection techniques, portable water , clean air and nosocomial infection control

4.6.3 World Bank Guidance note on COVID-19 and civil works

This guidance note provides guidance to projects on how to addressing key issues associated with COVID-19. It emphasizes the importance of; careful scenario planning, clear procedures and protocols, management systems, effective communication and coordination, and the need for high levels of responsiveness in a changing environment. It recommends assessing the current situation of the project, putting in place mitigation measures to avoid or minimize the chance of infection, and planning what to do if either project workers become infected or the work force includes workers from proximate communities affected by COVID-19.

4.6.3.1 Guidelines on Prevention of GBV/SEA

The WB Guidance Note on GBV/SEA in civil works describes GBV/SEA as an 'umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially ascribed gender differences.' Consequently, it can occur in a variety of ways, including through the infliction of physical, mental, and sexual harm or suffering threats of such acts, as well as coercion and other deprivations of liberty, such as early or forced marriage, economic abuse and denial of resources, services and opportunities, trafficking and abduction for exploitation, or Intimate Partner Violence (IPV) perpetrated by a former or current partner. Most importantly, the WB applies 'GBV/SEA' as an umbrella term that includes sexual exploitation and abuse (SEA).

The Bank defines SEA as any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another. In Bank financed operations/projects, sexual exploitation occurs when access to or benefit from a Bank

financed goods, works, non-consulting services or consulting services is used to extract sexual gain. Sexual abuse is defined as the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.

Sexual harassment (SH) is understood as unwelcome sexual advances, requests for sexual favours, and other unwanted verbal or physical conduct of a sexual nature. SH differs from SEA in that it occurs between personnel/staff working on the project, and not between staff and project beneficiaries or communities. The distinction between SEA and SH is important so that agency policies and staff training can include specific instructions on the procedures to report on both. Both women and men can experience SH. The WB Guidance Note defines four key areas of GBV/SEA risks:

1. SEA - exploitation of a vulnerable position, use of differential power for sexual purpose; actual or threatened sexual physical intrusion;
2. Workplace sexual harassment - unwanted sexual advances; requests for sexual favours, sexual physical contact;
3. Human trafficking - sexual slavery, coerced transactional sex, illegal transnational people movement; and
4. Non-SEA - physical assault, psychological or physical abuse, denial of resources, opportunities/services & IPV
5. Other specific C-HERP ES documents that are required for all subprojects include the ESMF, ICWMP and LMP

4.6.4 World Health Organization Guidelines for COVID-19 Prevention and Management

This section provides the highlights of the WHO Guidelines for COVID-19 Prevention and Management:

- i. **WHO Infection prevention and control during health care when COVID-19 is suspected:** Intended for health care workers (HCWs), health care managers, and IPC teams at the facility level, national, provincial and district levels. This means that all possible measures should be put in place within the HCF to prevent infection, especially from healthcare waste and in particular, adhering to respiratory etiquette and hand hygiene best practices, contact, droplet and airborne precautions, adequate environmental cleaning and disinfection; ensuring adequate ventilation; isolation facilities of COVID-19 patients; in addition, where possible, maintaining a physical distance among all individuals in health facilities of at least 1 metre (increasing it whenever feasible), especially in indoor settings.
- ii. **WHO rights, roles & responsibilities of HCWs, including key considerations for OSH in COVID-19 Outbreak:** Provides specific measures to maintain rights and responsibilities of HCWs and their OSH including provision of adequate IPC and PPE supplies (masks, gloves, goggles, gowns, hand sanitizer, soap and water, cleaning supplies) in sufficient quantity to healthcare or other staff caring for suspected or confirmed COVID-19 patients, such that workers do not incur expenses for occupational safety and health requirements;
- iii. **WHO Water, sanitation, hygiene, and waste management for the COVID-19 virus:** Intended for water and sanitation practitioners and providers and health care providers to ensure good and consistently applied WASH and waste management at the health care facilities to help prevent human-to-human transmission of the COVID-19 virus.
- iv. **WHO Rational use of personal protective equipment (PPE) for coronavirus disease (COVID-19):** Intended for those involved in distributing and managing PPE and its most appropriate use by public health authorities and individuals in health care and community settings.
- v. **WHO Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19):** Aimed to offer guidance to WHO Member States on implementing quarantine measures for individuals in the context of COVID-19 outbreak; and
- vi. **WHO Infection Prevention and Control for the safe management of a dead body in the context of COVID-19:** intended for those, including managers of health care facilities and mortuaries, religious and public health authorities, and families, who tend to the bodies of persons who have died of suspected or confirmed COVID-19.

5 STAKEHOLDER CONSULTATION AND PUBLIC PARTICIPATION

5.1 Introduction

The World Bank's ESF, the Constitution of Kenya (2010), Legal Notice No. 101 the Environmental (Environmental and Social Impact Assessment and Audit) Regulations, 2003 (Revised in 2016), the Legal Notice Number 31 read together with Legal Notice Number 32 of 2019 and the EMCA 1999 as amended in 2015 require that the views of persons who may be affected by a proposed project be sought during the process of conducting an ESIA. The MoH has also developed a SEP for the project, which defines the stakeholder engagement process, including public information disclosure and consultation, throughout the project cycle.

Based on the above provisions, beneficiaries and members of the public likely to be affected by the proposed project were consulted to seek their views and opinions regarding the project before it is implemented. This was achieved through a public meeting that was held on the 16th of December 2020. (See appendix 8 Minutes of the Consultative Public Participation Meeting,)

5.2 Stakeholder Consultations

5.2.1 Goals of Consultations

The primary goals of the CPP process were to:

- Ensure transparency and involvement of stakeholders in assessing and managing the potential environmental and socioeconomic impacts of the project;
- Help manage risks, concerns and public expectations through ongoing dialogue with stakeholders;
- Improve decision-making and build understanding by actively involving key project stakeholders and PAPs in two-way communication. Through this process, the implementing agencies will better understand the concerns and expectations of the stakeholders, beneficiaries and PAPs, and the opportunities to increase project value to the local community.

5.2.2 Objectives of CPP

The CPP was carried out to specifically achieve the following objectives:

- To provide information about the project and to tap stakeholder information on key environmental and social baseline information in the project area;
- To provide opportunities to stakeholders and communities to discuss their opinions and concerns respectively and get an appreciation of their expectations
- To solicit the stakeholders' views on the project and discuss their involvement in the various project activities;
- To discern the attitudes of the community and their leaders towards the project so that their views and proposals are taken into consideration in the formulation of mitigation and benefit enhancement measures;
- To identify specific interests of and to enhance the participation of the poor and vulnerable groups; and
- To inform the process of developing appropriate mitigation measures as well as institutional arrangements for effective implementation of the project.

5.3 Summary of Public Consultations Findings

During the meeting held on 16th December 2020 at HCRH, there were a total of 13 participants plus two of the ESIA Experts. In attendance were 5 women and 10 men and the meeting lasted 1 hour. The forum was a major avenue for people living around HCRH to contribute to ensuring effective HCWM at the HCRH and other HCF within Hola Township and the entire Galole Sub-County. The participants included area residents, hospital representatives, Public Health Officers, Church Leaders, Village Managers, and the National Government Administration Representatives (Assistant Chief). During the meeting, the participants were provided with information about what the proposed project will entail by the ESIA Experts. Overall, the participants in the consultative meeting indicated that they fully support the proposed project.

Table 6: Issues/Views of Stakeholders

Name of stakeholder	Issue raised	Response given
Mr. Esser Dhidha - PHO	Poor Waste Handling process at the hospital He pointed out that the hospital has been undertaking open HCW burning for a long time. He said that the hospital appreciates that open burning is not good though they had received minimal complaints from the surrounding community.	The PHO noted that the hospital desperately needed a modern HCWM facility. He informed the meeting that all HCW should be treated within 24hours of its generation and that the best way was through the use of a MWTI

Mikaya D. Yaro, the Area Assistant Chief	<p>Scavenging by birds and rodents It was reported that the HCW was being accessed by animals/birds and unauthorised persons such as kids including / street children. He owned that this has been happening hence posing a health hazard to the surrounding community because he has witnessed cats and dogs carrying away waste materials from the HCW heaps</p>	The ESIA Expert informed the meeting that the proposed MWTI will come with provisions for a lockable temporary waste holding area that should not be accessible to scavenging animals and kids. The MWTI will also enable the treatment of the HCW so as to remain with a very small volume of ash which will be disposed into an ash pit to be constructed together with the MWTI.
Mr. Abdala Ali Barisa	<p>Designs of the MWTI shelter –Are there standard designs for MWTI shelter? Seeking to establish what the project entails</p>	The ESIA expert, Patrick reported that the MWTI shelter will come as complete unit with changing area for incinerator operators, temporary waste holding area, bathrooms and toilets and ash pit to ensure effective disposal of the incineration ash
Mr. Subira	<p>Clarification of expertise needed to operate an incinerator The community member wanted to understand the qualification and techniques required to operate an incinerator</p>	The ESIA experts clarified that the incinerator supplier should provide training to people selected by the hospital management on how to operate the incinerator. In that regard, the ESIA Experts requested that the hospital management to ensure that at least five people are trained in the operation of the incinerator including representatives of the Medical Engineering and Public Health Departments.
The Area Assistant Chief, Mr. Mikaya	<p>Air Pollution He expressed his worry about the quality of the smoke to be released by the incinerator during its operations.</p>	The ESIA Experts undertook to explain to the meeting that the proposed incinerator was equipped with an air scrubber to assist in filtering all the emissions being released from the incineration process to minimize negative impacts to the atmosphere, if any. The ESIA Expert explained that the incinerator chimney should also not be less than 10ft tall above the incinerator shelter roof so as to ensure that most of the emissions do not find their way to the ground level. Mr. Esser also explained that the winds in the area are ever strong and that dispersal of the smoke from the incinerator will be very fast and thorough
Mr. Esser Dhidha - PHO	<p>Request by nearby health facilities to be provided with such machines</p>	Mr. Esser explained that the facilities are fairly expensive and hence the government may not be in a position to install them in all HCF. But he clarified that he will be developing HCW transfer guidelines to help in the treatment of HCW especially from the private HCF within Hola Township so as to assist in keeping the town clean and prevent the pollution of the River Tana, which is not more than 1km away from the town.
Hospital staff (Name withheld)	<p>Risk of exposure to COVID-19 virus The hospital noted that there was poor disposal of masks and thus increasing the risk of exposure There were no thermo-guns at outpatient areas but in the inpatient areas.</p>	The PHO informed the meeting that the wastes from COVID-19 isolation wards were fumigated and sprayed with 0.5% hydrochloric acid before being taken out for burning. Handwashing stations were placed at designated points Ensuring all staffs, patients and visitors were masked at all time. Ensuring social distancing at the hospital and minimizing crowds However, he pointed out that was is upon all members of the community to ensure proper disposal of masks
Gladys Malika, Community Member	<p>Grievance Redress Mechanism The hospital does not have a well-known method for communicating grievances The grievances take so long to be addressed and at times even ignored</p>	The PHO agreed that there is need for a functional feedback and grievance redress mechanism for workers and stakeholders including the local community to ensure a seamless flow of information by all concerned stakeholders. He said that they will partner with the community leaders to formulate a Community Engagement Plan (CEP) that will ensure feedback on all matters arising.

5.4 Conclusion of the Stakeholder Engagement

The stakeholders present reaffirmed their support for the proposed project owing to its value in addressing the present waste disposal and management challenges. There was therefore a consensus among the stakeholders to fast track the completion of the MWTI especially due to the escalating cases of COVID-19 infections.

The stakeholders underscored the need for a functional feedback and grievance redress mechanisms within the facility to allow all stakeholders raise their concerns and get feedback. The facility should therefore assess and strengthen the existing system to make it more responsive to the public and in line with the CHERP requirements.



Figure 7: A member of the community giving his contribution during the public meeting (source: Field Work)



Figure 8: The meeting attendees raising their hands as a sign of support for the project (Source: Field Work)



Figure 9: A visit to the project site by some of the meeting attendees (Source: Field Work)

6 ANALYSIS OF PROJECT ALTERNATIVES

This section analyses the projects alternatives in terms of site, technology, scale and waste management options. The proposed project site has been chosen after consideration of several factors including space for such a project, hospital layout, water supply, and sewer line connection within the hospital. Thus, the proposed site is the best suited for construction and installation of the proposed MWTI Project.

6.1 Relocation Option

Relocating the proposed project to an alternative site is not a viable option. This is because the proposed installation of a MWTI is meant to assist in the efficient management of HCW from the operations at HCRH which is a designated COVID-19 treatment facility. Relocation would also require acquisition through purchase of an alternative parcel of land. Such a scenario would mean going through the tedious procurement process. If the MWTI is constructed away from the HCF, it will also mean that the hospital would need to acquire a vehicle fully licensed by NEMA for transportation of the medical waste generated, making the whole process inconvenient, inefficient and prone to additional health and safety risks. The siting of the MWTI will be next to the existing HCWM area, which is well isolated from the rest of the hospital facilities. The site can easily and properly be fenced off from the other hospital activities, and hence, is the most appropriate. The space within the site is also enough for the equipment housing, and so will not require decommissioning of the existing structures within the area nor require relocation because of inadequate space.

6.2 The No Action Alternative

This alternative describes a situation where the proposed development fails to be implemented. In case this happens, positive impacts associated with the proposed development will not accrue to the stakeholders including the hospital, the environmental and public health advocates, the development consultants, contractors and suppliers of materials. However, from an environmental management perspective, the “*No action alternative*” will be beneficial in the sense that any potential negative impacts associated with the project implementation process will be avoided. However, the “No Action Alternative” should not be adopted, as there is need to encourage installation of adequate HCWM equipment to address the current HCWM challenges and mitigate public health related risks associated with poor medical waste management. From the analysis above, it becomes apparent that the *No Project alternative* is no alternative to the local people, the hospital, and the GoK.

6.3 Analysis of Alternatives to Incineration

6.3.1 Open Uncontrolled, Non-Engineered Dump Sites

Open dumping of wastes is widely practised, but has proved to be the most environmentally and socially unfriendly method of waste disposal. As per the public meeting discussion, this method was utilized at one time leading to a lot of public outcry due to potential pollution to water resources among other nuisances. Disposal of HCW into open dumpsites either within the HCF or in the municipal facilities is not an acceptable solution and may lead to environmental pollution not forgetting the social disturbance that it may cause leading to unnecessary conflicts between the hospital and members of the public. Disposal of waste in an uncontrolled, open dumpsite will cause environmental pollution and should not be undertaken.

6.3.2 Sanitary Landfill

Properly constructed and operated landfill sites offer a relatively safe disposal route for most wastes including HCW. The priority is protection of the water aquifers and each day’s waste is compacted and covered with soil to maintain sanitary conditions. Nevertheless, this method could not also be considered because it requires a large space as well as specialized machines for compaction of each day’s waste.

6.4 Incineration

Incineration is a high-temperature dry oxidation process that reduces organic and combustible waste to inorganic, incombustible matter and result in very significant reduction of waste volume and weight. This process is usually selected to treat waste that cannot be recycled, reused or directly disposed off in sanitary landfill.

All types of incinerators if operated properly according to the specifications will eliminate pathogens from the waste and reduce waste to ashes. Most modern incinerators have scrubbers that limit the atmospheric pollution and odours produced by the incineration process.

a) Advantages of incineration include:

- Accept the greatest variety of solid hazardous waste,
- Treated waste is unrecognizable as ash,
- Significant volume reduction,
- Energy recovery,
- Waste totally sterilized.
- Trained personnel readily available,
- Existing guidelines in place,
- Cheaper to install and maintain compared to other methods like autoclaves.

b) Disadvantages include:

- Acid gases in air emissions,
- Heavy metals in ash residues,
- Convert biological problem into potential air quality emission problems,
- Major source of dioxin and furan emissions.

Because of the many advantages of incinerators including that they can treat the greatest variety of waste, significant volume is reduced, trained personnel are readily available and that they are cheaper to install and maintain, this method is considered as a viable option provided the mitigation measures provided in this ESIA report are fully exercised.

6.5 Open Burning of HCW

Burning HCW at low temperatures in the open should be discouraged because this may release toxic pollutants into the air. This method is totally discouraged and should be avoided at all costs just the same way as is the case open dumping.

6.6 Microwaving

Microwave technology of managing HCW is considered an alternative technology of the incinerator. This is a steam-based process, and electromagnetic waves with frequencies between radio and infrared waves that use steam inside the wastes or by additional steam to sterilize wastes and destroy infectious agents and pathogenic organisms in the waste. So, it includes the use of high-intensity radiation to heat the moisture inside the waste. The types of waste generally treated in incinerator systems are equal to those treated in autoclaves.

a) Advantages of Microwaving include:

- Technology is easy to install and operate,
- Reduces HCW volume by up to 80%,
- Environmentally friendly due to lack of release of smoke and other pollutants such as dioxins, hence its emissions, if any are minimal
- Minimal liquid effluents,
- No danger of explosion as is the case with autoclaves as it does not make use of pressure

b) Disadvantages include:

- Its operating cost is very high (high electricity bills and need to further meet costs of disposing the treated waste),
- Produces offensive odours within the sheds
- Volatile and semi-volatile organic compounds, chemotherapeutic waste, mercury, other hazardous chemical waste and radiological waste should not be treated in a microwave
- It produces waste material that will need further disposal; hence need to invest in other items such as dedicated specialized waste transportation vehicles. In some cases, the public may not accept the disposal of HCW into the municipal dumpsites regardless of whether it is treated hence leading to conflicts

This method could not be considered given that it will need further investment in items such as specialized waste transportation vehicles.

6.7 Autoclaves

An autoclave consists of a metal chamber sealed by a charging door and surrounded by a steam jacket. Steam is introduced into both the outside jacket and the inside chamber which is designed to withstand elevated pressures. Heating the outside jacket reduces condensation in the inside chamber wall and allows the use of steam at lower temperatures. Because air is an effective insulator, the removal of air from the chamber is essential to ensure penetration of heat into the waste. This is done in two general ways: gravity displacement or pre-vacuuming. A gravity-displacement (or downward-displacement) autoclave takes advantage of the fact that steam is lighter than air; steam is introduced under pressure into the chamber, forcing the air downward into an outlet port or drain line in the lower part of the chamber.

a. Advantages of Autoclaves:

- Steam treatment is a proven technology with a long and successful track record,
- The technology is easily understood and readily accepted by hospital staff and communities,
- It is approved or accepted as an alternative technology in all states,
- The time-temperature parameters needed to achieve high levels of disinfection are well-established,
- Autoclaves are available in a wide range of sizes, capable of treating from a few pounds to several tons per hour,
- If proper precautions are taken to exclude hazardous materials, the emissions from autoclaves are minimal.
- Many autoclave manufacturers offer many features and options such as programmable computer control, tracks and lifts for carts, permanent recording of treatment parameters, auto clavable carts and cart washers, and shredders.

b. The disadvantages include the following:

- They are too expensive to install and maintain.
- The technology does not render waste unrecognizable and does not reduce the volume of treated waste unless a shredder or grinder is added,
- Any large, hard metal object in the waste can damage any shredder or grinder,
- Offensive odours can be generated but are minimized by proper air handling equipment,
- If hazardous chemicals such as formaldehyde, phenol, cytotoxic agents, or mercury are in the waste, these toxic contaminants are released into the air, wastewater, or remain in the waste to contaminate the landfill,
- If the technology does not include a way of drying the waste, the resulting treated waste will be heavier than when it was first put in because of condensed steam,
- Barriers to direct steam exposure or heat transfer (such as inefficient air evacuation; excessive waste mass; bulky waste materials with low thermal conductivities; or waste loads with multiple bags, air pockets, sealed heat-resistant containers, etc.) may compromise the effectiveness of the system to decontaminate waste.
- They require highly trained personnel to implement.
- There is danger of explosion

Though modern, this method was found to be too expensive to install and maintain since they are not common, and that they require highly trained personnel to implement, who are hard to find in the country and more so in hard to reach areas. This, in addition to the above disadvantages rendered the technology not a viable option for consideration.

6.8 Comparison of Alternatives

The proposed project is the best alternative since it will provide a modern hazardous waste management/HCWM facility within the hospital leading to conservation of environmental resources and public health. Incineration methods are most used among the technologies for HCWM in many countries including Kenya. Therefore, opting for incineration against the other waste treatment options is well within the standards for HCWM and favourable for this health facility.

7 POTENTIAL IMPACTS IDENTIFICATION AND MITIGATION MEASURES

7.1 Introduction

The activities undertaken during designing and planning, implementation, operation and decommissioning of the proposed MWTI are associated with several potential impacts which can be classified into two categories, namely:

- ✓ Potential Negative environmental and social impacts and
- ✓ Potential Positive environmental and social impacts.

The various impacts in these two categories are then examined in categories of their time of occurrence (pre-construction/design, construction, operational or decommissioning phase).

7.2 Potential Impacts During Planning and Design Phase

7.2.1 Potential Positive Impacts During Planning and Design Phase

a) Employment Opportunities

The proposed project at this stage is likely to generate employment opportunities especially for professionals such as engineers, surveyors, environmentalists, hydro geologists, social scientists among others.

b) Creation of Awareness

Awareness improves civility in project planning, implementation and operations. This is a sure formula for ensuring there is social acceptability that leads to ownership and sustainability of the project. Awareness was done through consultations on different aspects of the project with the key stakeholders.

7.2.2 Potential Negative Impacts During Planning and Design Phase

It is envisaged that there will be minimal to no negative impacts during the planning and design stage.

Proposed Mitigation Measures:

As noted above, impacts during this phase of the project are not significant. However, the design team and key stakeholders shall take necessary measures to document any concerns and incorporate appropriate measures to mitigate the impacts in the final designs and implementation process. The design of the MWTI should provide for amenities such as sanitary conveniences, office space, store for materials and equipment, temporary HCW storage area well aerated but free from access by scavenging animals and birds, perimeter fencing, adequate ash pit, emergency alarm system and fire-fighting equipment.

The design team, Environment and Social experts shall take the necessary measures to mitigate risks through:

- Liaising with the relevant technical government departments in development of the designs;
- Proper siting of the waste treatment facility and ensuring harmony with the hospital layout and planning;
- Ensure all the legally required permits such as getting the designs approved, acquiring the ESIA License prior to undertaking the construction activities;
- The contractor bidding documents should contain clauses on Environmental Social Health and Safety (ESHS) requirements to guide the contractor on the key requirements;
- Project Management Team (PMT) specifically the Environmental and Social Experts should ensure the design requirements are adhered to in the planning stage; and
- Ensure the stakeholders are aware of the initiation of the project and the plans under way.

7.3 Potential Impacts during Construction Phase

7.3.1 Potential Positive Impacts during Construction Phase

7.3.1.1 Creation of a Market for Construction materials

The contractor will utilize locally available materials for building and construction of the project. This will in turn provide a ready market for suppliers within and around the project area.

7.3.1.2 Creation of Employment Opportunities

The construction works are a source of employment to the community, either as skilled or as unskilled labourers.

7.3.2 Potential Negative Impacts during Project Construction

The following negative impacts are associated with the construction of the proposed incinerator shed.

7.3.2.1 Interference with the Physical Setting

Some of the activities for shed construction will include site clearance and excavation works that will interfere with the physical setting of the project site. It is recommended that the excavated spoil should be disposed-off in the correct manner such as reuse in landscaping, backfilling or in road construction. It is advisable that any excavated parts be well secured before they could be refilled or before construction could be carried out to make them safe.

Proposed Mitigation Measures:

- ✓ The proponent should ensure minimal disturbance to the topography of the area as much as possible;
- ✓ The proponent shall as much as possible complete the works in such a way that natural aesthetics shall be retained at the locations, hence the project as a whole should be aesthetically acceptable to blend in with the surrounding environment; Any topographical change needed should be done to avoid soil erosion or storm water drainage issues;
- ✓ Construction of the waste storage area should have adequate capacity to accommodate peak waste generated due to increased patient intake as a result of COVID-19 compared to normal average daily medical waste generated. Such a waste storage area should be constructed in a manner that does not allow leachate from the waste to find its way to the outside in cases of prolonged storage or access of the waste by scavengers with proper signage placed,
- ✓ Restoration shall be undertaken to ensure that the original setting is as much as possible retained;
- ✓ All workers participating in the construction of the MWTI shelter and associated structures should be provided with adequate and appropriate PPE, be trained on their appropriate use and enforce on use,
- ✓ The proponent should observe measures stipulated in the ESMP for sustainable project implementation.
- ✓ It is recommended that the excavated spoil should be disposed-off in the correct manner such as reuse in landscaping, backfilling or in improvement of access roads at the health facility
- ✓ The selected site should have three phase electricity connection and piped water within proximity in order to avoid long trenching distances.

7.3.2.2 Noise and Vibration Generation

Machines used for the construction activities of the project such as excavation equipment and construction vehicles delivering materials to site are likely to emit noise. The same applies to labourers to be engaged for executing the construction activities.

Proposed Mitigation measures

Both the proponent and the contractor of the project shall put in place several measures that will mitigate noise pollution during the construction phase such as the following:

- ✓ Install portable barriers to shield compressors and other small stationary equipment where necessary;
- ✓ Equipment designed with noise control elements such as those that utilize electricity as opposed to those which utilize diesel or petrol shall be widely utilized;
- ✓ Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, as well as encouraging workers to shut off vehicle engines whenever possible;
- ✓ The workers and any other person visiting the construction site shall be provided with the appropriate PPE such as ear plugs;
- ✓ The contractor is encouraged to work during the day time as much as possible i.e., from 8am to 5pm;
- ✓ Consider manual labour-based construction methodologies and skills as opposed to the use of heavy machinery; and
- ✓ Avoiding verbal noise from the workers at the site or be kept at minimal levels possible.

7.3.2.3 Air Pollution (Dust and Emissions)

Excavation and related earthworks are likely to generate dust which could potentially lead to air-borne particulate matter pollution. This is likely to affect site workers, staff in the hospital and the neighboring community members, in extreme situations leading to respiratory problems.

i. Proposed Mitigation measures

To ameliorate these, the following mitigations measures are proposed:

- ✓ Contractors should wet the surfaces, use dust screens/nets during demolition activities or when dusty construction activities are occurring;

- ✓ The number of motorized vehicles shall be minimized as well as limit the speed to a maximum of 10km/hr;
- ✓ Make use of pre-marked routes to and from the project site;
- ✓ Cover the stock piled construction materials and spoil generated from any excavations; and
- ✓ Wet all active construction areas as and when necessary to reduce dust
- ✓ When transporting construction material, ensure vehicles are covered with tarpaulins in order to decrease dust emissions; and
- ✓ Discourage burning of solid waste at project site

7.3.2.4 Management and Disposal of Spoil Material Generated

Construction works will involve minor earthworks and excavation which will generate some spoil. The waste spoil requires to be adequately disposed to avoid the surrounding environment from being affected adversely. This can be ameliorated by observing the following measures:

- ✓ Re-use the excavated materials for works at the site as far as feasible to ensure that no permanent spoil dumps are created;
- ✓ The hospital management be consulted where loads of murrum are to be used to make good of any worn-out sections of the walkways/ driveways within the hospital
- ✓ Properly disposing off the spoil in an area identified by the contractor team and approved by the confirmed land owners, hospital management as well as by NEMA. Care should be taken to avoid spoiling/ degrading land that could otherwise be used for productive purposes.
- ✓ Spoil dumping should be away from any water resources to avoid possible water pollution from siltation;

7.3.2.5 Vegetation Loss

The significance of vegetation loss during the site clearance can be minimised if care is taken to site the construction away from trees. To contain the potential negative impacts related to vegetation loss, the following mitigation measures are recommended:

- ✓ The contractor should properly demarcate the project area likely to be affected by the construction works by the contractor;
- ✓ Strict control of construction vehicles to ensure that they operate only within the area to be disturbed by access routes and other works;
- ✓ Avoid clearance of indigenous herbaceous plants, shrubs and trees, where possible on the potential sites for screening of the visual impact;
- ✓ Re-plant vegetation in the disturbed surfaces.

7.3.2.6 Accidental Spills and Leakages

The principal chemicals to be held on the site during the construction phase are likely to be fuel, lubricants, oil, grease, paints and pest control substances to be applied on the wooden structures and foundations. Spillage or escape of such compounds are likely to have an immediate impact upon the local water resources (through storm water) and consequently on the terrestrial and aquatic flora and fauna. This can be checked by observing the following measures:

- ✓ Temporal storage of all hazardous/toxic substances in specifically designated areas on site will be in safe containers, labelled with details of composition, properties and handling information including safety data sheets, and for use only for construction works;
- ✓ Store all chemicals and related materials properly and if possible, in secondary containers just in case of accidental puncturing; and away from storm water runways or exposure to weather elements such rains
- ✓ Disperse the meteoric waters during the course of the construction works by constructing temporary drainage channels and soak pits
- ✓ Contractor to have spill prevention and response procedure including all necessary equipment and that of workers are trained.
- ✓ Contractor to immediately report to HCF and Project PIU any spills or accidental releases

7.3.2.7 Extraction, Use and Management of Solid waste from Construction Materials

Construction materials that will be used include; timber, building blocks, ballast, sand and cement. This will be obtained from quarries, hardware shops and sand harvesters who extract such materials from natural resource banks such as rivers and land. To check on the impacts of material extraction use and for management of non-hazardous wastes, both solid and liquid, the following is recommended:

- ✓ The Contractors should source construction materials such as sand and ballast from registered and NEMA licensed quarry and sand mining firms and/or from suppliers, of such firms are expected to apply acceptable environmentally and socially friendly processes in their operations;
- ✓ The Contractor should adhere to the procurement plan and only order for what will be required through accurate budgeting and estimation of actual construction material requirements;
- ✓ Contractor shall prepare waste management plan as part of the C-ESMP to be implemented at the site (storage, provision of bins, site clean-up, bin clean-out schedule, etc.) before commencement of any works, which should promote waste minimization and recycling.
- ✓ Contractor shall be responsible for handling and disposal of all construction and related waste;
- ✓ Encourage efficient use of materials to as much as possible avoid and minimize waste production;
- ✓ Ensure waste are recycled / reused before opting to dispose of.
- ✓ Designate temporal waste / garbage holding areas at site;
- ✓ Use of waste receptacles that encourage segregation to hold waste on site before its collection;
- ✓ Use of durable, long-lasting materials that shall not need to be replaced often;
- ✓ Engage NEMA registered waste contractor to dispose of hazardous waste and have waste destruction certificate and waste transfer notes;
- ✓ Waste disposal by burning shall not be permitted and signage should be erected; and
- ✓ Fine earth materials (sand and murrum) should be covered using tarpaulins during haulage to prevent spillage, dust and particulate matter emission.

7.3.2.8 Increased Water Demand

Demand for water is expected to rise during the construction phase of the proposed project for use by both the construction workers and the construction works in addition to the existing demand given that the water is to be sourced from the hospital supply. To check on its sustainable use, the following mitigation measures have been proposed:

- ✓ All project stakeholders and especially proponent and contractor shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water use; and
- ✓ The contractor water intake point should be metered so that the contractor is made to pay for water consumed or for the water wasted. Alternatively, the contractor should source water from licensed water vendors who can supply by use of water bowsers.
- ✓ Encourage prompt maintenance of water pipeline leaks;

7.3.2.9 Archaeological and Other Cultural Properties

The field studies did not identify any known archaeologically protected monuments and cultural properties in the proposed project area and therefore, there will be no impacts on them. Should any archaeological or culturally important artefact be discovered during the construction/excavation process, the contractor should implement the **Chance Find Procedure** attached as appendix 3 to this report.

7.3.2.10 Occupation/Public Health and Safety risks

Construction works unavoidably expose workers to OSH risks such as accidents and injuries resulting from unintentional falls and injuries associated with working from heights, burns from welding, electrocution and use of faulty hand tools and construction equipment. Construction workers are also likely to be exposed to health hazards related to the handling and disposal of HCW next to the construction site. The piling and open burning of the HCW near the construction site exposes the workers to the risk of contact with infectious wastes, and inhalation of toxic fumes emitted as the waste burns.

In relation to public safety, the most serious threats will be on the areas with heavy plant and equipment moving in and out of the construction site. There will also be an increased risk of traffic related accidents from vehicles transporting construction materials. Although there are additional measures listed in ESMF, ICWMP, LMP, and WG EHS General Guidelines, this can be mitigated through observing the following:

- To reduce on workers accidents and hazards, the contractor is expected to comply with Occupational Health and Safety rules and regulations as stipulated in the Occupational Safety and Health Act (OSHA), 2007. Ensure the workplace is registered by the Directorate of Occupational Safety and Health Services (DOSHS);
- The contractor shall prepare an OHS plan as part of their C-ESMP for the construction works and which should include input from the HCF management on potential health and safety risks associated with the construction

activities. The Plan should meet all OHS requirements in Kenyan laws and regulations, WB ESS2, and C-HERP ESMF and LMP;

- Workers on site should be sensitized on the health and safety requirements while at project site;
- Workers should be provided with adequate and appropriate PPE (safety helmets, shoes, gloves, mask)
- Provision of clean and accessible sanitary facilities and water to workers;
- Train all workers on Safety, Health & Environment (SHE) with an aim of improving awareness;
- Barricade the active work sites to limit entry of unauthorized people. Use of screens and nets to avoid flying debris and ensure good housekeeping in the construction sites ;
- All trenches or wherever soil conditions dictate should be secured to prevent accidental fall by workers and the public into the trenches;
- Have safety signage installed along the work areas;
- A safety officer shall be designated at each site and shall maintain a log of incidents (safety register) on site
- Task based risk assessment should be done on daily basis to assess the risks and hazards thereby prescribing the appropriate prevention measures;
- The contractor to ensure compliance with the provisions of WIBA 2007 for all the workers engaged;
- Site should have an accessible grievance redress mechanism to allow workers/community to raise safety issues and propose improvements on projects sites;
- Electrical works and installations of the medical waste incinerator should be done by a trained certified, experienced personnel and
- Contractor shall report immediately to the HCF and C-HERP PIU any worker death or serious accident.
- The Hospital management to immediately put a stop to the dumping and open burning of medical waste next to the construction site and find an interim means of disposal away from the construction site

Potential Spread of Communicable Diseases and Other Infections

Due to increased human traffic at the site during the construction phase there is a risk of spread of communicable diseases such as tuberculosis and pulmonary infections like COVID-19. Aspects of the physical environment that promote transmission of diseases include: disposal of wastes and ventilation which are likely to occur during the construction phase of the project. With the influx of people during construction, there will be a likelihood of increase in diseases such as typhoid, tuberculosis, diarrheal diseases, dysentery, and cholera and, respiratory diseases like the COVID-19. Proposed mitigation measures include the following:

- ✓ Immunize and treat affected workers
- ✓ Controlling the movement of disease carrying vectors (such as contaminated water and between people);
- ✓ Ensure personal hygiene facilities are supplied in good condition with adequate water supply; and
- ✓ Ensure awareness rising on proper sanitation and personal hygiene to promote proper health.

All the requisite COVID-19 prevention measures should be observed such as the following:

- ✓ Wearing prescribed and appropriate PPE on site at all times
- ✓ Regularly washing hands, sanitizing and observing social distancing at all times as well as following WHO and GOK updated guidelines.
- ✓ Seeking healthcare services immediately one experiences any of the following symptoms (while at home or work): cough, fever and shortness of breath.
- ✓ Train staff on signs and symptoms of COVID-19 such as respiratory hygiene, cough etiquette, hand hygiene and use of PPE
- ✓ Place signs and posters in areas around the project site
- ✓ Regularly assess work force characteristics and adjust work practices such as avoiding concentration of more than 15 workers per site)
- ✓ Clean up the tools and equipment used on site with soap and water or use sanitizer as appropriate
- ✓ Comply with all Kenyan laws geared towards controlling spread of diseases especially COVID-19.

7.3.2.11 Increase in HIV/AIDS Prevalence and other STIs

The increase in numbers of people is likely to cause new infections around and within the construction area. This is due to the fact that the contractors, traders and workers will have money to attract women/men from the project area in a bid to solicit for sex, thereby creating avenues for spread of HIV/AIDS and other STIs. The most vulnerable members of the community are women as they don't have access to resources necessary for production and wealth creation. This will further predispose them to sex pests and consequently to HIV/AIDS. It is recommended that the

project proponent and the contractor should ensure that prevention and management of STIs occurrence as a result of social is conducted through:

- ✓ Limiting workforce importation to those with specialized skills.
- ✓ Creating awareness and sensitization of workers and the local communities on STIs including provision of condoms to the project team and the public;
- ✓ The contractor to carry out regular HIV/AIDS awareness and prevention campaign amongst workers for the duration of the contract e.g., erecting and maintaining HIV/AIDS information posters at prominent locations as specified by the PWE;
- ✓ The contractor has to ensure that staff is made aware of the risks of contracting or spreading sexually transmitted diseases.

7.3.2.12 Labour influx

It is envisaged that there will be quite a significant population within the health facility during the construction phase. It is recommended that the contractor observes the a-third rule as proposed in the Kenya Constitution 2010 by making sure that;

- ✓ Construction workers are hired from within the locality (especially for unskilled workers) hence limiting movement or only short distances from their homes;
- ✓ Effective contractual obligations for the contractor will be done with workers to adhere to the mitigation of risks against labour influx, including SEA;
- ✓ The contractor to maintain proper records of all workers indicating age and gender and avoid recruiting people aged below 18 years and forced labor;
- ✓ Contractor to observe fair treatment, non-discrimination and equal opportunity of all labourers including persons with disabilities;
- ✓ All contracted workers to sign a CoC that will have provisions on individual responsibilities; and
- ✓ The contractor to ensure that the workers have access to and are informed about the project GRM.

7.3.2.13 Human Rights and Gender Inequalities

Women are highly vulnerable as their labour participation is often highly informal. Low-income and migrant female workers are especially vulnerable. The COVID-19 pandemic worsened the already high prevalence of gender-based violence (GBV) due to greater economic stress in households coupled with increased social isolation. It is recommended that:

- ✓ Contractor to ensure no discrimination against one gender either by design or oversight during recruitment;
- ✓ The contractor/facility to ensure provision of the necessary basic sanitary facilities in relation to gender – provide separate sanitary facilities;
- ✓ The contractor to collaborate with the hospital management in handling any GBV/SEA cases that may arise;
- ✓ Report any violations of the CoC/gender mainstreaming requirements to workers' representative, HR or grievance redress committee, the Social Safeguards experts at the PMT and ensure that no employee who reports a violation of the CoC in good faith will be punished in any way;
- ✓ Comply with the National Gender and Equality Act, 2011 and related statutes;
- ✓ Treat women, children and men with respect regardless of race, colour, language, tribe, religion, or other status; and
- ✓ Implement strict sanctions on any worker who is reported to have been a perpetrator of SEA to fellow workers and community members.

7.3.2.14 Conflict and Insecurity

There is likelihood of conflict between the contractor and the surrounding communities due to: labour recruitment; shared resources (road, etc.); and behaviour of workers. This could also be as a result of community clashes around the facility, theft of construction equipment and commodities, vandalism, conflict between construction workers and contractor management due to working conditions and terms of service.

Proposed Mitigation Measures

- ✓ The contractor should explore possibilities of having a different access to the project site so as to enhance security and differentiate between patients, visitors and workers accessing the site.
- ✓ The contractor, in conjunction with the hospital management, should hire more security personnel, and if possible, security personnel dedicated to the construction site and its activities.

- ✓ Ensure heightened surveillance of the project site and facility during the construction/installation works.
- ✓ Utilize intelligent information for security of workers and project materials, e.g. during operations and transit of materials and workers.
- ✓ Raise awareness on the GRM mechanisms.
- ✓ Adequate consultation with surrounding communities and workers regarding the construction works.
- ✓ It is also recommended that the construction workers be provided with easily identifiable uniforms.
- ✓ Contractor security personnel should sign the CoC that discourages the use of force unless for defensive purposes.
- ✓ Ensure proper arrangement for shared resources, e.g. water.

7.3.2.15 Sexual Exploitation and Abuse/Sexual Harassment

Interaction between construction workers and other project stakeholders such as hospital staff and community could lead to SEAH as senior workers may seek sexual favors from the juniors especially in relation to recruitment and promotion opportunities. It is recommended that:

- ✓ The contractor develops a CoC which encompasses clear warning to workers on SEAH and to be signed by every worker on site;
- ✓ The contractor, with the supported HCF should provide a mechanism where workers and clients are free to report any SEAH to the senior management without fear of intimidation;
- ✓ Share information with the facility and project GRM to communities and all stakeholders;
- ✓ Share information on GBV/SEAH services around/near the facility for victim's information support; and
- ✓ Contractor to ensure that staff is sensitized on GBV/SEAH risk management.

7.3.2.16 Grievance emanating from the project construction activities

This is the procedure and mechanism through which relevant stakeholders, specifically the project affected persons (PAPs) and hospital community members express their concerns against the project and the implementing staff. Various construction activities may cause dissatisfaction among stakeholders. The GRM provides the means through which relevant stakeholders, specifically the PAPs and hospital community members express their concerns against the project and the implementing staff. In reference to the minimum GRM indicated in the project SEP, it is recommended that the contractor and facility should:

- Put in place grievance mechanisms, e.g.:
 - Assigning a contractor-based GRM Focal Person;
 - Putting in place channels to allow people to complain, e.g., telephone, Email, registers, WhatsApp, platform for workers, suggestion box, among others; and
 - Ensuring documentation of complaints in complaints registers.
- Raise awareness to all stakeholders including project workers on the existing GRM and sensitize them on the need to register their dissatisfaction with the contractor or the facility;
- Resolve complaints within the project timeline (acknowledging within 7 days and resolving within 21 days or as soon as possible (within 24 hours for GBV/SEA complaints);
- Implement strict sanctions to any worker who contravenes the CoC; and
- Compile reports on the complaints and grievances received on the project and submit monthly reports to the PMT using the guidance provided in appendix 5.

7.3.2.17 Labor Disputes

The contractor and suppliers for the MWTI will have workers who will be involved in the installation of the MWTI. The potential labour disputes may arise due to breach of contract regarding conditions of employment, fringe benefits, hours of work, and wages negotiated or of already agreed terms. Labor disputes may also arise due to disagreements amongst the workers and between workers and the contractors and other service providers.

Proposed Mitigation measures

The project shall adhere to the requirements proposed in the project LMP including:

- Fair terms and conditions shall be applied for project workers (guided by relevant labour laws);
- The project shall also have GRMs for project workers (direct workers and contracted workers) to promptly address their workplace grievances;
- The project contractors shall abide by the provision of the projects LMP, and

- The project shall respect the workers' right of labor unions and freedom of association.

7.3.2.18 Child labour risks in the sub-project

Incidence of child workers may occur during construction especially in light of the rising livelihood needs at the households' level as a result of the impacts of COVID-19 and other causes. It will be important for the contractor management to protect the project from such incidence by ensuring that recruitment comply with the national laws and that continuous monitoring is done within the phase to ensure non-occurrence of such incidences.

Proposed Mitigation Measures

- The contractor will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated by the Project including on GBV/SEAH.
- All staff must sign, a contract which clearly defines what is and is not acceptable behaviour and commit themselves towards protecting children
- Children under the age of 18 years should not be hired on site as provided by Child Rights Act (Amendment Bill) 2014.
- Wherever possible, ensure that another adult is present when working in the proximity of children.
- Not to invite unaccompanied children to workers' home, unless they are at immediate risk of injury or in physical danger.
- Project workers must refrain from hiring children for domestic or other labor
- Comply with all relevant local legislation, including labor laws in relation to child labor specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation
- Ensure that recruitment inventory indicates the ages of employment applicants and age verification is done using the national identification cards

7.4 Potential impacts during Operational phase

7.4.1 Improper Healthcare Waste Management

During the operation, the MWTI will treat medical waste generated from the hospital healthcare activities which need to be disposed of in an appropriate medical waste disposal facility. Improper disposal of medical waste would have adverse environmental and public health impacts: for example, open burning and incineration of medical wastes can result in emission of dioxins, furans and particulate matter, and result in unacceptable health risks.

Impact mitigation⁷

The WHO has developed guidelines and recommendations in operation of MWTI. There will also be specific procedures detailed in the Operation Manual for the MWTI equipment. In addition to these, the following are some of the recommended impact mitigation measures:

- The hospital shall prepare, operate and maintain a Health Care Waste Management Plan (HWMP) adequate for the scale and type of activities and identified hazards consistent with the National regulations, project ICWMP and the WBG EHS guidelines for Health Facilities, and WHO guidelines (section 4.5.2). Key content of HCF waste management plan should include: assignment of responsibilities including designate waste management officer; waste classification (including quantities of waste generated); waste minimization, reuse and recycling; waste segregation; on-site handling, transport and storage practices (including containerization, color coding, labeling and signage); waste-treatment and disposal options (on-site and off-site); record keeping and documentation, training and monitoring; costs relating to waste management, including capital, operational and maintenance costs; Training; Procedures for segregation, storage and handling of wastes requiring special arrangements, contingency plans, containing instructions on storage or evacuation of health-care waste in case of breakdown of the treatment unit or during closure for planned maintenance and emergency procedures,
- Waste should be identified and segregated at the point of generation. The segregated waste should not be lumped together during its collection and transportation to the MWTI. Non-hazardous waste, such as paper and cardboard, glass, aluminium 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 the colour-coded system at their place of production to reduce the health risk from the smaller potentially infectious factions (typically waste items contaminated with body fluids and used sharps); Staff should receive instruction on three-bin waste segregation and safe handling and storage of health-care wastes;

⁷IFC Environmental Guidelines for Health Care Facilities, 2007.

- Staff are aware of how to protect themselves from injuries and infection from waste; Waste containers and storage areas are cleaned regularly . ;
- Prevention and minimization of the production of waste (integrating systems and practices to avoid the creation of waste into facility design and management and equipment and consumables purchasing);
 - Reuse or recycling of wastes to the degree feasible, employing:
 - Source reduction measures such as purchasing restrictions to ensure the selection of methods or supplies that are less wasteful or generate less health care waste;
 - Recyclable products (use of materials that may be recycled either on- or off-site);
 - Good management practices rigorously applied to purchase and control of chemicals and pharmaceuticals; and
 - Segregation of wastes into different categories—for control of quantities and disposal methods.
 - Seal and replace waste bags and containers when they are approximately three quarters full. 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; Disinfectant should be used on outer and inner surfaces in order to avoid possible transmission of the infections. Transport of general waste and infectious health-care waste should be collected separately and at least once a day. Collection is at regular times and is reliable; Waste containers and on-site transport trolleys are closed with lids to isolate wastes from patients and the public.
 - Transport staff (Health care waste handlers) should be vaccinated at least against hepatitis A and B, polio and tetanus
 - Recommendations for storage facilities for healthcare waste (WHO, 2014). Waste storage areas should be located within the hospital 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 isolated from patients and the public;
 - The facility to keep general waste separated from infectious and other hazardous waste
 - 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; and
 - Equipped with supplies of protective clothing, and spare bags / containers.
 - Have a washing basin with running tap water and soap that is readily available for the staff; be cleaned regularly (at least once per week); have spillage containment equipment;
 - As for infectious waste storage: Floors and walls should be sealed or tiled to allow easy disinfection. If present, the storage room should be connected to a special sewage system for infectious hospital waste water.
 - Unless refrigerated storage is possible, storage times between generation and treatment of waste should not exceed 48 hours during cool season, 24 hours during hot season.
 - Packaging containers for sharps should be puncture-proof.
 - Customized training for the staff handling and managing HCW contaminated with COVID-19 should include:
 - The use of appropriate / full PPEs (***N95 respirators, apron, heavy duty gloves, eye protection, boots and long-sleeved gown***);
 - Hand hygiene practices;
 - Waste segregation strategies and clean up procedures;
 - On-site Handling, Collection, Transport and Storage;
 - Exposure to COVID-19 infections and diseases transmission;
 - Exposure to radiation; and
 - Fire safety measures.
 - Training treatment plant operators should be on general functioning of the treatment facility, including simple maintenance of the incinerator where appropriate; Health, safety and environmental implications of treatment operations; technical procedures for operation of the plant; Recognition of abnormal or unusual conditions; Emergency response, in case of equipment failures and alarms; Maintenance of the plant and record keeping and quality control

- Seek operational licence from NEMA of the waste treatment incinerator to ensure compliance with the Waste Management Regulations, 2006

7.4.2 Fire Risk

Without provisions for fire safety, there is a risk of fire outbreak at the waste treatment area with disastrous life and financial impact. Fires can start from accidents or elevated emissions associated with incinerator, the high voltage electricity, chemical spills, ignitable materials within the hospital, cigarette smoking in non-designated places or old electrical connections.

Proposed Mitigation Measures

- Provide fire extinguishers at strategic positions within the MWTI and ensure servicing is done.
- The MWTI operators shall have basic training in fire control.
- Fire emergency telephone numbers should be well displayed at the MWTI.
- The MWTI team shall prepare a fire emergency management plan.
- Undertake regular fire drills targeting the MWTI operators to gauge preparedness level and use the results to improve on the response mechanism.

7.4.3 Occupational Safety and Health Risks for Waste Handlers/Workers and Operators

OHS hazards associated with handling and transport of HCW include needle-sticks injuries; injuries due to other sharps such as broken glass; ergonomic issues especially related to lifting; blood splatter during waste handling; aerosolized pathogens (disease-causing micro-organisms released as aerosols or tiny droplets suspended in air) during loading, compaction, or break up of untreated waste; breakage and spills of infectious waste bags and chemical exposure. COVID-19 is highly infectious and the risk of contraction by healthcare workers and the general public is high, if requisite training, sensitization and protective gear are not provided. The hospital environment is a potential source of infectious waste and these could pose unsafe conditions for healthcare staff. Of particular concern are health workers handling infectious waste (including sharps) without adequate protective gear, and run the risk of piercing from, storage of sharps in containers that are not puncture-proof. While some OHS risks will be new borne by the equipment introduced, most other effects exist (hence cumulative) and would only be exacerbated by increased use of healthcare services as a result of COVID-19 cases. Below is a list of OHS risk sources for healthcare staff:

- i Electrical hazard /Loose electrical installations;
- ii Lack of adequate lighting in workplaces;
- iii Lack of safe access particularly for disabled employees;
- iv Inadequate ventilation in the MWTI shelter;
- v Lack of adequate training (or neglect of safety precautions/ guidelines) in operation of the MWTI;
- vi Dust emission;
- vii Handling and transportation of contaminated wastes (biological hazards);
- viii Malfunctioning machine controls; and
- ix Loose mechanical fixes;
- x Misuse of equipment and materials for functions they are not designed;

These hazards have the potential to cause injury or fatalities to the healthcare workers involved in handling HCW and plant maintenance. In this regard, plant operators should be trained on occupational health and safety and expected to implement the prevailing National Health Care Waste Management Strategic Plan (2016-2021) applicable to HCW treatment to avoid and minimize injuries or fatalities on their premises.

Proposed Mitigation measures

- Ensure the implementation of standard precautions and transmission based precautions in line with national guidelines for IPC in healthcare facilities, the MOH waste Management plan (2016 – 2021), the Project Infection Control and Waste Management Plan and the Operational Manual and Procedures for the MWTI equipment as provided by Equipment Company. These shall be customized through the development of the health facility specific instruments, among this include facility level infection control and waste management plan that incorporate among others health and safety aspects which must contain appropriate safety measures;
- Ensure identification of risks (Job Risk Assessment) and instituting proactive measures,
- Train the healthcare workers on the potential OSH risks in relation to COVID-19. Of particular interest are the operators of the MWTI, who must be trained on the contents of the health and safety plan including on the

- general functioning of the treatment facility, heat recovery and flue-gas cleaning technologies, where appropriate; Health, safety and environmental implications of treatment operations; Technical procedures for operation of the plant; Recognition of abnormal or unusual conditions; Emergency response, in case of equipment failures and alarms; Maintenance of the plant and record keeping; Surveillance of the final waste treated product
- Provision of adequate and required PPE to health workers and enforce on use. This includes: single use medical mask, gown, Apron, eye protection, boots or closed shoes.
 - Implementation of systemic risk management plan comprising risk prevention, evacuation of accident victims, evaluation and improvement measures.
 - All MWTI operators should be provided with appropriate PPE and trained on their proper use. Each of the MWTI operators should be provided and equipped with an approved unused disposable overall; Safety gumboots; Right grade hand gloves; recommended goggles; Helmet; Right grade respirators; and Ear Plugs.
 - Limit access to the waste treatment area only to authorised persons;
 - Warning and safety signage to be placed at the areas within the MWTI site;
 - All personnel involved with the HCWM process should be subjected to medical surveillance;
 - Regularly cleaning and disinfecting the waste treatment area;
 - The waste holding area/chambers should be well sheltered from direct rainfall, sunlight and strong winds but should be adequately aired;
 - All machinery and equipment involved in the waste treatment and disposal process should be washed and disinfected prior to leaving site;
 - Thorough, complete and up to date records should be kept of:
 - Medical surveillance of operators for a minimum period of 5 years;
 - Maintenance of control measures for a period of 3 years;
 - Daily HCW inventory;
 - Training given to employees in terms of HCWM and machine maintenance for as long as the employee remains at the workplace in which he is being exposed to HCW.

7.4.4 Gender Based Violence/Sexual Exploitation and abuse

During the C-HERP implementation period, the project will continue to monitor SEAH risks in the supported healthcare sites including HCRH. The hospitals will be required to report any SEAH cases affecting sub-project workers to the PMT within 24-hour of the incidence.

Proposed mitigation measures

- ✓ Continue sensitization of staff on She risk management;
- ✓ Provision of GRM channels for reporting SEAH cases;
- ✓ Ensuring that the GBV/SEAH one pager is placed on strategic points of the facility;
- ✓ Document available GBV/SEAH referral pathways for victims' information and support;
- ✓ Develop an action plan of all GBV/SEAH incidences to avoid recurrence;
- ✓ Ensure the facility is well lit to avoid hiding places for SEAH perpetrators;
- ✓ Provision of separate sanitary facilities for men and women;
- ✓ The hospital will continue to mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule;
- ✓ To include prohibition of GBV/SEAH in Employees CoC, e.g. outlawing the use of inappropriate language or behaviour, harassment, use of abusive, sexually provocative, demeaning or culturally inappropriate language towards women or children; and
- ✓ Prohibiting sexual activity with children under 18 years, which is a criminal offense, including through digital media and promoting respect to the rule of law in respect to children's rights.

7.4.5 Security concerns and conflict

Lack of proper security arrangements may predispose the MWTI and accessories to theft, vandalism and pilferage among other security risks. There are also risks of break-ins and attacks by militia groups including Al Shabaab. There could also be security risks during the transportation of project equipment and materials. Therefore, there is need to ensure adequate security arrangements as provided for under CHERP Security Management Plan (SMP).

Mitigation measures

- ✓ Ensuring that security personnel undertake adequate surveillance of the security situation at all times.

- ✓ Ensuring that incinerator sheds are locked all the time when not in use.
- ✓ Stock taking of the equipment and accessories to ensure there is no loss.
- ✓ Ensuring proper fencing and lighting arrangement.
- ✓ Consider public police reinforcement in incidences of escalated insecurity.
- ✓ Liaise with the national security forces especially during the transportation of equipment and materials.
- ✓ Ensure transport of equipment and materials to the sites is done during the day.
- ✓ Engage drivers who are appropriately trained in defensive driving.

7.4.6 Grievances arising from the project activities

Complaints can increase especially where there is lack of proper arrangement to dispose incineration ash leading to piles of wastes in the neighbourhood. Similarly, there could be increased dissatisfaction of workers over terms and working conditions of operating the microwave waste treatment facility, therefore the need to continuously operationalize the facility GRM mechanisms. Other complaints could be related to the location and services rendered at the hospital and other general complaints related to the management of COVID-19 by the facility. There also may be complaints on community health and GBV/SEAH.

Mitigation measures

- ✓ Ensuring that there is an operational GRM that is responsive to stakeholders' concerns.
- ✓ Continuous stakeholder engagement to raise awareness of the project and clarify any outstanding issues.
- ✓ The hospital should continue to create awareness about the GRM mechanism in place to all workers, patients and neighbouring communities.
- ✓ Ensure appropriate and mutually acceptable redress actions are identified and implemented to the satisfaction of complainants.
- ✓ Ensure that there is a workable mechanism of opening complaints reported through suggestion boxes.
- ✓ Ensure that workers adhere to the CoC and implement strict sanctions to misdeeds.

7.4.7 Environment Pollution

Solid waste to be generated during operation phase of the MWTI is mostly incineration ash. Littering around the site will interfere with the aesthetic status and has a direct effect on the surrounding community. Disposal of the same ashes off-site could also be a social inconvenience if done in the wrong places. The off-site effects could be pollution of physical environment including water resource, invasion of scavengers and informal reuse by communities.

Proposed Mitigation Measures

- The hospital management shall be responsible for handling and disposal of all incineration ash in to the ash
- Designate temporal waste / garbage holding areas at site.
- Waste disposal by burning shall not be permitted and signage should be erected.
- Depending on the service level and tasks of the health-care facility, the wastewater might contain chemicals, pharmaceuticals and contagious biological agents, and might even contain radioisotopes. A major part of liquid chemical waste is disposed of via the sink. The most important chemicals in hospital wastewater are anaesthetics, disinfectants, chemicals from laboratory activities, developer and fixer solutions from photographic film processing, and iodinated X-ray contrast media. Note that sludge and sewage from health-care facilities generated by a basic wastewater-management system should never be used for agricultural or aquaculture purposes. Effluents from the basic treatment should not be discharged into water bodies that are used nearby to irrigate fruit or vegetable crops or to produce drinking-water or for recreational purposes.
- Wastes generated from maintenance of MWTI facility should be collected and disposed as per the management and handling guidelines of medical waste including decontamination, reuse and recycling

7.4.8 Community Health and Safety Risk

Due to increase interaction of the contracted workers and community members and potential of risk posed by the existing poor practice of waste management, the risk of exposure to health and safety of the workers and community gets escalated. It's therefore important to ensure the safety of communities from COVID-19 and other waste related infections. .Medical wastes and general waste from the hospital have a high potential of carrying micro-organisms that can infect the community at large if they are not properly disposed of, and so is a public health risk and may exacerbate risk of environmental pollution. This could be from diminished air quality due to open air burning of HCW, storm water contamination or when people rummage through raw waste stockpiles or when livestock are exposed to

contaminated water and waste or the poor disposal of masks and gloves. Unless the mitigation measures recommended are implemented, the likelihood of the impact occurring is high. Communities may also be exposed to COVID-19 infections through interactions with the project workers. There are also risks of HIV/AIDS infections and other STIs. Risks of GBV/SEAH could also increase through the interactions of the workers and community members.

Proposed Impact Management Measures

- Ensure regular monitoring of solid, liquid waste management practices and waste treatment;
- Ensure provision of sanitation facilities to the healthcare waste handlers and operators
- Install appropriate drainage channels within the health facility, and specifically the around the MWTI;
- The hospital administrator should undertake regular assessment of waste generation quantities and categories to facilitate waste management planning, and investigate opportunities for waste minimization on a continuous basis,
- Separate residual chemicals from containers and dispose of the containers to reduce generation of secondary contamination especially wastewater;
- Ensure the incinerator is serviced regularly and scrubbers changed to mitigate risks from emissions from the incinerator
- Seek NEMA license for the MWTI, and
- The MWTI should be secured and out of reach from any unauthorised persons

7.4.9 Increased Water Use and Liquid Waste Generation

Once the MWTI is completed, there will be an increased demand and or water use as well as increased liquid wastewater generation.

Proposed Mitigation Measures

- The MWTI shelter construction should provide for a human waste/sewage and cleaning water management facility such as connecting to the main septic tank serving the entire hospital.
- Designs have to provide for the facilities to be fitted with easy to clean tiles on their walls as well.
- Fix roof gutters to collect rainwater from the facility roof during the rainy season,
- Encourage prompt maintenance of water pipeline leaks,
- Install water conserving taps that turn-off automatically when water is not being used,
- The septic tank should never be allowed to spill on land. It should be exhausted by a NEMA licensed exhauster

7.4.10 Increased Energy Use

The Installation of the MWTI will lead to the increased demand for electricity energy to run MWTI.

Proposed Mitigation Measures

- Use load shedding on lighting system and other equipment to avoid creating peaks in demand;
- Turn lights off using automated sensors or a building automation system;
- Install a sub-meter at the MWTI to monitor power usage;
- Install solar energy resources to provide for additional security lighting within the waste management area in case of power outages;
- Health facility during the operation of the MWTI should practice effective health-care waste management through source reduction, segregation, resource recovery and recycling and training of personnel in order to aid in reduction of waste quantities requiring incineration, and so may lead to reduced emissions;
- Ensure the complete combustion of the waste to reduce production of polluting emissions, like dioxins or furans, and
- Use of best available emissions controls in order to substantially reduce the emission of carbon dioxide and other GHG.

7.4.11 Occupational Health and Safety Risk to Waste Handlers

While working at the MWTI facility, the operators will face daily health and safety risks as a result of uneven walkways; Dust; Handling and transportation of contaminated wastes; loose electrical installations; Malfunctioning machine controls; and loose mechanical fixes. These hazards have the potential to cause injury or fatalities to the healthcare workers involved in handling HCW and plant maintenance. In this regard, plant operators should be trained on OHS and expected to implement the prevailing National Health Care Waste Management Strategic Plan

(2016-2021) applicable to HCW treatment to avoid and minimize injuries or fatalities on their premises.

Proposed Mitigation Measures:

- The MoH waste management strategic plan, guidelines and IPC and waste management plan should be applied, observed and customized through the development of the facility specific instruments. This should be augmented by guidelines issued by WHO;
- All the operators should be in the appropriate PPE during operations of the MWTI;
- There must be a health and safety plan that is kept on-site which must contain appropriate safety measures;
- The operators of the MWTI must be trained on the contents of the health and safety plan;
- Provide adequately stocked first aid kit to be placed at strategic locations within the MWTI;
- Provide serviceable fire safety equipment and workers on use,
- Regular fire safety drills should be undertaken to gauge the levels of preparedness of the operators,
- Ensure good documentation and inventory on waste received and treated,
- Maintenance of an accident incident log book on site.

During the operation of the MWTI, the hospital management through the Hospital Public Health office and/or the grievance redress focal point will continue to ensure all social safeguards requirements and mitigation measures as highlighted in 7.3 (m) to (r) are managed appropriately as required.

7.5 Potential Impacts during Decommissioning Phase

After the MWTI including the shelter is considered non-functional, by the PWE or PHO, the facility will require to be decommissioned. At that point, the proponent may be required to vacate the site. The decommissioning exercise will have both positive and negative impacts:

During the decommissioning stage, demolition will be done, creating job opportunities for the youth. As well, rehabilitation works will be undertaken for the proposed project site to restore it to its original state. This will include replacement of the topsoil and re-vegetation, which will enhance the aesthetic value of the area. There will be need to employ people who will be involved in the reclamation of the site to near its original state. The earth moving works during top soil replacement will lead to significant deterioration of the acoustic environment within the area and the surrounding areas. This will be as a result of the noise and vibration that will be experienced from machines and workforce being utilized. Dust will also be emitted affecting the surrounding environment. The proponent will put in place mitigation measures for noise and dust pollution during the decommissioning phase. Some of the decommissioning operations may also elicit grievances from the community and therefore such complaints should be handled in a responsive manner.

A decommissioning plan will be prepared by the HCF and submitted to NEMA for approval before decommissioning works begin. The plan will contain sub-plans for protection of occupational and public health and safety, waste management, noise management, and site restoration, among other sub-plans for identified risks and impacts.

8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

8.1 Introduction

Under the ESMF, the MoH developed the project ESMP to guide in the development of the recommended safeguard instruments based on the specific proposed project activities under the C-HERP. The main objective of the project ESMP is to guide the Project Management Team (PMT) and the sub-project proponents on the E&S screening and subsequent sub-project E&S assessment, monitoring and reporting including development of sub-project specific plans that have to be developed in accordance with the World Bank ESF⁸.

The project ESMF forms the basis of the ESIA prepared for Hola County referral Hospital for the proposed sub-projects. The proponent acknowledges the fact that the proposed project activities will have some impacts on the biophysical environment, health and safety of its employees, workers, the wider public as well as the local residents. Thus, the focus will be on minimizing/mitigating the negative impacts and enhancing the positive impacts associated with the project activities through a program of continuous improvements.

Environmental and social management and monitoring plans (ESMMP) are important tools developed to assist in guiding the proponent and contractor in mitigating the potential environmental, social health and safety risks and impacts of a proposed project. It is worth noting that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the ESMP. As such, the ESMP will be subject to a regular periodic reviews on need basis. Thus, it is imperative that the project proponent focuses on reducing the negative impacts and maximizing the positive impacts associated with its activities through a program of continuous improvement. These include, but are not limited to, the following.

8.2 Project Preparation

- Training of the relevant project staff in environmental and social safeguards management;
- Verification of design details, layout and specifications;
- Inclusion of environmental health and safety specifications in Tender Documents, and development of CoC for the Contractor; and
- Stakeholder engagement.

8.3 Construction

- Implementation of mitigation measures through development of contractors' E&S Management Plan (C-ESMP) that shall include elaborate approach on how to handle the following aspects: Occupational Safety and Health, HIV/ AIDS management, Infection Control and Waste Management, labour management, update of health facility Emergency Preparedness and Response, COVID-19 management, among others.
- The contractor should prepare an occupational/community safety and health plan and a C-ESMP for use during project construction phase to be reviewed and approved by the PIU and HCF prior to start of any construction works.
- Enforcement of environmental and OHS requirements by the ESH Expert; as provided in the ESMP;
- Collection of data on air quality, and noise and vibration levels at the construction site by qualified specialists;
- Disposal of construction solid, liquid and sanitary wastes in an acceptable manner and in conformance with regulations;
- Ensuring that the Contractor and contractor staff are adhering to the CoC and environmental health and safety specifications in the contract documents and C-ESMP;
- Training the Contractor's workforce on environmental and social safeguards requirements and responsibility (including COVID-19, STD/HIV/AIDS, awareness);
- Liaison with local administration and community leaders in matters of disturbance to the public, security issues, and other matters arising from the project;
- Ensure engagement with the key stakeholders as identified in the SEP;
- Maintenance of a practical and responsive GRM system; and
- GBV/SEA risks management

i. ⁸ MoH (2020). *Environmental and Social Management Framework for Kenya COVID-19 Emergency Response Project*. GoK, Nairobi.

8.4 Operation

- The healthcare facility shall develop (or update the existing) and implement an Environmental, Health and Safety Management Plan, a HCF Waste Management Plan (for all hospital wastes)/ICWMP, and Emergency Response Plan; ,
- Establish written agreement with other HCFs related to accepting and treating their HCF wastes;
- Operation and maintenance, calibration and checking of all equipment as specified in respective manuals or as required by regulations;
- Undertaking air quality monitoring and emissions testing of the incinerator,
- Monitoring of any leakages and spills around the MWTI;
- Collection of data on water (surface and ground), noise and vibration levels, to be used for analysis and re-remediation where necessary;
- Disposal of incineration ash and sanitary wastes in an acceptable manner and in conformance with regulations;
- Compliance with OHS manual to be prepared by the hospital management during the project preparation phase;
- Environmental and social performance reporting based on evaluation of data collected, investigations especially the air quality monitoring etc. This will include a statutory annual environmental and social audit of the operations of the MWTI, to be submitted to NEMA for review;
- Observing SOP designed for the proposed MWTI;
- Monitoring and implementation of various requirements in project SEP, LMP, ESMMP, GBV/SEAH , Stakeholder involvement and management of complaints arising from the sub-project operations; and
- Observing and implementing all the guidelines in HCWM and COVID-19 guidelines on infections spread control and other facets of human interactions vis-à-vis environmental and social bearing of these interactions.

Table 7 provides detailed suggestions on how each of the main mitigation measures proposed should be implemented, the frequency, and the responsible party during the construction and operation phases. The ESMMP table 8 includes the monitoring indicators and means of verification. It is imperative that this ESMMP forms part of contractors' bidding documents so that they can allocate resources required for implementing the proposed mitigation measures. Prior to mobilization, the Contractor should also prepare a contractor-ESMP for review by the MoH E&S Specialist. In his schedule of works, the contractor must include all potential risks and mitigation measures, and the MoH E&S experts and the health facility public health officer should ensure that the schedule and ESMMPs are complied with.

8.5 Decommissioning

Decommissioning is an important phase in the project cycle and comes last to wind up the operational activities of a particular project. It refers to the final disposal of the project and associated materials at the end of the project lifespan. During this phase the proponent will be required to prepare a decommissioning management plan that will guide the decommissioning process and seek approvals/ permits from all the relevant government agencies such as NEMA, DOSHS, MoH, and Public Health among others. Any concerns that may emanate from the decommissioning activities must be addressed appropriately.

8.6 Personnel Responsible for Implementing the Environmental and Social Safeguards

The primary role of monitoring and supervision of project environmental and social compliance of the proposed sub-project will fall squarely in Tana River County Government since it has the mandate and institutional framework enshrined in the County Government Act of 2012. Key players in the monitoring of compliance in the project will include:

- i. MoH E & S specialists
- ii. HCRH health facility administrator and the public health officer;
- iii. External monitoring from Tana River County Administration staff which include:
 - County Director for Environment
 - County director for Physical Planning,
 - County Public Health Officer
 - Labour Officer

- Community Development Officer
- Physical Planner
- Public Works Engineer
- Occupational Safety and Health Officer

8.7 External Supervision and Support Implementation

- National Environment Management Authority
- Directorate of Occupational Health and Safety Services (DOSHS)
- World Bank CHERP Project Task team

This expertise is to be brought on board to oversee specific aspects of the project during its implementation to ensure compliance. In addition, the contractor will be required to have an environmental and social management plan to facilitate self-monitoring of impacts and implement recommended mitigation measures, during the construction and the defects liability phase. Under these phases, the contractor shall hire/employ an Environmental, Health Safety (EHS) Specialist as part of his employees. During the operation phase, the County Engineer / Public Works Engineer, County Director for Environmental and Lands Officer will play a greater role to ensure the mitigation measures are implemented.

Table 7: Roles and Responsibilities

Entity	Roles and Responsibilities
MOH Environment and Social Specialists	<ul style="list-style-type: none"> ➤ Ensure the project is screened including coordinating the impact assessment and audit. ➤ Preparation of the E & S instruments, review of the instruments and ensure they are cleared by World Bank and disclosed prior to implementation of the project, ➤ Ensure the environmental and social requirements are prescribed in contractors bidding documents ➤ Periodic monitoring and surveillance of all project's investment to ensure compliance with the mitigation measures as set out in the ESMMP. ➤ Required to provide monthly, quarterly environmental & social status of the project progress to feed into the overall project progress reports ➤ Report immediately to the WB upon occurrence of any significant environmental, social, or health and safety incident ➤ Advice on implementation of corrective actions where required,
County Government of Tana River Housing, Lands urban Renewal, urban Planning and Projects Management/PMT	<ul style="list-style-type: none"> ➤ Supervise the Consultant and monitor works at all sites in particular; ➤ Provide specific technical advice on mitigation measures for construction and operational activities related to the project, ➤ Supervise the implementation of the approved project design, ➤ Supervise project's implementation for construction progress with regard to timelines and quality.
Hospital Administration with assistance from County of Tana River Technical Team Labour / Probation Officer, Labour Officer, Engineer, others/PMT	<ul style="list-style-type: none"> ➤ Mainly to ensure that respective activities are being done in compliance with the relevant laws, regulations and guidelines; ➤ The Hospital Administration with assistance from County Technical Team will ensure that ➤ Mobilisation of the communities to keep project on truck, ➤ Monitoring of the project works with regard to the technical issues, ➤ Monitoring project's compliance implementation with the mitigation measures set out in the ESMMP and other contractual requirements ➤ Advice on implementation of corrective actions where required, and ➤ Recruit employees according to the Employment & Labour Act. ➤ Develop and fully implement, including all necessary resources, all operational phase EHS plans.
Contractor's Community Liaison Officer/ Sociologist Specialist.	<ul style="list-style-type: none"> ➤ Develop the Contractor ESMP focusing on social Issues with reference to the relevant documents i.e., client ESMP, NEMA license and any contractual conditions ➤ Display and educate the workers on the workers' CoC, ➤ Work with the PMT to address worker's and community concerns in a timely manner, ➤ Liaise with the HIV/AIDS service provider, undertake HIV/AIDS sensitization and organize special clinic days for the workers and the community adjacent to the site. ➤ Create awareness on importance of child protection and GBV in relation to the project; and as appropriate organize counselling sessions for any victims, workers and the adjacent community. ➤ Develop a Social, Gender and HIV/AIDS/ Child protection Checklist, code of conduct, stakeholder engagement/ communication plan and report regularly on progress ➤ Educate the communities on the site operations and the Grievance Redress System, ➤ Make available the telephone to facilitate community liaison. ➤ Establish a grievance handling committee; create awareness on mechanism/committee/process. ➤ Manage the complaints log and act as a secretary to the Grievance Committee, and ➤ Manage the environmental and social impacts and implement mitigation measures as stipulated in the ESMP.

Entity	Roles and Responsibilities
	<ul style="list-style-type: none"> ➤ Mobilisation of the communities to keep project on track, ➤ Provide information to PIU and HCF related to HSE performance, and immediately report any significant environmental incident or worker accident
Contractor's HSE personnel	<ul style="list-style-type: none"> ➤ Develop the Contractor ESMP based on the Client ESMP, NEMA license conditions and any other contractual conditions ➤ Develop traffic management plan, ➤ Ensure safe storage of the materials on site, ➤ Prepare a waste management Plan for the site and ensure its implementation ➤ Prepare safety management plan for the site and ensure safety on site ➤ Ensure staff regular orientation on environment management and safety drills, and ➤ Display of the ESMP and Safety information. ➤ Ensure availability and access of drinking water at the work site by all workers. ➤ Develop an Environment, Health and Safety Checklist, and report regularly on progress. ➤ Take responsibility for mitigation and management of potential environmental and social issues on site; ➤ Organize and maintain briefing session records and mitigation and monitoring documentation on all matters of HSE; ➤ Respond to site inspection findings; ➤ Institute management of accidents (if they occur), keep a log book/ sheet ➤ Follow up on the health insurance requirements including compensation related to accidents (in case of any occurrence). ➤ Monitoring project's compliance implementation with the mitigation measures as set out in the ESMMPP ➤ Advice on implementation of corrective actions where required, ➤ Receive and respond to any complaints from external parties on project issues on HSE ➤ Provide information to PIU and HCF related to HSE performance, and immediately report any significant environmental incident or worker accident
Public Works Engineer	<ul style="list-style-type: none"> ➤ Supervision and manage the site with regard to the administration of the Construction Contracts including E&S management compliance ➤ Review and approve contractor ESMP and other plans ➤ Ensure compliance with the ESMP and other laws ➤ Ensure that payment certificate includes environment and social costs duly endorsed, ➤ Responsible for ensuring that the MWTI shelter with its associated facilities are constructed in accordance with the approved designs, ➤ Responsible for approvals of the construction materials to be used in the project, ➤ Undertake supervision and monitoring of environmental and social issues and report to the Hospital Administrator, and ➤ Clear contractors' compliance with managing social risks. ➤ Provide information to PIU and HCF related to HSE performance, and immediately report any significant environmental incident or worker accidents
Directorate of Occupational Safety and Health Services (DOSHS)	<ul style="list-style-type: none"> ➤ Ensure compliance with the provisions of the OSHA of 2007 and promote safety and health of workers, and ➤ Issue the Certificate of Workplace for the construction site and supervise the implantation of the conditions in the certificate.
The National Construction Authority (NCA)	<ul style="list-style-type: none"> ➤ Issuing of the construction permit for the construction site and advising the Hospital over the construction related activities on value for money. ➤ Ensure that the contractor is an accredited by NCA,
National Environment Management Authority (NEMA)	<ul style="list-style-type: none"> ➤ Issuance of the EIA License and supervise and co-ordinate all matters relating to the environment and to be principal instrument of government in the implementation of policies relating to the environment. ➤ Carry out site inspection to ensure compliance with the ESIA conditions of approval.
World Bank	<ul style="list-style-type: none"> ➤ Carry out the Implementation Support Mission periodically to ascertain the level of implementation in line with the Environment and Social Commitment Plan and other environment and social instruments prepared for the project namely: ESMF, LMP and SEP.

8.8 Key Monitoring Indicators

Key monitoring indicators proposed include:

- i. Vegetation loss and remedial restoration measures instituted;
- ii. Air quality and noise pollution control measures in place and how they operate;
- iii. Erosion control measures
- iv. Control measures for traffic accidents
- v. OHS measures for workers and the hospital staff
- vi. Public health observance
 - i. Waste management measures and performance
 - ii. Water supply and waste water
 - iii. Energy Use

- iv. Material storage
- vii. Employment opportunities
- viii. HIV/AIDS interventions and related sexual behaviors among workers, and
- ix. Labour recruitment by gender and age
- x. GRM including number of complaints received and resolved within the project timeline
- xi. Number and type of stakeholders consulted during the sub-project period
- xii. Number of staff inducted on safeguards requirements and those who have signed the CoC
- xiii. Security incidences and systems
- xiv. GBV/SEA prevalence reported in the facility

Note: This is a partial table covering the E&S risks, impacts and mitigation measures. Reference could be made to other CHERP project documents (including the LMP, ICWMP and ESMF) for additional mitigation measures

Table 8: General Environmental and Social Management Plan

Aspect	Potential Impact	Proposed Mitigation Measure (s)	Timing	Responsibility	Estimated cost of implementation (KShs)
Construction Phase					
Soil resources	Soil erosion	Re-vegetation through grassing	After construction	Contractor, MoH E&S Expert and HCRH management, CPHO, PWE	100,000.00
		Provision of silt traps during construction as necessary	Continuous		
	Soil compaction by equipment and machinery	Restrict construction vehicle movements to defined tracks/paths	Continuous		
Water Quality and Resource use efficiency	Contamination of local water resources from inappropriate wastewater discharges	Direct wastewater from site activities to a sump from where suspended solids can be deposited before discharge to local drainage systems	Continuous	Contractor, MoH E&S Expert and HCRH management, CPHO, PWE	90,000.00
	Contamination of water resources from spillages and leakages	Institute spill prevention and response procedures	Continuous	Contractor	60,000
	Increased demand on local water resources	Ensure efficient use of water in construction activities	Monthly		0.00
Construction materials usage	Depletion of natural resources	Ensure efficient use of building materials	Continuous	Contractor	0.00
		Optimize materials through reuse	Continuous		
	Building materials	<ul style="list-style-type: none"> • Efficient use of building materials • Optimize materials reuse 	Monthly	Contractor, MoH E&S Expert and HCRH management, CPHO, PWE	0.00
Air Quality (Dust and Emissions)	Nuisance and adverse health due to dust emission	<ul style="list-style-type: none"> • Wetting of project site to reduce dust • Put up dust screen/nets around the construction and renovation sites, • Provision of PPE (dust masks) for the workers, • Covering all trucks delivering construction material • Covering of stock piled construction material 	Continuous	Contractor, MoH E&S Expert and HCRH PHO, PWE	100,000.00
	Adverse health impacts as a result of emissions of fumes from vehicles,	<ul style="list-style-type: none"> • Use of low emission machinery that use electricity as source of power or use manual labour; • Periodically Service all the equipment and machinery used during construction phase 	Continuous		
Noise and Vibration	Nuisance and adverse health impacts from high	<ul style="list-style-type: none"> • Planned schedules for Construction during day time; • Using silencers in heavy machines, 	While at site and during operation of	Contractor, MoH E&S Expert and HCRH PHO, PWE	50,000.00

	noise and vibration levels	<ul style="list-style-type: none"> • Use of PPE such as ear muffs • Operation and maintenance of equipment used on site 	heavy machines		
Waste Management	Health and safety hazards and environmental pollution from poor management of wastes	<ul style="list-style-type: none"> • Provide appropriate solid waste receptacles on site • Sensitize workers on appropriate solid waste management • Engagement of a NEMA licensed contractor to collect and dispose the waste 	Continuous	Contractor, MoH E&S Expert and HCRH PHO, PWE	50,000.00
Social Concerns during construction and operational phases	Insecurity / public safety	<ul style="list-style-type: none"> • Having guards dedicated to the project sites and fencing off the project sites 	Continuous	The proponent HCRH /MoH, PWE	30,000.00
	Exclusion (ethnicity, gender, age, location and disability)	<ul style="list-style-type: none"> • Public awareness of the project requirements, • Stakeholder engagement and collective reasoning, • Implementation of the requirements of the LMP, and the GBV Action Plan. 	Continuous	MoH E&S Expert, HCRH PHO/CLO	30,000.00
	Gender based Violence/Sexual Exploitation and Abuse	<ul style="list-style-type: none"> • The contractor should develop a code of conduct which should encompass clear warning to workers on any kind of sexual exploitation and abuse. • The contractor should provide a mechanism where workers are free to report any sexual advances and abuse to the senior management without fear of intimidation. • The contractor should communicate to the workers that there should be no or minimal interaction with the patients. 	Continuous	MoH E&S Expert, HCRH PHO/CLO	30,000.00
	Lack of access to grievance redress mechanism	<ul style="list-style-type: none"> • A verbal or written complaint from a complainant will be received by the site supervising engineer/site agent and recorded in a complaints log that is kept on site. The log will indicate grievances, date lodged, action taken to address complaint or reasons the grievance was not acted on; information provided to complainant and date the grievance was closed. 	Continuous	MoH E&S Expert, HCRH CLO, PHO, PWE Contractor	30,000.00
	Labour influx	<ul style="list-style-type: none"> • effective community engagement and strong grievance mechanisms on matters related to labour, including sexual exploitation and abuse 	Continuous	MoH E&S Expert, HCRH CLO, PHO, PWE Contractor,	30,000.00
	Child labour	<ul style="list-style-type: none"> • Ensure no child of below 18 years is seen on site • Ensure contractor sign a CoC for child protection 	Continuous	MoH E&S Expert, HCRH CLO, PHO, PWE, Contractor	30,000.00
	Public health and safety hazards which may be potential risk to contract communicable diseases and infectious diseases like COVID-19 at the site	<ul style="list-style-type: none"> • Treat affected local and migrant workers to control the spread of disease vectors (through contaminated water and between people); • Provision of adequate and accessible sanitation facilities in good condition with adequate water supply; • Create awareness to workers on proper sanitation and personal hygiene to promote proper health; and • To mitigate risk from food related contamination amongst construction workers, food supplies will be from the vendors with public health certificate. • Put in place all infectious diseases including COVID-19 prevention and containment measures. • Publish health and safety information 	Continuous	MoH E&S Expert, HCRH CLO, PHO, PWE, Contractor	

		<p>including site rules at the site</p> <ul style="list-style-type: none"> • Ensure observance of public and community health and safety. 			
General Health and Safety	Accidents, incidents causing harm or sickness due to existence of health and safety hazards on site	<ul style="list-style-type: none"> • Provision and use of proper personal protective equipment • Provision of first aid kits • Undertake first aid training and awareness creation on OHS • OHS policy strategically displayed • Erecting hazards warning signs on site 	Continuous	MoH E&S Expert, HCRH CLO, PHO, PWE, Contractor	250,000 once
Operational Phase					
Efficient use of resources	Surface run-off and waste water management	<ul style="list-style-type: none"> • Embankment, re-vegetation, proper drainage systems • Efficient use of water resources • Spill prevention procedures and response plan 	Continuous	HCRH management, PHO	150,000.00
	Pollution of surface and ground water	<ul style="list-style-type: none"> • All liquid waste from the MWTI should be directed to the hospital septic/sewerage system • Installation of pre-treatment chambers before discharge to hospital septic system 	Construction	HCRH management, hospital PHO	
	Increased use of Energy and indoor air pollution	<ul style="list-style-type: none"> • Efficient energy use and use of clean energy as back up source of power • Install a meter to monitor power consumption • Switch of lights when not in use 	Continuous	HCRH management, hospital PHO	
Air Quality (Dust and Emissions)	Emissions arising from MWTI combustion	<ul style="list-style-type: none"> • Use of air pollution control devices through installation of scrubbers/filters to the incinerator to remove particulate matter and other gases • Train the MWTI operators on best operational practices • Periodic operation and maintenance of the MWTI • Conduct periodic air quality monitoring of the MWTI area 	Continuous	HCRH management Hospital, hospital PHO & Biomedical Engineer	50,000
Waste Management	Healthcare Waste generated from the health facility	<ul style="list-style-type: none"> • Ensure appropriate and adequate segregation of HCW waste at source • Ensure appropriate on-site transportation of HCW to Waste treatment area, • Ensure proper records of waste received from the immediate health facility and other health facilities, • Appropriate healthcare waste storage area free from vermin • Ensure efficient treatment of healthcare waste • Appropriate transportation of ash to disposal site that is if ash pit not within the hospital. 	Continuous	Health facility manager, HCRH PHO & Biomedical engineer	200,000
General Health and Safety	Occupational and public health hazards	<ul style="list-style-type: none"> • Ensure provision of and appropriate use personal protective equipment • Erecting warning signs on site • Regular medical check-up for healthcare waste handlers and vaccination such as against Hepatitis A, B and tetanus and COVID-19, • Provision of appropriate sanitary facilities, • Provision of first aid kits • Undertake awareness creation on OHS to the healthcare workers and the MWTI operators in relation to COVID-19 and first aid training 	Continuous	Proponent, HCRH PHO, CLO & biomedical engineer	1,500,000

		<ul style="list-style-type: none"> • OHS policy strategically displayed • SOPs for MWTI operation displayed • Ensure observance of public and community health and safety • Ensure thorough general cleanliness and disinfection of the facility among other appropriate housekeeping and ventilation practices. • Train MWTI operators on operation and maintenance 			
	Fire preparedness Operation of health facilities and MWTI plant	<ul style="list-style-type: none"> • Conduct regular drills on fire emergency response and evacuation. • Conduct regular inspection of fire-fighting equipment. • Install an adequate number of fire-fighting equipment and systems including portable fire extinguishers and hose reels 	Continuous	HCRH PHO, CLO & biomedical - engineer	
	Total cost				2,780,000

Table 9: Environmental and Social Monitoring Plan

Aspect	Potential Impact	Mitigation Measure (s)	Monitoring Indicators	Frequency of Monitoring	Responsibility	Estimated cost of implementation (KShs)	
Construction Phase							
Soil resources	Soil erosion	Re-vegetation through grassing	Extent of vegetation cover; % of bare ground around the project site	After construction	Contractor, MoH E&S Expert and HCRH management, CPHO, PWE	50,000	
		Provision of silt traps during construction as necessary	Presence of silt traps	Continuous		0.00	
	Soil compaction by equipment and machinery	Restrict construction vehicle movements to defined tracks/paths	Percentage of actual compacted area vis-à-vis the proportion that would inevitably be compacted even when caution is applied	Continuous		0.00	
Water Quality and Resource use efficiency	Contamination of local water resources from inappropriate wastewater discharges	Direct wastewater from site activities to a sump from where suspended solids can be deposited before discharge to local drainage systems	<ul style="list-style-type: none"> • Existence and operation of a wastewater sump at the site • Size and type of drainage system • 	Continuous	Contractor, MoH E&S Expert and HCRH management, CPHO, PWE	50,000.00	
	Contamination of water resources from spillages and leakages	Institute spill prevention and response procedures	Established procedures for identified hazardous materials	Continuous		Contractor	0,000
	Increased demand on local water resources	Ensure efficient use of water in construction activities	<ul style="list-style-type: none"> • Records of amount of water used monthly. • Water saving measures instituted at the site 	Monthly			0.00
Construction materials usage	Depletion of natural resources	Ensure efficient use of building materials	<ul style="list-style-type: none"> • Records of building materials tracking • Financial savings in subsequent bills 	Continuous	Contractor	0.00	
		Optimize materials through reuse		Continuous			
Air Quality (Dust and Emissions)	Nuisance and adverse health due to dust emission	<ul style="list-style-type: none"> • Wetting of project site to reduce dust • Put up dust screen/nets around the construction and renovation sites, 	<ul style="list-style-type: none"> • Air quality measurement to determine amounts of dust at site • Visual observation 	Continuous	Contractor, MoH E&S Expert and HCRH PHO,	100,000.00	

		<ul style="list-style-type: none"> • Provision of PPE (dust masks) for the workers, • Covering all trucks delivering construction material • Covering of stock piled construction material 	<ul style="list-style-type: none"> • Complains received from staff 		PWE	
	Adverse health impacts as a result of emissions of fumes from vehicles,	<ul style="list-style-type: none"> • Use of low emission machinery that use electricity as source of power or use manual labour; • Periodically Service all the equipment and machinery used during construction phase 	<ul style="list-style-type: none"> • Type of machinery being used, • Visual observation of emissions • Air quality measurements to determine air borne particulate matter. • Records of serviced construction vehicles 	Continuous		
Noise and Vibration	Nuisance and adverse health impacts from high noise and vibration levels	<ul style="list-style-type: none"> • Planned schedules for Construction during day time; • Using silencers in heavy machines, • Use of PPE such as ear muffs • Operation and maintenance of equipment used on site • 	<ul style="list-style-type: none"> • schedules of activities • Noise and vibrations measurement in Decibels • Complains from workers and staff • Records of machine operation and maintenance 	While at site and during operation of heavy machines	Contractor, MoH E&S Expert and HCRH PHO, PWE	30,000.00
Waste Management	Health and safety hazards and environmental pollution from poor management of wastes	<ul style="list-style-type: none"> • Provide appropriate solid waste receptacles on site • Sensitize workers on appropriate solid waste management • Engagement of a NEMA licensed contractor to collect and dispose the waste 	<ul style="list-style-type: none"> • Availability of waste receptacles • Waste streams and volumes generated on site including hazardous waste - used oil, waste paints • Waste tracking documents 	Continuous	Contractor, MoH E&S Expert and HCRH PHO, PWE	30,000.00
Social Concerns during construction and operational phases	Insecurity / public safety	<ul style="list-style-type: none"> • Having guards dedicated to the project sites and fencing off the project sites 	<ul style="list-style-type: none"> • Presence of a security Personnel. • Fence around the project site; 	Continuous	The proponent HCRH/MoH, PWE	30,000.00
	Exclusion (ethnicity, gender, age, location and disability)	<ul style="list-style-type: none"> • Public awareness of the project requirements, • Stakeholder engagement and collective reasoning, • Implementation of the requirements of the LMP, and the GBV Action Plan. 	<ul style="list-style-type: none"> • Minutes of public awareness/ stakeholder engagements carried out • 	Continuous	MoH E&S Expert, HCRH PHO/CLO	30,000.00
	Gender based Violence/Sexual Exploitation and Abuse	<ul style="list-style-type: none"> • The contractor should develop a code of conduct which should encompass clear warning to workers on any kind of sexual exploitation and abuse. • The contractor should provide a mechanism where workers are free to report any sexual advances and abuse to the senior management without fear of intimidation. • The contractor should communicate to the workers that there should be no or 	<ul style="list-style-type: none"> • Availability of Code of conduct for workers • Signed code of conduct • 	Continuous	MoH E&S Expert, HCRH PHO/CLO	30,000.00

		minimal interaction with the patients.				
	Lack of access to grievance redress mechanism	<ul style="list-style-type: none"> A verbal or written complaint from a complainant will be received by the site supervising engineer/site agent and recorded in a complaints log that is kept on site. The log will indicate grievances, date lodged, action taken to address complaint or reasons the grievance was not acted on; information provided to complainant and date the grievance was closed. 	<ul style="list-style-type: none"> Grievance logs No of resolved cases No of escalated cases 	Continuous	MoH E&S Expert, HCRH, CLO, PHO, PWE Contractor	30,000.00
	Labour influx	<ul style="list-style-type: none"> effective community engagement and strong grievance mechanisms on matters related to labour, including sexual exploitation and abuse 	<ul style="list-style-type: none"> Copies of employment contract segregated by gender 	Continuous	MoH E&S Expert, HCRH, ICLO, PHO, PWE Contractor,	30,000.00
	Child labour	<ul style="list-style-type: none"> Ensure no child of below 18 years is seen on site Ensure contractor sign a CoC for child protection 	<ul style="list-style-type: none"> The work force registry with details of age 	Continuous	MoH E&S Expert, HCRH, CLO, PHO, PWE, Contractor	30,000.00
General Health and Safety during construction & operation	Public health and safety hazards which may be potential risk to contract communicable diseases and infectious diseases like COVID-19 at the site	<ul style="list-style-type: none"> Treat affected local and migrant workers to control the spread of disease vectors (through contaminated water and between people); Provision of adequate and accessible sanitation facilities in good condition with adequate water supply; Create awareness to workers on proper sanitation and personal hygiene to promote proper health; and To mitigate risk from food related contamination amongst construction workers, food supplies will be from the vendors with public health certificate. Put in place all infectious diseases including COVID-19 prevention and containment measures. Publish health and safety information including site rules at the site Ensure observance of public and community health and safety Ensure thorough general cleanliness and disinfection of the facility among other appropriate housekeeping and ventilation practices. 	<ul style="list-style-type: none"> Visual inspection and observation of functionality of sanitary facilities 	Continuous	MoH E&S Expert, HCRH, CLO, PHO, PWE, Contractor	50,000
	Accidents, incidents causing harm or sickness due to	<ul style="list-style-type: none"> Provision and use of proper personal protective equipment Provision of first aid kits Undertake first aid training and 	<ul style="list-style-type: none"> Display of OHS policy First aid training records, list of first aiders and 	Continuous	MoH E&S Expert, HCRH, CLO, PHO, PWE,	50,000 once

	existence of health and safety hazards on site	<p>awareness creation on OHS</p> <ul style="list-style-type: none"> • OHS policy strategically displayed • Erecting hazards warning signs on site • Undertake awareness creation on OHS to the healthcare workers and the MWTI operators in relation to COVID-19 and first aid training • SOPs for MWTI operation displayed • Train MWTI operators on operation and maintenance and general health and safety 	<p>those of health and safety committee members.</p> <ul style="list-style-type: none"> • Well stocked first aid kit 		Contractor	
	Fire preparedness Operation of health facilities and MWTI plant	<ul style="list-style-type: none"> • Conduct regular drills on fire emergency response and evacuation. • Conduct regular inspection of fire-fighting equipment. • Install an adequate number of fire-fighting equipment and systems including portable fire extinguishers and hose reels 	<ul style="list-style-type: none"> • Presence of fire fighting equipment • Statistical records and safety reports • Serviced fire extinguishers. 	Continuous	HCRH PHO, CLO & biomedical engineer	
Operational Phase						
Efficient use of resources	Surface run-off and waste water management	<ul style="list-style-type: none"> • Embankment, re-vegetation, proper drainage systems • Efficient use of water resources • Spill prevention procedures and response plan 	<ul style="list-style-type: none"> • Extent of vegetation cover; % of bare ground • Amount of water used monthly; water saving measures instituted at the site • Presence of silt traps 	Continuous	HCRH management, PHO	50,000.00
	Pollution of surface and ground water	<ul style="list-style-type: none"> • All liquid waste from the MWTI should be directed to the hospital septic system • Installation of pre-treatment chambers before discharge to hospital septic system 	<ul style="list-style-type: none"> • Established procedures for identified hazardous materials 	Construction	HCRH management, hospital PHO	
	Increased use of Energy and indoor air pollution	<ul style="list-style-type: none"> • Efficient energy use and use of clean energy as back up source of power • Install a meter to monitor power consumption • Switch of lights when not in use 	<ul style="list-style-type: none"> • Power usage bills monthly; energy saving measures instituted, presence of a meter 	Continuous	HCRH management, hospital PHO	
Air Quality (Dust and Emissions)	Emissions from the MWTI during the combustion process	<ul style="list-style-type: none"> • Use of air pollution control devices through installation of scrubbers/filters to the incinerator to remove particulate matter and other gases • Train the MWTI operators on best operational practices • Periodic operation and maintenance of the MWTI • Conduct periodic air quality monitoring of the MWTI area 	<ul style="list-style-type: none"> • Air quality measurement to determine amounts of dust at site • Visual observation • Complains received from staff • 	Continuous	HCRH management Hospital, hospital PHO & Biomedical Engineer	50,000
Waste Management	Healthcare Waste generated from the health facility	<ul style="list-style-type: none"> • Ensure appropriate and adequate segregation of HCW waste at source • Ensure appropriate on-site 	<ul style="list-style-type: none"> • Availability of waste receptacles • Waste streams and volumes 	Continuous	Health facility manager, HCRH PHO & Biomedical	200,000

		transportation of HCW to Waste treatment area, <ul style="list-style-type: none"> • Ensure proper records of waste received from the immediate health facility and other health facilities, • Appropriate healthcare waste storage area free from vermins • Ensure efficient treatment of healthcare waste • Appropriate disposal of ash to ash pit or transportation to disposal site. 	generated on site including hazardous waste - used oil, waste paints <ul style="list-style-type: none"> • Waste tracking documents 		engineer	
	Total cost					790,000

9 CONCLUSION AND RECOMMENDATION

9.1 Conclusion

In accordance with EMCA CAP 387 (Amended 2015) and the Environmental (Impact and Audit) Regulations, 2003, the findings of the ESIA carried out for this project indicate that the possible environmental and social impacts generated during construction, operation and decommissioning phases can be addressed effectively by the proponent through the mitigation measures indicated in Table 9 (ESMP) and the monitoring options have been suggested on Table 10. As per the above analysis on the aspects of both positive and negative environmental and social impacts of the project development and operations, we, the experts found no significant negative impacts that could pose adverse effects to the extent of barring the proposed project from being implemented. This is provided that the project is designed, constructed, monitored and operated in compliance with all applicable design and ESHS requirements. Having considered the data collected, analyzed and collated information that is available, it is the experts' considered opinion that:

- i. The project does not pose any serious environmental concerns, other than those of a moderate scale that accompany similar projects;
- ii. The positive impacts of the project outweigh the negative ones, which will be adequately contained by following the prescribed ESMP and ESMMP;
- iii. The project is highly needed to address the gaps in medical care,
- iv. MoH has put appropriate measures for the management of medical waste in most of HCFs. There is need for a robust monitoring and supervisory framework for its service providers. There should be routine monitoring of medical waste collection, transportation and validation of functionality / operations of disposal sites, and
- v. As such, the project could be allowed to commence, and activities out in compliance with the ESMP, ESMMP and sound environmental management practices that are locally and internationally recognized.

9.2 Recommendations

The following are recommended going-forward with the project:

- a. Though the anticipated negative environmental impacts of the project are considered moderate, localized and can be easily mitigated, the ESMP needs to be operationalized to ensure sustainable delivery of this project.
- b. In addition, the institutional framework for the delivery of the project needs to operationalize to effectively follow up compliance as per their mandates.
- c. The proponent and the contractor shall ensure that they implement and adhere to the statutory provisions of the statutes mentioned in Chapter three of this report and any other relevant ones provided for in Kenya especially the Government of Kenya COVID-19 management regulations, frameworks and guidelines.
- d. The project should earmark some resources for supporting the Waste Treatment Facility staff to continue to benefit from continuous capacity building especially on aspects of waste management, safety and emergency preparedness among other key areas of priority.

10 REFERENCES

- i. A. Al-Yaqout and M. Hamoda, "Evaluation of landfill leachate in arid climate--a case study," *Environ. Int.*, vol. 29, pp. 593-600, 2003
- ii. ATSDR, "Landfill Gas Primer," Department of Health and Human Services, Agency for Toxic Substances and Disease Registry. Division of Health Assessment and Consultation 2001
- iii. CIEH (1999) *Health and safety: First principles*. Chartered Institute of environmental health, UK
- iv. Crowley, D., et al., *Health and environmental effects of landfilling and incineration of waste- A literature review*. 2003
- v. ESF/Safeguards Interim Note: Covid-19 Considerations in Construction/Civil Works Projects.
- vi. *Health Care Waste Management Training Guide*, 2015, MoH (K)
- vii. International Bank for Reconstruction and Development / the World Bank (2018). *World Bank Environmental and Social Framework*. World Bank, Washington, DC.
- viii. International Commission on Non-Ionizing Radiation Protection (1998). *Guidelines for limiting exposure in time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz)*. *Health Phys.* 74, 494-522.
- ix. Kenya gazette supplement Acts 2000, Environmental Management and Coordination Act Number 8 of 1999. Government printers, Nairobi,
- x. Kenya gazette supplement Acts Building Code 2000. Government printers, Nairobi
- xi. Kenya gazette supplement Acts Land Planning Act (Cap. 303) government printer, Nairobi
- xii. Kenya gazette supplement Acts Local Authority Act (Cap. 265) government printer, Nairobi
- xiii. Kenya gazette supplement Acts Penal Code Act (Cap.63) government printer, Nairobi
- xiv. Kenya gazette supplement Acts Physical Planning Act, 1999 government printer, Nairobi
- xv. Kenya gazette supplement Acts Public Health Act (Cap. 242) government printer, Nairobi
- xvi. Kenya gazette supplement number 56. *Environmental Impact Assessment and Audit Regulations 2003*. Government printer, Nairobi
- xvii. Kenya Harmonized Health Facility assessment (KHFA) Community Health Systems Report 2018/2019. Ministry of Health Division of Health Sector Monitoring and Evaluation,
- xviii. Ministry of Health Kenya, 2007, *National Policy on Injection Safety and Health Care Waste Management*
- xix. Ministry of Health Kenya, 2020, *Environmental and Social Screening Report*
- xx. Ministry of Health Kenya, 2020, *Labour Management Procedures by Ministry of Health of Kenya*.
- xxi. Ministry of Health website, accessed April 2021, www.health.go.ke
- xxii. MoH (2020). *Environmental and Social Management Framework for Kenya COVID-19 Emergency Response Project*. GoK, Nairobi.
- xxiii. MoH, 2001, *Kenya National Guidelines on Safe Disposal of Pharmaceutical Waste*.
- xxiv. MoH, Kenya, 2007, *National Standards and Guidelines on Injection safety and Medical Waste management*.
- xxv. Munishinge Mohan 1993: *Environmental Economics and Sustainable development*. The World Bank Washington DC
- xxvi. *Nairobi County Integrated Development Plan, 2018- 2022*
- xxvii. *National Guidelines for Safe Management of Health Care Waste*, 2011, MoH (K)
- xxviii. *National Health Care Waste Management Plan (2016 – 2021)*, MoH (K)
- xxix. *National Infection Prevention and Control Guidelines for Health Care Services in Kenya*, 2014, MoH (K)
- xxx. *The Public Health (Covid-19 Restriction of Movement of Persons and Related Measures) Rules*, 2020;
- xxxi. Vesilind, P.A., W. Worrell, and R. Reinhart, *Solid Waste Engineering*. 2002: Brooks/Cole. 428
- xxxii. Goldberg, M.S., et al., *Risks of developing cancer relative to living near a municipal solid waste landfill site in Montreal, Quebec, Canada*. *Archives of Environmental Health*, 1999. 54(4): p. 291-296
- xxxiii. Y. Abu Rukah and Y. Al-Kofahi, "The Assessment of the Effect of Landfill Leachate on Ground-Water Quality-A Case Study. El-Akader landfill site-north Jordan," *J. Arid. Environ.*, vol. 49, pp. 615-630

11 APPENDICES

Appendix 1: Copy of NEMA Practicing Certificate for the Consulting Firm

Appendix 2: The eight components of C-HERP

Appendix 3: Chance Find Procedure

Appendix 4: Hola Sub County Hospital Environmental and Social screening checklist

Appendix 5: Grievance Redress Management Plan and Sample of GRM register at the hospital

Appendix 6: Code of Conduct for All Staff and Project Workers on Kenya C-HERP Project

Appendix 7: Terms and Conditions for Employment

Appendix 8: List of Attendance and Minutes of Public Participation Meeting

Appendix 9: HCWM Unit Layout/Design Specifications

Appendix 10: Hola County Hospital Part Development Plan

Appendix 11: Bill of Quantities

11.1 Appendix I: Copy of NEMA Practicing Certificate for the Consulting Firm



FORM 7

(r.15(2))

**NATIONAL ENVIRONMENT MANAGEMENT
AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING
LICENSE**

License No : NEMA/EIA/ERPL/18295

Application Reference No: NEMA/EIA/EL/23981

M/S DEVLINK RESOURCES CONSULTANTS

(individual or firm) of address
P.O. Box 76065 - 00508 NAIROBI

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts**
registration number **2355**

in accordance with the provision of the Environmental Management and Coordination
Act Cap 387.

Issued Date: 12/30/2022

Expiry Date: 12/31/2023

Signature.....

(Seal)

Director General

The National Environment Management Authority

P.T.O.



ISO 9001:2015 Certified



FORM 7

(r.15(2))

**NATIONAL ENVIRONMENT MANAGEMENT
AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING
LICENSE**

License No : NEMA/EIA/ERPL/18293
Application Reference No: NEMA/EIA/EL/23979

M/S PATRICK KYALO KITUTA
(individual or firm) of address
P.O. Box 76065 - 00508 NAIROBI

is licensed to practice in the
capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
General
registration number **1275**

in accordance with the provision of the Environmental Management and Coordination
Act Cap 387.

Issued Date: 12/30/2022

Expiry Date: 12/31/2023

Signature.....

(Seal)

Director General
The National Environment Management Authority

P.T.O.



11.2 Appendix 2: The Eight Components of C-HERP

The C-HERP project entails eight components as stated below:

- i. **Component 1: Medical Supplies and equipment:** This component aims to improve the availability of supplies and equipment needed to respond to COVID-19 and other public health emergencies and strengthen the capacity of the Ministry of Health (MoH) to provide timely medical diagnosis for COVID-19 patients;
- ii. **Component 2. Response, Capacity Building and Training:** This component aims to strengthen response and build capacity of key stakeholders including health workers and communities;
- iii. **Component 3. Quarantine, Isolation and Treatment Centres:** This component will strengthen the health systems capacity to effectively provide Infection Prevention and Control (IPC) and case management of COVID-19 cases;
- iv. **Component 4. Medical Waste Management:** This component will ensure the safe management of waste generated by laboratory and medical activities.
- v. **Component 5. Community Discussions and Information Outreach:** Advocacy, communication and social mobilization is an integral component of strengthening surveillance and response to health emergencies. GoK has developed a risk communication and community engagement strategy to keep the public informed on expected behaviors, how best to avoid infection and advise how to mitigate social and economic impacts due to the COVID-19.
- vi. **Component 6: Availability of Safe Blood and Blood Products:** This support will go towards strengthening the capacity of the Kenya National Blood Transfusion Service (KNBTS) to provide safe blood and blood products. Blood is core to all clinical aspects of health systems. As patients fall ill with COVID-19, many of whom will have co-morbidities, transfusions will be needed. Anaemic mothers who deliver in this period will also continue to be at risk, e.tc. Further, at this time when people are less likely to go out, donations will fall which endangers the whole system.
- vii. **Component 7: Project Implementation and Monitoring:** Institutional and implementation arrangement are detailed under Section III. To support implementation, the project shall finance costs associated with the project coordination, activities for program implementation and monitoring and to strengthen management capacity.
- viii. **Component 8: Improving Quality and Capacity for Gender Based Violence Response** This component aims to improve the capacity and quality of GBV response services for survivors in targeted counties, with focus on health systems strengthening. While GBV is an issue requiring comprehensive, multi-sectoral interventions in order to reduce incidents and to respond to the full range of needs of survivors, the health sector presents an immediate and critical entry point for engaging in GBV mitigation and first line response through the provision of medical and psychosocial care, and through referral to additional services beyond health. The health sector is often a key starting point for referral processes as it is often the first and only place women are willing to disclose experiences of violence in order to receive care and access to other needed services, including access to justice and police support, protection/shelter options and economic support.

11.3 Appendix 3: Chance Find Procedure

Chance find procedures will be used as follows:

- a. Encounter or detection of a PCR.
- b. Stop the construction activities in the area of the chance find;
- c. Delineate the discovered site or area;
- d. Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the Directorate of Antiquities Sites and Monuments, National Museums of Kenya, take over;
- e. Notify the supervisory Engineer who in turn will notify the responsible local authorities and the Directorate of Antiquities Sites and Monuments (within 24 hours or less);
- f. The Directorate of Antiquities Sites and Monuments (DASM) would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archeologists of the Directorate of Antiquities Sites and Monuments (within 24 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
- g. Decisions on how to handle the finding shall be taken by the Directorate of Antiquities Sites and Monuments. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;
- h. Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the Directorate of Antiquities Sites and Monuments;
- i. These procedures must be referred to as standard provisions in construction contracts, when applicable. During project supervision, the Site Engineer / Public Works Engineer (PWE) shall monitor the above regulations relating to the treatment of any chance find encountered are observed;
- j. Construction work will resume only after authorization is given by the responsible local authorities and the National Museum concerning the safeguard of the heritage; and
- k. Relevant findings will be recorded in World Bank Implementation Supervision Reports (ISRs), and Implementation Completion Reports (ICRs) will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.

11.4 Appendix 4: Hola Sub County Hospital Environmental and Social Screening Checklist

HOLA

ENVIRONMENTAL AND SOCIAL SCREENING FORM FOR POTENTIAL ENVIRONMENTAL AND

SOCIAL ISSUES

FOR

KENYA COVID-19 EMERGENCY RESPONSE PROJECT (P173820)

UNDER THE

COVID-19 STRATEGIC PREPAREDNESS AND RESPONSE PROGRAM

Screening Form for Potential Environmental and Social Issues

E&S Screening Form: This form will be completed during identification of project activities by the Environment and Social Specialists in Project Implementation Unit (PMT) to screen for the potential environmental and social risks and impacts of a proposed sub-project. It will help the PMT in: (i) identifying the relevant Environmental and Social Standards (ESS); (ii) establishing an appropriate E&S risk rating for these sub-projects; and (iii) specifying the type of environmental and social assessment required, including specific instruments/plans. The completed forms will be signed and the record stored.

This form will allow the PMT to form an initial view of the potential risks and impacts of a sub-project. **It is not a substitute for project-specific E&S assessments or specific mitigation plans.**

A note on Considerations and Tools for E&S Screening and Risk Rating is included in this Annex I to assist the process.

Sub-project Name	HOLA COUNTY GENERAL HOSPITAL
Sub-project Location	TANA RIVER COUNTY
Sub-project Proponent	
Estimated Investment	
Start/Completion Date	

Questions	Answer		ESS relevance	Due diligence / Actions
	Yes	No		
Does the sub-project involve civil works including new construction, expansion, upgrading or rehabilitation of healthcare facilities and/or waste management facilities?	✓		ESS1	ESIA/ESMP, SEP
Does the sub-project involve long-term, permanent and/or irreversible adverse impacts (e.g. loss of major natural habitat);	*	✓	ESS1	ESIA/ESMP, SEP

Questions	Answer		ESS relevance	Due diligence / Actions
	Yes	No		
Does the sub-project involve acquisition of assets for quarantine, isolation or medical treatment purposes?		✓	ESS5	
Is the sub-project associated with any external waste management facilities such as a sanitary landfill, incinerator, or waste water treatment plant/ healthcare waste disposal?	✓		ESS3	ESIA/ESMP, SEP
Is there a sound regulatory framework and institutional capacity in place for healthcare facility infection control and healthcare waste management?	✓		ESS1	ESIA/ESMP, SEP
Does the sub-project have an adequate system in place (capacity, processes and management) to address waste?		✓		HASP (Health and Safety Plan)
Does the sub-project have appropriate OSH procedures in place, and an adequate supply of PPE (where necessary)?	✓			HASP (Health and Safety Plan)
Will the activities have high probability of causing serious adverse effects to human health and/or the environment not related to treatment of COVID19 cases;	*	✓	ESS4	ESIA/ESMP, SEP
Is the sub-project located within or in the vicinity of any ecologically sensitive areas?		✓	ESS6	ESIA/ESMP, SEP
Does the sub-project involve transboundary transportation (including Potentially infected specimens may be transported from healthcare facilities to testing laboratories, and trans boundary) of specimen, samples, infectious and hazardous materials?		✓	ESS3	ESIA/ESMP, SEP
Does the sub-project involve land acquisition and/or restrictions on land use?		✓	ESS5	RAP/ARAP, SEP
Will the activities affect lands or rights of VMGs or other vulnerable minorities;	*	✓	ESS5	RAP/ARAP, SEP
Does the sub-project involve permanent resettlement or land acquisition?	*	✓	ESS5	RAP/ARAP, SEP

Questions	Answer		ESS relevance	Due diligence / Actions
	Yes	No		
Does the sub-project involve recruitment of workers including direct, contracted, primary supply, and/or community workers?	✓		ESS2	LMP,/SEP
Does the sub-project have a GRM in place, to which all workers have access, designed to respond quickly and effectively?	✓			SEP/LMP
Does the sub-project involve significant adverse social impacts and may give rise to significant social conflict;	* ✓		ESS1	ESIA/ESMP, SEP
Does the sub-project involve use of security or military personnel during construction and/or operation of healthcare facilities and related activities?	✓		ESS4	ESIA/ESMP, SEP
Are there any indigenous groups (meeting specified ESS7 criteria) present in the sub-project area and are they likely to be affected by the proposed sub-project negatively or positively?		✓	ESS7	Indigenous Peoples Plan/other plan reflecting agreed terminology
Does the sub-project require Free Prior Informed Consent (FPIC);	* ✓		ESS7	Indigenous Peoples Plan/other plan reflecting agreed terminology
Is the sub-project located within or in the vicinity of any known cultural heritage sites?	*	✓	ESS8	ESIA/ESMP, SEP
Does the project area present considerable Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) risk?	✓		ESS1	ESIA/ESMP, SEP
Is there any territorial dispute between two or more countries in the sub-project and its ancillary aspects and related activities?		✓	OP7.60 Projects in Disputed Areas	Governments concerned agree
Will the sub-project and related activities involve the use or potential pollution of, or be located in international waterways ¹ ?	✓	✓	OP7.50 Projects on International Waterways	Notification (or exceptions)

¹ International waterways include any river, canal, lake or similar body of water that forms a boundary between, or any river or surface water that flows through two or more states.

* The exclusion list of the sub-projects. If any of these parameters are "Yes", the sub-project is excluded from financing under the program.

The Environmental and Social Commitment Plan (ESCP) prepared for the project has clearly outlined the activities considered as ineligible for financing under the project. The following is a negative/exclusion list of activities that will not be financed under the project and that will be screen out:

- Activities that may cause long-term, permanent and/or irreversible adverse impacts (e.g. loss of major natural habitat);
- Activities that have high probability of causing serious adverse effects to human health and/or the environment not related to treatment of COVID-19;
- Activities that may have significant adverse social impacts and may give rise to significant social conflict;
- Activities which would require Free Prior Informed Consent (FPIC);
- Activities that may affect lands or rights of VMGs or other vulnerable minorities; and
- Activities that may involve permanent resettlement or land acquisition or adverse impacts on cultural heritage.

Conclusions:

1. Proposed sub-project is eligible for financing under the project criteria:

..... *Y/Yes*

2. Proposed Environmental and Social Risk Ratings (High, Substantial, Moderate or Low), Provide Justification:

..... *HIGH*

3. Proposed E&S Management Plans/ Instruments:

..... *ESIA/ESMP*

11.5 Appendix 5: Grievance Redress Management Plan

This ESIA provides for a GRM which includes tools methods, and processes by which a resolution to a grievance is sought and provided. The processes are as shown below.

The project will have several channels for complaints and grievances including email, phone calls, texts, blogs, toll free number and letter writing that will also be accessible to all workers. Information on the project GRM will be made available to workers at all facilities, government offices (both national and county) and community level (chief's office, for instance) to ensure that all workers, including CHVs have adequate information on how to lodge a complaint and who to direct it to. Anonymity will be assured when handling workers' grievances. Although 'suggestion boxes' exist in many worksites and appear to be a preferred form of reporting complaints, the experience has been that these boxes are hardly opened. If these have to be used as part of the GRM, a structure needs to be put in place for opening, reviewing, responding and providing feedback on the issues raised.

The following actions will be used for managing complaints for this project:

- a. Complaints will be sent to the GRM focal point at the workplace by email, text, phone, letter or in person. The complaints will be collated onto a complaints form and logged into the register (and reported). The email address and phone number will be made available to the workers at signing the contract/recruitment.
- b. Complaints will be reviewed by the PMT weekly upon receipt. The grievance committee at the workplace will comprise of the in-charge (health superintendent or contractors (who will be the chair), GRM focal point will act as the secretary, and departmental heads. The team will review the complaints and provide guidance on the course of action and ensure follow-up on previous complaints. Any preliminary investigation should take place within 5 working days of the committee meeting. Feedback will be given to the complainant within 10 working days.
- c. For informal complaints i.e., those raised through social media, print media or not formally lodged, the committee will be deliberate upon them to decide whether to investigate based on the substance and potential impact/reputational risk.
- d. If the complaint is referred to the main project GRM and government's legal complaints structures (EACC, CAJ, etc.), the World Bank will be notified.
- e. Complaints regarding SEA will be kept confidential, the name of the complainant will not be recorded, only the age and gender of the complainant, and whether a project worker was involved and should be sent directly to the PM who should immediately inform the World Bank.
- f. No disciplinary or legal action will be taken against anyone raising a complaint in good faith.
- g. A monthly report of complaints resolution should be provided to the PMT and the World Bank.

11.6 Appendix 6: Code of Conduct for All Staff and Project Workers on Kenya C-HERP Project

DOs

1. Wear prescribed and appropriate personal protective equipment on site at all times.
2. Wash hands, sanitize and observe social distancing at all times and follow WHO and GOK updated guidelines.
3. Seek healthcare if you experience any of the following symptoms (while at home or work): cough, fever and shortness of breath.
4. Prevent avoidable accidents and report conditions or practices that pose a safety hazard or threaten the environment.
5. Treat women, children and men with respect regardless of race, color, language, religion, or other status.
6. Report any violations of this code of conduct to workers' representative, HR or grievance redress committee. No employee who reports a violation of this code of conduct in good faith will be punished in any way.
7. Comply with all Kenya laws.

DON'Ts

1. Expose other people to the risk of infection in any form.
2. Leave personal protective equipment lying around.
3. Come to work if you or any of your family members has any symptoms of COVID-19 (cough, fever and shortness of breath). Report immediately to your supervisor if you or family member has any of these signs.
4. Make unwelcome sexual advances to any person in any form.
5. Have sexual interactions unless full and unequivocal consent is given and there is no form of material or other coercion
6. Use alcohol or narcotics during working hours.

* Employees, associates, and representatives, including sub-contractors and suppliers, without exception.

11.7 Appendix 7: Terms and Conditions for Employment

Below is the list of relevant provisions of the Employment Act, 2007 mainstreamed to MoH Human Resources Manual with regard to terms and conditions of work.

a. Content of individual contract in-line with Employment Act 2007 (Section 10)

Subject to the provision of this Act or regulations made hereunder, a written individual contract of employment shall specify the following: (a) name and father's name of workers; (b) address, occupation, age and sex of workers; (c) employer's name and address; (d) nature and duration of contract; (e) hours and place of work; (f) remuneration payable to the worker; (g) procedure for suspension or termination of contract.

b. Notice for termination of contract in-line with Employment Act, 2007 (Part VI; Sections 35 - 51)

Either of the contracting parties may terminate a contract of employment by giving written notice in-line with the provisions of employment Act, 2007, i.e., (a) Not less than ten days in the case of manual workers; (b) Not less than 30 days in the case of non-manual workers. Provided that no notice need be given in case the duration of contract does not exceed one month.

c. Protection of wages in-line with Employment Act, 2007 (Part IV; Sections 17 - 25)

Taking into consideration the economic and social conditions of the country (and in consistence with the provisions of Employment Act, 2007 and NEMA Human Resources Manual), the minimum wages for any category of workers may be determined by the salary's remuneration commission.

d. Hours of work – Employment Act, 2007 (Article 85, 86)

The normal hours of work of a worker shall not exceed eight a day or 48 a week.

Hours worked in excess of the normal hours of work shall not exceed 12 a week and shall entitle a worker to a proportionate overtime payment in-line with the provisions of NEMA Human Resources Manual on allowances.

e. Weekly Rest

Every worker shall be entitled to one day's rest each week, which should normally fall on Friday. It shall consist of at least 24 consecutive hours each week. Workers shall also be entitled to a rest day on public holidays recognized as such by the State.

f. Annual leave (Employment Act, 2007)

Workers shall be entitled to 30days' leave with pay for every year of continuous service.

An entitlement to leave with pay shall normally be acquired after a full year of continuous service.

g. Fringe benefits (Employment Act 2007)

Any employer shall provide (a) accommodation when a worker is required to be away from his normal residence; (b) free food to workers, or subsistence allowance in place thereof; (c) free transport to and from the place of work, when a worker is required to work in a town or locality away from his normal residence.

h. Deductions from remuneration (Employment Act 2007)

No deductions other than those prescribed by the Code or regulations made hereunder or any other law or collective labor agreement shall be made from a worker's remuneration, except for repayment of advances received from the employer and evidenced in writing.

i. Death benefit (Employment Act 2007)

In case of death of a worker during his contract of employment, the employer shall pay to his heirs an amount not less than 15 days' remuneration as death benefit for funeral services.

j. Maternity and Paternity Leaves (Employment Act, 2007)

A woman worker shall be entitled for maternity leave with pay for 90 days and male workers 14 days in-line with the provisions of the Employment Act, 2007 and NEMA Human Resources manual.

11.8 Appendix 8: List of attendants and minutes of public participation meeting

MINUTES FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) MEETING HELD AT HOLA COUNTY REFERRAL HOSPITAL ON 16TH DECEMBER 2020 FOR THE PROPOSED INSTALLATION OF A MODERN HEALTH CARE WASTE INCINERATOR AT HOLA COUNTY REFERRAL HOSPITAL UNDER THE COVID-19 HEALTH EMERGENCY RESPONSE PROJECT (C-HERP)

ATTENDANCE LIST






ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) PUBLIC MEETING ATTENDANCE LIST
Project: PROPOSED INSTALLATION OF AN INCINERATOR AT HOLA COUNTY REF-HERP.
Venue: HOLA COUNTY REFERRAL HOSPITAL **Date:** 16/12/2020

No.	Name	Residential area/Designation	Telephone No.	ID. No.	Signature
1)	Patrice KANON	ETA Road Export	0721997826	20782205	
2)	Timothy Kamony	ETA Export	0794694595	20413011	
3)	Assee I. DITHA	Gu.M. O.TECS	0799372574	8064482	
4)	ABDALA ALI BARI SA	Chairman e.i. PK	0727691678	0166930	
5)	Shadrach S. MUKOBE	HOLA MISSION CHURCH	0726495310	91625700	
6)	EUANSON -H. GIWA	NO YC	0721157443	20531035	
7)	Asullathi MUYARU EST	HOLA/LINA	0712065850	3919153	
8)	Gladys Malika	HOLA MISSION	07211775331	11891299	
9)	Sulvisi Kapo Hadinga	HOLA MISSION	07954478657	12-726167	
10)	HELEN BUDUKE SGM	L.B.G.R.H	07009377445	12730997	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) PUBLIC MEETING ATTENDANCE LIST

Project: PROPOSED WINDPOWER INSTALLATION AT HOLO COUNTY REFERRAL HOSPITAL

Venue: HOLO COUNTY REFERRAL HOSPITAL **Date:** 18/02/2020

No.	Name	Residential area/Designation	Telephone No.	ID. No.	Signature
1)	Ali MOHAMMED	No	0706092506	24463962	
2)	Sahim Mbarak	Holo mission	0746840901	30926298	
3)	Mikaya O. yano	Asol/chiya	0718842813	82296141	
4)	Singile D. WRO	Mukindwi village	0729482536	5955862	
5)	MURUNNANUSI TH JUD	MURUNGWA HOA	0745680162	22075416	
6)					
7)					
8)					
9)					
10)					

AGENDA

1. Welcome and Introduction
2. Purpose of the meeting
3. Presentation: Project description
4. Questions for clarity on project description
5. Presentation: Environmental and Social Impact Assessment
6. Discussion
7. Support for the project
8. Closing Remarks

MINUTE 01/16/12/2020/C-HERP: WELCOME AND INTRODUCTION

The meeting was called to order at 1600hours by Mr. Asser Timona the County Coordinator on Healthcare Waste Management. He called upon the Sheikh in attendance to lead in a word of prayer. He thereafter welcomed everyone in attendance and called upon all in attendance to briefly introduce themselves. All in attendance visited the site for the proposed project.

MINUTE 02/16/012/2020/C-HERP: PURPOSE OF THE MEETING

Mr Asser Timona welcomed the ESIA experts to execute the agenda of the day. The Lead Expert (Mr. Kituta) welcomed all for insightful discussions. To start with the Area Chief was confirmed to chair the meeting and he opened the meeting officially.

The lead expert informed the meeting that Regulation 17 of the Environmental (Impact Assessment and Audit Regulations, 2003) requires the project proponent in consultation with the authority (NEMA) to seek views of the persons that may be affected by the proposed project either directly or indirectly.

The purpose of consultation and public participation is to:

- (a) Provide information regarding the proposed project- Installation and commissioning of modern medical waste incinerator to the affected people, key stakeholders, and interested persons;
- (b) Provide an overview of the EIA &Public Participation Process (PPP) being followed for the proposed project;
- (c) Provide an opportunity for affected people, key stakeholders and Interested persons to seek clarity and provide input into the project; and
- (d) Record and document the comments raised and include them in the final report; and
- (e) To enable the authority (NEMA) make informed decision based on input from the project affected persons and all those living within the project influence area.

MINUTE 03/16/12/2020/ C-HERP: PROJECT DESCRIPTION

The lead expert gave a brief description of the proposed project detailing the particular components of the project. He informed the meeting that the project will entail procurement, installation and commissioning of modern medical waste incinerator. The major components of the incinerator were discussed in details and their respective role(s) highlighted.

The project would also entail the following:

- ✓ Construction of an Incinerator Shelter;
- ✓ Construction of an ash pit;
- ✓ Construction of a waste storage chamber (temporary storage);
- ✓ Construction of an office, changing rooms, sanitary convenience (toilet) and material/ supplies store;
- ✓ Electrical works;
- ✓ Installation of fire suppression system;
- ✓ Installation of emergency alert system;
- ✓ Paint works;
- ✓ Site landscaping;
- ✓ Signage works;
- ✓ Construction of perimeter fence;
- ✓ Hiring and training of an incinerator operator;

- ✓ Acquiring of requisite operating licences and permits; and
- ✓ Undertaking requisite managerial strategies (Air quality monitoring, environmental auditing, Safety audits)

MINUTE 04/16/12/2020/ C-HERP: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

The lead expert gave brief description of ESIA and elaborated on the process of ESIA. He informed the meeting that ESIA process was a management tool that ensured all potential environmental and social risks and impacts associated with a proposed project are identified prior to project implementation and the necessary mitigation measures/ strategies formulated. In addition, the meeting was informed that ESIA was site specific because every project was unique and the impacts likely to occur in one site would not be the same to impacts that would occur in another site.

The meeting was also informed that ESIA process was based on set of regulatory frameworks that entailed local and international policies, laws, regulations and treaties. The following regulatory frameworks were applicable to the proposed project.

- Environmental Management Principles and Guidelines
 - ✓ Sustainability
 - ✓ Principle of Intergenerational Equity
 - ✓ Principle of Prevention
 - ✓ Precautionary Principle
 - ✓ Polluter Pays Principle
 - ✓ Principle of Public Participation
 - ✓ The Cultural and Social Principle
 - ✓ Principle of International Co-Operation
- Policy Framework
 - ✓ Environmental Policy Framework
 - ✓ National Water Policy, 2000
 - ✓ Water Catchment Management Policies
- Legal Framework
 - ✓ Environmental Management and Coordination (Amendment) Act 2015.
 - ✓ County Government Act, 2012.
 - ✓ Environmental Impact Assessment and Audit Regulations of 2003 (revised 2019)
 - ✓ EMCA (Waste Management) Regulations, 2006 Legal Notice No.12.
 - ✓ The Public Health Act, Cap 242.
 - ✓ Occupational Safety and Health Act (OSHA) 2007.
 - ✓ Noise and Excessive Vibrations Pollution Control Regulations 2009.
 - ✓ Way leave Act, 2010.
 - ✓ Water Act of 2016 and others
- The Constitution of Kenya

MINUTE 04/16/12/2020/ C-HERP: DISCUSSIONS ON ENVIRONMENTAL AND SOCIAL IMPACTS

Several issues were discussed during the meeting majoring on the potential negative and positive impacts of the proposed project. The community members were aware of the prevailing challenges in healthcare waste management (HCW) at the hospital. It was observed that the hospital lacks capacity to dispose HCW generated and the entire county was equally the same. It was therefore agreed that the proposed project as described by the lead expert was good for the hospital but a few issues needed to be discussed and dispensed with before the project commenced. The following issues were discussed:

i. Capacity of the Incinerator

It was proposed that the capacity of the proposed incinerator should be able to dispose HCW wastes from all the public healthcare facilities in the county because there is no other incinerator at Tana River County. It was therefore proposed that the proposed incinerator should have capacity not less than 100kg/hr. There was however no data recorded for HCW generated at the hospital. The meeting proposed that the incinerator should also be used to incinerate HCW from private healthcare facilities at a fee to eradicate impacts associated with

poor disposal of HCW by private healthcare facilities.

The County HCWM coordinator informed the meeting that HCW ought to be disposed close to the point of generation but since there was no other incinerator in the county, it was prudent that the project financier (World Bank) though the Ministry of Health (MoH) should factor in HCW waste transfer vehicle as part of the project to facilitate the transfer of all the HCW generated by all the satellite healthcare facilities in the county. He however, cautioned that the vehicle must meet all the NEMA set standards for such a vehicle.

ii. Air Quality

Incineration is burning of HCW and therefore is bound to generate smoke/ emissions that would pollute the air thereby degrading the air quality. The members of local community requested to be informed what guarantees would ensure that the incinerator does not pollute the air. The lead expert assured the meeting that as discussed during the project description, the air cleansing system was one of the major components of the incinerator. He informed the meeting that the air cleaning system fitted on the incinerator would ensure that the smoke was thoroughly cleaned prior to releasing to the air during the waste incineration process.

The lead expert cautioned that the operator must strictly observe all the guidelines as detailed in the user guide manual to ensure that the incinerator operated as designed to ensure that there are no emissions emitted to the air that would degrade the environment.

iii. Noise pollution

Noise pollution is a major impact associated with running of machines; the community members feared that the incinerator machine would be source of noise pollution. The lead expert assured all in attendance that the incinerator produced very little noise that was within permissible levels.

iv. Employment

The hospital management would be required to hire operators to run the machine, the youths called upon the hospital management to hire local youths for the operators' job. It was however, agreed that the operators must be hired from those already engaged by the hospital as an added advantage.

v. Ashpit

The residual ash from the incineration process should be disposed off in a sustainable manner. The meeting wanted more information on how the residual ash would be disposed. The lead expert confirmed that as discussed during the project description, the project would entail the ashpit that would be constructed to engineer's specification to ensure that all residual ash is well disposed. The ashpit is expected to have a lifespan of minimum 10 years.

vi. Project Implementation Period

Project implementation is an issue that affects government funded projects with many delays culminating in prolonged project implementation period. As such, the community members observed that project should be implemented in the shortest time possible without compromising the quality of the project components.

vii. Security of the incinerator/ Existing Shelter

The security of the project material and the incinerator upon project commissioning is a factor affects implementation and the eventual success of the project. The attendees requested the hospital management to ensure that adequate security is put in place to safeguard the project property. The hospital management was requested to undertake the necessary modifications to the incomplete incinerator shelter to make the shelter attain the desired standard. The structure was found to be structurally stable and as such the hospital management should ensure that the structure is completed in time.

MINUTE 05/16/12/2020/ C-HERP: SUPPORT FOR THE PROJECT

Project support is a crucial component of any proposed project. The ESIA expert called upon the attendees to declare their support for the proposed project or otherwise. There is total support for the proposed project and

there was no objection.

MINUTE 06/16/12/2020/ C-HERP: CLOSING REMARKS

The County HCW Coordinator Mr. Asser Timona thanked all for attending the meeting and making their views/opinions heard. The ESIA experts registered his appreciation to all in attendance and encouraged them to actively participate in environmental matters in their locality. The Area Chief concluded the meeting and thanked the ESIA experts for the noble engagement while acknowledging that the proposed project was timely and a sound intervention to the HCW management in Tana River County. The meeting ended at 1700hrs.



DEVLINK RESOURCES CONSULTANTS
P.O. Box 76065-00508,
NAIROBI

Minutes taken by:

Patrick Kituta (Lead Expert)

Patrick Kituta

Name

[Signature]

Sign

Witnessed by:

George Muthoka - Sign:

[Signature]

Date:

Team Leader, Devlink Resources Consultants

DEVLINK RESOURCES
P.O. Box 76065-00508,
NAIROBI

Witnessed by:

Hospital Representative:

ASSED TIMOMA DHOTHA

Name

[Signature]

Sign

Hospital Stamp:

MEDICAL SUPERINTENDENT
HOLA COUNTY REFERRAL HOSPITAL
7 MAR 2022
P. O. Box 38 - 70101,
HOLA

Date *7/ March/ 2022*

Witnessed by:

Area Chief/Assistant:

MIKAYA YATZ

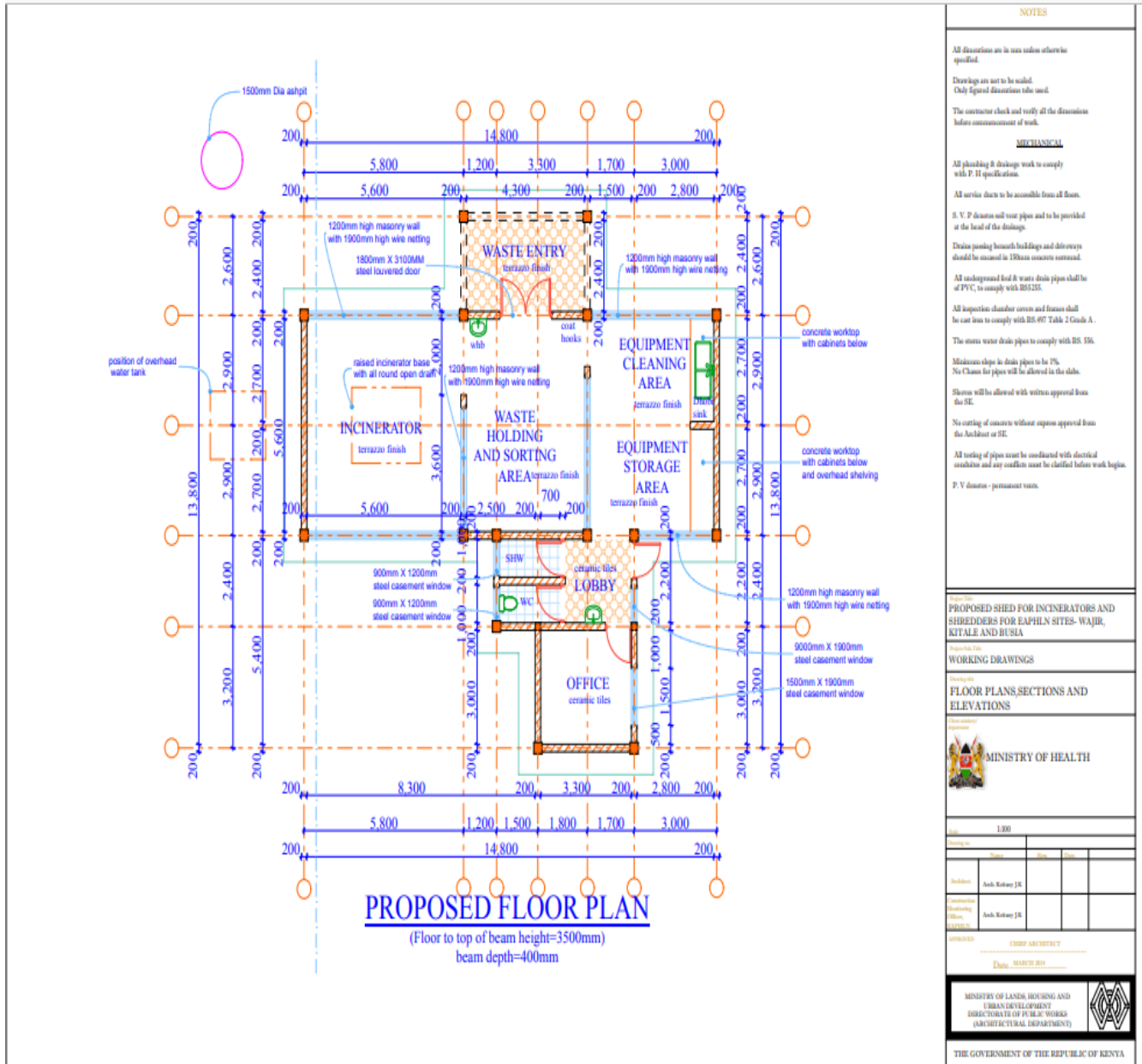
Sign

Chief's /Assistant Chief's Stamp:

[Signature]
ASSISTANT CHIEF
HOLA MISSIONS SLS - L/C
P.O. Box 1-70101

Date *7/3/2022*

11.9 Appendix 9: HCWM Unit Layout/Design Specifications



11.10 Appendix 10: Hola County Hospital Part Development Plan

EXISTING SITE FOR THE DISTRICT HOSPITAL AREA = 8.75 Ha (Approx.)

CERTIFICATE
I Certify that this plan has been prepared and published as per the requirements of the Physical Planning Act Cap 286.

NAME OF PLANNER D. Hando SIGN [Signature]

AMMENDMENTS _____ DATE _____

MINISTRY OF LANDS, HOUSING & URBAN DEV'T.
PHYSICAL PLANNING DEPARTMENT

HOLA

PART DEVELOPMENT PLAN

SCALE 1 : 5 000
DATE 24 - 10 - 2014
PREPARED BY M. OCHIENG
DRAWN BY J. K. LUSULI

DEPARTMENTAL REFERENCE No TRC / 312 / 2014 / 09

CERTIFIED
DIRECTOR OF PHYSICAL PLANNING _____ DATE _____

APPROVED
NAIROBI CABINET SEC. LANDS _____ DATE _____

APPROVED DEVELOPMENT PLAN No _____

11.11 Appendix 11: Bill of Quantities