ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN FOR REHABILITATING AN X-RAY ROOM AND INSTALLING AND OPERATING A MECHANICAL INCINERATOR AT NTCHISI DISTRICT HOSPITAL IN NTCHISI DISTRICT, MALAWI.

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JULY 2024

Executive Summary

This is an Environmental and Social Management Plan (ESMP) for rehabilitating the x-ray room and installing a mechanical incinerator at Ntchisi District Hospital in Ntchisi District. Under the auspices of the Malawi Ministry of Health, the Malawi Covid-19 Emergency Response and Health System Preparedness Project (MCERHSPP) aims to fortify the national framework to detect, prevent, and respond to the ongoing COVID-19 pandemic and future health threats. The project's objective is to prevent, detect, and respond to COVID-19 in Malawi while strengthening national systems for public health preparedness.

Ntchisi District Hospital benefits from the MCERHSPP initiative, which includes rehabilitating the X-ray room and installing a mechanical incinerator. This report serves as a basis for managing, mitigating, and monitoring the environmental and social impacts associated with the project's construction and operation phases. The objective of the Environmental and Social Management Plan (ESMP) was to assess and predict potential positive and negative social and environmental impacts and develop suitable enhancement and mitigation measures.

The proposed rehabilitation of the X-ray room and installation of a mechanical incinerator at Ntchisi District Hospital are vital for enhancing diagnostic capabilities and infection control. These upgrades aim to improve the hospital's capacity to diagnose and treat various medical conditions, including those related to COVID-19. Moreover, the mechanical incinerator ensures proper medical waste disposal, minimizing the risk of infection spread within the hospital and surrounding areas. Aligned with national public health preparedness initiatives, these works reinforce Ntchisi District Hospital's role in combating current health challenges while laying the groundwork for sustainable healthcare infrastructure development in the district.

Ntchisi District Hospital is located at Ntchisi Boma (Town) in Group Village Headman Mgungu, Traditional Authority Kalumo. The hospital is on the northern side of the Ntchisi Boma to Mponela (T350) Road. The proposed site for the incinerator is idle land overgrown with grass but is within the hospital campus and is approximately 50 meters west of the hospital’s main entrance. The building hosting the maintenance personnel offices and workshop is located about 15 meters from the western direction of the site.

The general steps followed during the assessment were desk studies, physical inspection of the site and surrounding areas, stakeholder consultations, and reporting and documentation. The desk studies involved reviewing project-related documents. Site inspection and stakeholder consultations were conducted between 3 and 4 April 2024. This ESMP has outlined the project's construction phase's potential positive and negative environmental and social impacts and has an ESMP implementation cost of MK18,435,000. The construction phase is divided into specific activities to track their impacts: mobilisation, demolition, construction, finishing, and demobilisation. The key impacts identified are presented as follows:

- **Improved Healthcare Services:** The rehabilitation of the x-ray room at Ntchisi District Hospital significantly enhances its diagnostic capabilities. With upgraded equipment and facilities, medical staff can perform more accurate and timely medical imaging, leading to better patient outcomes. Doctors can make more informed treatment decisions, reducing

the need for patients to travel elsewhere for imaging services and ensuring quicker access to necessary medical care.

- **Enhanced Waste Management and Environmental Protection:** The installation of a healthcare waste mechanical incinerator brings substantial benefits in waste management and environmental protection. It ensures safe and efficient disposal of medical waste, significantly reducing the risk of infection within the hospital. Proper incineration prevents the release of harmful substances into the environment, protecting soil, water, and air quality. This upgrade streamlines waste management processes, reducing the burden on staff and allowing the hospital to focus more resources on patient care.
- **Creation of Job Opportunities:** During the construction phase, the project will employ construction staff, involving at least twenty people for less than 90 days. This short-term impact is of low significance but provides temporary employment.
- **Improved Project Compliance with Environmental and Social Legislation**: During mobilisation, the project will prepare relevant environmental and social safeguard documents, including a Contractors-ESMP. These documents will be used throughout the project, making this impact highly significant.
- **Disruption of Healthcare Services:** The rehabilitation of the X-ray room in a functioning hospital can lead to significant disturbances in the provision of healthcare services. During the construction period, the X-ray room will be out of service, potentially delaying diagnostic procedures and forcing patients to seek imaging services at other facilities.
- **Temporary Air Quality Deterioration:** Construction activities, including site clearing and excavation, will generate dust and particulate matter, causing short-term air quality deterioration. Emissions from construction machinery may include CO2, SO2, NOx, and other hydrocarbons. However, it is unlikely that ambient air quality standards will be exceeded.
- **Elevated Noise Levels:** Construction machinery will generate noise, potentially impairing hearing and causing nuisance issues. If noise levels exceed 65dBa, they can increase annoyance and lead to complaints.
- **Loss of Trees and Ground Cover:** The project will result in the loss of one tree and other ground cover, but this impact is of low significance.
- **Accidents and Injuries On-site:** Construction workers will face occupational risks from using large machinery, working at heights, and handling hazardous chemicals. Increased traffic on hospital premises due to construction will pose additional risks.
- **Spread of Infectious Diseases:** Interactions between workers and the community may increase the spread of STIs, HIV, and COVID-19. Cholera, linked to inadequate sanitation, also poses a significant risk.
- **Gender-Based Violence and Sexual Exploitation:** The construction site may create environments where GBV and SEA occur, affecting workers and the local community. Female workers may face harassment and discrimination, leading to mental health issues and reduced productivity.
- **Generation of Solid Wastes and Spills:** Construction activities generate various wastes, including hazardous materials. Chemical spills and other hazardous fluids need careful management to avoid environmental contamination.

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Chapter One: Introduction

This is an Environmental and Social Management Plan (ESMP) for rehabilitating the x-ray room and installing a mechanical incinerator at Ntchisi District Hospital in Ntchisi District. This chapter provides background information on the project, details of the project proponent, project justification, objectives for developing the ESMP, methodology employed, and potential users of the ESMP.

1.1 Background Information

Under the auspices of the Malawi Ministry of Health, the Malawi Covid-19 Emergency Response and Health System Preparedness Project (MCERHSPP) aims to fortify the national framework to detect, prevent, and respond to the ongoing COVID-19 pandemic and future health threats. The project's objective is to prevent, detect, and respond to COVID-19 in Malawi while strengthening national systems for public health preparedness.

Ntchisi District Hospital benefits from the MCERHSPP initiative, which includes rehabilitating the X-ray room and installing a mechanical incinerator. Considering the proposed civil works at the health facility, MCERHSPP recognizes the need to assess anticipated environmental and social impacts and propose measures for managing these impacts. This report serves as a basis for managing, mitigating, and monitoring the environmental and social impacts associated with the project's construction and operation phases. The objective of the Environmental and Social Management Plan (ESMP) was to assess and predict potential positive and negative social and environmental impacts and develop suitable enhancement and mitigation measures. This was done following the Environment Management Act of 2017, the Environmental Impact Assessment Guidelines 1997, and the World Bank Environmental and Social Framework.

The proposed rehabilitation of the X-ray room and installation of a mechanical incinerator at Ntchisi District Hospital are vital for enhancing diagnostic capabilities and infection control. These upgrades aim to improve the hospital's capacity to diagnose and treat various medical conditions, including those related to COVID-19. Moreover, the mechanical incinerator ensures proper medical waste disposal, minimizing the risk of infection spread within the hospital and surrounding areas. Aligned with national public health preparedness initiatives, these works reinforce Ntchisi District Hospital's role in combating current health challenges while laying the groundwork for sustainable healthcare infrastructure development in the district.

1.2 Spatial Location and Size of Land

Ntchisi District Hospital is located at Ntchisi Boma (Town) in Group Village Headman Mgungu, Traditional Authority Kalumo. The hospital is on the northern side of the Ntchisi Boma to Mponela (T350) Road (Figure 1-2). The proposed site for the incinerator is idle land overgrown with grass (Figure 1-1) but is within the hospital campus and is approximately 50 meters west of the hospital's main entrance (**Error! Reference source not found.**). The building hosting the maintenance p ersonnel offices and workshop is located about 15 meters from the western direction of the site. The site also has electricity powerlines that pass through 16 meters west of the site. There are no residential houses or business buildings within a 50-meter radius of the site, with the main hospital buildings located about 55 meters east of the site.

The X-ray room that will be rehabilitated is at the same hospital and is in a building east of the main hospital facilities. It is approximately 8 by 12 meters and is directly opposite the hospital's laboratory, the minor theatre lies to its right with the dental section situated behind it. This room is already being used as an X-ray room and is equipped with an old model X-ray that will be replaced (**Error! Reference source not found.**).

Figure 1-1: Proposed site for installation of mechanical incinerator.

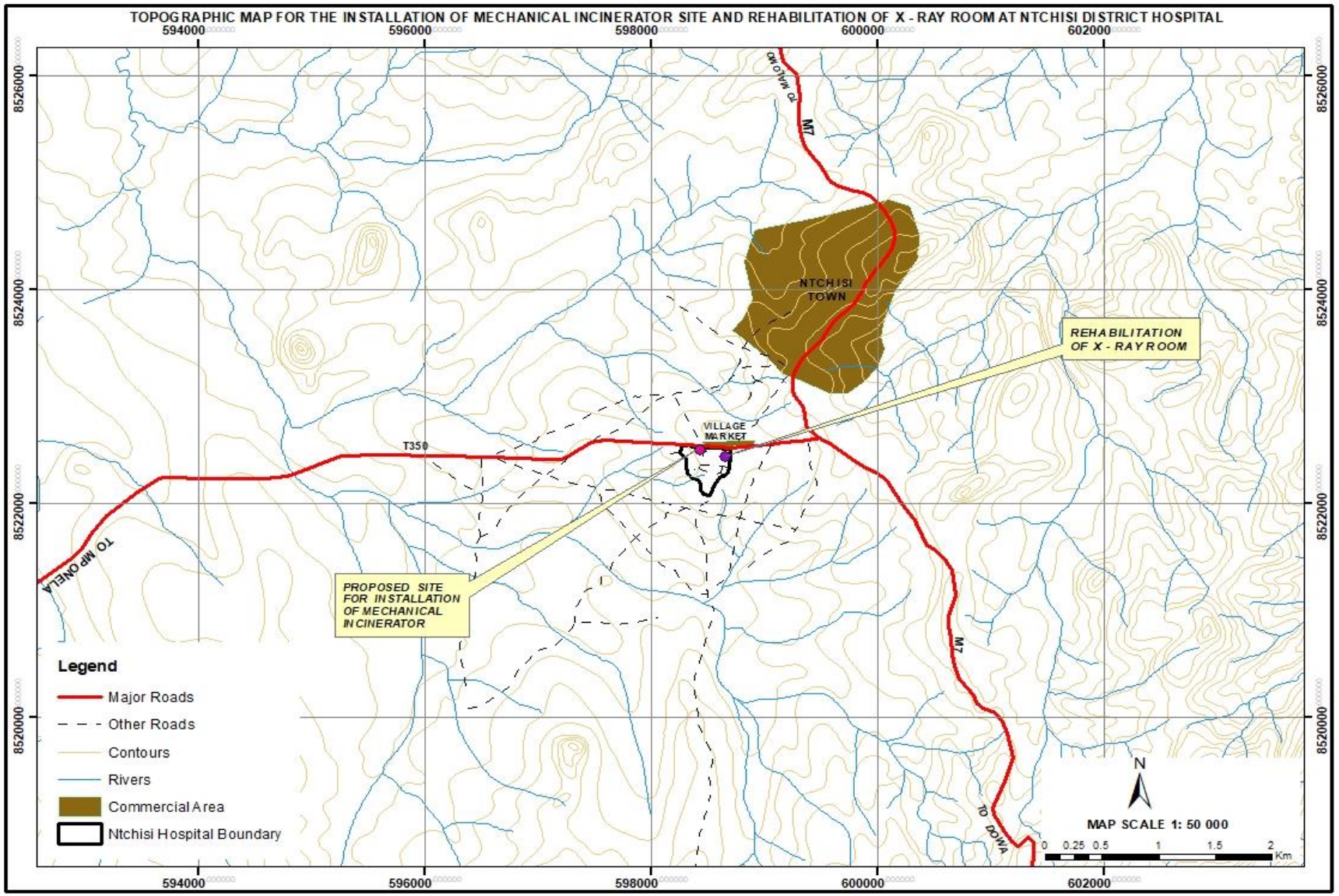


Figure 1-2: Topographic map of Ntchisi District Hospital.

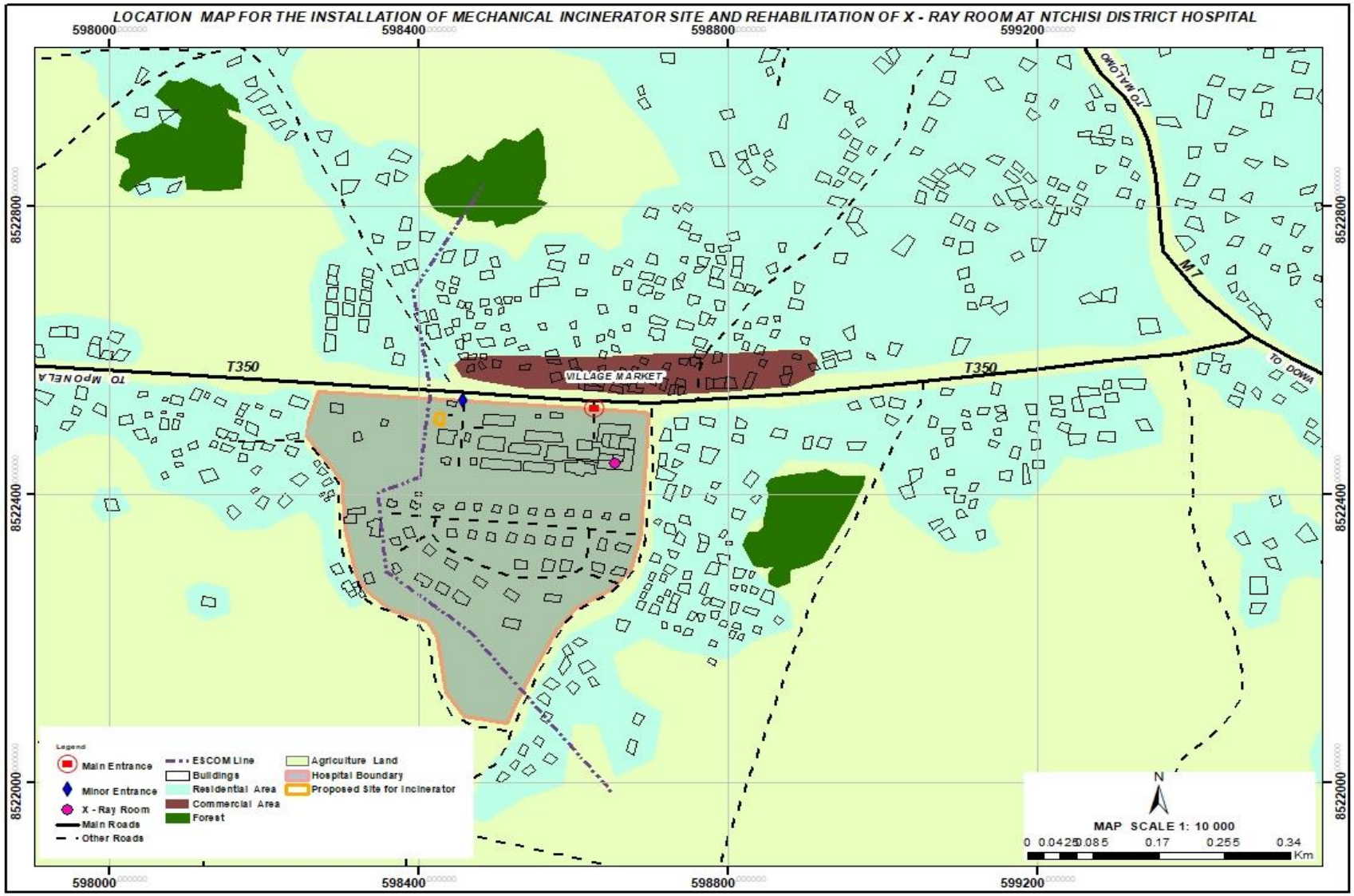


Figure 1-3: Location Map of Ntchisi District Hospital.

1.3 Methodology for Preparing ESMP

The general steps followed during the assessment were desk studies, physical inspection of the site and surrounding areas, stakeholder consultations, and reporting and documentation.

1.3.1 Desk Studies

The desk studies involved a review of Project Appraisal Document (PAD), Project Implementation Manual (PIM), World Banks Environmental and Social Framework (ESF), WB Industry EHS guidelines, Malawi CERHSPP Environmental and Social Management Framework (ESMF), Environmental and Social Commitment Plan (ESCP), Labour Management Plan (LMP), the Stakeholder Engagement Plan (SEP), and the socioeconomic profile for Ntchisi District Council.

1.3.2 Physical Inspection of Project Sites

The study team conducted a site inspection on 3rd May 2024 to conduct a detailed environmental and social screening of the proposed site and its surroundings. During this environmental and social screening process, various factors were assessed to identify potential impacts and devise appropriate mitigation measures. This comprehensive analysis encompassed environmental, social, health, economic, and legal considerations, ensuring a holistic approach to decision-making and sustainable development. Environmental factors were meticulously examined to identify sensitive nearby features. Social factors were equally paramount, focusing on understanding the impact on nearby communities. Assessing potential land use patterns or changes in community dynamics ensured that the proposed works respected and preserved local social structures. Health impacts were carefully evaluated, particularly regarding potential risks associated with emissions from the incinerator. Finally, legal and regulatory compliance was rigorously assessed to ensure national and international standards adherence. This included identifying necessary permits, licenses, or approvals required for the installation and operation of the incinerator, thereby ensuring that the project operated within the bounds of the law.

1.3.3 Stakeholder Consultations

Considering that the proposed project will be done within the hospital campus, stakeholder consultations were mainly done through key informant interviews with relevant heads of hospital departments. These consultations were done on 3 and 4 April 2024. These included the Hospital administrator, the District Environmental Health Officer, Laboratory Technicians, Radiology staff, Maintenance Supervisors (who oversee Waste Management Staff), and Waste Management Staff. Interviews with patients were also conducted with randomly selected patients at the hospital. Consulting patients helped identify concerns about indoor air quality, noise levels, or other environmental factors affecting their rehabilitation work experience. Consulting patients also allowed us to assess potential risks and develop mitigation strategies to minimise environmental impacts on patient health and safety. Key issues raised during the KIIs are provided in Annex 2.

Chapter Two: Project Description

This chapter provides an overview of the project's current status within the project cycle, aiming to facilitate comprehension regarding the level of detail and the available planning or design options. It delineates the primary activities carried out during the project's implementation phase, encompassing details such as the machinery type to be utilised during the installation, the nature of generated waste, on-site facilities, waste management strategies, and estimated project costs.

2.1 Nature of the Project

The project entails the comprehensive rehabilitation of the existing X-ray room at Ntchisi District Hospital and installing state-of-the-art digital X-ray equipment. This modernisation effort aims to enhance diagnostic capabilities, allowing for more accurate and efficient medical imaging services. Additionally, the project includes the installation of a medical incinerator to ensure proper disposal of hazardous waste generated during medical procedures, contributing to infection control and environmental sustainability efforts within the hospital premises. Overall, the project combines infrastructure upgrades with the implementation of advanced medical technologies to improve healthcare delivery and safety standards at Ntchisi District Hospital.

2.1.1 Description of the digital X-ray equipment

The X-ray room has a main room with 4.90 meters in width and 6.90 meters in length, giving an area of 33.81 square meters (Figure 2-1). There is also a change room that is 1.6 meters in length and 1.8 meters in width, which is also adjacent to the toilet. The proposed work will maintain the changing room and toilet to the exact dimensions as the existing plan. However, the main room will be partitioned into a control room of 1.8 meters by 1.2 meters. These dimensions are designed to accommodate the necessary equipment, including the X-ray generator, digital detector panel, patient table, and control console while allowing sufficient space for staff movement and patient positioning.

A digital X-ray system typically comprises several key components designed to deliver high-quality imaging while prioritising safety and efficiency. Here's a detailed description:

i. *X-ray Generator*: This component produces X-ray beams that pass through the patient's body to create the image. It is typically housed in a protective casing to prevent radiation exposure to operators and patients.
ii. *X-ray Tube*: The X-ray tube emits X-ray photons. It consists of a cathode and an anode housed within a vacuum-sealed glass envelope. When activated, the cathode emits electrons that are accelerated towards the anode, producing X-rays upon impact.
iii. *Digital Detector Panel*: Unlike traditional film-based X-ray systems, digital X-ray systems utilise flat-panel detectors to capture X-ray images digitally. These detectors convert X-ray photons into electrical signals, which are then processed and displayed as high-resolution images on a computer monitor.
iv. *Control Console:* The control console is where the radiologic technologist operates the X-ray system. It allows for adjustments to exposure settings, image processing parameters, and other system functions.
v. *Patient Table:* The table provides a stable and comfortable surface for patients to lie on during X-ray examinations. It may be adjustable to accommodate various positions and imaging techniques.

vi. *Lead Aprons and Shields:* Lead aprons and shields are essential for protecting both patients and operators from unnecessary radiation exposure. They are worn by patients and staff during X-ray procedures to minimise radiation dose to sensitive body parts.

To promote safety within the X-ray room, several measures will be implemented:

i. *Lead-Lined Walls:* The walls of the X-ray room will be lined with lead or other radiation-absorbing materials to prevent radiation leakage into adjacent areas.
ii. *Controlled Access:* Access to the X-ray room should only be restricted to authorised personnel. This helps prevent unauthorised individuals from entering the room during procedures and minimises the risk of radiation exposure.
iii. *Lead Glass Windows:* Lead glass windows can be installed in observation windows to allow operators to monitor patients without direct radiation exposure.
iv. *Clear Signage:* Clear signage indicating radiation hazards and safety precautions should be posted prominently in and around the X-ray room to remind staff and patients of safety protocols.
v. *Partitioning:* The X-ray room can be partitioned into designated areas for patient preparation, imaging, and post-imaging care. This helps streamline workflow and minimize unnecessary movement within the room during procedures.

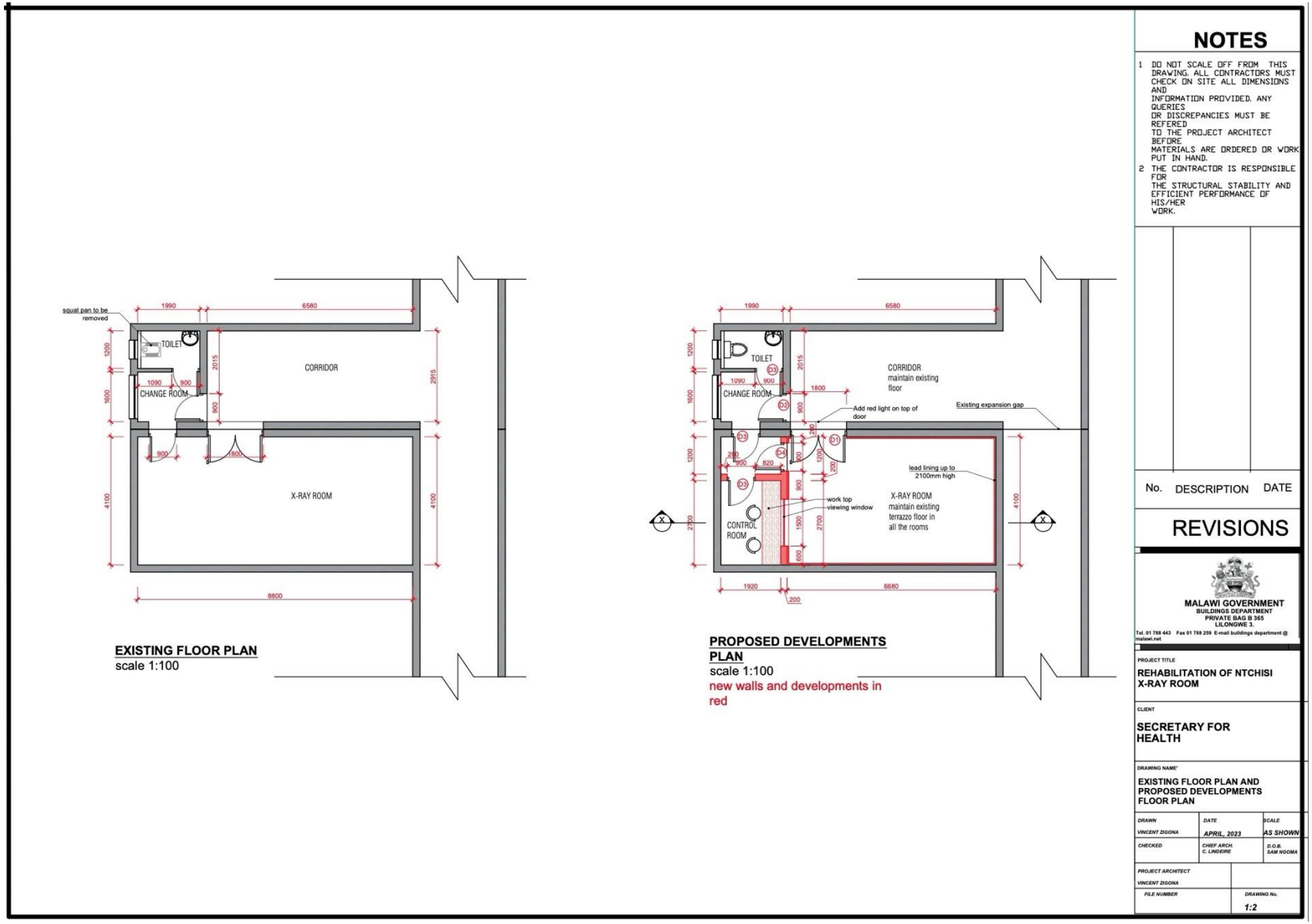


Figure 2-1: Existing and Proposed floor

2.1.2 Description of the Hospital Incinerator

A medical waste incinerator is a crucial component of healthcare waste management systems, designed to safely and efficiently dispose of hazardous medical waste generated by hospitals, clinics, and other healthcare facilities. Engineered to meet stringent environmental and safety standards, these incinerators are pivotal in mitigating public health risks associated with improper medical waste disposal. Powered by diesel fuel, these incinerators utilise high temperatures to completely destroy pathogens, infectious agents, and other hazardous substances present in medical waste, safeguarding the health and well-being of healthcare workers and the community.

At the time of preparing this ESMP, details of the Medical Waste Incinerator were not available and specific designs of the building to have the incinerator were unavailable. Considering that the installation and operation of medical waste incinerators follow prescribed standards, the ESMP utilised the WHO Safe Management of Wastes from Healthcare Activities guidelines. Based on WHO recommendations, the following are the key design considerations of the incinerator:

i. *Load Capacity:* The incinerator's load capacity has to be designed to accommodate the estimated volume of medical waste generated by the healthcare facility. WHO guidelines suggest that incinerators for healthcare waste should have a minimum capacity of 50-100 kg per hour to effectively handle the waste generated by hospitals and clinics. The incinerator is expected to have a capacity of 50 kg per hour.
ii. *Energy Source:* The incinerator will be powered by diesel fuel, commonly used in Malawi. Diesel fuel is preferred to electricity because it is reliable and more convenient, as the Ntchisi can have times of extensive blackouts. Diesel engines provide the necessary heat to reach and maintain the high temperatures required for the complete combustion of medical waste.
iii. *Combustion Chamber:* The incinerator will feature a combustion chamber where medical waste is loaded for disposal. The chamber will be lined with refractory materials to withstand high temperatures and ensure efficient combustion. WHO guidelines recommend a minimum operating temperature of 850-1100°C to ensure complete destruction of pathogens and hazardous substances in the waste.
iv. *Air Pollution Control Devices:* To mitigate air pollution emissions, the incinerator has to be equipped with air pollution control devices such as scrubbers, filters, and particulate matter control systems. These devices remove harmful pollutants, including dioxins, furans, and heavy metals, from the incinerator's exhaust gases before they are released into the atmosphere.
v. *Required Space:* The incinerator installation requires a designated area within the healthcare facility. WHO guidelines recommend that the incinerator be located in a well-ventilated area away from patient care areas and residential buildings. The incinerator should also have a stable foundation with adequate space for safe operation and maintenance.
vi. *Operational Safety Features:* Safety features such as temperature monitoring systems, flame detection sensors, and automatic shut-off mechanisms must be incorporated into the incinerator to prevent accidents and ensure safe operation. Additionally, the incinerator should be equipped with fire suppression systems and emergency backup power sources to minimise risks during operation.
vii. *Associated Incinerator Facilities:* The description provided above

As already alluded to, the medical waste incinerator will be installed in a standalone building that is yet to be constructed 70 meters from the main hospital. Several associated facilities and infrastructure are necessary to ensure safe and efficient operation:

i. *Access Corridor*: A dedicated and paved access corridor connecting the incinerator building to the main hospital is essential for transporting medical waste to the facility. The corridor will be two meters wide and paved with concrete to accommodate waste disposal personnel with easy access.
ii. *Waste Collection Area*: Adjacent to the incinerator building, a designated waste collection area is required for temporarily storing medical waste before incineration. This area should be equipped with appropriate waste bins or containers to segregate different types of waste and prevent cross-contamination.
iii. *Storage Facility*: A secure storage facility is needed to store spare parts, maintenance equipment, and supplies for the incinerator. This facility should be located within the incinerator building to ensure easy access for maintenance staff.
iv. *Utility Infrastructure*: Adequate lighting, water supply, and drainage infrastructure should be installed to support the incinerator's operation. This includes electrical connections for powering the lights, water supply for cooling and cleaning purposes, and drainage systems to manage wastewater and runoff.
v. *Safety Features*: Safety features such as fire suppression systems, emergency lighting, and first aid stations should be installed within the incinerator building to mitigate potential hazards and ensure personnel safety.
vi. *Fencing and Security:* Perimeter fencing and security measures should be implemented to restrict access to the incinerator facility and prevent unauthorised entry. This helps safeguard the incinerator equipment and ensures safety and security protocol compliance.

2.2 Project Cost, and Duration and Estimated Number of Employees

The project costs are pending identification following the completion of detailed designs. It is anticipated to encompass several stages, including construction, operation and maintenance, and decommissioning. Throughout the construction phase, employment opportunities will be provided. Upon completion, during the operation phase, the project aims to benefit over 20 individuals from the catchment area. Gender representation will be prioritised, striving for at least 40% representation of females wherever feasible.

2.3 Main Activities of the Project

The project implementation cycle comprises planning and design, construction, operation, and decommissioning phases. The following sections highlight the main activities carried out during these phases.

2.3.1 Planning and design phase

During the planning and design phase for the rehabilitation of the X-ray room and installation of a medical waste incinerator at Ntchisi District Hospital, several key activities will be undertaken to ensure the successful implementation of these essential healthcare infrastructure projects. This phase will involve a series of key activities to assess needs, evaluate site conditions, develop

technical designs, ensure regulatory compliance, and engage stakeholders to lay the groundwork for effective project execution.

During this phase, one of the initial activities was the needs assessment, which involved consulting with hospital administrators and healthcare professionals to identify specific requirements and objectives for the rehabilitation of the X-ray room and the installation of the medical waste incinerator. This process helped define the project's scope and priorities, ensuring that it aligns with the hospital's goals and objectives for improving healthcare delivery and waste management practices. Following the needs assessment, a thorough site survey and evaluation were conducted to assess the hospital's existing infrastructure, utilities, and environmental conditions. Based on the findings of the site survey and needs assessment, detailed technical designs and specifications will be developed to rehabilitate the X-ray room and install the medical waste incinerator. This will involve determining the X-ray room's layout, dimensions, and structural requirements and specifying the incinerator's size, capacity, and operational features.

Throughout the planning and design phase, regulatory compliance will be a paramount consideration. Project planners will work closely with local authorities and regulatory agencies to obtain necessary permits and approvals for the rehabilitation and installation works. This will involve securing environmental permits, building permits, and other regulatory clearances to ensure the project meets legal requirements and standards.

2.3.2 Construction phase

During the construction phase of rehabilitating the existing X-ray room and installing a medical waste incinerator at Ntchisi District Hospital, several activities will be undertaken to ensure the successful completion of the project. Here's a description of the key activities:

2.3.2.1 Site Preparation for Construction of Incinerator House and Associated Facilities

During the site preparation phase, meticulous efforts are undertaken to prepare the construction site for installing the medical waste incinerator and associated facilities at Ntchisi District Hospital. The following activities will be done as part of site preparation:

1) *Site Clearing and Preparation*
   - Clearing the designated area for the standalone building and incinerator installation, which currently consists of idle land covered with grass.
   - Removal of grass and vegetation to create a clean and level surface conducive to building construction and equipment installation. The site has no trees and as such no tree will be cut down.
2) *Utility Assessment and Relocation*
   - Assessment of existing utilities, notably moving of the two-phase electricity power line traversing the construction site.
   - Coordination with utility providers, specifically ESCOM, to relocate the power line, ensuring safety and unimpeded access for construction activities.
3) *Soil Stabilization and Drainage*
   - Implement soil stabilisation measures to fortify the stability and integrity of the construction site and prevent soil erosion.

- Establish adequate drainage systems to manage surface water runoff effectively, thereby averting water accumulation during construction and incinerator operation.

2.3.2.2 Construction of Standalone Building for the Incinerator

Constructing the standalone building to house the new medical waste incinerator and associated facilities, such as storage areas, ventilation systems, and administrative offices. The construction will follow architectural and engineering plans to ensure the building meets structural and safety requirements, including proper ventilation and fire safety measures. The main activities to be executed on the site during building work are as follows:

- *Foundation excavation*—To construct a brick-and-mortar building, foundation excavation will begin with site preparation and marking the layout. Hand tools will be employed to excavate to a depth of 1.5 meters, adhering to building requirements. Concrete footings will then be installed to distribute the building's weight evenly. After the concrete foundation is poured and cured, waterproofing and drainage systems will be implemented. The final step will involve backfilling around the foundation with compacted soil to ensure stability and prevent settling, which is crucial for the building's longevity and safety.
- *Concrete Mixing*—Concrete production for constructing a brick-and-mortar building will adhere to high-quality standards, particularly in sourcing materials and preparing the concrete mix. Cement will be obtained from reputable suppliers within Ntchisi District, and fine and coarse aggregates will come from licensed quarries in Lilongwe District that meet rigorous laboratory testing standards. The mixing water, crucial for achieving the correct concrete consistency, will be sourced from the existing Central Region Water Board water mains, which meet the quality standards to achieve maximum concrete strength and durability. Additives such as retarders or plasticisers will be used as the mix design requires to modify the concrete's properties.
- *Material transportation*—Materials (fine and coarse aggregates) from quarries in Lilongwe will be transported by tipper trucks to Ntchisi District Hospital. A ten-tonne truck will be adequate to transport other materials like cement, timber, and reinforcement bars from local suppliers found at Ntchisi Boma or Lilongwe City to the hospital.
- *Material Storage*—Materials like aggregates will be stored in specific areas near construction sites. Cement and reinforcement bars will be stored in special storage rooms. Timber will be used directly in the required areas, so there will be no stockpiling of timber.
- *Masonry, Concrete Works, and Related Activities* - The construction of the building walls, foundations, floors, pavements, and drainage systems, among other components of the project, will involve a lot of masonry work and related activities. General masonry and related activities will include stone shaping, concrete mixing, plastering, slab construction, foundation construction, erection of building walls, and curing of fresh concrete surfaces. These activities are known to be labour-intensive and will be supplemented by lite machinery such as concrete mixers.
- *Steel Structure Works*—Where necessary, the buildings will be reinforced with structural steel for stability. Structural steelworks will involve cutting, welding, and erection.
- *Roofing and sheet metal work*—Roofing activities will include sheet metal cutting, raising roofing materials such as clay roofing tiles and structural steel, and fastening the roofing materials to the roof.

- *Electrical Work*—Electrical work during the construction of the premises will include installing electrical equipment and appliances, including electrical cables, lighting apparatus, power sockets, etc. In addition, other activities involving electricity use, such as welding and metal cutting, will be performed.
- *Plumbing* - Pipework installation for water supply and distribution will occur within all units and associated facilities. Similarly, pipework installation for wastewater and sewer pipes will occur within all units and associated facilities.

2.3.2.3 Rehabilitation of X-ray Room

The rehabilitation of the 36 square meter X-ray room at Ntchisi Hospital, which includes a sanitary room, will involve a series of meticulously planned steps to ensure the facility meets modern medical standards. The process will begin with the demolition and removal phase, where existing structures and elements within the room that are outdated or no longer meet operational requirements will be carefully dismantled. This includes the removal of old X-ray equipment and any outdated infrastructure components. Special attention will be given to properly disposing of demolished materials and hazardous waste, with all actions taken strictly with environmental regulations to avoid potential contamination.

The installation phase will commence following the clearance and preparation of the space. This step will involve procuring and installing cutting-edge digital X-ray equipment, representing a significant upgrade over the old machines. The new digital systems will be more efficient and provide enhanced imaging quality, which is critical for accurate diagnostics. The installation process will include rigorous calibration and testing of the equipment to ensure its functionality and accuracy are optimal before it is used, guaranteeing diagnostic procedures' reliability. The final phase of the rehabilitation process will be the interior finishing and fit-out of the X-ray room and its associated sanitary room. This stage will involve completing the internal setup, including painting, laying new flooring, and installing fixtures and essential equipment. Moreover, the entire process will adhere to stringent infection control standards and cleanliness requirements, paramount in maintaining a sterile environment in healthcare settings. This comprehensive approach will ensure that the X-ray room at the Hospital is aesthetically pleasing and aligned with the best practices in medical facility operations.

2.3.2.4 Construction Material

The primary raw materials for construction are cement hollow blocks (400mm x 200mm x 200mm). Table 2 2 summarises construction materials and equipment for the construction phase.

Table 2-1: Summary of construction material

SN	Raw Material	Estimated Quantity	Source
1	Cement Hollow Blocks	3,500 blocks (400mm x 200mm x 200mm).	Local suppliers
2	Cement	15 tons.	Local suppliers
3	Fine aggregate	25 cubic meters.	Licensed Quarry
4	Coarse Aggregate	20 cubic meters.	Licensed Quarry
5	Steel Bars (Rebar)	2 tons.	Local suppliers
6	Iron Sheets	100 square meters.	Local suppliers
7	Steel Roofing Framework	150 linear meters.	Local suppliers

8	Water	30 cubic meters.	Local suppliers
9	Waterproofing Material	200 square meters.	Local suppliers
10	Paint and Other Finishes	500 litres of paint for internal and external finishes.	Local suppliers

2.3.2.5 Construction Equipment

A summary of construction equipment for the construction phase has been provided in Table 2-2.

Table 2-2: Summary of construction material and equipment

SN	Raw Material	Source	Mode of Delivery
1	Diesel (for the operation of the generator and machinery)	Local approved suppliers	Road truck
2	Construction Water	Existing water sources from Central Region Water Board	Existing water mains
3	Equipment (Tippers, scaffolding materials, light passenger vehicles, Engine generator and hand tools)	Contractor	Road truck

2.3.2.6 Construction Waste Generation and Management

The project is expected to produce different types of waste. Table 2-3 shows the expected type of waste and proposed management measures. For this project, each construction and rehabilitation work is expected to generate non-hazardous waste that can either be recycled, reused or disposed of at the Ntchisi Local Council dumpsite. For liquid waste, the construction and rehabilitation work will utilise the existing septic tank for the construction staff, who are expected not to exceed 20 people when operating at total capacity.

Table 2-3: Main expected type of waste and proposed management measures

Waste type	Source/activity	Estimated quantity	Management Measure
Concrete waste	Brocken cement blocks, demolition of walls	200 Kgs	Reused; or disposal at Ntchisi Local Council dumpsite
Plastics, wood and glass (packaging waste)	Used as packaging materials	2 tonnes	Recycle; or disposal at Ntchisi Local Council dumpsite
Steel Bars (Rebar) Cut-offs	Scraps	10 kgs	Recycle
Human Waste	Toilets facilities	200 litres	Existing Septic Tank
Iron Sheets Offcuts	Offcuts and/or damaged sheets	5 square meters	Recycle

2.3.3 Operation and Maintenance Phase

The operation and maintenance phase of the newly installed hospital facilities is a critical component of the overall project lifecycle. This phase encompasses all necessary activities to ensure that the medical waste mechanical incinerator and the modern digital X-ray machine

operate efficiently, safely, and sustainably over their intended lifespan. The following are detailed operational tasks and maintenance routines that will be put in place to facilitate the smooth running of these essential medical technologies.

i. *Training of Staff*: Personnel responsible for operating the incinerator will be trained in proper medical waste handling and operational procedures. Similarly, radiologists and technicians will be trained on the optimal use of digital X-ray machines.
ii. *Quality Control Tests*: Regular quality control tests are conducted to ensure the X-ray machine produces high-quality images.
iii. *Patient Scheduling and Management*: Patient flow is managed to optimise the use of the X-ray machine and enhance patient experience.
iv. *Proper Segregation of Waste*: Medical waste will be segregated by type at the point of generation to ensure effective disposal.
v. *Regular Inspections*: Routine inspections are conducted to assess the condition of the incinerator.
vi. *Replacement of Parts*: Critical parts such as filters or refractory lining are replaced according to wear and usage.

Chapter Three: Legal Framework

This chapter provides a review of the legal framework relevant to the proposed project and outlines its potential impacts on the project. It also references key legislation. Additionally, the chapter offers an account of all the regulatory licenses and approvals necessary for the proposed project to align with environmentally sound management practices and comply with pertinent existing legislation.

3.1 Relevant Malawi Policies and Legislation

Malawi, committed to the 1992 Rio Declaration's Principle 17, mandates environmental impact assessments (EIA) for activities with significant environmental impacts. The project aligns with the 2017 EMA and various sectoral policies, ensuring sustainable environmental management and responsible resource use..

Piece of Legislation	Description	Relevance to Project Activities
National Environmental Policy (2004)	The policy provides strategies for environmental and social planning, environmental and social impact assessment, environmental and social audits, and environmental and social monitoring, among others. On ESIAs, the objective is to regularly review and administer the guidelines for ESIAs, audits, monitoring, and evaluation so that adverse environmental and social impacts can be eliminated or mitigated and environmental and social benefits enhanced.	Project activities will integrate environmental and social management and protection during project planning and implementation.
Environmental Management Act (2017)	The Act is the main law for environmental protection and sustainable resource use. Section 7 establishes MEPA and its authority over environmental assessments. Section 31provides requirements for MEPA approval for projects needing an ESIA. Sections 99-104 prescribe penalties for ESIA non-compliance, hazardous substance mismanagement, and pollution, including fines of up to fifty million Kwacha and imprisonment of up to fifteen years.	The proposed works will comply with Malawi's 2017 Environment Management Act, ensuring MEPA approval for ESMP, adherence to environmental standards, and avoidance of non-compliance penalties.
National Gender Policy (2015)	The National Gender Policy provides guidelines to reduce gender inequalities, promote participation, and achieve equitable development. Section 1.3 provides guidelines for mainstreaming gender, and section 3.6 promotes the economic development and empowerment of women. Section 3.7 recognizes that GBV, especially violence against women, girls, and vulnerable groups, severely impedes social well-being and poverty reduction.	The proposed project will contribute to addressing GBV by identifying risks and mitigation measures for workers and surrounding communities, sexual exploitation (for those seeking job opportunities), sexual harassment at the workplace, and other GBV related spillover effects of the project.
Gender Equality Act (2015)	The Act in Chapter 25:06 promotes gender equality and equal integration, influences empowerment, dignity, and opportunities for men and women in all functions of society, prohibits and provides redress for sex discrimination, harmful practices, and sexual harassment, provides for public awareness on the promotion of gender equality and connected matters. Section 6(1) of the Act states that a person who commits an act of harassment if he or she engages in any form of unwanted verbal, non-verbal, or physical conduct of a sexual nature in the circumstances would have anticipated that the other person would be offended, humiliated or intimidated, and (2) a person who	The implication of the Act on the proposed project is that sexual harassment must be addressed by contractors holistically, including by instituting the measures prescribed by law.

Piece of Legislation	Description	Relevance to Project Activities
	sexually harasses another in terms of the preceding subsection is liable to a fine and imprisonment specified under subsection (2).	
National Water Policy (2005)	Section 1.3 of the National Water Policy explains that the policy provides an enabling framework for integrated water resources management in Malawi. Section 3.4.9 stresses that Pollution control of water resources shall adopt the 'Polluter–Pays' principle to ensure water user's responsibility. Section 5 points out that environmental degradation has negatively affected surface and groundwater quality, among other factors. Section 5.2.2 - Ensuring and promoting proper management and disposal of wastes.	The project activities have the potential to negatively affect the water resources of the rivers in the project area. It is therefore recommended that the implementation of the project's activities should minimize pollution of the public water, promoting public health and hygiene and environmental sustainability.
National Sanitation Policy (2008)	The National Sanitation Policy provides a vehicle to transform Malawi's hygiene and sanitation situation. Section 3.1.1 promotes the improvement of hygiene, sanitation, and waste recycling in the country.	The proposed project will ensure that liquid and solid waste management encourages waste reduction, recycling, and reuse before final disposal, complying with the policy's provisions.
National HIV and AIDS Policy (2005)	The policy aims to prevent HIV infections, reduce vulnerability, improve treatment and support for those living with HIV/AIDS, and mitigate its socio-economic impact. Chapter 7 addresses HIV/AIDS in the workplace, highlighting issues like absenteeism, low productivity, and discrimination.	The proposed project will implement an HIV/AIDS policy and support program, ensuring no pre-employment HIV testing or discrimination based on HIV status. Employees will not be forced to disclose their HIV status, and any voluntary disclosures will remain confidential.
National Equalization of Opportunities for Persons with Disabilities Policy (2006)	The Policy promotes the rights of people with disabilities and integrates them to enable them to play a full and participatory role in society. Section 2, subsections 2.3 and 2.4.8 of the policy state that people with disabilities are most affected by poor infrastructure, such as buildings not designed to accommodate or meet their special needs. Similarly, Subsection 2.45 of the policy states that people with disabilities have restricted employment opportunities, mainly due to discrimination, inadequate education, job experience, and confidence.	The policy on the proposed project implies that the contractor will be required to provide job opportunities to people with disabilities to ensure that they are also economically empowered.
Disability Act (2013)	This act is a significant step towards ensuring equal opportunities and rights for persons with disabilities. Promoting policies and legislation that aim to equalise opportunities, protect rights, and fully integrate persons with disabilities into all aspects of life recognises their inherent dignity and well-being. Sections 9 and 13 of the acts are particularly commendable, as they prohibit discrimination in accessing premises, provision of services, and employment opportunities based on disability.	The project will ensure that buildings, facilities, and infrastructure are accessible to all persons with disabilities. and promote equal employment opportunities for persons with disabilities.
Public Health Act (1948)	The Public Health Act of 1948 governs health-related issues, including environmental and occupational health and solid waste management. Section 59 prohibits nuisances in workplaces, such as unclean conditions, offensive odours, poor ventilation, and inadequate lighting, which endanger employee health. It also addresses the need	The proposed projects must ensure suitable toilet facilities for all genders, manage stormwater effectively and prevent nuisances to maintain public health and safety. Compliance with these provisions is essential for the project's success.

Piece of Legislation	Description	Relevance to Project Activities
	for sanitary latrines and proper wastewater discharge. Section 88 mandates separate toilets for males and females in public buildings.	
Occupation Safety, Health, and Welfare Act (1997)	The Act regulates employment conditions for safety, health, and welfare in workplaces in Malawi. It mandates workplace registration, inspection of plant and machinery, and accident prevention. Part II requires workplaces to be registered with the director maintaining a register. Part III outlines employer duties, including providing safe work systems, risk-free handling of substances, and adequate employee training and supervision.	Safety measures, particularly shielding and limiting radiation exposure, will be prioritised. Personal protective equipment will be used supplementally or in emergencies. The hospital must implement all ESMP safety measures.
Environment Management (Waste Management and Sanitation) Regulations (2008)	The regulations, under the Environment Management Act, expand on the 1948 Public Health Act. Hazardous waste is identified by categories in the Seventh Schedule and characteristics in the Eighth Schedule, such as corrosiveness and flammability. Section 8 mandates waste generators to safely store general waste to prevent health hazards.	Bwaila Hospital must manage all waste during rehabilitation, ensuring compliance with these regulations for safe storage, handling, and disposal to protect public health and the environment.
Public Health Corona Virus Disease of 2019 (COVID-19) (Prevention, Containment and Management) Rules (2020)	Public Health rules mandate both employers and employees to implement general preventive measures, such as self-quarantine for at-risk individuals, covering mouth and nose when coughing or sneezing, avoiding touching the face, eating thoroughly cooked food, and avoiding handshakes and close contact. Employers must form a team to implement these guidelines and disseminate them to all employees. Employees must cooperate and report non-compliance.	The Ministry of Labour will inspect workplaces for adherence. The developer of the two proposed projects must ensure COVID-19 guidelines are implemented and followed by both employers and employees.
Child Care, Protection and Justice (Amendment) Act (2010)	The Act in Part II, division 6 emphasizes the protection of children from undesirable practices. The undesirable practices are outlined in sections 79 and 80. Section 79 of the Act protects any child from child trafficking. Section 80 protects a child from harmful cultural practices.	The implication of the Act on the proposed project is that plans and strategies must be in place to guard against child trafficking, including through recruitment (child labor).
Penal Code, Chapter 7:01	Section 138 (1) of the Penal Code punishes the defilement of girls under sixteen years of age (punishable with life imprisonment). Sexual abuse and exploitation of children is a common practice in construction in sites.	The ESMP has articulated how project will guard against the perpetuation of the crime by project workers.

3.2 World Bank Environmental and Social Framework

The World Bank Environmental and Social Framework sets out the World Bank's commitment to sustainable development through a Bank Policy and a set of Environmental and Social Standards designed to support Borrowers' projects to end extreme poverty and promote shared prosperity. The Environmental and Social Standards set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the Bank through Investment Project Financing. The Bank believes that the application of these standards, by focusing on the identification and management of environmental and social risks, will support Borrowers in their goal to reduce poverty and increase prosperity in

a sustainable manner for the benefit of the environment and their citizens. The Environmental and Social Standards that apply to the project are given in Table 3-1.

Table 3-1: Relevance of WB Environmental and Social Standards to the project

Environmental & Social Standards	**Main requirements and conducted activities to meet them**
ESS 1 - Assessment and Management of Environmental and Social Risks and Impacts	ESS1 sets out the Client's responsibilities for assessing, managing, and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through Investment Project Financing, to achieve environmental and social outcomes consistent with the Environmental and Social Standards (ESSs). The objective of the standard is to identify, assess, evaluate, and manage environment and social risks and impacts in a manner consistent with the ESF. Adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities *The proposed work has identified E&S risks and impacts based on consultations with health facility stakeholders. This ESMP has also been prepared in line with the standard.*
ESS 2 – Labour and Working Conditions	ESS2 recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions. ESS2 applies to project workers, including fulltime, part-time, temporary, seasonal, and migrant workers. *The project has a Labour Management Plan that guides implementation of its activities and this will apply to this sub-project. This ESMP has also identified impacts related to labour and working conditions and their mitigation measures are also provided.*
ESS 3 – Recourse and Efficiency, Pollution Prevention and Management	ESS3 Promote the sustainable use of resources, including energy, water, and raw materials. Avoid or minimise adverse impacts on human health and the environment caused by pollution from project activities. Avoid or minimise project-related emissions of short and long-lived climate pollutants. Avoid or minimise generation of hazardous and non-hazardous waste. Minimise and manage the risks and impacts associated with pesticide use. Requires technically and financially feasible measures to improve efficient consumption of energy, water, and raw materials, and introduces specific requirements for water efficiency where a project has high water demand. *The MCERHSP project has prepared a Construction Manual for construction workers that will guide them in environmentally friendly construction methods that will use cement blocks but also promote efficient energy and water usage and management during construction.*
ESS 4 – Community Health and Safety	ESS4 addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Borrowers to avoid or minimize such risks and impacts, with particular attention to people who, because of their circumstances, may be vulnerable. *The construction works under the MCERHSP project will take place in Hospitals where there will be patients that need special protection from possible accidents. The project has ensured that the ESMP documents has provided mitigation measures to ensure community safety.*

Environmental & Social Standards	Main requirements and conducted activities to meet them
ESS 10 – Stakeholder Engagement and Information Disclosure	This ESS recognizes the importance of open and transparent engagement between the borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. *The MCERHSP project has been engaging with stakeholders and will continue to do so throughout the project life cycle. This ESMP also has a Grievance Redress Mechanism that is to be used at each project site and this GRM is in line with provisions of the projects Stakeholder Engagement Plan (SEP).*

Chapter Four: Environmental and Social Setting

This chapter provides an overview of the existing environment for the project, which is related to the proposed areas' physical, biological, socio-economic, and structural aspects. It also provides basic baseline information in the project area. The information provides a basis for the changes that might come due to the implementation of the project or future environmental changes that are likely to occur. It also forms a part of baseline information within the project area that might be used for future planning.

4.1 Physical Environment

4.1.1 Topography

The proposed site for the incinerator is situated along the Kasungu – Lilongwe plain, characterised by a gentle slope on the western side and undulating hills in the southern position. The terrain becomes hilly toward the eastern and northern parts, while the northern, southern, and western areas are generally flat and rolling. The site features slopes ranging from 1 to 2 degrees and sits between 1,300 to 1,700 meters above sea level.

4.1.2 Geology

According to the Ntchisi District Socio-Economic Profile (2017), the predominant geological formations in the hospital's project area are semi-pelitic rocks, graphite, granitoid and pegmatoid gneiss, and psammites quartzites and quartzofeldspathic granulites. These rocks contribute to the overall geological landscape and influence factors such as soil composition, groundwater flow, and land stability within the hospital site.

4.1.3 Soils

The proposed incinerator site was observed to have sandy loam soils, providing a sturdy foundation for supporting the proposed infrastructure. The good soils, which are well-drained and fertile nature, prevent waterlogging and support construction activities and other adverse conditions over time.

4.1.4 Land use

The proposed project's primary land use is a hospital facility, which includes hospital buildings, emergency services areas, parking lots, support services areas, educational and research facilities, accessibility features, and security infrastructure. These elements are strategically planned to ensure efficient patient care, safety, and sustainability.

4.1.5 Climatic Conditions

Local climatic conditions are crucial in operating a medical waste mechanical incinerator. This section highlights essential climatic factors such as temperature, humidity, wind speed and direction, and rainfall, pivotal for the incinerator's performance. Due to the unavailability of specific weather data at Ntchisi District Hospital, district-wide climatic data was utilised. The district's geographical proximity and topographical uniformity justify this approach, as similar meteorological conditions are likely prevalent across the area, making district-level data a reliable proxy for the site. Table 4-1 provides average weather data from World Weather Online (https://www.worldweatheronline.com/ntchisi-weather-averages/ntchisi/mw.aspx) from 2010 to 2023.

Table 4-1: Average weather data for Ntchisi District

Month	Temperature	Rainfall (MM)	Relative Humidity (%)	Weed Speed (Kph)
January	24	250	84	8
February	24	200	85	8
March	23	160	83	9
April	20	50	76	10
May	18	9	73	10
June	16	2	67	11
July	15	1	65	11
August	16	1	59	12
September	17	1	53	13
October	21	3	54	14
November	22	60	57	12
December	21	200	84	10

4.1.5.1 Temperature

The mean annual temperature varies from 22 degrees Celsius in low-altitude areas to 18 degrees Celsius in high-altitude areas. However, temperatures can occasionally soar as high as 36 degrees Celsius at the lower altitudes during the months of October and November, as shown in Table 4-1.

4.1.5.2 Rainfall

Table 4-1 shows the rainfall trend for the district typically follows a seasonal pattern, with most of the precipitation occurring during the rainy season, typically from November or December to March or April. During this period, the district receives the bulk of its annual rainfall, ranging from approximately 900mm to 1,500mm. However, like many regions, rainfall patterns can vary from year to year due to factors such as climate variability and local weather systems. The hospital experiences its rainy season from November/December to March/April. Annual rainfall levels range from 900mm to 1,500mm, supporting agricultural activities and contributing to the region's ecological diversity.

4.1.5.3 Relative Humidity

As shown in Table 4-1, the relative humidity ranges from around 60% to 80% throughout the year. However, it can vary based on seasonal and weather conditions. During the rainy season, which generally occurs from November to April, relative humidity tends to be higher due to increased moisture from rainfall. Conversely, during the dry season, which spans from May to October, relative humidity may decrease somewhat as precipitation becomes less frequent. Overall, Ntchisi district experiences a humid subtropical climate year-round with relatively high humidity levels.

4.1.5.4 Wind Speed

Wind patterns are primarily influenced by local topography and broader atmospheric conditions. Prevailing winds typically come from the southeast due to factors like nearby mountains or coastlines. However, occasional gusts from other directions occur due to temporary weather systems or local terrain features. Wind speeds range from 10 to 15 kph (6 to 9 miles per hour), contributing to climate dynamics affecting temperature, humidity, and airborne particles. Understanding these patterns is crucial for construction works.

4.2 Vegetation

The proposed site for the incinerator is currently undeveloped and surrounded by existing hospital structures. It is overgrown with grass and has no trees that will be cut down. However, on the east side of the site, there are scattered trees.

4.3 Facility Management and Health Safety Protocols

4.3.1 Water Supply

The Central Region Water Board provides potable water to the facility and is noted for its highly reliable water supply. The proposed project will utilise the same board water source throughout the construction and operational phases.

4.3.2 Sanitation Facilities

Ntchisi District Hospital has 208 staff and is comprised of approximately nine wards. Each ward has four toilets, two designated for females and two for males. Additionally, the hospital's departmental offices include toilets available for staff use. Unfortunately, most of the pit latrines are in poor condition. The X-ray room has one toilet and a washroom dedicated to the staff.

4.3.3 Hygiene Practices

Ntchisi District Hospital is equipped with handwashing stations in each ward, each stocked with hand sanitisers, to promote awareness about hygiene practices throughout the premises. Management conducts training sessions for every new employee, although according to protocol, these training sessions should ideally occur annually, contingent upon the availability of funds. The most recent training session was conducted in November 2023. However, only about 50% of staff adhere to these hygiene practices.

4.3.4 Infections Prevention and Control

Ntchisi District Hospital employs chlorine-soapy water for cleaning and decontamination purposes within its wards and other hospital areas. The wards undergo cleaning procedures twice a day, both during the day and night shifts, ensuring a high standard of cleanliness and hygiene. Additionally, the facility is equipped with infrared TB detectors installed in various wards, including the X-ray room, to aid in the early identification of TB cases. This proactive approach helps reduce the transmission of TB within the hospital setting, where transmission can occur among patients and healthcare workers. The detectors promptly identify TB cases, allowing for the implementation of infection control measures to prevent further transmission within the facility. Moreover, the X-ray room is furnished with personal protective equipment for personnel, and a shield is available to minimise radiation exposure to personnel and patients near the X-ray equipment (Figure 4-1). Thus, prioritising safety and infection control measures.

Figure 4-1: Protective equipment in the X-ray room

4.3.5 Waste Management

Waste from various departments and wards is collected and disposed of at the hospital accordingly. Infectious and non-infectious waste undergo proper disposal by being thrown into the batch burner (Figure 4-2) twice to thrice a week. The X-ray room also generates waste, such as cartons, which are managed accordingly. Non-infectious or hazardous waste is disposed of in designated rubbish bins. When these bins become full, waste collectors empty them and dispose of them at a dump site. Regarding water waste management, the water used for mopping is directed into sluices in each department. These sluices are connected to soakaways around the facility, ensuring proper water waste disposal.

Figure 4-2: Batch-burner at Ntchisi Hospital

4.3.6 Health Facility Capacity

Ntchisi District Hospital is a cornerstone in delivering primary and secondary healthcare services to the community. The hospital boasts essential infrastructure comprising wards for inpatient care, outpatient departments, laboratory facilities, pharmacy services, and operating theatres tailored for minor surgeries. Offering a wide array of medical services, Ntchisi District Hospital provides outpatient consultations, inpatient care, maternal and child health services, emergency care, laboratory services, pharmacy services, HIV and AIDS management, and immunisation programs.

4.3.7 Healthy Status and HIV &AIDS Prevalence at the Facility

The project site is situated within Ntchisi District Hospital, serving over 352000 individuals residing in the surrounding areas, including Traditional Authority Kalumo. As per reports from Ntchisi District Hospital, the most prevalent diseases observed over the past six months include Malaria (7792 cases), diarrhoea (2708 cases), and respiratory diseases such as coughing and flu (493 cases). These Out-Patient Department (OPD) cases for the past six months are illustrated in Figure 4-3. Remarkably, there has been encouraging progress in combating HIV and AIDS within Ntchisi District. According to the Malawi HIV subnational estimates using the Naomi model of 2022, the prevalence rate stood at three percent. However, through the collaborative efforts of key stakeholders in the district, this rate has been successfully reduced to 1.8 percent.

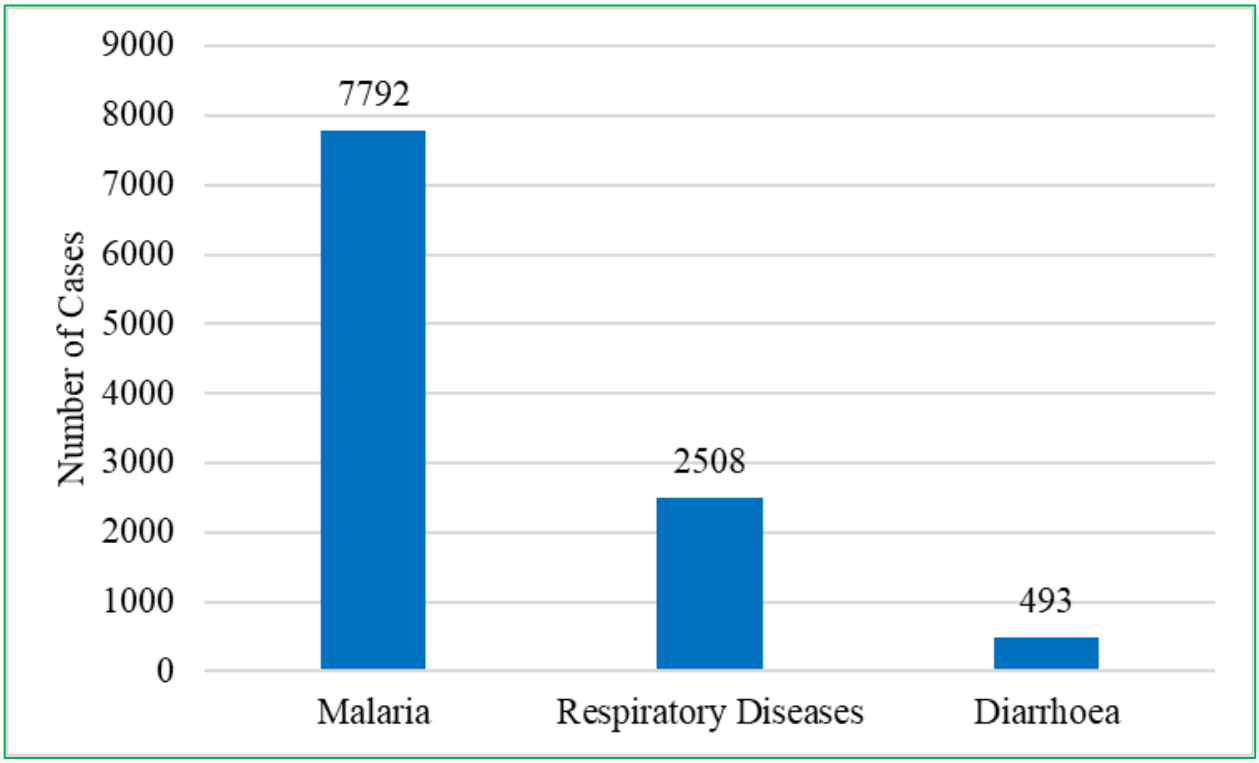


Figure 4-3: Out-Patient Department cases for the past 6 months

4.3.8 Communication and Transport Systems

Telekom Networks Malawi Limited (TNM) and Airtel are the main providers of mobile phone services in the project area, resulting in widespread cellular network coverage (Socio-Economic Profiles: 2017-2022). During site visits and interviews, it was established that network connectivity for both providers is excellent. Additionally, transportation is convenient as the site is only 195 meters away from the M1 road.

4.3.9 Security

Security in Ntchisi is provided by both public and private institutions. The hospital's crime rate is low, with petty theft being the most common type.

Chapter Five: Assessment of Environmental and Social Impacts

This chapter provides a description of expected occurrence of beneficial and adverse impacts, both direct and indirect, for each feature of the environment in the project site. There is a highlight of possible cumulative and synergistic effects. The section includes a discussion of the analytical methods used to forecast impact of how environmental and social data was gathered, and of the methods and criteria used to judge impact severity and significance. The chapter concludes with a summary of those impacts considered to be of greatest significance and measures proposed to avoid, reduce and/or manage them. It also discusses the distribution of adverse and beneficial impacts locally and regionally.

5.1 Impact identification

Identifying impacts considers both positive and negative impacts resulting from the interaction between project-related activities and valued environmental components (VECs). VECs can be physical, biological, social, economic, or cultural. The identified potential environmental impacts are based on the interaction between the project-related activities and selected VECs. VECs were selected based on the existing project environment (environmental baseline conditions), opinions/views obtained from stakeholder consultations, and the consultant's professional judgment. For this project, the selected VECs include atmospheric environment, acoustic environment, wetlands, a terrestrial environment, public health and safety, labour and economy, and public services infrastructure/utilities. The potential interactions between the Project Related Activities and the Selected VECs for each project implementation phase are illustrated in Table 5-1.

Table 5-1: Potential Interactions of the Project with VECs.

Valued Environmental Component	**Project Phase**						
	Mobilisation	***Construction***				***Demobi-lisation***	***Operation***
		Earth-Works	*Super-Structure*	*Structural Framing*	*Fit-Out*		
Air Quality	-	x	x	-	-	-	x
Noise & Vibration	-	x	x	x	x	-	-
Water Resources	-	-	-	-	-	-	-
Terrestrial Biodiversity	-	x	-	-	-	-	-
Public Health & Safety	-	x	x	x	x	x	x
Labour & Economic Conditions	-	x	x	x	x	x	x
Service Infrastructure & Utilities	-	x	x	-	-	-	-
Soil and Land Capability	-	x	-	-	-	-	-
Visual Impact	-	x	x	x	x	-	-
Waste Management	-	x	x	x	x	x	x
Social Dynamics and Community Well-being	-	-	-	-	-	-	-
Climate Change and Greenhouse Gas Emissions	-	-	-	-	-	-	x
Hazardous Materials and Contamination Risks	-	-	x	-	x	-	x
Key							
No Substantial Interaction	-						
Possible Interaction	x						

5.2 Significance Ranking of the Impacts

The key objective of implementing this methodology was to identify any potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues or aspects were reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considered direct[1], indirect[2], and secondary[3], as well as cumulative impacts[4]. A standard risk assessment methodology was used to rank the identified environmental impacts pre- and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering criteria[5] presented in Table 5-2.

Table 5-2: Impact Assessment Criteria and Scoring System

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
IMPACT SIGNIFICANCE RATING					
Total Score	**4 to 15**	**16 to 30**	**31 to 60**	**61 to 80**	**81 to 100**
Environmental Significance Rating (Negative (-))	**Very low**	**Low**	**Moderate**	**High**	**Very High**

[1] Impacts that arise directly from activities that form an integral part of the Project.

[2] Impacts that arise indirectly from activities not explicitly forming part of the Project.

[3] Secondary or induced impacts caused by a change in the Project environment.

[4] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

[5] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Environmental Significance Rating (Positive (+))	Very low	Low	Moderate	High	Very High

5.3 Impact Significance Rating for the Identified Impacts

Annexe 1 presents the assessed potential environmental and social impacts and their significance rankings. The impact significance without mitigation measures is assessed with the design controls. The residual impact remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during project implementation to verify that actual impacts are the same as predicted in this report.

5.4 Description of Identified Impacts

This section outlines the project's construction phase's potential positive and negative environmental and social impacts. The construction phase has been subdivided into specific activities to track the specific impacts. The impacts are organised according to the stages of the project life cycle, specifically construction and operation.

5.4.1 Anticipated Positive Impacts

The positive impacts of the proposed project are described in the subsections below.

5.4.1.1 Improved Healthcare Services

The rehabilitation of the x-ray room significantly enhances the hospital's diagnostic capabilities. With upgraded equipment and facilities, medical staff can perform more accurate and timely medical imaging, which is crucial for diagnosing various conditions. This improvement leads to better patient outcomes as doctors can make more informed decisions about treatment plans. Furthermore, having a state-of-the-art x-ray room reduces the need for patients to travel to other facilities for imaging services, ensuring quicker access to necessary medical care.

5.4.1.2 Enhanced Waste Management and Environmental Protection

The installation of a healthcare waste mechanical incinerator brings substantial benefits in terms of waste management and environmental protection. By ensuring the safe and efficient disposal of medical waste, the risk of infection within the hospital is significantly reduced. Proper incineration of hazardous materials prevents the release of harmful substances into the environment, thereby protecting soil, water, and air quality. This upgrade also enhances the overall operational efficiency of the hospital, as modern waste management systems streamline processes and reduce the burden on staff. In turn, this allows the hospital to focus more resources on patient care, improving the quality of healthcare services provided.

5.4.1.3 Creation of job opportunities

During the construction phase, the contractor will employ construction staff, and prepare relevant environmental and social safeguard documents. The impact is short-term as it will last for less than 90 days during the construction phase but will also involve at least twenty people. Hence the impact is of low significance.

5.4.1.4 Improved project compliance to environmental and social legislations

During the mobilisation phase, the project will involve preparing related environmental and social instruments that will be used for the project's lifespan. These documents could include a Contractors-ESMP and other related documents. The impact is expected to be of high significance as it will be used for the entirety of the project.

5.4.2 Anticipated Negative Impacts

5.4.2.1 Disruption of Healthcare Services

The rehabilitation of the X-ray room in a functioning hospital can lead to significant disturbances in the provision of healthcare services. During the construction period, the X-ray room will be out of service, potentially delaying diagnostic procedures and forcing patients to seek imaging services at other facilities. This can lead to longer wait times for diagnosis and treatment, thereby affecting patient outcomes. Additionally, noise, dust, and movement of construction personnel and equipment within the hospital premises can disrupt the normal functioning of other departments, causing inconvenience to both patients and staff. These disruptions may result in reduced efficiency of healthcare delivery, increased stress for healthcare workers, and a possible decline in patient satisfaction. Effective planning and communication are essential to minimize these impacts and ensure that critical services remain available during the rehabilitation period.

5.4.2.2 Temporary Air Quality Deterioration

Dust and particulate matter emissions are anticipated as short-term impacts of the construction activities during the site clearing and excavation for the foundations of the incinerator housing. Site clearing and excavation work generate dust from the disturbance of soil and other materials. This dust can present respiratory problems and cause nuisance issues when redeposited on clothes and surfaces, as well as hinder visibility.

During the construction of the 25 square meter building to house the incinerator, the use of cement and aggregates will further increase dust levels. Additionally, vehicles, electricity generators, and other machinery likely to be used during construction will emit gases and particulate matter, including carbon dioxide (CO_2), sulfur dioxide (SO_2), nitrogen oxides (NOx), and various other hydrocarbons. Despite these emissions, it is considered unlikely that ambient air quality standards will be exceeded.

5.4.2.3 Elevated noise levels from machinery and construction activities.

Construction machinery and equipment will generate noise that may impair the hearing of workers as well as the hospital community. Maximum noises generated can be audible over long distances but are generally of short duration. If maximum noise levels exceed 65dBa at a receptor, or if it is clearly audible with a significant number of instances where the noise level exceeds the prevailing ambient sound level with more than 15dBA, the noise can increase annoyance levels and may ultimately result in noise complaints.

5.4.2.4 Loss of a tree and other ground cover

The impact of the loss of trees is expected to be of low significance as the project sites has one tree on the boundary of that site that is not going to be cut down.

5.4.2.5 Potential for accidents and injuries on-site affecting workers

Workers involved in construction works will be exposed to various occupational risks; the project activities will bring about hazards such as the use of large machinery and equipment, working in proximity to water, working at height, use of electrical tools, trips and falls, use of hazardous and flammable chemicals just to mention a few.

5.4.2.6 Potential for accidents and injuries on-site affecting nearby communities.

The construction works will involve the movement of vehicles carrying various construction materials. Civil and structural construction will increase traffic on the hospital premises as vehicles will be used for various activities. During construction, it is expected that there will be an increase in road traffic on the access roads due to the transportation of goods, and equipment.

5.4.2.7 Infectious Disease Impact (spread of STIs, HIV and AIDS, and Covid 19)

Interactions between workers and the communities and even amongst themselves can increase the likelihood of spreading HIV and AIDS. Therefore, it is important for the Project to put measures in place to control the spread of the disease at the workplace.

The Ministry of Health declared a cholera outbreak in Malawi on March 3, 2022, following laboratory confirmation of a case in the country. Cholera is an acute enteric infection caused by ingesting the bacteria Vibrio cholera present in contaminated water or food. It is mainly linked to insufficient access to safe drinking water and inadequate sanitation. It is an extremely virulent disease that can cause severe acute watery diarrhoea resulting in high morbidity and mortality, and can spread rapidly, depending on the frequency of exposure, the exposed population and the setting.

5.4.2.8 Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) Impact

The construction site has the potential to create environments where gender-based violence (GBV) and sexual exploitation and abuse (SEA) may occur. These impacts can affect both workers and the surrounding community, including hospital staff, patients, and residents. The presence of construction workers, often from different areas and backgrounds, can increase the vulnerability of local women and girls to GBV and SEA. In addition, female workers on the construction site may face sexual harassment, discrimination, or exploitation from their colleagues or supervisors. A hostile work environment can lead to mental health issues, reduced job satisfaction, and decreased productivity among female workers.

5.4.2.9 Generation of solid wastes, spills, and effluent

Various construction activities are expected to generate many types and varying quantities of wastes that will include construction rubbles, spoil from land clearing, packaging materials, vehicles and machine maintenance wastes, remains from form works, general mixed wastes (glass, wooden pallets, plastic, paper, metal scraps and cut-offs, fillings, food items etc.), material residues, hazardous wastes (used oils, discarded fuels and paints, termite proofing material residues, discarded thinners and cleaning agents etc.) and others. Spillages of chemicals, oils, paints, thinners, fuel, and other hazardous fluids, pastes or powders together with affected soils or surfaces should be regarded as hazardous waste. Effluents may include concrete spills, kitchen and bath wastewater cleaning wastewater and others.

Chapter Six: Environmental and Social Management Plan

6.1 Environmental and Social Management Plan

An Environmental and Social Management Plan (ESMP) has been developed to assist in mitigating and managing environmental impacts associated with the construction works. It is noteworthy that key factors and processes may change during the construction works and considerable provisions have been made for dynamism and flexibility of the ESMP. As such, the ESMP will be subject to a regular regime of periodic review during project implementation. **Error! Reference source not found.** forms the core of this ESMP for the construction phase of the proposed project respectively. In general, the table outlines the potential environmental and social risks associated with the project and details all the necessary mitigation measures, their financial costs, as well as the institutions responsible for their implementation.

6.2 Implementation of ESMP

The ESMP shall be implemented to address all activities that have been identified to have potentially significant impacts on the environment during normal operations and upset conditions. The implementation of the project environment and social component will be overseen by different institutional arrangements. The players include the following:

6.2.1 Ministry of Health

The Ministry of Health (MoH) has established a Project Implementation Unit (PIU) to oversee the responsibility of coordinating all matters pertaining to the implementation of the project. The PIU has recruited an environmental and social expert to monitor environmental compliance and the social dimensions of the project. The PIU as such will be responsible for overseeing the monitoring activities conducted by the Construction Supervision Consultant. The main activities of the PIU regarding environmental and social safeguards are:

i. Planning and implementation of ESMP;
ii. Ensuring that the social and environmental protection and mitigation measures in the ESMP are incorporated in the site specific Environmental and Social Action Plans;
iii. Supervision and monitoring of the progress of activities of the contractors;
iv. Provide guidance to construction teams in conducting subsequent monitoring and reporting and in undertaking corrective options;
v. Responsible for modifications to the ESMP when unforeseen changes are observed during implementation;
vi. Ensure submission of periodical environmental and social management and monitoring reports to the World Bank;
vii. Promote improved social and environmental performance through the effective use of management systems; and
viii. External communications with other implementing partners, government ministries and agencies, and non-government organisations on the matters of mutual interest related to environmental management under the project development.

6.2.2 Supervision Consultant

Monitoring activities will be the responsibility of the supervision with the Resident Engineer being the leader. Among other staff, the Resident Engineer will have a qualified Environmental and

Social Expert. Among the immediate and follow-up tasks of the Environmentalist and Social Experts at the Resident Engineers office will include;

i. Development of a monitoring tool or checklist based on the ESMP and guided by the project physical layout;
ii. Develop a monitoring program for the works targeting specific project working sites, material sites, sensitive environment and social areas, etc.
iii. Prepare monthly site meetings to involve the Contractor, Client and Stakeholders.
iv. Monthly reports in addition to continuous communications to the Contractor, Client, the Authorities and
v. the Stakeholders as situations require,
vi. The Resident Engineer will convene monthly meetings for progress reporting by the Contractor and the supervision team.

6.2.3 The Contractor

The Contractor is expected to integrate environmental and social focus during project Management. To ensure effective implementation of the project impacts mitigation measures, therefore, the contractor will mobilise in-house Environment and Social Expert with the following responsibilities;

i. Evaluate and review the ESMP developed from the main ESIA process and internalise the provisions for implementation based on the realities of the project.
ii. Customise the project ESMP and generate a Construction Environmental and Social Management Plan as a tool to guide the implementation and monitoring of indicators. File a copy with the Resident Engineer.
iii. Procure necessary equipment for environment measurements or engage some appropriate expert personnel for the activity in specific environment quality aspects including air quality, noise, water, and soil quality,
iv. Monthly reporting throughout the project period.

Table 6-1: Environmental and Social Management Plan

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
P-1M1	Improved Healthcare Services	Conduct regular training programs for medical staff on the use and maintenance of the upgraded x-ray equipment.	Ongoing during and post-construction	MK2,000,000.00	Number of training sessions conducted; staff competency levels	Quarterly	Hospital Management	Ministry of Health (MoH)
		Organize health awareness campaigns to inform the community about the new diagnostic services available at the hospital.	Monthly during post-construction period .	MK500,000.00	Number of awareness campaigns; community awareness level	Monthly	Hospital Management	MoH
		Conduct regular service of the x-ray machine.	Ongoing; quarterly basis	MK2,000,000.00	Maintenance logs; machine uptime	Quarterly	Hospital Maintenance Team	MoH
P-1M2	Enhanced Waste Management and Environmental Protection	Implement strict protocols for segregating different types of medical waste at the source. Categories include infectious waste, hazardous waste, and general waste, as per WHO guidelines.	Ongoing on monthly basis during post-construction	MK1,000,000.00	Compliance with waste segregation protocols	Monthly	Hospital Waste Management Team	MoH
		Ensure that color-coded bins and clearly labeled containers are used for different types of waste.	Ongoing on monthly basis during post-construction	MK2,000,000.00	Number of bins and containers in use; compliance rate	Monthly	Hospital Waste Management Team	MoH; MEPA
		Train hospital staff on proper waste handling and segregation practices to minimize the risk of infection and contamination.	Ongoing on monthly basis during post-construction	MK1,500,000.00	Number of training sessions; staff compliance	Monthly	Hospital Waste Management Team	MoH; MEPA
		Designate storage areas for hazardous and non-hazardous waste, ensuring	Ongoing on monthly basis	MK2,000,000.00	Designated storage areas;	Monthly	Hospital Management	MoH; MEPA

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
		they are secure and comply with health and safety standards outlined in the World Bank's Environmental, Health, and Safety (EHS) Guidelines.	during post-construction		compliance with standards			
		Ensure that waste storage areas are well-ventilated, protected from the elements, and inaccessible to unauthorized personnel.	Ongoing on monthly basis during post-construction	MK1,500,000.00	Storage area conditions; security measures	Monthly	Hospital Management	MoH; MEPA
		Implement measures to prevent spills and leaks, including secondary containment systems for liquid waste.	Ongoing on monthly basis during post-construction	MK1,000,000.00	Number of spill incidents; containment measures in place	Monthly	Hospital Waste Management Team	MoH; MEPA
		Establish a routine maintenance schedule for the incinerator to ensure it operates efficiently and effectively.	Annually during and post-construction	MK2,000,000.00	Maintenance logs; incinerator efficiency	Annually	Hospital Maintenance Team	MoH; MEPA
P1M1;	Creation of Job Opportunities	Inform local communities of employment opportunities and prioritize their employment.	Before construction phase starts	MK100,000.00	Number of local workers employed	Once	Contractor	District Labour Office (DLO); PIU E&S Expert
		Treat employees in compliance with Malawi Labour Regulations and labor and working conditions as per the project's Labour Management Plan.	Ongoing during construction phase	MK0.00	Compliance with labor regulations	Ongoing	Contractor	DLO; PIU E&S Expert
		Pay the same rates for workers working on similar	Ongoing during construction phase	MK0.00	Pay equity records	Ongoing	Contractor	DLO; PIU E&S Expert

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
		tasks regardless of gender and origin.						
		Have workers sign a code of conduct.	Before employment starts	MK0.00	Number of signed codes of conduct	Once	Contractor	DLO; PIU E&S Expert
		Sensitize workers to a full range of risks related to occupational health and safety, labor rights, public health, community safety, sexual harassment, and GBV.	During induction and ongoing	MK50,000.00	Number of sensitization sessions; worker awareness levels	Ongoing	Contractor	DLO; PIU E&S Expert
		Ensure that 30% of the workforce are women.	Ongoing during construction phase	MK0.00	Workforce gender ratio	Ongoing	Contractor	DLO; PIU E&S Expert
P1M2	Improved project compliance to environmental and social legislations	Develop a contractors ESMP that will include Occupational Health and Safety Plan, Traffic Management Plan, Waste Management Plan among others.	Before construction phase starts	MK5,000,000	Approved C-ESMP	Once	Contractor	PIU E&S Expert
		Solicit views of the public and stakeholders through consultations to ensure that their concerns are considered in the project documents.	Before construction phase starts	MK75,000.00	Number of consultations held; stakeholder feedback incorporated	Once	Project Management Team	Environment District Officer (EDO); PIU E&S Expert
		Undertake community liaison meetings to notify the community of the commencement date, inform them of the grievance mechanism, and labor policy.	Before construction phase starts	MK50,000.00	Number of liaison meetings; community awareness level	Once	Project Management Team	EDO; PIU E&S Expert

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
		Obtain relevant approvals and certificates from authorities, including the Malawi Environment Protection Authority and Ntchisi District Council.	Before construction phase starts	MK2,000,000.00	Number of approvals and certificates obtained	Once	Project Management Team	EDO; PIU E&S Expert
P1M3	Disruption of Healthcare Services	Set up a temporary X-ray facility within the hospital	Before construction phase starts	MK500,000.00	Availability of temporary room	Once	Hospital Management	MoH
		Inform staff, patients, and visitors about the construction schedule and expected disruptions well in advance. Use signage and announcements to keep everyone updated on progress and temporary arrangements.	On-going during rehabilitation and installation phase	MK250,000.00	Availability of temporary room	Ongoing	Hospital Management	MoH
		Designate specific access routes for construction personnel and equipment to minimize interference with hospital operations. Ensure these routes are clearly marked and separate from patient and staff areas.	Before construction phase starts	MK150,000.00	Availability of temporary room	Once	Contractor	Hospital Management
P2-1M1	Temporary Air Quality Deterioration	Sprinkle water during the site clearing and excavation phase regularly, particularly during dry and windy periods, to mitigate dust dispersion.	During site clearing and excavation	MK200,000.00	Frequency of water sprinkling; dust levels	Weekly	Contractor	EDO; PIU E&S Expert
		Transport particulate or powdery construction materials or residues with	Ongoing during transport	MK150,000.00	Compliance with transport protocols	Ongoing	Contractor	EDO; PIU E&S Expert

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
		adequate load cover to prevent/restrain the dispersion of particulate matter.						
		Unload transported powdery materials to drop-height regulation equipment to ensure the lowest drop height possible in these operations.	Ongoing during material handling	MK0.00	Drop-height compliance; dust levels	Ongoing	Contractor	EDO; PIU E&S Expert
		Minimize stockpiling of excavated soils within the construction site by immediate removal and transportation to the dumping site.	Ongoing during excavation	MK150,000.00	Amount of soil stockpiled; compliance with removal schedule	Ongoing	Contractor	EDO; PIU E&S Expert
		Carry out regular maintenance of vehicles and avoid the use of old vehicles and mobile construction equipment which emit black smoke.	Ongoing; monthly maintenance	MK150,000.00	Maintenance logs; vehicle emission levels	Monthly	Contractor	EDO; PIU E&S Expert
P2-1M2	Elevated noise levels from machinery and construction activities	Limit noisy construction activities only to daytime hours.	Ongoing during construction phase	MK0.00	Compliance with work hours; noise level readings	Daily	Contractor	EDO; PIU E&S Expert
		Notify hospital management and staff residential area at least twenty-four hours in advance if particularly noisy activities are anticipated.	As needed during construction phase	MK0.00	Number of notifications sent; community feedback	As needed	Contractor	EDO; PIU E&S Expert

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
		Ensure that noise levels at the hospital do not exceed 55 dB (A) and keep noise levels for workers below 80 dB (A).	Ongoing during construction phase	MK100,000.00	Noise level readings; compliance with standards	Weekly	Contractor	EDO; PIU E&S Expert
		Place stationary noise sources (e.g., the generator) away from sensitive receptors such as wards and staff houses.	During equipment setup	MK100,000.00	Placement compliance; noise level readings	Once	Contractor	EDO; PIU E&S Expert
P2-1M3	Loss of a tree and other ground cover	Confining land clearing to worksite.	During site preparation	MK0.00	Area cleared; compliance with site boundaries	Quarterly	Contractor	EDO; PIU E&S Expert
		Protect the existing tree on the project site's boundary by installing physical barriers to prevent accidental damage during construction activities.	Before and during construction	MK50,000.00	Condition of tree; effectiveness of barriers	Monthly	Contractor	EDO; PIU E&S Expert
P2-1M4	Potential for accidents and injuries on-site affecting workers	Develop and implement an Occupational Health and Safety Plan that aims to avoid, minimize, and mitigate the site-specific risk of workplace accidents.	Before construction phase starts	MK250,000.00	Existence of OH&S plan; compliance with safety protocols	Quarterly	Contractor	DLO; PIU E&S Expert
		Provide OSH orientation training and hazard-specific training.	During induction and ongoing	MK50,000.00	Number of training sessions; worker awareness levels	Monthly	Contractor	DLO; PIU E&S Expert
		Conduct a thorough risk assessment before excavation to identify potential hazards and implement necessary safety measures.	Before excavation starts	MK50,000.00	Risk assessment report; implementation of safety measures	Monthly	Contractor	DLO; PIU E&S Expert

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
		Install barriers and warning signs around the excavation area to prevent unauthorized access and to alert workers to potential hazards.	During excavation	MK150,000.00	Number of barriers and signs; compliance with safety protocols	Monthly	Contractor	DLO; PIU E&S Expert
		Use secure and stable ladders or scaffolding that meet safety standards for working at height.	During construction	MK1,000,000.00	Equipment inspection logs; compliance with safety standards	Monthly	Contractor	DLO; PIU E&S Expert
		Provide personal protective equipment (PPE), including safety harnesses, helmets, and non-slip footwear to all workers working at height.	Before work at height begins	MK1,000,000.00	PPE availability and usage; compliance with safety standards	Monthly	Contractor	DLO; PIU E&S Expert
		Provide PPE, including gloves, work suits, and boots, to all workers handling cement during construction works.	Before construction begins	MK500,000.00	PPE availability and usage; compliance with safety standards	Monthly	Contractor	DLO; PIU E&S Expert
		Carry out regular toolbox talks as specified in the Health and Safety Plan of the project.	Ongoing; weekly	MK50,000.00	Number of toolbox talks; worker attendance	Annually	Contractor	DLO; PIU E&S Expert
		Install first aid kits proportionate to each project site activity.	Before construction begins	MK250,000.00	Availability and accessibility of first aid kits	Once	Contractor	DLO; PIU E&S Expert
		Obtain medical insurance for the workforce.	Before construction begins	MK200,000.00	Number of insured workers	Ongoing	Contractor	DLO; PIU E&S Expert
		Compensate injured workers in line with the Workers' Compensation Act of 2000.	As needed	MK200,000.00	Number of compensation cases handled; compliance with Workers'	Ongoing	Contractor	DLO; PIU E&S Expert

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
					Compensation Act			
P2-1M5	Potential for accidents and injuries on-site affecting nearby communities	Erect safety barriers around the construction site to prevent unauthorized access.	Before construction begins	MK150,000.00	Number of barriers erected; incidence of unauthorized access	Once	Contractor	DLO; PIU E&S Expert
		Schedule construction deliveries and heavy machinery movement during off-peak hours to minimize disruption.	During construction phase	MK0.00	Delivery schedule compliance; community feedback	Ongoing	Contractor	DLO; PIU E&S Expert
		Coordinate with hospital administration to ensure that alternative routes and access points are available during construction.	Before construction begins	MK0.00	Number of coordination meetings; availability of alternative routes	Ongoing	Contractor	DLO; PIU E&S Expert
		Hire transporters whose vehicles have valid Certificate of Fitness (CoF) and drivers with the appropriate driving licence category.	During construction phase	MK0.00	Number of compliant vehicles and drivers	Once	Contractor	DLO; PIU E&S Expert
		Construction vehicles to observe a 20 km/hr speed limit on the hospital campus. Put in place signposts indicating the speed limits on the construction site.	During construction phase	MK50,000.00	Compliance with speed limits; number of signposts	Once	Contractor	DLO; PIU E&S Expert
P2-1M6	Infectious Disease Impact (spread of STIs, HIV	Carry out monthly health education for construction workers in liaison with	Ongoing; monthly	MK150,000.00	Number of health education sessions; worker participation	Once	Contractor	DEHO (DEHO); PIU E&S Expert

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
	and AIDS, and Covid-19)	health personnel using the toolbox talks.						
		Free condoms are to be made available to all (100%) workers by placing them in the workers' toilets to ensure access and confidentiality.	Ongoing	MK100,000.00	Availability and usage of condoms	Once	Contractor	DEHO; PIU E&S Expert
		Sensitize construction workers on Covid-19 prevention including hand washing with soap, use of hand sanitizers, proper use of face masks, and workspace disinfection among others.	Ongoing	MK50,000.00	Number of sensitization sessions; worker compliance	Once	Contractor	DEHO; PIU E&S Expert
		Distribute information, education, and communication (IEC) materials on Covid-19, HIV and AIDS prevention, and cholera.	Ongoing	MK250,000.00	Number of IEC materials distributed; worker awareness	Ongoing	Contractor	DEHO; PIU E&S Expert
		Provide necessary PPE and other materials (e.g. cloth masks, hand sanitizers, hand-washing facilities) to help prevent construction workers from contracting and spreading Covid-19 at the workplace.	Ongoing	MK150,000.00	Availability and usage of PPE; compliance with health protocols	Once	Contractor	DEHO; PIU E&S Expert
P2-1M7	GBV and SEA Impact	Develop an induction program including a code of conduct for all workers which they will be required	Before construction phase starts	MK50,000.00	Existence of induction program; number of	Weekly	Contractor	District Social Welfare Office (DSWO); PIU E&S Expert

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
		to sign prior to starting their work.			signed codes of conduct			
		Ensure a copy of the code of conduct is presented to all construction workers and signed by each of them.	Before construction phase starts	MK50,000.00	Number of signed codes of conduct	Ongoing	Contractor	DSWO; PIU E&S Expert
		Implement a GBV management plan as presented in Annex 4.	During construction phase	MK250,000.00	Existence and implementation of GBV management plan	Ongoing	Contractor	DSWO; PIU E&S Expert
		Provide clear, trusted, and responsive channels for filing GBV/SEA/SH cases to the police or other relevant government authorities.	Ongoing during construction phase	MK150,000.00	Number of reported cases; resolution time	Ongoing	Contractor	DSWO; PIU E&S Expert
		Ensure the availability of an effective Grievance Redress Mechanism (GRM).	Ongoing during construction phase	MK50,000.00	Existence and accessibility of GRM; number of grievances addressed	Monthly	Contractor	DSWO; PIU E&S Expert
P2-1M8	Generation of solid wastes, spills, and effluent	Provide adequate on-site waste receptors such as colour-coded bins or skips for temporary waste storage. Use of rubbish pits should be discouraged.	Before construction phase starts	MK250,000.00	Number and type of waste receptors; compliance with waste management protocols	Daily	Contractor	EDO; PIU E&S Expert
		Arrange with the District Council to identify a suitable site or sites (new or existing) for waste disposal at different project sites if possible within 5 km radius.	Before construction phase starts	MK50,000.00	Number of waste disposal sites identified; compliance with disposal protocols	As needed	Contractor	EDO; PIU E&S Expert

Impact Code	Impact	Mitigation Measures	Implementation Period	Implementation Cost (MWK)	Key Perfomance Indicator	Monitpring Frequency	Implementation Responsibility	Monitoring Responsibility
		Obtain permits to handle, store, transport, and dispose of hazardous waste from the Environmental Authority in advance of construction.	Before construction phase starts	MK50,000.00	Number of permits obtained; compliance with hazardous waste regulations	Weekly	Contractor	EDO; PIU E&S Expert
		Segregate and clearly label hazardous waste and store in suitable drums or containers in secure facilities that have a banded impermeable layer.	During construction phase	MK100,000.00	Segregation and labeling compliance; condition of storage facilities	Once	Contractor	EDO; PIU E&S Expert
		Promote good housekeeping and sanitation practices at each site.	Ongoing	MK50,000.00	Cleanliness and organization of the site; worker compliance	Quarterly	Contractor	EDO; PIU E&S Expert
		Provide spill-control kits and materials (e.g. oil binding agents, sand, shovels, etc.) to drivers and workers, to clean up spills, if necessary.	During construction phase	MK100,000.00	Availability and usage of spill-control kits; number of spill incidents	Monthly	Contractor	EDO; PIU E&S Expert

Annex 1: Project impacts and their ratings

Activity Code	Project Activity	VEC	Potential Environmental & Social Impact	Impact Code	Nature of Impact	Impact Magnitude	Impact Extent	Impact Reversibility	Impact Duration	Probability of Occurrence	Significance	Significane Rating
P1	Mobilisation	Labour & Economic Conditions	Creation of job opportunities.	P1M1	Positive	2	3	3	2	3	30	Low
P1	Mobilisation	Labour & Economic Conditions	Improved project compliance to national environmental and social requirements	P1M2	Positive	3	3	3	2	3	33	Moderate
P2-1	Site clearing & Excavation	Air Quality	Temporary Air Quality Deterioration	P2-1M1	Negative	2	2	1	1	2	12	Very Low
P2-1	Site clearing & Excavation	Noise & Vibration	Elevated noise levels from machinery and construction activities.	P2-1M2	Negative	3	2	1	1	3	21	Low
P2-1	Site clearing & Excavation	Terrestrial Biodiversity	Loss of trees and other ground cover.	P2-1M3	Negative	2	3	1	2	2	16	Low
P2-1	Site clearing & Excavation	Public Health & Safety	Potential for accidents and injuries on-site affecting workers.	P2-1M4	Negative	3	2	3	2	3	30	Low
P2-1	Site clearing & Excavation	Public Health & Safety	Potential for accidents and injuries on-site affecting near-by communities.	P2-1M5	Negative	3	2	3	2	2	20	Low
P2-1	Site clearing & Excavation	Public Health & Safety	Infectious Disease Impact (spread of STIs, HIV and AIDS, and Covid 19)	P2-1M6	Negative	3	3	5	5	2	32	Moderate
P2-1	Site clearing & Excavation	Social Dynamics and Community Well-being	Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) Impact	P2-1M7	Negative	3	3	3	2	3	33	Moderate
P2-1	Site clearing & Excavation	Waste Management	Generation of solid and hazardous waste requiring proper disposal and management.	P2-1M8	Negative	3	2	1	2	3	24	Low
P2-2	Super Structure	Labour & Economic Conditions	Creation of job opportunities.	P2-2M1	Positive	3	3	3	2	3	33	Moderate
P2-2	Super Structure	Air Quality	Temporary Air Quality Deterioration	P2-2M2	Negative	2	2	1	1	2	12	Very Low
P2-2	Super Structure	Noise & Vibration	Elevated noise levels from machinery and construction activities.	P2-2M3	Negative	2	2	1	1	3	18	Low
P2-2	Super Structure	Public Health & Safety	Potential for accidents and injuries on-site affecting workers.	P2-2M4	Negative	3	2	3	2	3	30	Low

Activity Code	Project Activity	VEC	Potential Environmental & Social Impact	Impact Code	Nature of Impact	Impact Magnitude	Impact Extent	Impact Reversibility	Impact Duration	Probability of Occurrence	Significance	Significane Rating
P2-2	Super Structure	Public Health & Safety	Potential for accidents and injuries on-site affecting near-by communities.	P2-2M5	Negative	2	1	3	2	3	24	Low
P2-2	Super Structure	Public Health & Safety	Infectious Disease Impact (spread of STIs, HIV and AIDS, and Covid 19)	P2-2M6	Negative	3	3	5	2	3	39	Moderate
P2-2	Super Structure	Waste Management	Generation of solid and hazardous waste requiring proper disposal and management.	P2-2M8	Negative	3	2	1	2	3	24	Low
P2-2	Super Structure	Social Dynamics and Community Well-being	Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) Impact	P2-2M9	Negative	3	2	1	2	3	24	Low
P2-3	Structural Framing	Labour & Economic Conditions	Creation of job opportunities.	P2-3M1	Positive	3	3	3	2	3	33	Moderate
P2-3	Structural Framing	Noise & Vibration	Elevated noise levels from machinery and construction activities.	P2-3M2	Negative	3	2	1	1	3	21	Low
P2-3	Structural Framing	Public Health & Safety	Potential for accidents and injuries on-site affecting workers.	P2-3M3	Negative	3	2	3	1	3	27	Low
P2-3	Structural Framing	Public Health & Safety	Potential for accidents and injuries on-site affecting near-by communities.	P2-3M4	Negative	2	2	3	2	3	27	Low
P2-3	Structural Framing	Public Health & Safety	Infectious Disease Impact (spread of STIs, HIV and AIDS, and Covid 19)	P2-3M5	Negative	3	3	5	2	3	39	Moderate
P2-3	Structural Framing	Visual Impact	Visual intrusion from construction equipment, structures, and stockpiles.	P2-3M6	Negative	2	2	3	2	3	27	Low
P2-3	Structural Framing	Waste Management	Generation of solid and hazardous waste requiring proper disposal and management.	P2-3M7	Negative	2	2	1	1	3	18	Low
P2-4	Fit Out	Labour & Economic Conditions	Creation of job opportunities.	P2-4M1	Positive	3	3	3	2	3	33	Moderate
P2-4	Fit Out	Noise & Vibration	Elevated noise levels from machinery and construction activities.	P2-4M2	Negative	3	2	1	1	3	21	Low
P2-4	Fit Out	Public Health & Safety	Potential for accidents and injuries on-site affecting workers.	P2-4M3	Negative	3	2	3	1	3	27	Low
P2-4	Fit Out	Public Health & Safety	Potential for accidents and injuries on-site affecting near-by communities.	P2-4M4	Negative	2	2	3	2	3	27	Low

Activity Code	Project Activity	VEC	Potential Environmental & Social Impact	Impact Code	Nature of Impact	Impact Magnitude	Impact Extent	Impact Reversibility	Impact Duration	Probability of Occurrence	Significance	Significane Rating
P2-4	Fit Out	Public Health & Safety	Infectious Disease Impact (spread of STIs, HIV and AIDS, and Covid 19)	P2-4M5	Negative	3	3	5	2	3	39	Moderate
P2-4	Fit Out	Visual Impact	Visual intrusion from construction equipment, structures, and stockpiles.	P2-4M6	Negative	2	2	3	2	3	27	Low
P2-4	Fit Out	Waste Management	Generation of solid and hazardous waste requiring proper disposal and management.	P2-4M7	Negative	2	2	1	1	3	18	Low
P3	Demobilisation	Labour & Economic Conditions	Creation of job opportunities.	P3-M1	Negative	3	3	3	2	3	33	Moderate
P3	Demobilisation	Noise & Vibration	Elevated noise levels from machinery and construction activities.	P3-M2	Negative	2	2	3	1	2	16	Low
P3	Demobilisation	Public Health & Safety	Potential for accidents and injuries on-site affecting workers.	P3-M3	Negative	2	2	3	2	3	27	Low
P3	Demobilisation	Waste Management	Generation of solid and hazardous waste requiring proper disposal and management.	P3-M4	Negative	3	2	1	1	3	21	Low

Annex 2: Stakeholder Consultations

A2.1 Stakeholder Consultation Checklist for the ESMP

1. What type of environmental and social positive impacts will result from this proposed project and how will these impacts be enhanced (State positive impacts for each phase of construction and operation)?
2. What type of environmental and social negative impacts should be expected during the construction of the proposed project and what are the proposed mitigation measures?
3. What type of environmental and social negative impacts should be expected during the operation and maintenance phase of the proposed project and what are the proposed mitigation measures?
4. Who else should be consulted regarding the environmental and social impacts of the proposed project?

A2.2 Stakeholder Consultations

Stakeholder participation involved engaging institutions within the project impact area and selected public institutions who expressed their views about the proposed projects. The stakeholder participation process tried to ensure that due consideration will be given to stakeholder values, concerns, and preferences when decisions regarding the project are made. The purpose of stakeholder involvement was to:

- Inform the stakeholders about the proposal and its likely effects.
- Canvass their inputs, views, and concerns; and
- Take account of the information and views of the public in the EIA and decision making.

The key objectives of stakeholder involvement were to:

- Facilitate consideration of alternatives, mitigation measures and trade-offs (if any).
- Ensure that important impacts are not overlooked, and benefits are maximized.
- Reduce chances of conflict through early identification of contentious issues.
- Provide an opportunity for the stakeholders to influence project design in a positive manner (thereby creating a sense of ownership of the proposal).
- Improve transparency and accountability of decision-making; and
- Increase public confidence in the Environmental and Social Impact Assessment process.

Stakeholder participation in this project was facilitated through interviews and was guided by a checklist of questions that are presented in following sections.

A2.3 Stakeholders Comments

The comments stakeholders raised were collated and analysed to see which issues are of concern and should be addressed through the ESMP and are presented in Box below. The following subsections list these stakeholders and the comments they raised, whilst referencing to the impact assessment section and the proposed mitigation measures to elaborate how they contributed to the formulation of the ESMP of this report. This was done in respect to the fact that public concern is fundamental to the delineation and management of the project's significant risks.

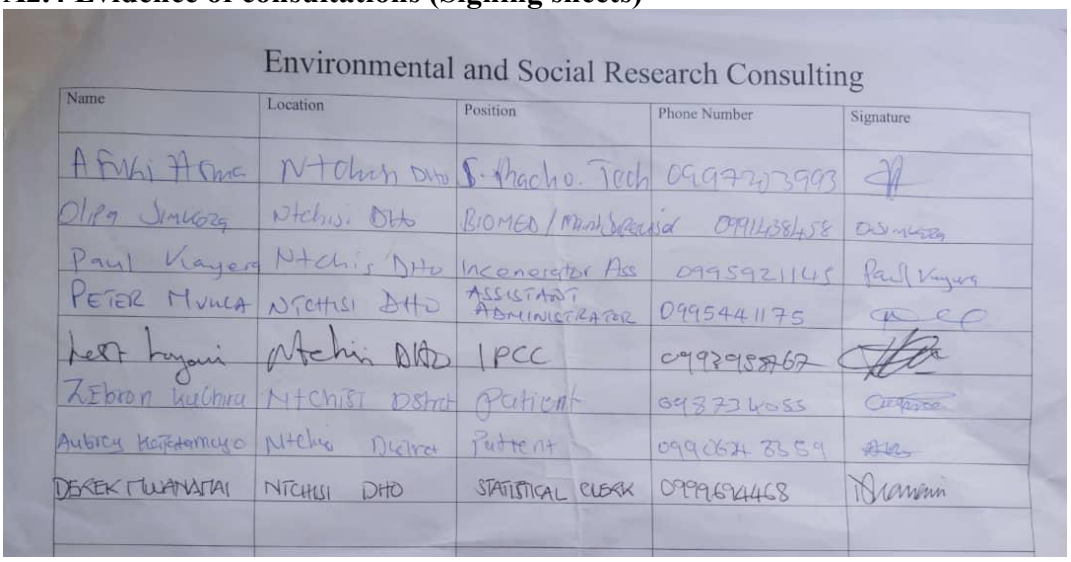
Key issues raised during the consultations.

SN	NAME	ISSUES RAISED	RECOMMENDATIONS
1	Paul Kayera (Incinerator Assstant-Ntchisi District Hospital)	***Positive impacts***	**Enhancement measure**
		Good sanitation: the coming of the mechanical incinerator will promote safely disposing of hazardous waste materials, including medical waste, chemicals, and other harmful substances, thus reducing the risk of environmental contamination.	Implementing strict health and safety protocols for incinerator operators and nearby communities to minimize exposure to pollutants and hazardous materials.
		The project will increase in job opportunities for its residents. Both individuals with existing skills and those without specific qualifications may find employment opportunities during construction and operation	They should prioritize employing people from within the project area and skilled
		Negative Impacts	**Mitigation measure**
		The project often tends to employ individuals who are not from the immediate area, which, in turn, diminishes the local people's opportunities to reap significant benefits from it	They should ensure that they employ individuals from within the local area
		Due to coming of the project there may be disruptions in marriages as some individuals, now having access to more money, might become involved in other sexual relationships	sensitize people regarding issues of marriage disruptions that would be inevitable because of the migrant workers.
		The migrant workers coming to the project site may potentially lead to an uptick in theft or security concerns. The unfamiliarity of these workers with the local community and their temporary presence might create situations where security needs to be reinforced	Community policing should be strongly emphasized to address and manage security concerns
2	Afuki arma (Radiology Technician-Ntchisi District Hospital)	***Positive impacts***	**Enhancement measure**
		Improved Healthcare Access: Rehabilitating the X-ray room will help diagnose and treat a wide range of medical conditions more effectively.	Ensuring that the radiology team are proficient in operating the equipment
		Negative Impacts	**Mitigation measure**
		The potential increase in cases of sexual abuse and harassment because of the project	they should be code of conduct that should be followed for the workers

SN	NAME	ISSUES RAISED	RECOMMENDATIONS
		Vehicles might cause accidents: The area can be an accident-prone area because of the frequent movement of vehicle to and from the site.	The project should conduct monthly road safety awareness campaigns with community members. The contractor will also use vehicles that have valid Certificate of Fitness and drivers with the appropriate driving licence category.
3	Olipa Simukoza (Biomedical Maintenance Supervisor-Ntchisi District Hospital)	***Positive impacts***	**Enhancement measure**
		Employment opportunities in the area are expected to improve significantly because of the project	they should make sure that they employ people from within the area and even the disabled should be considered
		Negative Impacts	**Mitigation measure**
		increase in child labor because of the project	they should make sure they employ people that above the minimum recommended age
		Increased risk of injuries and accidents especially to children	There is need to create safe space for children
		Increased risk of sexual harassment between employers and employees	Mainstream issues of awareness on the project
		Increased risk of spread of STIs including HIV/AIDS	Consider distributing contraceptives on the project i.e. condoms
		Increased employment opportunities especially for the local people	Ensure that there is equal opportunity for both men and women
			Contractor should Ensure that labour laws are followed
4	Lest loyani (Waste management officer-Ntchisi district hospital)	***Positive impacts***	**Enhancement measure**
		The upcoming project of the incinerator will help proper waste management	Integrate waste-to-energy processes to convert non-recyclable waste into valuable energy, reducing reliance on fossil fuels.
		modern incinerators are equipped with advanced pollution control technologies that minimize the release of harmful emissions, making them a more environmentally friendly option compared to traditional waste disposal methods.	Design the incinerator facility with sustainability in mind, incorporating energy-efficient buildings, green spaces, and practices that minimize environmental impact.
		The upcoming incinerator project aims to enhance waste management practices by providing a more efficient method for handling waste	Develop and implement methods for the safe handling, treatment, and recycling of incinerator ash
		Negative Impacts	**Mitigation measure**

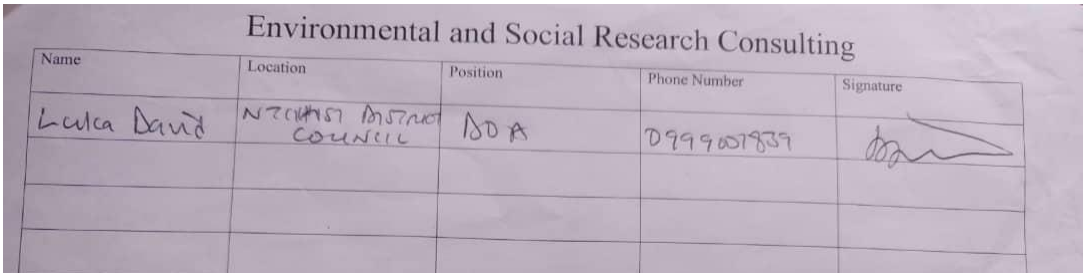
SN	NAME	ISSUES RAISED	RECOMMENDATIONS
		The introduction of the project to the area may potentially lead to an increase in HIV/AIDS and STIs	Provision of condoms and awareness campaigns
		Noise pollution in the area: The use of heavy machinery on the site will produce a lot of noise that can be harmful to the patients and workers	The Project should make sure that they use machines that do not produce a lot of noise
		Dust pollution in the area: Construction site will produce a lot of dust which can be very harmful to the people working on the site, this might increase respiratory diseases like TB among the workers	The project will enforce dust suppression measures such as spraying of water.

A2.4 Evidence of consultations (Signing sheets)



Environmental and Social Research Consulting

Name	Location	Position	Phone Number	Signature
A Fwki Atma	Ntchisi DHO	S. Pharm. Tech	0997203993	
Olipa Simkonda	Ntchisi DHO	BIOMED / Mini Specialist	0991438458	
Paul Kayera	Ntchisi DHO	Incinerator Ass	0995921145	Paul Kayera
PETER MVULA	NTCHISI DHO	ASSISTANT ADMINISTRATOR	0995441175	
Lesly Luyani	Ntchisi DHO	IPCC	0993958862	
ZEBRON KALIMIRA	NTCHISI DISTRICT	PATIENT	0983736055	
Aubrey Kajetamchiyo	Ntchisi District	Patient	0990624 3559	
DEREK MWANYATAI	NTCHISI DHO	STATISTICAL CLERK	0999624468	



Environmental and Social Research Consulting

Name	Location	Position	Phone Number	Signature
Lulca David	NTCHISI DISTRICT COUNCIL	DDA	0999007839	

Annex 3: Code of Conduct for Contractor in Relation to Child Protection

The contractor will be required to prepare a code of conduct in relation to child protection among others that they shall be following when undertaking construction works. These rules shall form part of the assessment criteria when selecting the contractor. A satisfactory code of conduct will contain obligations on all project staff (including sub-contractor s and day workers) that are suitable to address the following issues, as a minimum. Additional obligations may be added to respond to concerns of the region, the location, and the project sector or to specific project requirements. The issues to be addressed include:

1. Compliance with applicable laws, rules, and regulations of the jurisdiction.
2. Protection of children (including prohibitions against abuse, defilement, or otherwise unacceptable behaviour with children, limiting interactions with children, and ensuring their safety in project areas).
3. Sexual harassment (for example to prohibit use of language or behaviour, towards women or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate).
4. Violence or exploitation (for example the prohibition of the exchange of money, employment, goods, or services for sex, including sexual favours or other forms of humiliating, degrading, or exploitative behaviour).
5. Compliance with applicable health and safety requirements (including wearing prescribed personal protective equipment, preventing avoidable accidents and a duty to report conditions or practices that pose a safety hazard or threaten the environment).
6. The use of illegal substances.
7. Non-discrimination (for example based on family status, ethnicity, race, gender, religion, language, marital status, birth, age, disability, or political conviction).
8. Interactions with community members (for example to convey an attitude of respect and non-discrimination).
9. Sanitation requirements.
10. Avoidance of conflicts of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favours, are not provided to any person with whom there is a financial, family, or personal connection).
11. Respecting reasonable work instructions (including regarding environmental and social norms).
12. Protection and proper use of property (for example, to prohibit theft, carelessness or waste).
13. Duty to report violations of this Code; and
14. Non-retaliation against workers who report violations of the Code, if that report is made in good faith.

The Code of conduct should be written in local and plain language, and signed by each worker to indicate that they have:

- Received a copy of the code.
- Had the code explained to them;
- Acknowledged that adherence to this Code of conduct is a condition of employment; and
- Understood that violations of the Code can result in serious consequences, up to and including dismissal, or referral to legal authorities.

Annex 4: GBV Management Plan

Prevention of GBV is a multifaceted effort which should deal with or focus on:

1. women empowerment or agent of change
2. women participation and capacity to influence decision making
3. women economic empowerment
4. increased access to sexual and reproductive health and rights
5. incorporate men and boys in efforts (as perpetrators, victims and agents of change)
6. social gender norms and behaviour transformation (challenging gender stereotyping)

The specific prevention measures have been included in a GBV Management plan to ensure the implementation of actions in this regard and to allow for close monitoring of the contractor.

Activities	Action party	Responsibilities
Stakeholder engagement	Ntchisi District Hospital (NDH); DSWO	• Identify GBV service providers in the area. • Identify vulnerable groups within the community. • Inform community members about the details of the Project and the GBV risks associated with the project. • GBV training including what to do in case of grievance.
GBV training for GRC, contractor and staff, consultants and adjoining community members	NDH; Contractor; DSWO	• Training and sensitisation of all workers associated with the Project on GBV and how the project can contribute to GBV risks. • Training and sensitisation of adjoining communities on GBV risks, channels to report GBV incidents and services available for GBV survivors.
Codes of conduct signed and understood	NDH; Contractor	• Have the CoCs signed by all those with physical presence in the site. • Train construction workers on the behaviour obligation under the CoCs.
Handling GBV complaints (including support of survivors)	GRM	• Grievance redress committees to ensure confidential complaint uptake mechanisms are in place. • The GBV cases should be immediately reported to the Police (Victim Support Unit), District Social Welfare Office, psychosocial support institutions working in the project area or district.
Provision of separate, safe and easily accessible facilities for women and men working on the site	NDH; Contractor	• Ensure construction sites have separate facilities like toilets and/or bathrooms for men and women.
Monitoring and reporting	NDH; Contractor; DSWO	• Selection of monitoring indicators (such as: No. of reported cases of GBV; Resolved cases and time it took to address the complaints, No. of workers that have attained GBV training courses; No./percentage of workers that have signed CoC and No. of GBV cases that were referred to the GBV service provider). • Ensure new risks are uncovered and mitigated.