Government of the Republic of Malawi

Ministry of Health

EBOLA PREPAREDNESS PLAN

Environmental and Social Management Plan for the proposed Construction of an Ebola Virus Diseases Quarantine Centre at Dedza District Hospital

05 May 2016
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<tbody>
<tr>
<td>DPPD</td>
<td>Department of Policy and Planning Development</td>
</tr>
<tr>
<td>DEHO</td>
<td>District Environmental Health Officer</td>
</tr>
<tr>
<td>EHO</td>
<td>Environmental Health Officer</td>
</tr>
<tr>
<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
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<tr>
<td>ESMP</td>
<td>Environmental and Social Management Plan</td>
</tr>
<tr>
<td>EVD</td>
<td>Ebola Virus Disease</td>
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<tr>
<td>GoM</td>
<td>Government of Malawi</td>
</tr>
<tr>
<td>IPC</td>
<td>Infection Prevention Control</td>
</tr>
<tr>
<td>KCH</td>
<td>Kamuzu Central Hospital</td>
</tr>
<tr>
<td>MGDS II</td>
<td>Malawi Growth and Development Strategy II</td>
</tr>
<tr>
<td>MNREM</td>
<td>Ministry of Natural Resources, Energy and Mining</td>
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<tr>
<td>MoH</td>
<td>Ministry of Health</td>
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<tr>
<td>NCIC</td>
<td>National Construction Industry Council of Malawi</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental Organisation</td>
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<tr>
<td>NEAP</td>
<td>National Environmental Action Plan</td>
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<td>NCE</td>
<td>National Council for the Environment</td>
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<td>NEP</td>
<td>National Environmental Policy</td>
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<td>PPE</td>
<td>Personal Protective Equipment</td>
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<tr>
<td>TCE</td>
<td>Technical Committee on the Environment</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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ACKNOWLEDGEMENTS

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EXECTUTIVE SUMMARY

Introduction
The Government of Malawi, with support from the World Bank, is implementing Ebola Virus Disease (EVD) preparedness activities which include infection control interventions, particularly provision and use of Personal Protective Equipment (PPEs); and construction of EVD quarantine/treatment centres. The project is being implemented in selected border districts and referral hospitals. Dedza is one of the border districts where an EVD Quarantine Centre will be constructed at Dedza District Hospital.

The project is important for Malawi as during the Ebola outbreak of 2014, worst hit countries were those with a weak health-care system and poor infrastructure, thus unprepared. In addition, with the Ebola threat still existing in other countries, Malawi is at risk of an Ebola Virus Disease outbreak due to migration.

Objectives of the ESMP
The proposed construction of the Dedza EVD quarantine centre is likely to result in moderate environmental and social impacts; hence this ESMP. The ESMP is in line with the World Bank’s category B projects, within which this project is classified. The ESMP is also prepared in response to the “Environment Management Act, 1996” and the “Guidelines for Environmental Impact Assessment (EIA) for Malawi, 1997”, which recommend an ESMP for projects with moderate environmental and social impacts. The main objective of the ESMP is to provide measures to minimize adverse effects on the biophysical and socio-economic environment during construction and operation of the Dedza EVD Quarantine Centre.

Methodology for the study
In order to predict the impacts of construction of the EVD Quarantine Centre at Dedza District Hospital, field investigations were conducted at and around the construction site to appreciate the extent of impact of the project activities and determine their environmental and social footprint. The field investigations were also made to collect biophysical and socio-economic data and hold discussions with relevant stakeholders and surrounding local communities. In addition literature review was conducted including the review of the World Health Organisation Ebola guidelines for environmental management and infection control in Ebola Units.

Impacts of the Project
Potential environmental and social impacts for the Dedza EVD Centre will emanate from the project activities during the construction, operation and maintenance and decommissioning phases. The following are identified as potential positive impacts of the project:

i. Increase in knowledge and skills in infection control and prevention
ii. Employment opportunities
iii. Acquisition of skills in construction of prefabricated buildings
iv. Income for material/ equipment suppliers
v. Increased rooms for medical services  
vi. Improved medical services  
vii. Reduced environmental pollution  
viii. Improved accessibility to the structures at the back of the hospital

On the other hand, potential negative impacts that are likely to occur include:

i. Accidents to workers, staff and public on construction sites  
ii. Noise disturbances  
iii. Increased costs for electricity and water  
iv. Dust nuisance  
v. Waste generation and increased land degradation  
vi. Increased pressure on sanitary facilities  
vii. Fear of being infected  
viii. Increased air pollution from incineration of wastes  
ix. Water pollution  
x. Increased runoff  
xi. Occupation safety and health risks  
xii. Land degradation and soil contamination  
xiii. Air, land and water contamination  
xiv. Risk of infection from contaminated equipment

Management of the Impact

In view of the negative impacts outlined above, this document has presented an environmental and social management plan (ESMP) in Chapter 6, which outlines mitigation measures that must be implemented by the Ministry of Health and other key stakeholders in order eliminate or mitigate the impacts on the socio-economic environment. A monitoring plan, which outlines responsibilities for the Ministry of Health and other key stakeholders; along with monitoring verifiable indicators for each of the mitigation measures, has been provided in this ESMP. It is expected that if the ESMP is effectively and efficiently implemented, the negative impacts will be reduced to low or will be eliminated such that the project can be implemented sustainably.
CHAPTER 1 INTRODUCTION

1.1. PROJECT BACKGROUND

Ebola virus disease (formerly known as Ebola haemorrhagic fever) is a severe, often fatal and highly infectious disease. The virus is transmitted to people from wild animals and spreads in humans through direct contact with the blood, body fluids and tissues of infected people. Severely ill patients require intensive supportive care. During an outbreak, those at high risk of infection are health workers, family members and others in close contact with the sick and deceased.

The recent Ebola Virus Disease (EVD) outbreak started in March 2014 in the West African countries of Liberia, Guinea and Sierra Leone. A few cases were also reported in Italy, Mali, Nigeria, Senegal, Spain, United Kingdom and United States of America as a result of migration. Since the outbreak started, there have been approximately 28, 602 cases of the virus, causing 11 301 deaths (WHO, 2016). The worst hit countries were Liberia and Sierra Leone due to a weak health-care systems and a lack of infrastructure. The countries have been declared Ebola Free but enhanced surveillance is continuing.

Ebola preparedness and response planning has been in effect since shortly after the outbreak in Western Africa in 2014. Ebola infection prevention and control training has been administered across the entire country based on World Health Organization (WHO) guidance. Training included nurses and clinicians (doctors/ clinical officers) and focused on clinical management of Ebola patients based on WHO training materials. A training-of-trainers program was also established by the WHO in Brazzaville, Congo to provide a foundation on which to administer more regular Ebola response training.

With regards to Ebola waste management, specific Infection Prevention and Control (IPC) is built on already existing hospital IPC infrastructure. There is an IPC Unit in the Ministry of Health and the National Focal Officer is part of the team of Trainers on Ebola.

Ebola response equipment is also already in place at all the hospitals where EVD treatment centres are being constructed as part of this project. This includes vehicles (ambulances, double cabin 4X4 utility vehicles and motor cycles) washing machines, patient beds, mattresses and blankets. The different supplies and logistics necessary for IPC personal protective equipment (PPEs- coveralls, aprons, N-95 mask, gumboots, goggles, etc) have also been supplied to all district hospitals.

According to WHO, the introduction of an EVD case into unaffected countries remains a risk, as long as cases exist in any country. With adequate preparation, however, such an introduction can be contained through a timely and effective response. Therefore, the Government of Malawi (GoM), with support from the World Bank, is implementing EVD preparedness activities, which comprise construction of EVD quarantine/Treatment Centres and Infection Control Interventions.

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EVD quarantine centres are being proposed at Karonga, Dedza, Mchinji and Mwanza Districts, to be constructed inside the fences of the respective District Hospitals. In these locations, the major activity will be screening and isolation of suspected cases. Treatment for confirmed cases will be provided at the referral centres to be constructed in the major cities of Malawi – Lilongwe (the capital city), Blantyre and Mzuzu. In Lilongwe the EVD Treatment Centre will be at Kamuzu Central Hospital (KCH). In Mzuzu the Centre will be at Mzuzu Central Hospital and in Blantyre the facility will be at an undeveloped site owned by the government, along the M1 road after Kameza Roundabout, near the Kamuzu College of Nursing complex.

Karonga, Mwanza, Mchinji and Dedza are border districts. Karonga borders with Tanzania to the North of Malawi; Mwanza boarders with Mozambique to the east; and Mchinji and Dedza border with Zambia and Mozambique to the west of Malawi. A map showing the districts for the EVD quarantine/treatment centres is provided in figure 1.1.
Figure 0.1 Map of Malawi showing the districts for the proposed EVD Centres
1.2. NATURE OF THE PROJECT

EVD preparedness activities for Malawi aim to develop infrastructure and strengthen the health-care system in readiness of an EVD outbreak. The activities started during the recent outbreak in East Africa. For the project in Malawi, the World Bank is supporting the following two components:

**Component 1:** This Component will focus on Infection Control Interventions, specifically provision and use of Personal Protective Equipment (PPEs). Under this component, health-care workers will be trained in the use of PPEs, provision of care and treatment to Ebola patients, infection prevention and control and waste management. This component will also provide $20,000 for each of the seven districts where the project’s Ebola component is being implemented to increase capacity for district health authorities and the community to manage infectious disease response, including Ebola. This includes developing and implementing training of trainer programs with district health authorities where the EVD treatment centres are being constructed. Front-line staff are also being recruited and trained as part of this effort to investigate suspected cases, provide early warning and community level response. The community will also be targeted with social behaviour change communication programs to increase knowledge, shift attitudes and cultural norms and produce changes in a wide variety of behaviours. These activities are separate from the project’s Health Care Waste Management Plan (HCWMP).

**Component 2:** Construction EVD quarantine/treatment centres.

**Seven** Ebola Virus Disease quarantine/treatment centres are proposed to be constructed in Karonga, Mzuzu, Dedza, Mchinji, Mwanza, Lilongwe and Blantyre districts. Karonga, Dedza, Mchinji and Mwanza have been proposed because they are border districts. In these districts, health-care workers will be working with immigration officers at the borders to identify suspected cases and isolate them in the quarantine centres, in addition to surveillance of cases within the districts. When a suspected case is confirmed to be Ebola infected, the person will be referred to Blantyre, Lilongwe or Mzuzu EVD treatment centre. In Lilongwe the EVD treatment centre is being constructed at Kamuzu Central Hospital (KCH) by the Ministry of Health (MoH).

The scope of the project for all the sites, except Lilongwe include construction of the EVD pre-fabricated structure on a concrete base, construction of septic tanks, installation of incinerators, construction of ash pits and the construction of a safety fence around the treatment centre. For the Lilongwe EVD centre, the scope of works includes construction of a septic tank and an ash pit. It also includes provision of Ebola centre furniture.

As a requirement for all World Bank supported infrastructure development projects; and in consideration of the highly infectious nature of EVD, the project was screened for potential environmental and social impacts. The results showed that the construction activities of the EVD quarantine/treatment centre and the activities in the operational and maintenance phases will have moderate Environmental and Social Impacts. The project was assigned to the World Bank’s category B projects. Hence, preparation of the Environmental and Social Management Plans (ESMPs) was recommended for all the seven sites. The screening and the preparation of the ESMP are also in line with the “Guidelines for Environmental Impact Assessment (EIA) for Malawi, 1997”.

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1.3. OBJECTIVE OF THE ESMP

The main objective of the ESMP is to provide measures to minimize adverse effects on the biophysical and socio-economic environment; during construction and operation of the Ebola Virus Disease (EVD) quarantine centre for Dedza. The ESMP predicts and describes impacts of the project; and outlines the enhancement and mitigation measures to be implemented by Ministry of Health and other key stakeholders. These impacts were determined through investigations carried out on and around the site earmarked for erection of the pre-fabricated Ebola quarantine and treatment centres; as well as key stakeholder consultations and input from the surrounding communities.

1.4. SCOPE OF THE ESMP STUDY

This ESMP is specifically for the identification of impacts related to construction and operation activities for the Ebola Quarantine Centre at Dedza District Hospital; focusing on waste management during operation and maintenance phases. Preparation of the ESMP included the following activities:

- review of project reports, relevant literature and government regulations;
- identification and analysis of potential environmental and social impacts, which the project activities are likely to trigger and generate within and around the project site;
- determination of appropriate mitigation measures to minimize undesirable effects resulting from the proposed development;
- determination of costs of environmental management activities;
- preparation of an ESMP, which details the negative effects of the proposed project activities on the biophysical and socio-economic environment; and
- recommendations for future environmental protection during operation and maintenance of the EVD quarantine centre.

1.5. ASSESSMENT METHODOLOGY FOR THE ESMP

The following assessment methods were employed in order to prepare the ESMP:

a) field surveys to the construction site, to appreciate the magnitude of project activities and determine their environmental and social footprint. The surveys facilitated collection of biophysical and social data and discussions with relevant stakeholders and surrounding communities;

b) surveys of the waste management facilities at the hospital (septic tanks, incinerators, placenta pits and solid waste disposal pits) to appreciate the existing waste management and infection control practices;

c) literature review on the policies, regulations and environmental standards for the ESMP preparation. The purpose of reviewing such documents was to develop a comprehensive and guided policy and legal framework so that the ESMP is responsive and aligned with government’s and financiers’ policies;

d) interviews with key stakeholders including District Health Officer, Environmental Health Officer and Officers from the Local Council;

e) interviews with representatives of the community, including the chairman of Dedza District Health Care committee and the ward councillor); and
f) assessment of the socio-economic setting and the health-care systems data and prevailing national regulations, policies and standards.
CHAPTER 2  POLICY AND LEGAL FRAMEWORK FOR THE PROJECT

2.1  POLICIES

In Malawi, the overarching legislation is the 1996 Environment Management Act, currently under revision. The Malawi Guidelines for Environmental Impact Assessment were developed in 1997 and are also under revision. The Environmental Affairs Department determines whether an ESIA is required or not, for all projects. The Technical Committee on the Environment (TCE) reviews environmental impact assessment reports and makes recommendations to the Director, who reports to the National Council for the Environment (NCE). The NCE considers the recommendations and advises the Minister for approval and issuing the environmental certificate for the project to proceed. The Malawi national policies relevant to the activities for EVD preparation include:


The Constitution of the Republic of Malawi is supreme over any legal policy or Act in Malawi. Any Act of Government or any law that is inconsistent with the provisions of this Constitution shall, to the extent of such inconsistency, be invalid (Section 5). Hence the policies and legislation, relevant to the project activities have to be in line with the constitution.

In relation to the project, section 13 (c) dictates the provision of adequate health-care, commensurate with the health needs of the Malawian society and international standards of health-care. This is what the project as well as management of medical waste for the EVD aim to achieve. The proposed project must help improve rural life (section 13e).

Sections 13 (d) defines the role of the State as to manage the resources responsibly in order to prevent degradation of the environment, provide a healthy living and working environment for the people of Malawi, accord full recognition to the rights of future generations by means of environmental protection and sustainable development of natural resources and biodiversity of Malawi.

The proposed project at Dedza District Hospital must sustainably safeguard the people’s rights to a healthy living environment and protection of natural resources by ensuring that adverse impacts (particularly from medical wastes) on people and natural resources are avoided; and that mitigation measures are implemented for those impacts that cannot be avoided.

2.1.2 Malawi Growth and Development Strategy (2011 – 2016)

The Malawi Growth and Development Strategy II (MGDS II) is a decisive and strategic single reference document to achieve wealth creation through sustainable economic growth and infrastructure development. It acknowledges that a healthy population is key to increased productivity and sustainable economic growth. The following challenges facing the health sector are highlighted in the MGDS II: prevalence of preventable diseases, high mortality
rates, high prevalence of HIV, high incidence of malaria cases, high incidence of TB cases, limited access to maternal health services, low institutional capacity and inadequate supply of essential drugs and health infrastructure.

The project will improve infrastructure in readiness for EVD and improve capacity in infection control and provision of health interventions. All these are in line with the MGDS II.

2.1.3 The National Environmental Policy (2004)

The National Environmental Policy (NEP) developed in 1996 and revised in 2004 advocates for sustainable social and economic development through sound management of the environment and natural resources. Areas of priority include efficient utilization and management of natural resources; through involvement of the private sector, NGOs and communities for sustainable environmental management. The policy empowers communities to protect, conserve and sustainably utilize the nation’s natural resources and advocates for enhancement of public awareness and promotion of public participation.

In line with the requirements of the NEP, the proposed project has included participation of the local communities in the identification of potential impacts and development of appropriate mitigation measures.


The National Environmental Action Plan (NEAP) of 1994, updated in 2002, provides a framework for integrating the environment into all socio-economic development activities of the country. It documents and analyses major environmental issues and measures to alleviate them; promote sustainable use of natural resources in Malawi; and develop an environmental protection and management plan. The NEAP identifies the following as key environmental issues to be addressed, in relation to the proposed project: soil erosion, water resources degradation, air pollution and climate change. The NEAP also outlines actions to be undertaken to ensure adequate environmental protection. Hence the project must aim to protect the environment by avoiding as many of the significant impacts as possible in the first place; and where this is not possible, mitigation measures are to be implemented through management plans and monitoring has to be done effectively.

2.1.5 The National Water Policy (2005)

The overall goal of the National Water Policy 2005 is to provide an enabling framework for sustainable management and utilization of water resources, to provide water of acceptable quality and in sufficient quantities; and to ensure availability of efficient and effective water and sanitation services for every Malawian. In line with this policy, the project developers and administrators must: advocate for efficient utilization and management of water resources; participate or support efforts towards water resources conservation, harvesting and protection; ensure and promote proper management and disposal of wastes; properly dispose material that can pollute water resources; promote public awareness on guidelines and standards for water quality, public health and hygiene as well as pollution control.
2.1.6 Guidelines for Environmental Impact Assessment (EIA), 1997

The EIA Guidelines of 1997 outline the process for conducting ESIs to ensure compliance with the ESIA process as required in the Environment Management Act 1996. The Guidelines contain a list of prescribed projects for which ESIA is mandatory and those that may require an ESIA; hence they assist in environmental screening. The Guidelines require that no licensing authority issues any license for a project unless the Director of Environmental Affairs (DEA) has given consent to proceed, on the basis of a satisfactory ESIA or non-requirement of an ESIA. The EVD quarantine centre for Dedza is being developed within the fenced and existing hospital premises. Hence, it is an addition to the existing buildings and will comprise a pre-fabricated structure on a small area of land. An ESIA is not necessary in the case of this subproject.

2.1.7 National Construction Industry Policy, 2015

Construction of EVD quarantine/Treatment centres triggers the Construction Industry Policy, whose broad policy goals include to promote environmental sustainability in implementation of construction projects. In accordance with the policy goal, project implementers must ensure that the contractor protects the environment, in line with national and international policies for environmental sustainability. Other focus areas include disaster risk management; occupational health and welfare; gender; and HIV and AIDS.

2.1.8 Infection Prevention and Control Policy (2006)

This policy was formulated to guide health facility operators in development and implementation of infection prevention and control programs. It emphasises infection prevention and control programs at various levels of health-care delivery system for the public and private sectors. The policy also stipulates that all health-care facilities in Malawi shall have an active IPC program in place; aimed at promoting IPC practices and surveillance focusing on clients, patients, health-care personnel and the environment. Infection control measures to be enforced in the event of EVD must be in line with the existing infection prevention and control programs in the respective hospitals.

2.1.9 National Sanitation Policy (2007)

The policy stipulates the need for delivery of improved sanitation services in Malawi. Some of the strategies for accomplishing this objective include: (1) providing adequate wastewater disposal facilities at all wastewater generation points and (2) ensuring adequate provision of wastewater treatment and disposal facilities for all new piped water supply connections. One of the specific goals in the National Water Policy (NWP), is to ensure water of acceptable quality for all needs in Malawi. Wastewater and solid waste will be generated in the EVD quarantine centre. The Ministry of Health must therefore ensure that there are adequate wastewater disposal facilities.
2.1.10 Decentralization Policy 1998

The Decentralization Policy was adopted in 1998 to:

- Devolve administration and political authority to the district level;
- Integrate governmental agencies at the district and local levels into one administrative unit, through the process of institutional integration, manpower absorption, composite budgeting and provision of funds for the decentralized services;
- Divert the centre of implementation responsibilities and transfer these to the districts;
- Assign functions and responsibilities to the various levels of government; and
- Promote popular participation in the governance and development of districts.

Through the Decentralisation Policy, some of the roles of the authority at district level are to implement or facilitate development projects; to ensure development projects in their area are implemented in a sustainable manner; and to mobilize masses for socio-economic development at the local level. Therefore, for effective implementation of the project, the MoH must work closely with Dedza District Council. The Decentralisation Policy also provides for provision of environmental services such as refuse disposal, sewage removal and disposal, environmental reclamation, and environmental education. MoH must use the existing environmental services where they are not in capacity.

2.1.11 Revised Decentralized Environmental Management Guidelines, 2012

The Decentralized Environmental Management Guidelines (DEMG) were adopted in 2012 to address gaps and inconsistencies from other previous guidelines including the DEMG, 2002 and help ensure that Councils include emerging and critical environmental issues in the preparation of district plans and actions. The DEMG aims at guiding stakeholders to manage the environment and natural resources in a sustainable manner.

In line with the Decentralization Policy, the DEMG promotes local level environmental management, including planning, implementation, monitoring and evaluation.

2.1.12 Malawi Standards (MS) 615: 2005: Waste within health-care facilities, handling and disposal (code of practice)

This standard provides criteria for segregation, collection, movement, storage and on-site disposal of waste within health-care units and biological research facilities, among others. The standards must be observed at the EVD Quarantine/Treatment Centres. The hospital incinerators are being procured by the MoH in accordance with established international standards and no permits are required to have them installed or operated.

2.2 LEGAL FRAMEWORK

2.2.1 The Environment Management Act (1996)
The Act is the principal legislation on the protection and management of the environment. It provides the legal basis for protection and management of the environment; and the conservation and sustainable utilization of natural resources. Section 24 (I) gives powers to the minister to determine the types and sizes of projects which shall not be implemented unless an environmental impact assessment is carried out. The Act further outlines the ESIA process to be followed in Malawi; and requires that all project developers in both the public and private sectors comply with the process. Non-compliance with the ESIA requirements is an offence and attracts penalties. The Act also recognises that improper waste disposal can impact various environmental and social resources and therefore regulates the management, transportation, treatment and recycling; and safe disposal of waste; and the need to establish environmental quality standards for waste.

Preparation of ESMPs for the proposed project complies with the requirements of the Act and the Guidelines. The project has to be undertaken in an environmentally responsible manner to ensure protection and management of the environment and sustainable utilization of natural resources.

### 2.2.2. Public Health Act 1966

The Public Health Act 1966 seeks to preserve public health through the following provisions relevant to the project:

- Parts III, IV, V, VI and VII discuss infectious and epidemic diseases and how to handle them. The Act dictates notifying the Ministry of Health, when diseases such as T.B., Cholera and Measles are identified. A full list of notifiable diseases is presented in Part III. Medical personnel, project managers and family members have to follow the provisions given in the Act, which among others include isolating the patients and allowing medical personnel to attend to the patients.
- Part IX of the Act relates to sanitation and prohibited nuisances. Contractors have to ensure that there are sanitary structures; vehicles and that any other materials used are not in a state that can cause accidents; machine smoke cannot cause injuries to health; and that all material defined as nuisance are not in the work place.
- Part X has provisions for conservancy; sewerage and drainage; and encourages new buildings to have sewage systems, either private or public (connecting to the local authority sewerage). The Act also guides the protection of sewerage systems by preventing the throwing or emptying of waste that may injure the sewer, affect free flow of contents or affect treatment of sewage.

The provisions of the Public Health Act are to be followed and any deviation from the Act is punishable by fines and imprisonment. The Act gives the local authorities the right to inspect any premises for compliance with the Act.
2.2.3. The Water Resources Act (2013)

The Water Resources Act of 2013 supersedes the 1969 Water Resources Act and aims at improving on already existing water resources management efforts in the country. The Act is administered by the Water Resources Authority under the Ministry of Agriculture, Irrigation and Water Development. The Act requires any developer discharging wastewater (effluent) into surface water ecosystems to have an “Effluent Discharge” permit. One of the conditions in the permit is the need to comply with discharge quality limits for effluent, in accordance with applicable Malawi Standards or any relevant international standards.

2.2.4. Occupational Safety, Health and Welfare Act, 1997

The Occupational Safety, Health and Welfare Act has provisions for the registration of a workplace and the regulation of the conditions of employment in workplaces; with regard to the safety, health and wellbeing of employees. The Act provides for inspection of plant and machinery, for the prevention of accidents in the workplaces, including government establishments and operations, as well as building and civil engineering construction works (Section 5). It requires that employees are provided with appropriate protective clothing and equipment to prevent accident and injury.

The project will comply with the Occupational Safety, Health and Welfare Act. Workers will have to be provided with appropriate protective clothing to prevent accidents related to the construction and operation functions; and breathing masks, ear muffs and goggles where they will be exposed to potential risks and offensive substances; as required by Sections 58, 59, 60.

2.2.5. National Construction Industry Act, 1996

The Act provides for the establishment of the National Construction Industry Council of Malawi (NCIC), for the promotion and development of the construction industry, registration of persons engaged in the construction industry in Malawi, co-ordination of training of persons engaged in the construction industry and general matters incidental thereto. The NCIC is responsible for regulating the construction industry in Malawi through among others: registering consultants and construction firms, standardising quality control, codes of practice, procurement process; and legal contractual procedures in liaison with other organisation. In accordance with the Act, the NCIC must be involved in identifying the contractors, ensuring that a quality contract is in place, resolving conflicts between contractor and client and ensuring that quality structures are developed.

2.2.6. The Local Government Act (1998)

The Local Government Act was enacted to further democratic principles, accountability, transparency and participation of the Malawian people in the decision making and development process. According to the Act, District Councils have the mandate to: promote infrastructure and economic development (Section 6 (c)); establish, maintain and manage
services for the collection, removal and disposal of solid and liquid waste (second schedule 2(a)).

The construction and operation of the EVD Quarantine/treatment centres will generate both solid and liquid waste; hence there is need for the developer and contactors to work with the relevant district councils in waste management and disposal in the project areas, in line with the provisions of the Act. During the operation phase medical and domestic wastes will be generated. It will be important to involve the respective district councils in the managing of these wastes.

The Local Government Act also provides for local governance structures through which this Environmental and Social Management Plan must be implemented. These include:

- The District Executive Committee (DEC), which is responsible for implementation of all aspects of the District Development Planning System (DDPS).
- The District Environment Sub-Committee (DESC), which is the focal point on issues of the environment. It acts as a multi-disciplinary forum for environmental management and comprises environmental and natural resources management sector district officers. Some of the functions of the DESC include appraising micro-projects and facilitating their development; conducting awareness campaigns on environmental and natural resources management; and developing capacity on sustainable environmental management at community level so that issues of environment are integrated into decision-making process and planning systems.

### 2.3 ADMINISTRATIVE FRAMEWORK

The mission of the Ministry of Health (MoH) is to raise the level of health of all Malawians by reducing incidences of illness and death of the population. To achieve this, the major objective of MoH is to deliver health services and disseminate health information to the general public. The MOH has the directorate of Administration, Finance, Technical Support Services, Planning and Policy Development, Clinical Services, Nursing Services, Reproductive Health, Physical Assets Management, Pharmaceutical Services and Preventive Health Services (PHS); and a number health institutions throughout Malawi.

The health institutions are categorised into referral (major) hospitals, district hospitals, health centres and clinics. MoH is headed by the Minister of Health who handles policy issues, while operational issues are handled by the Principal Secretary. At district level, there is the District Health Officer (DHO) who is responsible for effective and efficient delivery of quality health services in the district and the District Medical Officer (DMO) in charge of medical services.

Construction activities for the Dedza EVD quarantine centre, are being implemented by the Department of Planning and Policy Development (DPPD) in the MoH, working hand in hand with the Ebola Coordination Unit under the directorate of Preventive Health. Management of the EVD quarantine centre, during the operation phase, will be done by the District Health Office, together with the Local Council and with assistance from the Ebola Coordination Unit.
2.4 THE WORLD BANK SAFEGUARD POLICIES

The World Bank has keen interest in protection of the environment, for investment projects they support, in line with its ten environmental safeguards policies. These policies provide guidelines, aimed at preventing and mitigating undue harm to people and the environment, when implementing development projects. The environmental safeguard policies, which provide a platform for the participation of stakeholders in project design and implementation, are:

   a) Environmental Assessment (OP/BP 4.01)
   b) Forests (OP/BP 4.36)
   c) Involuntary Resettlement (OP/BP 4.12)
   d) Indigenous Peoples (OP/BP 4.10)
   e) Safety of Dams (OP/BP 4.37)
   f) Pest Management (OP 4.09)
   g) Physical Cultural Resources (OP/BP 4.11)
   h) Natural Habitats (OP/BP 4.04)
   i) Projects in Disputed Areas (OP/BP 7.60)
   j) Projects on International Waterways (OP 7.50)

This project triggers OP 4.01 on Environmental Assessment. This is because moderate environmental and social impacts are anticipated, since the construction works and waste management activities will be primarily confined to within the existing hospital building premises.

2.4.1. Environmental Assessment (OP/BP 4.01)

The objective of Environmental Assessment is to ensure that project activities are environmentally sound and sustainable and that decision-making is improved through appropriate analysis of actions and mitigation of their likely environmental impacts. This policy is triggered if a project is likely to have potential adverse environmental risks and impacts in its area of influence. *Construction of the EVD Treatment Centre may have negative environmental impacts, which require mitigation. Hence this ESMP has been prepared.*
CHAPTER 3 DESCRIPTION OF THE PROJECT AND COMPONENTS

3.1 THE EVD QUARANTINE CENTRE FOR DEDZA

The Ebola Virus Disease (EVD) preparedness activities in Malawi include the development of a quarantine centre, dedicated septic tank and high temperature incinerator, ash pit and security fence at Dedza District Hospital. The centre will be used to screen and isolate suspected EVD cases. When the suspected cases are confirmed, they will be transferred to the referral centre which will be constructed at Kamuzu Central Hospital in Lilongwe for treatment.

The quarantine centre has been designed by the Ministry of Health (MoH) by adapting World Health Organisation (WHO) specifications for Ebola Quarantine/Treatment Centres. The main considerations in the design are infection prevention and control. Hence careful attention has been paid to isolation (case – case, patient-health care worker, case – visitor), ventilation of the facility, hand hygiene, safe water supply, sanitation and waste management. This is supported by fund allocations under Component 1 of this project for infectious disease management training and surveillance programs targeting district health officials, frontline staff and community.

The quarantine centre will have a floor area of 20.565 by 13.260 meters and the main rooms in the facility are as provided in table 3.1.

<table>
<thead>
<tr>
<th></th>
<th>Main rooms in the Dedza EVD Quarantine Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nurses Station</td>
</tr>
<tr>
<td></td>
<td>To be used as an office for nurses. The room has no direct door to the isolation ward as an infection control measure.</td>
</tr>
<tr>
<td>2</td>
<td>Change room</td>
</tr>
<tr>
<td></td>
<td>Nurses, doctors and other staff will be using the room to change from their clothes and wear personal protective kit (e.g. the Ebola Suit)</td>
</tr>
<tr>
<td>3</td>
<td>Decontamination Room</td>
</tr>
<tr>
<td></td>
<td>To be used for decontamination of the PPE after attending to suspected/confirmed cases</td>
</tr>
<tr>
<td>4</td>
<td>Isolation Ward</td>
</tr>
<tr>
<td></td>
<td>It is divided into two parts – for 3 confirmed cases and 3 suspected cases. The beds will be isolated from each other using curtains.</td>
</tr>
<tr>
<td>5</td>
<td>Drug store</td>
</tr>
<tr>
<td></td>
<td>For keeping drugs</td>
</tr>
<tr>
<td>6</td>
<td>Sluice Rooms</td>
</tr>
<tr>
<td></td>
<td>For sluicing used linen and other items before being dispatched from out of the isolation ward.</td>
</tr>
<tr>
<td>7</td>
<td>Toilets</td>
</tr>
<tr>
<td></td>
<td>A number of toilets are included in the design. 1 for nurses, 2 for suspected cases and 1 for confirmed cases. 4 Hand washing basins have also been included in the designs.</td>
</tr>
<tr>
<td>8</td>
<td>Stores</td>
</tr>
<tr>
<td></td>
<td>For keeping materials for use in the centre.</td>
</tr>
</tbody>
</table>

The centre will not have laboratories. Hence specimen will be transported to the referral centres. The floor plan for the EVD Quarantine Centre is given in figure 3.1.
3.2 WASTE DISPOSAL SYSTEMS

3.2.1. Liquid Waste Disposal

According to the WHO guidelines, all liquid waste from an EVD Quarantine/Treatment Centre is not supposed to be discharged into the public sewage system. Therefore a separate septic tank will be constructed for the EVD Centre at Dedza District Hospital.

The septic tank is the typical two chamber septic tank and a soak-pit. The design provides for specifications which are to be strictly adhered to during construction. Among others, these specifications include the size of the tank, cement mix ratios, walls thickness, materials to be used and the suitability of different types of soils for effluent disposal. Coarse sand or gravel with no clay silt is specified for disposal of effluent from the soak-pit. The specifications in general, aim at ensuring that there are no pollution effects. The design of the septic tank is provided in figure 3.3.
Figure 0.2: Designs of Septic Tanks
3.2.2. Solid Waste Disposal

All solid waste from the EVD Quarantine Centre is considered infectious. Hence, all the solid wastes will be treated in an incinerator and the ash will be disposed in a well-covered ash pit near the incinerator. The architectural design of the ash pit is provided in annex 4.

It is recommended that international industry best practices related to hazardous waste incineration are followed in accordance with the World Bank Group’s environmental, health, and safety technical (EHS) guidelines for Health Care facilities as well as the General EHS Guideline. Considering the infectious nature of the wastes, expected volume and the air pollution impacts of incineration, the following specifications have been proposed for the incinerators.

Table 0.2: Specifications of the incinerator for the EVD Treatment Centre

<table>
<thead>
<tr>
<th>Property</th>
<th>Description/ Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational temperature of 950 - 1320°C</td>
<td>To be able to fully incinerate highly infectious wastes</td>
</tr>
<tr>
<td>Two chambers</td>
<td>The second chamber to be equipped with an afterburner to allow for re-burn of harmful emissions</td>
</tr>
<tr>
<td>High chimney – Stack height to be designed according to Good International Industry Practice – See General EHS Guideline Annex 1.1.3</td>
<td>To ensure that smoke does not impact on the surrounding people and environment.</td>
</tr>
<tr>
<td>Top loading for waste</td>
<td>For easy loading and effective spreading of waste</td>
</tr>
<tr>
<td>Mechanical and air controlled operation</td>
<td>To ensure optimal combustion</td>
</tr>
<tr>
<td>150 – 200 kg batch size</td>
<td>To be able to take in a large volume of waste that would be expected during an outbreak.</td>
</tr>
<tr>
<td>100kg per hour burning rate</td>
<td>In the event that there is a lot of waste, a quick burning rate will ensure that the waste storage time is minimised.</td>
</tr>
<tr>
<td>Efficient average fuel consumption</td>
<td>To ensure operational costs are minimised</td>
</tr>
<tr>
<td>Average emissions according to European Union standards as provided in table 3.3</td>
<td>To reduce air pollution</td>
</tr>
</tbody>
</table>

---

2 The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice. When a member of the World Bank Group is involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. The World Bank Group’s EHS Guidelines for Health Care Facilities can be found at: http://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2B-%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&id=1323161961169 and the General Environmental Health and Safety Guideline can be found at http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES
The European Union (EU) has average emission guidelines for basic incinerators and these are presented in table 3.2

Table 0.3: Average emissions/EU standards on basic incinerators (with secondary chamber)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limits (1/2 hr. avg.)</th>
<th>Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total dust</td>
<td>30 mg/m³</td>
<td>12 mg/m³</td>
</tr>
<tr>
<td>Sulphur dioxide</td>
<td>200 mg/m³</td>
<td>2,4 mg/m³</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>400 mg/m³</td>
<td>60 mg/m³</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>100 mg/m³</td>
<td>78,3 mg/m³</td>
</tr>
</tbody>
</table>

### 3.3 CONSTRUCTION MATERIALS

Construction Materials for the EVD Quarantine Centre as specified by the Architect includes the following:

Table 0.4: Construction Materials for the EVD Quarantine Centre

<table>
<thead>
<tr>
<th>Structure</th>
<th>Characteristic feature</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor</td>
<td>Concrete slab with cement finish</td>
<td>cement, sand, concrete, wire mesh, damp proof membrane</td>
</tr>
<tr>
<td>Wall</td>
<td>Windows and wall</td>
<td>Prefabricated panels, steel windows, and Insulators</td>
</tr>
<tr>
<td>Roof</td>
<td>Roof sheets and trusses</td>
<td>Corrugated iron sheets, Steel trusses</td>
</tr>
</tbody>
</table>

The prefabricated materials including windows and still framework have been imported from South Africa; whereas sand, paints, cement, concrete, wire mesh and damp proof will be sourced locally.

### 3.4 CONSTRUCTION WORKS

At Dedza District Hospital construction activities started in December but have since been stopped to ensure compliance to environmental due diligence, in accordance with the World Bank Operational Policies. Figure 3.4 is the halted structure for EVD Quarantine Centre at Dedza.
3.5 LABOUR FOR CONSTRUCTION

An international contractor has been engaged by MoH to construct all the EVD Quarantine/Treatment Centres except at Kamuzu Central Hospital. The contractor has subcontracted a local construction company to construct the concrete slabs. Considering the small size of the EVD Quarantine Centre and that prefabricated materials are being used, a small team is engaged for the construction activities. About 10 locals will be employed as labourers for the Dedza District Hospital EVD centre project.
CHAPTER 4 ENVIRONMENTAL AND SOCIAL SETTING OF DEDZA EVD CENTRE

4.1 BIO-PHYSICAL CHARACTERISTICS OF THE PROJECT AREA

4.1.1. Project Location

Dedza District is located in the Central Region of Malawi about 86 Kilometres from Lilongwe District, the Capital City of Malawi. It borders Lilongwe District to the North, Salima District to the North East, Mangochi District to the East and Ntcheu District to the South. The District also shares its boundary with Mozambique to the South (see figure 4.1) and the official border post, Dedza Border post, is located 3km off the Blantyre – Lilongwe M1 road and borders with Mozambique’s Calomue Border Post north east of Tete Province.

![Figure 0.1: Dedza District Boundaries](image)

The proposed Ebola Virus Disease (EVD) Centre will be constructed at the Boma inside Dedza District Hospital fence and at approximately the following coordinates: 36L 644096 m E and 36L 8409243 m S. The proposed location is shown using the satellite image in figure 4.2.
Figure 0.2: Satellite image of Dedza District Hospital and the proposed site

4.1.2. Accessibility and Site Selection

From Lilongwe, Dedza District Hospital is accessible through the M1 road and the T374 tarmac road which branches from the M1 going to the Boma. The hospital is about 1.1km from the M1 road and is next to the Market as can be seen in figure 4.2 above. The site for the EVD Centre is near the Children’s Ward, the TB Isolation Ward, the Physical Asset Management (PAM) Offices and the waste disposal area. Next to the site is the back fence for the hospital which also separates human settlements and the hospital area.

The site was selected because of the following reasons:

i. It is at the back of the main hospital buildings; hence ensuring minimal traffic flow at the site. This is important as EVD requires isolation of patients. The place is an isolated area and near the TB isolation ward; and

ii. It is near the waste disposal area and this will ensure that infectious waste from the centre does not pass through the other wards or mix with wastes from other wards.

The proposed site is accessible through the main hospital gate, going towards the Physical Asset Management (PAM); offices. After these offices, the road branches to the staff houses and the back of the hospital where the proposed EVD quarantine centre is being constructed.
4.1.3. Topography and Drainage of Dedza District and the Project Site

Dedza is characterised by three topographic zones. The northern and western parts are in the Lilongwe Plains at an altitude of 1100-1300 metres above sea level. The eastern parts are in the Dedza Highlands (Dedza Mountain, Kirk Range and Dzalanyama Range) at an altitude of 1200 – 2000 and the Dedza escarpments, at an altitude of 1200 – 600 metres, occupy the eastern parts of the highlands, extending to areas along the lake at an altitude of 500 metres above sea level. Dedza District Hospital is at an altitude of about 1600 metres.

Figure 0.3: Topography for Dedza District

Inside the hospital fence, the terrain is flat at the entrance and slopes steadily at the back, such that the foundation for the EVD Centre is about a metre higher than the ground level on the southern side as shown in figure 4.4 on the next page. During the operational phase, run-off passing the EVD Centre, if contaminated by infectious waste, is likely to end up in the human settlements further down the slope outside the hospital brick fence.

It is also important to carefully select the site for the septic tank and soak pit to avoid wastewater reaching the human settlements in times of blockages and overflows.
4.1.4. Biodiversity

The project site was formerly used as a maize garden for the hospital and hence most of the plants at the site are weeds of no significant value. There is also a tree nearby which will not be affected. There is also no significant population or any rare or endangered species of fauna within the immediate vicinity of the project site.

4.1.5. Water Resources and Supply

Dedza Water Supply Scheme, owned by Central Region Water Board (CRWB) provides water at Dedza Boma and the District Hospital. The Scheme has two types of water sources (surface and groundwater). The surface sources include Mala, Chitowe and Namanolo streams from Dedza Mountain. These sources are supplemented by 7 boreholes. The current average raw water abstraction is 1,661 m$^3$/day. The raw water is treated by conventional treatment works which include clarifiers, pressure filters, disinfection facilities and clear water tanks. Hence the water at the hospital is safe for consumption and other domestic uses.

Dedza Town experiences intermittent water supply. For example in October 2015, according to newspaper$^3$ reports Dedza Border Post had two weeks of no water supply. The water problems extend to the hospital and affect hospital activities. The hospital has a 10,000 litres water reservoir but this is not sufficient. There is a need therefore, to sink a borehole for the EVD Quarantine Centre, which will require addition and reliable supply of water. It will be necessary to determine the appropriate distance of this borehole in relation to the new

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$^3$ http://zodiakmalawi.com/strange-news/two-weeks-without-water-at-dedza-border
and existing septic tanks and soak away. This is site specific and should be established for each water source on the basis of local hydrological and hydro geological conditions.

4.1.6. Temperature and Rainfall

Dedza District experiences a warm and temperate climate. The temperatures however vary according to the altitude, with high altitude areas experiencing low temperatures and low altitude areas experiencing high temperatures. The Hospital is at a high altitude area; hence it has low average temperatures.

The average temperature for the district is 18.0 °C, with the hottest months being October and November. According to the Dedza District Socio-economic Profile (2012 – 2018) the temperatures are rising steadily as a result of global warming.

The winter months have more rains than the summer months. Precipitation averages 1,041 mm, with the driest month being August, with 3 mm of rainfall. Most of the precipitation falls in January, averaging 247 mm. Figure 4.5 shows the average monthly temperature and rainfall for Dedza District.

![Figure 0.5: Average temperatures rainfall for Dedza District](image)

4.2 SOCIO-ECONOMIC ASPECTS

4.2.1. Population

According the National Statistical Office, Dedza District has a projected population of about 752,520, of which 49.66 percent are women. From the 2008 National Population Census, the population was reported to be at 678,789; of which 297,676 were male and 326,113 were female.
The district had a population density of 172 persons per square kilometre in 2008. This was much higher than the national average of 139 persons per square kilometre. The average number of persons per household is 4.3.

4.2.2. Migration Pattern

A large number of immigrants in Dedza District come from Mozambique, as a result of political conflicts. The 16 year Mozambique civil war that ended in 1992 displaced a number of people and some of them ended up settling in Dedza. Recently there have also been political tensions in Mozambique, especially after the 2014 disputed election and Dedza has continuously been receiving immigrants from Mozambique. There are also unregistered refugees from other countries.

Apart from political conflicts, a number of people immigrate to Dedza from other countries and other districts in Malawi for businesses and farming. Similarly people emigrate from Dedza for work, farming and business in other districts within Malawi and to other countries mainly Mozambique, South Africa, Zimbabwe and Zambia. In Mozambique some of the immigrants from Malawi work in the mines.

Dedza border post generally records a large number of inflow and outflow of people. The Dedza District Socio-economic Profile has provided statistics for 2007 to 2011 as given in Table 4.1. A health worker is stationed at the border to screen people for EVD. According to the immigration department, some of the people that enter through the border are prohibited immigrants e.g. prostitutes.

Table 0.1: Inflow and outflow of people at Dedza Border Post

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Visitor</th>
<th>No. of returning Residents</th>
<th>No. of Emigrants</th>
<th>No. of persons refused entry</th>
<th>No. of prohibited immigrants</th>
<th>No. of persons restricted</th>
<th>No. of refugees intercepted</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>17 784</td>
<td>23 005</td>
<td>48 643</td>
<td>0</td>
<td>12</td>
<td>126</td>
<td>500</td>
</tr>
<tr>
<td>2008</td>
<td>35 209</td>
<td>42 122</td>
<td>55 585</td>
<td>0</td>
<td>11</td>
<td>143</td>
<td>1504</td>
</tr>
<tr>
<td>2009</td>
<td>26 050</td>
<td>38 915</td>
<td>71 332</td>
<td>15</td>
<td>30</td>
<td>113</td>
<td>3191</td>
</tr>
<tr>
<td>2010</td>
<td>26 144</td>
<td>39 755</td>
<td>72 493</td>
<td>16</td>
<td>37</td>
<td>92</td>
<td>404</td>
</tr>
<tr>
<td>2011</td>
<td>24 676</td>
<td>30 626</td>
<td>75 200</td>
<td>2</td>
<td>45</td>
<td>136</td>
<td>620</td>
</tr>
</tbody>
</table>

Source: Dedza District Immigration Office, 2012

4.2.3. Economy

Economic activities in the district include farming, especially in the plains, forestry in the highlands and fishing along the lake area. Main crops that are grown include Maize, followed by beans and potatoes as evidenced by the land area used (see figure 4.6).
The crops are sold in the markets for income. Farming also employs a large number of people as labourers. Likewise the forest supports the people’s livelihoods through working as labourers for timber production and sales. Fishing is mainly done in the eastern areas.

4.3 HEALTH SERVICES

4.3.1 Health Services and Challenges

The health-care system in Dedza District, is delivered at the three levels of: district hospital, health centre/dispensary and community levels. Of great importance in these levels of health-care service delivery are the referral and communication systems. The communication system will also be useful when the Ebola Quarantine Centre is operational.

Health services are provided by the Ministry of Health, the private sector and Christian Health Association of Malawi (CHAM) health facilities. As of 2012, there were 34 health facilities in the district; 23 for government, 11 for CHAM and 1 for the Police. All the hospitals have telephones which can be used for communication in the case of an outbreak of EVD. The location for the hospitals is shown in figure 4.7.
According to the Dedza District Socio-Economic Profile, major causes of death in the district include malaria, tuberculosis, pneumonia, malnutrition and anaemia. Malaria is a leading cause of deaths.

### 4.3.2 Dedza District Hospital Existing Infrastructure

Dedza District Hospital is a standard district hospital comprising of an administration block, an out patients department (OPD) and registration, drug store, a laboratory, theatres, paediatric wards, gynaecology/antenatal maternity ward, female and male medical/surgical wards, male and female TB isolation wards, kitchen, laundry, mortuary and mourners shed. The hospital was built in December 1975 and most of the original buildings are still strong, only requiring refurbishments. Recently the Finance Merchants Bank (FMB) donated money for the construction of a corridor connecting the wards to the mortuary and the waste disposal area; and a new structure has been developed (see figure 4.8). Construction of the corridor has not finished but it is already being used.
4.3.3 Waste Management Services

4.3.3.1. Solid waste collection and disposal

Dedza District hospital has a disposal area for all wastes generated at the hospital. The disposal area is secured with a wooden fence and the hospital perimeter brick fence. There are three waste disposal pits which are currently in use: two open pits, one for food waste and the other for general hospital waste; and a covered placenta pit. The waste disposal area also has a waste storage room and an incinerator which is used for disposing infectious waste and sharps. There is also a water tap and a pit latrine outside the waste disposal area. The pit latrine is however closed as it is full.

The consultant assessed the waste management system and established the following:

1. The incinerator needs to be replaced with a high temperature, mechanical incinerator. The present one is a batch burner, which is discouraged by the Environmental Affairs Department (EAD), as it cannot reach high temperature to incinerate the waste completely, as is required. Moreover the incinerator is cracked and does not have a door (see figure 4.9) to stop ash and unburnt medical waste from falling out of the chamber. The incinerator also produces smoke and smell that is a nuisance.

2. Some sections of the wooden fence have fallen and must be maintained (figure 4.10). Future consideration should be paid by the hospital to arrange for a guard to be stationed permanently at the waste disposal area to ensure that birds, dogs and scavengers, which were reported to be a problem, are no longer picking wastes from the disposal site.
3. Waste are said to be segregated into sharps, infectious wastes and non-infectious wastes, from the point of generation (offices, laboratory and the wards) and is placed in appropriate receptacles. The receptacles are not colour coded but are labelled. When full, the receptacles are emptied into a wheelie bin which is then wheeled to the disposal site for burning in appropriate pits and the incinerator. However a visit to the disposal area unveiled that wastes are not fully segregated. Infectious wastes and sharps are burnt in the open pit, where it is not possible to burn the waste completely (see figure 4.11). These end up degrading the environment and can spread infections when picked by dogs, birds and scavengers. In addition, food/domestic waste especially from the patients’ wards is also mixed with infectious wastes.

4. The disposal pits are not well maintained and except for placenta pits, there is no covering of waste after throwing into the pit. When the pits are full, there is also no
proper rehabilitation as can be seen in figure 4.12; this is dangerous in terms of environmental health and safety.

Figure 0.11: An abandoned placenta pit and a full domestic waste pit that is still being used

5. The disposal area is generally not well maintained as evidenced by overgrown grass. The worker at the disposal site is exposed to health and safety risk due to shortage of personal protective equipment including appropriate gumboots, heavy duty gloves and face masks. Implementation of the Health Care Waste Management Plan under this project will provide support to these on-site health care waste disposal facilities.

6. The terrain of the disposal area is also a problem to effective waste management. The place slopes to the eastern side such that with the uncovered and full pits, run-off is likely to carry wastes away. The hospital must therefore close the pits and dig new ones, with a wall built around them to prevent contact with run-off. All the pits must be covered pits. In a phased approach, the hospital should consider ultimately closing the waste disposal site and out-sourcing waste management to the Local Council or private institution.

The hospital is currently constructing a new pit, which will replace the one that is now full, for medical waste, as shown if figure 4.12.
4.3.3.2. Liquid waste management

The liquid waste management system is characterised by septic tanks. Almost every major building at the hospital has its own septic tank. However it was established that in the past 5 years the septic tanks have never been emptied and are all full. The sewer line is also old and blockages and breakages are often experienced, resulting in overflow of sewage. During the site investigations there were at least two sites where sewage was flowing and one of them is shown in figure 4.13 below.

Figure 0.12: A non-infectious medical waste pit under construction

Figure 0.13: Sewage overflow through a broken line

Considering that the pit latrines that were seen at the site were also full and closed (especially those near the waste disposal area), a precarious situation looms and the hospital should make this a priority. Since the District Council does not have sewage tanker or disposal facility, it would be recommended that the hospital engage a private company to empty the septic tanks. The entire sewage systems should be inspected and rehabilitated.
CHAPTER 5 IMPACTS OF THE PROJECT AND SIGNIFICANCE RATING

Construction and operation of the Ebola Virus Disease quarantine centre at Dedza District Hospital will have both positive and negative impacts on the bio-physical and social-economic environment

5.1 IDENTIFICATION OF THE POTENTIAL IMPACTS

The impacts for the Ebola Virus Disease Centre were identified using the following approach and methodology:

5.1.1. Literature review

The consultant reviewed a number of documents including the Dedza District Socio-economic Profile and the World Health Organisation (WHO) manual for the care and management of patients in Ebola Care Units. The documents were reviewed to obtain a clear description of the environment in which the project will be implemented, the activities during operation and the anticipated impacts. WHO has also prepared guidelines for environmental management and infection control in Ebola Units and these have been included in the mitigation measures of some of the anticipated impacts. A list of documents reviewed is indicated in the references.

5.1.2. Site Investigations

Site investigations were carried out to complement the literature review. Specifically the consultant carried assessments at the hospital, visited the project site, the waste disposal area, the storage facilities and access areas to the project site. The investigations focussed on identification of critical environmental and socio-economic elements likely to be affected during the implementation and operation of the project.

5.1.3. Stakeholder Consultations

Stakeholder consultations were conducted with Hospital Officers and representatives of the community including the Ward Councillor who is also the Chairman of Health Advisory Committee. These consultations were held on 8th February and the list of people consulted is provided in annex 2, while issues raised are in annex 3.

5.1.4. Study of satellite images

Satellite images were produced and used to assess fine details of the geographical location and developments around at and around the site. This was important as the project’s area of influence is small and cannot be clearly presented by conventional maps.
5.2 DESCRIPTION OF POSITIVE IMPACTS

5.2.1. Positive impacts during planning phase

The main activities during this phase include:

i. Training and sensitizations;
ii. Designing of the EVD Quarantine/Treatment Centre;
iii. Assessment of existing infrastructure;
iv. Identification of contractor; and
v. Identification of the project site.

Significant impacts from the above activities will be as follows:

5.2.1.1. Increased knowledge and skills in infection control and prevention

The hospital staff that attended the training and sensitization in Ebola Virus Disease case management, Infection Control and Waste Management acquired knowledge and skills which can also be applied to the management of other infectious diseases. These efforts will be further supported under the infectious disease management training and surveillance programs targeting district health officials, frontline staff and community members that are a part of this Ebola response project.

The following measures can help enhance the impact:

i. Ensure that the trainings are continuous and that many people are trained and sensitised;
ii. MoH must use set communication channel and procedures when selecting people to participate in trainings;
iii. Trained people must be encouraged and motivated to be available during an outbreak;
iv. Ensure that the Health Care Waste Management Plan completed for the Nutrition and HIV/AIDS Project is implemented and followed to address potential environmental and health impacts due to operational activities; and
v. Conduct simulation exercise to firm up EVD response in case there is an outbreak.

5.2.2. Positive impacts during construction phase

Main activities during the construction phase include:

i. Site clearing and digging of the foundation;
ii. Construction of a concrete slab;
iii. Installation of prefabricated walls;
iv. Roofing of the building;
v. Excavation for the septic tank; and
vi. Construction of the septic tank as well as installation of incinerators.
5.2.2.1. Employment opportunities

The construction works will provide employment opportunities for the local people, although this will be short term and very few locals will be employed (about 10 people). During operation, the facility may also require skilled personnel (e.g. nurses and laboratory assistants); and unskilled workforce (e.g. guards and cleaners).

**Enhancement Measures**

i. The international contractor must observe local labour laws; and

ii. Workers must be paid fairly for the services rendered.

5.2.2.2. Acquisition of skills in construction of prefabricated buildings

The main contractor is from South Africa, but he has engaged local labourers. The local labourers to be used on the project are expected to acquire new skills from their counterparts through observation and training. To enhance the impacts, the contractor must be encouraged to provide on job training to the labourers.

5.2.2.3. Income to material/equipment suppliers

Construction of the treatment centre will require cement, sand and concrete. This will provide business opportunities for local materials suppliers; hence increased income opportunities. The impact can be enhanced by paying suppliers within the agreed times.

5.2.3. Positive Impacts during the Operation and Maintenance Phase

5.2.3.1. Increased rooms for medical services

The EVD Quarantine centre will be an additional infrastructure to the hospital and hence increase in the space for medical services. Since currently there is no EVD outbreak in Malawi, the EVD Centre structure can be used for other epidemics, thereby supplementing the use of tents for outbreaks and diseases including cholera. The new structure will also improve the appearance of the hospital.

The impact can be enhanced through:

i. Taking proper care of the EVD Quarantine Centre; and

ii. Ensuring the Centre is not misused and is readily available when needed for EVD.

5.2.3.2. Improved medical services

It is anticipated that there will be improved medical services due to the following:

i. Training and sensitization in infectious diseases management;

ii. Medical supplies and equipment that will be made available in readiness of EVD;
iii. An ambulance and utility vehicle that may be provided to the hospital for EVD. In the event that there is no Ebola Virus Disease, the ambulance and utility vehicle can be used for other infectious diseases.

The impact can be enhanced by:
   i. Periodic evaluation of the training and subsequent review of curricula;
   ii. Ensuring that EVD preparedness equipment is used properly (i.e. staff and equipment for an EVD outbreak should be readily available when needed).

5.2.3.3. Reduced environmental pollution

Installation and use of the new incinerator and implementation of waste management measures (from trainings and sensitizations) will result in a reduction of environmental pollution. The impact can be enhanced through the following measures:

   i. Continuously training waste handlers and medical staff in proper management of wastes;
   ii. Revising and updating the waste management plan for the hospital;
   iii. Monitoring staff and enforcing proper waste management practices
   iv. Allocating adequate financial resources to waste handling and management; and
   v. Monitoring the performance of incinerators and servicing them before they are broken.

5.3 DESCRIPTION OF NEGATIVE IMPACTS

5.3.1. Impacts during the planning and design

There will be no significant impacts on the biophysical and socio-economic environment in this phase as the activities are limited to predominantly desk work.

5.3.2. Impacts during construction

5.3.2.1. Accidents to workers, staff and public on the construction site

Accidents to staff, patients and the general public on the construction site may occur during construction. Sources of accidents may include electricity shocks during welding, objects falling on people, workers falling from heights, nailing or hammering oneself and injuries from lifting and carrying building materials. The general public and animals may also be exposed to risks of falling into open trenches, especially outside the contractor’s working hours. Mitigation measures include to:

- Train workers on prevention and managing incidences;
- Restrict hospital staff and the public from going to the construction site during and outside working hours; by placing posters, reflecting tapes and erecting barriers;
- Labourers must wear protective gear; and
- Provide first aid kit.
5.3.2.2. Utilizing unlicensed quarry sites

Construction of the treatment centre will require cement, sand and concrete. Indiscriminate mining activities can take place in sensitive areas and create depressions that often block surface drainage system and create pools of stagnant water. Such pools of stagnant water are breeding grounds for mosquitoes.

Mitigation measures include:
- Identify licensed quarries with the suitable materials for construction.
- Procure construction material only from permitted sites and licensed / authorized quarries

5.3.2.3. Use of lead-based paint products

Lead is commonly absorbed into the body by inhalation from use of and/or scrapping of lead-based products like paint. When workers breathe in lead as a dust, fume, or mist, their lungs and upper respiratory tract absorb it into the body. They can also absorb lead through the digestive system if it enters the mouth and is ingested.

5.3.2.4. Noise disturbances

Noise disturbances may result from metal fabrication activities and other machinery. The noise will be a source of discomfort to construction team and the users of the wards nearby. The construction team may make significant noise (including loud chatting) which can affect the children in the nearby children’s ward.

Mitigation measures include:
- The Hospital Administrator must sensitize the contractor to minimise noise;
- The contractor must use efficient machines that do not make loud noise;
- The contractor must provide appropriate PPE (e.g. ear muffs) to workers;
- The contractor must also ensure that noisy activities, which cannot be avoided, are limited to normal working hours.

5.3.2.5. Increased costs for electricity and water

An increase in the cost of utilities (electricity and water) may occur due to the contractor using water and electricity from the hospital supply lines. This can be a source of conflicts, considering that the hospital is underfunded and therefore is likely to have problems to pay additional utility charges. Currently, the hospital also experiences intermittent water supply and is not able to store adequate water to continuously supply the hospital. Hence any increase in demand is noticeable. Power supply from Electricity Supply Cooperation of Malawi (ESCOM) is also intermittent. The hospital has a diesel generator for use when there is no electricity. However diesel is far more expensive than power from ESCOM.

To avoid or mitigate the impact:
A proper arrangement for apportioning the costs must be agreed upon between the contractor and the hospital administration.

The contractor should provide a separate storage for water and an electricity generator to be used during construction and operation of the EVD Centre.

5.3.2.6. Dust nuisance

Levelling and reducing the slope is necessary to ensure that the foundation of the EVD Quarantine Centre is well protected and strong. These activities will likely lead to generation of dust, which can reach the nearby hospital wards, depending on the direction and strength of wind. Dust is also expected during the construction of access road.

To avoid or mitigate the impact:
- The construction team must wear dust masks during site clearing and levelling;
- Erect a barrier around the work sites where constructions is taking place to break or reduce wind and dust movement to the children’s ward; and
- Spray water on the activity area.

5.3.2.7. Risk of Spread of STIs and HIV/AIDS

Enhanced social interaction with the construction employees, most of whom are likely to come from other parts of the country, with the residents (considering the influence of money) is a potential avenue for transmission of HIV/AIDS and other social infections.

Mitigation measures include to:
- Awareness meetings shall be conducted as a part of all construction employee orientation programs; and
- Employees shall be provided with condoms for protection from STIs.

5.3.2.8. Waste generation and increased land degradation

Solid waste generation is anticipated during the construction phase. The waste may consist metal cuttings, excavated materials during levelling, paper/cement bags, empty paint and solvent containers and broken glass among others. Some of the wastes may be hazardous to the environment e.g. lead paints and cement while others like plastic are not biodegradable. The excavated soils on the other hand can be carried away by rain water and increase sedimentation and siltation.

The waste disposal area for the hospital is characterised by land degradation. Most of the generated waste will be disposed at this area thereby increasing land degradation.

To avoid or mitigate the impact:
- Properly segregate and separate wastes to encourage reuse of some of the wastes e.g. cartons and paint containers;
- Use some of the excavated materials e.g. stones for backfilling and rehabilitating eroded areas;
- Incinerate segregated hazardous wastes; and
Designate disposal sites in the contract and cost unit disposal rates accordingly.

5.3.3. Impacts during Operation and Maintenance

Activities during operation and maintenance phase include:

i. Receiving and isolation of suspected EVD cases and provision of health-care to EVD suspected or confirmed cases or to persons infected by other infectious diseases

ii. Specimen collection and transportation for the referral centre in Lilongwe; and

iii. Waste management (collection, transportation, treatment and disposal).

Significant negative impacts anticipated during this phase include:

5.3.3.1. Fear of being infected

EVD is a highly infectious disease that causes fear of being infected among the workers and the general public. When suspected or confirmed cases are reported, there is likely to be anxiety and fear among the hospital staff, patients and the nearby community. Some of the staff may be reluctant to work in the facilities and others may abscond for fear of getting the virus. Likewise some community members may shun using the hospital and may resist burial of dead bodies at their graveyards.

To avoid or mitigate the impact the following measures must be taken:

- Conduct adequate sensitization and awareness meetings with staff and the surrounding community on how the EVD may be contracted and transmitted;
- Inform and demonstrate to the staff and the community how safe burial practices may be conducted for EVD dead bodies;
- Secure consent to bury EVD corpses, at nearby graveyards, from the chiefs and local leaders;
- Train staff on Occupational Safety and Health and Infection Control; and
- Frequently update the public on the activities in the EVD Quarantine Centre

5.3.3.2. Air pollution and operational risk from incineration of wastes

During operation, there will be additional health-care wastes at Dedza District Hospital as a result of activities in the EVD quarantine centre. EVD centres generally produce a lot of wastes (2 – 20kg/person/day). The wastes will be incinerated in the proposed high temperature, two chamber incinerator with low emissions; to be installed by the project. Large amounts of emissions, if allowed to accumulate in the air may contribute to climate change effects. In addition, the current solid waste management practices at the hospital may result in smoke and emissions and these could also contribute to cumulative impacts of climate change.

Proposed mitigation measures for air pollution impacts are as follows:

- Ensure that good international industry practices related to hazardous waste incineration are followed in accordance with the International Finance Corporation’s
environmental, health, and safety technical (EHS) guidelines for waste management facilities.\(^4\)

- Install a high temperature, mechanical incinerator as specified for the EVD Centre;
- Train staff on how to operate the incinerators
- Orient laboratory and health-care staff to the infection control and waste management practices
- Plant trees around the incinerator to absorb carbon dioxide from the incinerator.
- Sensitize and train staff to adequately segregate the waste from the point of generation to ensure only combustible waste goes into incinerators;
- Adequately budget for fuel for the incinerators;
- Regularly maintain the incinerators to ensure they are working properly

5.3.3.3. Water pollution

Spillages of wastewater and chemicals from the EVD Quarantine Centre may occur resulting in water pollution. Water pollution is highly anticipated in areas where wastewater will settle after being carried by run-off from the area around the EVD Centre.

The EVD quarantine centre will use a septic tank and a soak-pit, which can also be a source of water pollution. Moreover, the project site steadily slopes towards human settlements. Hence improper siting of the soak pit may result sewage flowing into the human settlements. The septic tanks can also pollute the environment when the wastewater overflows either through the manholes or broken pipes. Since the wastes from the EVD Quarantine Centre will be infectious, ground water pollution can result in indirect and cumulative impacts.

To mitigate the impact:

- Ensure that wastewater disposal is adequately budgeted to ensure regular cleaning of the septic tank;
- Only licensed waste collectors shall be employed for this disposal;
- Construct the septic tank and soak pit according to the design specifications;
- Landscape the area to reduce slopping surfaces;
- Sensitize staff to avoid spillage of waste water on the ground surface;
- Sensitize staff and users of the EVD centre to appropriately use the waste drainage facilities to avoid blockages; and
- The septic tank and soak pit site should be regularly monitored to ensure early detection of problems.

\(^4\) The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice. When a member of the World Bank Group is involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. The World Bank Group's EHS Guidelines for Health Care Facilities can be found at: [http://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&localid=1323161961169](http://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&localid=1323161961169) and the General Environmental Health and Safety Guideline can be found at [http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES)
5.3.3.4. Increased runoff

The roof of the EVD Quarantine centre will serve as a water collector thereby increasing run-off around the centre. The terrain at the project site is slopping towards the brick fence and settlements outside the fence. Contaminated run-off may therefore, find its way to the nearby settlements.

To mitigate or avoid the impact:
- Carefully design the drainage system for the EVD quarantine centre.
- Installation of rain gutters to harvest rain water and reuse the water.
- Comprehensive soft and hard landscaping of the project site after construction works.

5.3.3.5. Occupation safety and health risks

The main health and safety issues will relate to the following:
   i) Working in a confined space and highly infectious disease;
   ii) Improper use of personal protective equipment e.g. the Ebola Suit;
   iii) Shortage of medical supplies;
   iv) Exposure to highly infectious waste, especially by the waste handlers; and
   v) Intermittent supply of utilities (electricity and water).

Health-care workers are likely to contract the Ebola Virus Disease. However the impact can be avoided or mitigated as follows:

- Dedza District Hospital shall be responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;
- The MoH and Dedza District Hospital must continue to train and sensitize its staff in infection control and best practices for managing infectious wastes in accordance with the World Health Organization’s Safe Management of Wastes from Health-care Activities\(^5\) handbook and its Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings\(^6\). Other relevant infection prevention and control guidelines provided by WHO should further inform operational procedures;
- Regularly monitor performance of equipment and carry out maintenance;
- Ensure there is enough supply of medical supplies including PPEs;
- Ensure that a fence around the EVD treatment centre is constructed according to WHO guidelines to keep visitors at distance but allowing them to see through;
- Regularly train staff on how to use PPE; and
- Ensure that the Project’s Health Care Waste Management Plan and the infectious disease management training and surveillance programs targeting district health officials, frontline staff and community members under Component 1 are implemented.

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\(^5\) http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1

\(^6\) http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1&ua=1
5.3.3.6. Land degradation and soil contamination

Waste that cannot be incinerated completely, ashes from incineration and other types of wastes may be buried in the ground. The hospital does not have an ash pit and ash is disposed either in the infectious or the non-infectious waste pit. Improper disposal of ash and incombustible wastes may result in land degradation and soil contamination. The impact can be mitigated by observing the following:

The impact can be mitigated by observing the following:

- Ensure wastes are incinerated completely;
- Construct an ash pit with a cover as specified;
- Close the existing open pits and rehabilitate the area;
- Dispose wastes in properly sealed tough plastic bags that cannot leak; and
- Properly fence the waste disposal area.

5.3.3.7. Increase in water demand

Dedza Town experiences intermittent water supply. The water problems extend to the hospital and affect hospital activities. The hospital has a 10,000 litres water reservoir but this is not sufficient. There is a need therefore, to sink a dedicated borehole for the EVD Quarantine Centre, which will require addition and reliable supply of water.

To mitigate this impact, the hospital should:

- Before the EVD treatment centre can become operational and receive patients, a borehole must drilled and or CRWB has to provide a dedicated water line for the hospital;
- Install a dedicated water reservoir for the EVD treatment facility;
- Determine the appropriate distance of this borehole in relation to the new and existing septic tanks and soak away.

5.3.4. Impacts during Decommissioning

Decommissioning entails closure of the facilities and services. Consideration of impacts of decommissioning is important so that on closure of these facilities, due consideration is given to mitigate impacts from abandoned structures and equipment. Consideration should also be given to staff that may be made redundant.

5.3.4.1. Air, land and water contamination

Air, land and water contamination from waste would result from cleaning of premises and equipment and from transportation and disposal of wastes. The impact can be mitigated through the following measures:

- Disposing wastewater in appropriate and approved drainage systems; and
- Incinerating contaminated solid waste and disposing ash in approved landfill sites
5.3.4.2. Risk of infection from contaminated equipment

The decontamination team and other people are likely to be at risk of infection of handling equipment that has not been fully decontaminated. Mitigation measures would include to:

- Provide appropriate PPE for staff for destroying equipment used in the centre; and
- Destroy all equipment used in the EVD Quarantine Centres.

5.4. SIGNIFICANCE RATING OF NEGATIVE IMPACTS

The significance of the identified potential negative environmental and social impacts has been determined by assessing and rating the impacts as (-1), (-2) or (-3), using the available information, professional judgement and experience from similar development projects. The ratings are based on:

a) Likelihood of occurrence (L) – a measure of the likelihood of the impact to occur;
b) Spatial Distribution (SD) - size of the area to be impacted; and
c) Time (duration) of impact Distribution (TD) - the period of time over which the impact may occur.

The significance of the impact has been determined by the product of L, SD and TD. Table 5.1 provides the significance rating of the impacts of the construction and operation of the EVD Quarantine Centre at Dedza District Hospital before mitigation. After implementation of the mitigation measures, the impacts are assessed as low to nil.
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<th>Impact</th>
<th>Likelihood of occurrence (L)</th>
<th>Spatial Distribution (SD)</th>
<th>Time (duration) of impact Distribution (TD)</th>
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<td>Occupation safety and health risks</td>
<td>-3</td>
<td>-1</td>
<td>-3</td>
<td>-9</td>
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<tr>
<td>2.6</td>
<td>Land degradation and soil contamination</td>
<td>-2</td>
<td>-1</td>
<td>-3</td>
<td>-6</td>
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<tr>
<td>2.7</td>
<td>Increase in water demand</td>
<td>-3</td>
<td>-1</td>
<td>-1</td>
<td>-3</td>
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<td>3.</td>
<td><strong>Decommissioning Phases</strong></td>
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<tr>
<td>3.1</td>
<td>Air, land and water contamination</td>
<td>-2</td>
<td>-1</td>
<td>-2</td>
<td>-4</td>
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<tr>
<td>3.2</td>
<td>Risk of infection from contaminated equipment</td>
<td>-2</td>
<td>-1</td>
<td>-2</td>
<td>-4</td>
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</tbody>
</table>
CHAPTER 6 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

6.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This Environmental and Social Management Plan (ESMP) has been prepared to facilitate the integration of environmental and social management measures in the construction and operation of the EVD Treatment Centre. The ESMP contains:

- Anticipated negative impacts of the proposed project and mitigation measures identified in Chapter 5 of this report;
- Responsible institutions to implement the mitigation measures; and
- Time frame for implementation of the mitigation measures.

Implementation of the ESMP will be done by the Contractor and Dedza District Hospital. Hence the contractor has to include the costs for implementing the mitigation measures in the contract bid.

The aim of the ESMP is to ensure that the Ministry of Health will prevent, reduce, mitigate and compensate for the impacts of the proposed project on the biophysical and socio-economic environment. Key elements of the ESMP are summarised table 6.1. As part of the environmental management, the Department of Planning and Policy Development (DPPD) in the MoH must ensure that the ESMP is included as part of the contractor’s contract documents. The MoH and Dedza District Hospital must also ensure that funds are available for implementation of the ESMP.

Several issues with the existing infrastructure and operational sustainability at the hospital have been identified through the development of this ESMP, including the poor condition of the incinerator and septic system. While these are not directly linked to this project, it is recommended that Dedza District Hospital take a phased approach, to correct systemic challenges affecting human health, the natural environment and the general level of hospital performance. Other systemic issues, like those associated with inadequate water and electrical supplies, have to be properly mitigated as they can directly result in potentially serious environmental health issues during operation of the EVD treatment centres.
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Environmental or Social Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Institutional Responsibility</th>
<th>Time for Implementation</th>
<th>Source of Funds</th>
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<tbody>
<tr>
<td>1.</td>
<td>Construction Phase</td>
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</table>
| 1.1 | Accidents to workers, staff and public on construction sites | • Train workers on prevention and managing incidences;  
• Restrict hospital staff and the public from going to the construction site during and outside working hours, by placing posters, reflecting tapes and erecting barriers;  
• Labourers must wear protective gear; and  
• Provide first aid kit. | Contractor | Throughout the construction phase | Include in the project bid for the Contractor |
| 1.2 | Utilizing unlicensed quarry sites       | • The Contractor will identify materials from existing licensed quarries with the suitable materials for construction.  
• Procurement of construction material only from permitted sites and licensed / authorized quarries. | Contractor | Throughout the construction phase | Include in the project bid for the Contractor |
| 1.3 | Use of lead-based paint products       | • The Contractor shall ensure that no paint containing lead or lead products is used. | Contractor | Throughout the construction phase | Include in the project bid for the Contractor |
| 1.4 | Noise disturbances                     | • The hospital administrator must sensitize the contractor to minimise loud chatting;  
• The contractor must use efficient machines that do not make a lot of noise;  
• The contractor must provide appropriate PPE (e.g. ear muffs) to workers; and  
• The contractor must also ensure that noisy activities which cannot be avoided are limited to normal working hours. | Contractor | Throughout the construction phase | Include in the project bid for the Contractor |
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<th>No.</th>
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<th>Proposed Mitigation Measure</th>
<th>Institutional Responsibility</th>
<th>Time for Implementation</th>
<th>Source of Funds</th>
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</thead>
</table>
| 1.5 | Increased costs for electricity and water | • A proper arrangement for apportioning the costs must be agreed upon between the contractor and the hospital administration.  
• The contractor should provide a separate storage for water and an electricity generator to be used during construction and operation of the EVD Centre. | Dedza District Hospital, Contractor | Once before construction starts | Include in the project bid for the Contractor |
| 1.6 | Dust nuisance | • The construction team must wear dust masks during the site clearing and levelling;  
• Erect a barrier around the work sites where construction is taking place to break or reduce wind and dust movement to the children ward; and  
• Spraying water on the activity area. | Contractor | Throughout the construction phase | Include in the project bid for the Contractor |
| 1.7 | Spread of HIV AIDS | • Awareness meetings shall be conducted as a part of all construction employee orientation programs; and  
• Employees shall be provided with condoms for protection from STIs. | Contractor | Throughout the construction phase | Include in the project bid for the Contractor |
| 1.8 | Waste generation and increased land degradation | • Properly segregate and separate wastes to encourage reuse of some of the wastes e.g. cartons and paint containers;  
• Use some of the excavated materials e.g. stones for backfilling and rehabilitating eroded areas;  
• Incinerate segregated hazardous wastes; and  
• Designate disposal sites in the contract and cost unit disposal rates accordingly. | Contractor | Throughout the construction phase | Include in the project bid for the Contractor |

2. Operational and Maintenance phase
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Environmental or social Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Institutional Responsibility</th>
<th>Time for Implementation</th>
<th>Source of Funds</th>
</tr>
</thead>
</table>
| 2.1 | Fear of being infected                  | • Conduct adequate sensitization and awareness meetings with staff, and reaching out to the whole surrounding community on how the EVD may be contracted and transmitted;  
• Inform and demonstrate to the staff and the community how safe burial practices may be conducted for EVD dead bodies;  
• Secure consent to bury EVD corpses at nearby graveyards from the chiefs and local leaders;  
• Train staff on Occupational Safety and Health and Infection Control; and  
• Frequently update the public on the activities in the EVD Quarantine/Treatment Centre | Dedza District Hospital, Local District Council | Once every month | Include in the project budget |
| 2.2 | Air pollution and operational risk from incineration of wastes | • Install a high temperature, mechanical incinerator as specified for the EVD Centre and in accordance with the International Finance Corporation’s environmental, health, and safety technical (EHS) guidelines for waste management facilities;  
• Train staff on how to operate the incinerators  
• Orient laboratory and health-care staff to the infection control and waste management practices  
• Plant trees around the incinerator to absorb carbon dioxide from the incinerator. | Contractor, Dedza District Hospital | Once during construction for installing the incinerator | Include in the project budget |
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Environmental or social Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Institutional Responsibility</th>
<th>Time for Implementation</th>
<th>Source of Funds</th>
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<tr>
<td></td>
<td>• Ensure that good international industry practices related to hazardous waste incineration are followed in accordance with the International Finance Corporation’s environmental, health, and safety technical (EHS) guidelines for waste management facilities.</td>
<td>Dedza District Hospital</td>
<td>Once every month</td>
<td>Include in the hospital’s recurrent budget</td>
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<td></td>
<td>• Sensitize and train staff to adequately segregate the waste from the point of generation; to ensure only combustible waste goes into incinerators;</td>
<td>Contractor</td>
<td>Once during construction of septic tank</td>
<td>Include in the project budget</td>
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<td>• Adequately budget for fuel for the incinerators;</td>
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<td>• Regularly maintain the incinerators to ensure they are working properly; and</td>
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<td></td>
<td>• Train staff on how to operate the incinerators;</td>
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<td>2.3</td>
<td>Water pollution</td>
<td>• Construct the septic tank and soak pit according to the design specifications;</td>
<td>Contractor</td>
<td>Once after construction</td>
<td>Include in the project budget</td>
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<td>• Landscape the area to reduce slopping surfaces;</td>
<td>Dedza District Hospital</td>
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<td>No.</td>
<td>Potential Environmental or Social Impact</td>
<td>Proposed Mitigation Measure</td>
<td>Institutional Responsibility</td>
<td>Time for Implementation</td>
<td>Source of Funds</td>
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| 2.4 | Increased runoff                       | • Carefully design and construct the drainage for the EVD quarantine centre and site.  
• Incorporate comprehensive soft and hard landscaping of the project site after construction works. | Dedza District Hospital | Once after construction | Include in the project budget |
|     |                                        | • Sensitize staff to avoid spillage of waste water on the ground surface;  
• Sensitize staff and users of the EVD centre to appropriately use the waste drainage facilities, to avoid blockages;  
• The septic tank and soak pit site should be regularly monitored to ensure early detection of problems;  
• Ensure that wastewater disposal is adequately budgeted to ensure regular cleaning of the septic tank; and  
• Only licensed waste collectors shall be employed for this disposal; | Dedza District Hospital | Once every month | Include in the hospital’s recurrent budget |
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<th>No.</th>
<th>Potential Environmental or social Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Institutional Responsibility</th>
<th>Time for Implementation</th>
<th>Source of Funds</th>
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</thead>
</table>
| 2.5 | Occupation safety and health risks      | • Dedza District Hospital shall be responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;  
  • Regularly screen health workers for Ebola;  
  • The MoH and Dedza District Hospital must continue to train and sensitize its staff in infection control and best practices for managing infectious wastes in accordance with the World Health Organization’s *Safe Management of Wastes from Health-care Activities*[^8] handbook and its *Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings*[^9]. Other relevant infection prevention and control guidelines provided by WHO should further inform operational procedures;  
  • Regularly monitor performance of equipment and carry out maintenance;  
  • Ensure that a fence around the EVD treatment centre is constructed according to WHO guidelines to keep visitors at distance but allowing them to see through;  
  • Ensure that the Project’s Health Care Waste Management Plan and infectious disease management training and surveillance programs targeting district health officials, frontline staff and community members are implemented;  
  • Ensure there is enough supply of medical supplies including PPEs; and  
  • Regularly train staff on how to use PPE. | Dedza District Hospital, | Once every month | Include in the hospital’s recurrent budget |

[^8]: http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1
[^9]: http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SD_S_2014.4_eng.pdf?ua=1&ua=1&ua=1
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<th>No.</th>
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<th>Proposed Mitigation Measure</th>
<th>Institutional Responsibility</th>
<th>Time for Implementation</th>
<th>Source of Funds</th>
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</table>
| 2.6 | Land degradation and soil contamination | • Construct an ash pit with a cover as specified;  
• Close the existing open pits and rehabilitate the area;  
• Properly fence the waste disposal area;  
• Ensure wastes are incinerated completely; and  
• Dispose wastes in properly sealed tough plastic bags that cannot leak. | Contractor | Once during construction | To be included in the hospital’s development budget |
| 2.7 | Increase in water demand | • A borehole has to be drilled and or CRWB has to provide a dedicated water line for the hospital before the EVD treatment centre can become operational and receive patients;  
• Install a dedicated water reservoir for the EVD treatment facility;  
• Determine the appropriate distance of this borehole in relation to the new and existing septic tanks and soak away. | Dedza District Hospital, Mchinji District Hospital | Once | To be included in the hospital’s development budget |

### 3. Decommissioning Phases

| 3.1 | Air, land and water contamination | • Dispose wastewater in appropriate and approved drainage systems; and  
• Incinerate contaminated solid waste and dispose ash in approved landfill sites | Dedza District Hospital, | Throughout the decommissioning phase | Include in the hospital’s recurrent budget |
| 3.2 | Risk of infection from contaminated equipment | • Provide appropriate PPE for staff for destroying equipment used in the centre; and  
• Destroy all equipment used in the EVD Quarantine Centre. | Dedza District Hospital, | Throughout the decommissioning phase | Include in the hospital’s recurrent budget |
6.2 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

Environmental and social monitoring has to be carried out during construction, operation and maintenance and decommissioning of the Ebola Virus Disease Treatment Centre. Table 6.2 provides the proposed monitoring institutions, monitoring indicators, monitoring frequency and the estimated costs for monitoring the ESMP implementation. The contractor (Project Engineer) will also perform monitoring activities as stipulated in the contract.
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>Implementation cost</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Construction Phase</td>
<td>Train workers on prevention and managing incidences; Restrict hospital staff and public from going to the construction site during and outside working hours; by placing posters, reflecting tapes and erecting barriers; Labourers must wear protective gear; and Provide first aid kit.</td>
<td>- Number of workers trained - Number of posters and perimeter covered with barrier - Number of workers wearing protective gear - Types and number of supplies in the first aid box</td>
<td>Contractor, District Health Office, Local Council, MoH (DPPD)</td>
<td>Once every month during the construction phase</td>
<td>$1,000 USD (for transport and allowances for officials from the DPPD)</td>
</tr>
<tr>
<td>1.1</td>
<td>Accidents to workers, staff and public on construction sites</td>
<td>- The Contractor will identify materials from existing licensed quarries with the suitable materials for construction. - Procurement of construction material only from permitted sites and licensed / authorized quarries.</td>
<td>- Evidence provided upon request demonstrating source of construction materials</td>
<td>Contractor, District Health Office, Local Council, MoH (DPPD)</td>
<td>As appropriate during the construction phase</td>
<td>Included in 1.1</td>
</tr>
<tr>
<td>1.2</td>
<td>Utilizing unlicensed quarry sites</td>
<td>- The Contractor shall ensure that no paint containing lead or lead products is used.</td>
<td>- Evidence of using non lead-based paint.</td>
<td>Contractor, District Health Office, Local Council, MoH (DPPD)</td>
<td>As appropriate during the construction phase</td>
<td>Included in 1.1</td>
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<tr>
<td>1.3</td>
<td>Use of lead-based paint products.</td>
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<td>No.</td>
<td>Potential Impact</td>
<td>Proposed Mitigation Measure</td>
<td>Monitoring indicator</td>
<td>Institution/person to monitor</td>
<td>Monitoring frequency</td>
<td>Implementation cost</td>
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<td>1.4</td>
<td>Noise disturbances</td>
<td>- The hospital administrator must sensitize the contractor to minimise loud chatting;</td>
<td>- Complaints/reports on loud chatting&lt;br&gt;- Efficiency rating of machines&lt;br&gt;- Number of staff using PPEs&lt;br&gt;- Time of the day when noise making activities are carried</td>
<td>Contractor, District Health Office, Local Council, MoH (DPPD)</td>
<td>Once every month during the construction phase</td>
<td>Included in 1.1</td>
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<td></td>
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<td>- The contractor must use efficient machines that do not make a lot of noise;</td>
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<td></td>
<td>- The contractor must provide appropriate PPE (e.g. ear muffs) to workers; and</td>
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<td></td>
<td></td>
<td>- The contractor must also ensure that noisy activities which cannot be avoided are limited to normal working hours.</td>
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<tr>
<td>1.5</td>
<td>Increased costs for electricity and water</td>
<td>- A proper arrangement for apportioning the costs must be agreed upon between the contractor and the hospital administration.</td>
<td>- A signed agreement on payment of utility bills&lt;br&gt;- Use of a separate water reservoir and generator</td>
<td>Contractor, District Health Office, MoH (DPPD)</td>
<td>Once every month during the construction phase</td>
<td>Included in 1.1</td>
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<td></td>
<td></td>
<td>- The contractor should provide a separate storage for water and an electricity generator to be used during construction and operation of the EVD Centre.</td>
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<tr>
<td>1.6</td>
<td>Dust nuisance</td>
<td>- The construction team must wear dust masks during the site clearing and levelling;</td>
<td>- Use of mouth and nose masks&lt;br&gt;- Perimeter covered with a barrier&lt;br&gt;- Area sprayed with water</td>
<td>Contractor, District Health Office, Local Assembly, MoH (DPPD)</td>
<td>Once every month during the construction phase</td>
<td>Included in 1.1</td>
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<td>- Elect a barrier around the work sites where constructions is taking place to break or reduce wind and dust movement to the children ward; and</td>
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<td>- Spraying water on the activity area.</td>
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<tr>
<td>No.</td>
<td>Potential Impact</td>
<td>Proposed Mitigation Measure</td>
<td>Monitoring indicator</td>
<td>Institution/person to monitor</td>
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</tbody>
</table>
| 1.7 | Spread of HIV/AIDS | - Awareness meetings shall be conducted as a part of all construction employee orientation programs; and  
- Employees shall be provided with condoms for protection from STIs" | - Number of meetings conducted  
- Number of condoms distributed | Contractor, District Health Office, Local Assembly, MoH (DPPD) | Once every month during the construction phase | Included in 1.1 |
| 1.8 | Waste generation and increased land degradation | - Properly segregate and separate wastes to encourage reuse of some of the wastes e.g. cartons and paint containers;  
- Use some of the excavated materials e.g. stones for backfilling and rehabilitating eroded areas;  
- Incinerate segregated hazardous wastes; and  
- Wastes must be disposed in appropriate disposal pits. | - Volume of wastes that is segregated  
- Area that is rehabilitated using material from excavations  
- Volume of hazardous material that is incinerated  
- Size and area for a waste disposal pit | Contractor, District Health Office, Local Assembly, MoH (DPPD) | Once every month during the construction phase | Included in 1.1 |

2. **Operational and Maintenance phase**
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>Implementation cost</th>
</tr>
</thead>
</table>
| 2.1 | Fear of being infected | • Conduct adequate sensitization and awareness meetings with staff, and reaching out to the whole surrounding community on how the EVD may be contracted and transmitted;  
• Inform and demonstrate to the staff and the community how safe burial practices may be conducted for EVD dead bodies;  
• Secure consent to bury EVD corpses at nearby graveyards from the chiefs and local leaders;  
• Train staff on Occupational Safety and Health and Infection Control; and  
• Frequently update the public on the activities in the EVD Quarantine/Treatment Centre | • Number of times sensitizations meetings are conducted  
• Number of staff and community members people sensitized  
• Consent for conducting burial at nearby community graveyard  
• Number of staff trained in occupation safety and health and infection control  
• Reports on activities at the EVD Quarantine Centre | District Health Office, Local Council, MoH (Ebola Coordination Unit) | Once every month | $2,000 USD (for transport and allowances for officials from the Ebola Coordination Unit) and $20,000 USD for infectious disease management training and surveillance programs under Component 2. |
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<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/Person to monitor</th>
<th>Monitoring frequency</th>
<th>Implementation cost</th>
</tr>
</thead>
</table>
| 2.2 | Air pollution and operational risk from incineration of wastes | - Install a high temperature, mechanical incinerator as specified for the EVD Centre and in accordance with the International Finance Corporation’s environmental, health, and safety technical (EHS) guidelines for waste management facilities;  
- Train staff on how to operate the incinerators  
- Plant trees around the incinerator to absorb carbon dioxide from the incinerator. | - Specifications of the incinerator installed  
- Number of planted trees | Contractor, District Health Office, Local Council, MoH (DPPD, Ebola Coordination Unit) | Once every month | Included in 2.1 |
<table>
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<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
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<td></td>
<td>• Ensure that good international industry practices related to hazardous waste incineration are followed in accordance with the International Finance Corporation’s environmental, health, and safety technical (EHS) guidelines for health care facilities.</td>
<td>• Number of staff trained in waste sorting and volume of waste segregated appropriately</td>
<td>District Health Office, Local Assembly, MoH (Ebola Coordination Unit)</td>
<td>Once every month</td>
<td>Included in 2.1</td>
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<td></td>
<td></td>
<td>• Sensitize and train staff to adequately segregate the waste from the point of generation to ensure only combustible waste goes into incinerators;</td>
<td>• Litres of fuel available every month</td>
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<td>• Adequately budget for fuel for the incinerators; and</td>
<td>• Records of maintenance of incinerators</td>
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<td></td>
<td>• Regularly maintain the incinerators to ensure they are working properly.</td>
<td>• Number of staff oriented in infection control and waste management</td>
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</tbody>
</table>

10 The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice. When a member of the World Bank Group is involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. The World Bank Group’s EHS Guidelines for Health Care Facilities can be found at: [http://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2B%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&id=1323161961169](http://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e6f66a6515bb18/Final%2B%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&id=1323161961169) and the General Environmental Health and Safety Guideline can be found at [http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2B Ambient%2BAir%2B Quality.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2B Ambient%2B Air%2B Quality.pdf?MOD=AJPERES)
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>Implementation cost</th>
</tr>
</thead>
</table>
| 2.3 | Water pollution     | - Construct the septic tank and soak pit according to the design specifications;  
- Landscape the area to reduce slopping surfaces;  
- Sensitize staff to avoid spillage of waste water on the ground surface;  
- Sensitize staff and users of the EVD centre to appropriately use the waste drainage facilities to avoid blockages; and  
- The septic tank and soak away pit site should be regularly monitored to ensure early detection of problems.  
- Ensure that wastewater disposal is adequately budgeted to ensure regular cleaning of the septic tank;  
- Only licensed waste collectors shall be employed for this disposal; and  

- Specifications of constructed septic tanks  
- Slope of the area  
- Reports of spillages in inappropriate places  
- Number of staff sensitized to appropriately use the drainage system  
- Reports of misuse and blockage of sewage system  
- Records of monitoring and maintenance of the septic tank  

- Ensure that wastewater disposal is adequately budgeted to ensure regular cleaning of the septic tank;  
- Only licensed waste collectors shall be employed for this disposal; and  | District Health Office, Local Assembly, MoH (Ebola Coordination Unit) | Once every month | Included in 2.1 |

| 2.4 | Increased runoff    | - Carefully design and construct the drainage for the EVD quarantine centre and site; and  
- Incorporate comprehensive soft and hard landscaping of the project site after construction works.  
- Presence of a well designed and constructed drainage system  
- Whether soil erosion is being mitigated appropriately.  | District Health Office, MoH (DPPD) | Twice during the construction phase | Included in 2.1 |
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>Implementation cost</th>
</tr>
</thead>
</table>
| 2.5 | Occupation safety and health risks | • Dedza District Hospital shall be responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;  
• The MoH and Dedza District Hospital must continue to train and sensitize its staff in infection control and best practices for managing infectious wastes in accordance with the World Health Organization’s *Safe Management of Wastes from Health-care Activities*\(^{11}\) handbook and its *Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings*\(^{12}\);  
• Regularly monitor performance of equipment and carry out maintenance;  
• Ensure there is enough supply of medical supplies including PPEs;  
• Sensitize and train staff to adequately segregate the waste from the point of generation.  
• Orient laboratory and health-care staff to the infection control and waste management practices; and  
• Ensure that a fence around the EVD treatment centre is constructed according to WHO guidelines to keep visitors at distance  
• Ensure that the Project’s Health Care Waste Management Plan and infectious disease management training and surveillance programs targeting district health officials, frontline staff and community members under Component 1 is implemented; | • Number of staff trained in occupational safety, infection control and waste management  
• Number of times equipment is maintained  
• Number of PPE in stock  
• Records on frequency of trainings, the names of people in attendance and the topics covered. | Dedza District, MoH (Ebola Coordination Unit) | Once every month | Included in 2.1 |

\(^{11}\) [http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1)  
\(^{12}\) [http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1&ua=1](http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1&ua=1)
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
<th>Institution/Person to monitor</th>
<th>Monitoring frequency</th>
<th>Implementation cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6</td>
<td>Land degradation and soil contamination</td>
<td>• Construct an ash pit with a cover as specified;</td>
<td>• Specifications of ash-pits</td>
<td>District Health Office, Local Assembly, Local NGO’s, MoH (Ebola</td>
<td>Once every month</td>
<td>Included in 2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Properly fence the waste disposal area;</td>
<td>• Closed pits and area of land rehabilitated</td>
<td>Coordination Unit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ensure wastes are incinerated completely;</td>
<td>• Perimeter that is fenced properly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Dispose wastes in properly sealed tough plastic bags that cannot leak; and</td>
<td>• Percentage of wastes incinerated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Material used to dispose wastes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.7</td>
<td>Increase in water demand</td>
<td>• A borehole has to be drilled and or CRWB has to provide a dedicated water line for the</td>
<td>• Presence of borehole</td>
<td>District Health Office, MoH (Ebola Coordination Unit)</td>
<td>Once every month</td>
<td>Included in 2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hospital before the EVD treatment centre can become operational and receive patients;</td>
<td>• Presence of dedicated water line for the hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Install a dedicated water reservoir for the EVD treatment facility;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Determine the appropriate distance of this borehole in relation to the new and existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>septic tanks and soak away.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Decommissioning Phases</td>
<td>• Dispose wastewater in appropriate and approved drainage systems; and</td>
<td>• Area for disposal of wastewater</td>
<td>District Health Office, MoH (Ebola Coordination Unit and DPPD)</td>
<td>Twice during</td>
<td>$400 USD for transport and</td>
</tr>
<tr>
<td>3.1</td>
<td>Air, land and water contamination</td>
<td>• Incinerate contaminated solid waste and dispose ash in approved landfill sites</td>
<td>• Volume of solid waste incinerated</td>
<td></td>
<td>decommissioning phase</td>
<td>allowances for officials from</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>the planning Department</td>
</tr>
<tr>
<td>No.</td>
<td>Potential Impact</td>
<td>Proposed Mitigation Measure</td>
<td>Monitoring indicator</td>
<td>Institution/Person to monitor</td>
<td>Monitoring frequency</td>
<td>Implementation cost</td>
</tr>
<tr>
<td>-----</td>
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<td>-----------------------------</td>
<td>----------------------</td>
<td>-------------------------------</td>
<td>---------------------</td>
<td>--------------------</td>
</tr>
</tbody>
</table>
| 3.2 | Risk of infection from contaminated equipment | • Provide appropriate PPE for staff for destroying equipment used in the centre; and  
• Destroy all equipment used in the EVD Quarantine/Treatment Centres. | • Reports of use of PPE during cleaning  
• Number of equipment destroyed | District Health Office, MoH (Ebola Coordination Unit, DPPD) | Twice during decommissioning phase | |
For effective implementation of the Environmental Management and Monitoring Plan, there is need for clear roles, responsibility and reporting procedure:

The Ministry of Health through the Department of Planning and Policy Development (DPPD) and the Ebola Coordination Unit will have the responsibility to ensure that the ESMP and the monitoring plan is implemented. They must ensure that all stakeholders are familiar with the contents of the ESMP and their roles; resources are available and key staff for implementing the activities are adequately trained. As part of the environmental management, the DPPD must also ensure that ESMP is included as part of the contract documents. Specific guidelines which the contractor must observe to minimise or mitigate impacts on the biophysical and social economic environment are provided in annex 5.

Since the impacts are mainly localised and moderate, the actual implementation of the ESMP and monitoring will be done by the stakeholders at district level as follows:

1. **Dedza District Health Office**, is responsible for delivering health services including environmental health in the area. The Environmental Health Officer (EHO) will lead in the implementation of the ESMP. The EHO will familiarise with the contents of the ESMP, mobilise resources and stakeholders and ensure that the mitigation measures are implemented. The EHO will however need training in management of wastes from an Ebola Treatment Centre. The will be reporting to the District Environmental Health Officer (DEHO) and the Hospital Administrator.

   The District Health Office also has the **Maintenance Supervisor** who will supervise the contractor in the construction phase, ensuring that the contractor is adhering to the contract agreement with the ESMP included. The Maintenance Supervisor will be reporting to the Hospital Administrator, the DEHO and the Projects Engineer from the Department of Policy and Planning Department.

2. **The Contractor** will be responsible for ensuring construction activities are carried out sustainably through compliance to the contract with ESMP included. The contractor will also adhere to the regulations and environmental standards for Malawi.

3. The hospital’s Healthcare Advisory Committee (HAC) will also work with the District Hospital in the implementation and monitoring of the ESMP.

4. **The District Council** is the Local Authority for the district. The district council has a District Environmental Sub-Committee (DESC) which has the responsibility for appraising projects, environmental management plans and monitoring. Therefore all reports from the DEHO, Contractor and HAC will be reviewed by the DESC. The District Council’s Environmental District Officer (EDO) and Engineer must also work with Dedza District Health Office in implementing the ESMP and monitoring the project activities.

   The DESC reports to the **District Executive Committee (DEC)**. Where the ESMP is found to be inadequate or there is non-compliance to the ESMP, the DESC will recommend the
revision of the ESMP or discontinuing of the project. The DEC has the authority to stop order the review of the project or stop it.

The Environmental Affairs Department (EAD) in the Ministry of Natural Resources, Energy and Mining will provide an advisory role to the District Council. The EAD also has inspectors who will inspect the project for compliance to Environmental Standards in accordance with the Environmental Management Act (1996).

### 6.4 COSTS FOR ENVIRONMENTAL MANAGEMENT

Costs for managing the impacts on the biophysical and socio-economic environment are, in general, included in the project budget. Costs for monitoring the ESMP have also been estimated in dollars at the exchange rate of 1 USD = MK 700.00 and they are as in Table 6.3.

**Table 6.3: Summary of the costs for monitoring the ESMP**

<table>
<thead>
<tr>
<th>Item/Activity</th>
<th>During construction phase</th>
<th>During operation phase (5 Years)</th>
<th>During decommissioning phase</th>
<th>Total Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport and allowance for monitoring staff from the Ebola Coordination Unit</td>
<td>1,000</td>
<td>10,000</td>
<td>400</td>
<td>11,400</td>
</tr>
<tr>
<td>and Planning Department of Ministry of Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infectious disease management training and surveillance programs targeting</td>
<td></td>
<td>20,000</td>
<td></td>
<td>20,000</td>
</tr>
<tr>
<td>district health officials, frontline staff and community members</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,000</td>
<td>30,000</td>
<td>400</td>
<td>31,400</td>
</tr>
</tbody>
</table>
CHAPTER 7 CONCLUSION AND RECOMMENDATIONS

7.1 CONCLUSIONS

This Environmental and Social Management Plan (ESMP) has been prepared for the construction of Ebola Virus Disease (EVD) Quarantine Centre at Dedza District Hospital. The study for the ESMP has revealed that implementation of the project will have both beneficial and adverse impacts on the environment. It is expected that the plan will serve as a basis for integration of environmental considerations into the project and will guide in mitigation of the negative impacts to low and negligible levels with the aim of improving the sustainability and the performance of the EVD Quarantine center.

7.2 REQUIREMENTS

To ensure effective implementation of the ESMP the following summary of requirements are made:

- Dedza District Hospital is shall ensure an adequate and sustainable supply of water and electricity to the EVD treatment centre;
- The MoH and Dedza District Hospital will continue to train and enforce infection control practices for managing wastes in accordance with standards set by the World Health Organization, including those outlined in the Safe Management of Wastes from Health-care Activities handbook in addition to the Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings.
- During construction, operation and maintenance phases, the MoH and the Dedza District Hospital will implement all the good international industry practices provided in the International Finance Corporation’s environmental, health, and safety technical (EHS) guidelines for Health Care Facilities.
- The ESMP is adopted and effectively applied;
- The Ministry of Health (MoH) will ensure there is funds are available for implementation of the ESMP;
- The District Health Office, the District Council and the other responsible institutions will ensure that technical expertise and financial resources are available for mitigating of the negative impacts;
- MoH will include the ESMP in the construction activities contract;
- The district health office will adequately sensitize the local people about the project and Ebola Virus Disease to calm Ebola fears and get assistance in the project in the event there is an outbreak;
- The contractor and monitoring authorities will comply with all relevant legal provisions outlined in this report and any other provisions that may arise due to new activities that may be introduced; and
• The District Health Office and the District Council will be open to the communities, and provide updates on the EVD preparedness activities.
REFERENCES

17. UNDP (2014). Assessing the socio-economic impacts of Ebola Virus Disease in Guinea, Liberia and Sierra Leone - The Road to Recovery
ANNEXES

ANNEX 1: TERMS OF REFERENCE

Environmental and Social Management Plans for 6 Ebola Sites

Introduction:
Any civil works/constructions being funded under World Bank projects require an Environmental and social due diligence to be undertaken during project conceptualization/preparation and prior to start of works. Such due diligence requires actions to be taken, and the process is documented, consulted and disclosed before project implementation starts. This step was missed out when the AF phase was approved; however, this is a requirement which the Bank has mandated which cannot be bypassed. Recognizing that the project is in active implementation, the Bank would help in any way possible to ensure requirements are adhered to and compliance is met, while also not significantly delaying project implementation. Therefore as a start, site-specific Environmental and Social management plans (ESMPs) must be prepared.

Scope of the ESMP:
1. Include a description of the geographical locale of each site and its environs and the associated social aspects during construction and operation of the Ebola Virus Diseases Quarantine/Treatment Centres;
2. Where the EVD Quarantine/Treatment is being constructed at a hospital include a detailed description of the existing waste management systems including incinerators and conditions of sewage systems;
3. Provide the mode of treatment of infectious waste water, a description what is to be undertaken in the event that a connection has been made to the municipal sewer lines. Likewise the system to be put in place for infectious sharps and waste;
4. Assess impacts of installation of incinerators, wastewater discharges and solid waste management will not have any negative impacts
5. Define any measures required to prevent any longer-term impacts on the environment and the neighbouring community and could also build in such enhancements into the design/infrastructural plan of the units.
6. Propose an EMP in tabular form by which all of the mitigation measures prescribed will be carried out. An environmental monitoring plan should also be prepared.
7. The ESMPs will need to be consulted with the local community and disclosed prior to continuation of works.

Report format:
Considering the project has been stopped prepare a summarised report of 6 – 10 pages.

Assignment Duration: 13 days

---

13 ToRs based on communications with World Bank and meetings between NAC and the Consultant. No official ToRs were provided
### ANNEX 2: LIST OF PEOPLE CONSULTED

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation -</th>
<th>Institution</th>
<th>Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Solomoni Jere</td>
<td>District Health Officer</td>
<td>Dedza District Hospital</td>
<td>0881188734</td>
</tr>
<tr>
<td>Elizabeth Chingayipe</td>
<td>Chief Preventive Officer</td>
<td>Dedza District Hospital</td>
<td>0888364552</td>
</tr>
<tr>
<td>Darwin Mingoli</td>
<td>Hospital Administrator</td>
<td>Dedza District Hospital</td>
<td>0888528878/0999096455</td>
</tr>
<tr>
<td>Wiseman Chimwaza</td>
<td>Environmental Health Officer</td>
<td>Dedza District Hospital</td>
<td>0888353592</td>
</tr>
<tr>
<td>Alick Mkunguza</td>
<td>Maintenance Manager</td>
<td>Dedza District Hospital</td>
<td>0999351297</td>
</tr>
<tr>
<td>Lovemore Japhet</td>
<td>Waste Disposal Area worker</td>
<td>Dedza District Hospital</td>
<td>0992143491</td>
</tr>
<tr>
<td>Davie Lingalawe</td>
<td>Ward Councillor and HAC member</td>
<td>Dedza District Hospital</td>
<td>0999941873</td>
</tr>
<tr>
<td>S. Saidi</td>
<td>Health Advisory Committees (HAC) - Chairman</td>
<td>Dedza District Hospital</td>
<td>0881018568</td>
</tr>
</tbody>
</table>

Some of the community members interviewed immediately outside Dedza Hospital.
<table>
<thead>
<tr>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General environmental management and Infrastructure</strong></td>
</tr>
<tr>
<td>- The incinerator at the hospital was opened in 1975 when the hospital was being opened. Maintenance of the incinerator has been a problem due to funding;</td>
</tr>
<tr>
<td>- The hospital usually gets less money than budgeted such that at times staff have been forced to use their own money to buy PPEs and Cleaning equipment e.g. blooms and mops;</td>
</tr>
<tr>
<td>- The worker at the waste disposal area is not provided with PPE including appropriate shoes and gloves.</td>
</tr>
<tr>
<td>- Wastes from the hospital is not segregated adequately;</td>
</tr>
<tr>
<td>- Awareness and sensitization have started targeting managers the hospital staff and members of the Health Advisory Committee. The whole community is yet to be sensitized.</td>
</tr>
<tr>
<td>- Very few hospital staff have received training in the wearing of the Ebola Suit.</td>
</tr>
<tr>
<td>- Safety of health workers at the border must be included in the project concept. Presently the hospital is failing to adequately support the health worker at the border.</td>
</tr>
<tr>
<td>- The community has never complained about smoke from the incinerator. Smoke goes towards the direction of the hospital and it is felt the hospital staff;</td>
</tr>
<tr>
<td>- Funding problems are the main reasons why the hospital is having problems to trim grass, maintain the incinerator, maintain the sewage system and carry out other environmental management issues properly.</td>
</tr>
<tr>
<td>- The hospital has a heavy duty generator which is adequate.</td>
</tr>
<tr>
<td>- There are water tanks but they are not enough. There is a need of a bore hole.</td>
</tr>
<tr>
<td><strong>Ebola Preparedness Activities</strong></td>
</tr>
<tr>
<td>- Hospital staff are afraid of Ebola – some are likely to refuse to work in the EVD Quarantine Centre in the event there is Ebola.</td>
</tr>
<tr>
<td>- There is limited involvement of hospital staff in the development of the EVD Quarantine Centre.</td>
</tr>
<tr>
<td>- The Hospital Staff was involved in the finding of a construction site.</td>
</tr>
<tr>
<td>- The site was selected as it is an isolated place.</td>
</tr>
<tr>
<td>- Construction for the EVD centre has stopped.</td>
</tr>
<tr>
<td>- The District Council and TAs are involved in Ebola Preparedness activities.</td>
</tr>
<tr>
<td>- The community welcomes the new infrastructure</td>
</tr>
</tbody>
</table>
ANNEX 4: ARCHITECTURAL DESIGN OF ASH PIT FOR THE EVD CENTRES

NOTES

1. DO NOT SCALE OFF FROM THIS DRAWING. ALL DIMENSIONS MUST BE CHECKED ON SITE AND ACCURATELY DETAILED. ACKNOWLEDGEMENT OF DESIGNER TO THE PROJECT ARCHITECT IS REQUESTED.

2. THE CONTRACTOR IS RESPONSIBLE FOR THE STRUCTURAL STABILITY AND SAFETY PERFORMANCE OF THEIR WORK.

REVISIONS

PROJECT TITLE
CONSTRUCTION OF AN INCINERATOR

CLIENT
SECRETARY FOR HEALTH
P.O. BOX 30377
LILONGWE

ELEVATIONS

DRAWN
A. G. KAZA

DATE
JANUARY 2023

SCALE
A1

CHECKED
E.C. MATHANDA

PROJECT NUMBER
A B B

DRAWING NUMBER
PILE NO
SERIAL No
REVISION No
ANNEX 5: ENVIRONMENTAL GUIDELINES FOR CONTRACTORS

1. General Provisions and Precautions
The contractor shall take all necessary measure and precautions to ensure that all the works and associated operations on or off the work sites are carried out in accordance with statutory and regulatory environmental and social requirements of the Malawi. The contractor shall take all measures necessary to implement the requirements of the ESMP and protection measures relevant to the works.

The contractor shall avoid and prevent any nuisance or disturbance associated with execution of work under this project. In the event of any soil, debris or silt from the work sites being deposited on any adjacent land, the contractor shall immediately remove all such spoil debris or silt and restore the affected area to its original state, to the satisfaction of the responsible authorities. Any temporarily acquired land for construction purposes should be restored to its prior condition, to the satisfaction of the client or client’s representative.

The contractor shall include environmental management costs in the bid and shall commit to implementing the environmental management activities as agreed in the contract conditions. The contractor shall be liable to a fine as determined by the Environmental Affairs Department (or Minister of Natural Resources, Energy and Mining) in accordance with the EMA 1996, where his actions contravene environmental compliance.

2. Protection of Water and other Public Services
The Contractor shall ensure that no public services are disrupted as a result of execution of the construction works. In particular, the Contractor shall:

- Not interfere with supply or abstraction of water for public or private use; and shall not pollute any water resources (including groundwater);
- Not disrupt power supply or telephone connections or any other public or private services including footpaths and walkways;
- Not discharge or deposit any waste or any material into any waters or any grounds except with the permission of the appropriate regulatory authorities.
- At all times ensure that all streams, drains and trenches within and adjacent to the work sites are kept safe and free from any debris and any material arising from the works;
- Protect all water courses (including ditches, canals, drains and lakes) from pollution, siltation, flooding or erosion as a result of the execution of the works.
- Assume all responsibility to locate or to confirm the details and location of all utility services on or in the vicinity of the site
- Assume responsibility for any damage and/or interference caused by him or his agents, directly or indirectly, arising from actions taken or a failure to take action to protect public or private utilities.
- Be responsible for full restoration of any damage caused and for restoration of services. Restoration shall be to the satisfaction of the client/client’s representative. The client/client’s representative will ensure that any affected third party is content before confirming they are content with the restoration enacted by the contractor.
• Ensure that water and waste products shall be collected, removed and disposed of at a site approved by the District Council in a manner that will not cause pollution or nuisance.
• Not dispose of any surplus material on private land unless authorized in writing by the owner(s), authenticated before a notary public, and with previous authorization of the District/City Council.

3. **Control of Air Pollution**
• Open fires and burning of construction waste shall not be permitted;
• Dust-generating operations shall not be permitted to affect any residential areas, pedestrians or any public or private property. Where dust generation is inevitable, appropriate measures such as use of water sprays and fencing shields or appropriate covering material shall be employed. All workers shall be protected from dust emissions by providing them with appropriate protective wear.
• All construction machinery, plant and equipment including all vehicles shall be regularly maintained to ensure that no smoke or obnoxious gas is discharged to pollute the air and affect the public or property.

4. **Acquisition of Construction Material**
• Only licensed quarrying, sand mining and brick-making operations and sites shall be used as sources of construction materials.

5. **Prevention of Soil Erosion.**
• The Contractor shall fence off construction sites, provide appropriate drainage and ram or compact soils where necessary to stabilize the soils and reduce erosion.
• All construction sites shall be backfilled, levelled and re-planted with trees, vegetation and grass to restore them to the original state and to prevent soil erosion to the satisfaction of the client or client’s representative
• As far as possible the contractor shall avoid or reduce construction activities and mining of construction material during the peak of rainy seasons.

6. **Control of Social Impacts**
• The Contractor shall coordinate with all the neighbouring land users and respect their rights to a clean and safe environment. Written agreements with local landowners for temporary use of their sites or property shall be made and sites must be restored to original condition or conditions acceptable to the owner within an agreed time. Camp sites shall be maintained and cleaned up at all times and on completion of the works.
• Health and safety of workers shall be protected by providing basic emergency health and first aid facilities and awareness meetings aimed at the prevention of sexually transmitted diseases. Awareness meetings shall be conducted as a part of all construction employee orientation programs. Employees shall be provided with condoms for protection from STIs.
• The Contractor shall obtain all necessary written traffic control permissions including for use of flagmen, traffic cones or other devices such as barricades
and/or lights which he must use to control traffic for safety of pedestrians, cyclists and all road users, particularly school children.

- The Contractor shall neither stockpile nor store any construction materials; nor park construction plant or vehicles in walk ways, pedestal routes or driveways. Stockpiles of material shall be covered with tarpaulins or sprayed with water where these materials pose risks of dust to the public or people’s property.

7. **Noise Control and Regulation**

- The Contractor shall take all necessary measures to ensure that the operation of all mechanical equipment and construction processes on and off the site shall not cause any unnecessary or excessive noise to the public. In addition, the Contractor shall operate noisy equipment within government working times unless with prior arrangement and permission from the employer.
- Vehicle, plant and equipment exhaust systems shall be maintained in good working order, as recommended by the manufacturers, to ensure that no noise is unnecessarily generated to inconvenience the public.
- Construction works and operations shall be scheduled to coincide with periods when people would least be affected by noise, having due regard for avoiding any noise disturbances to local residents, hospitals, schools or any other public and private places in the work site neighbourhood.
- The contractor shall notify public (likely to be affected by the works) of impending construction operations and specify methods to receive and handle all public complaints.

8. **Environmental Monitoring**

- The Contractor shall be responsible for monitoring all his activities and ensuring that all environmental requirements and the above conditions are met at all times.
- Contractor shall also facilitate regular environmental, social and health; and safety monitoring by the Client, the Client’s representative or an independent monitor appointed by the Client, or any other national agency with a remit to inspect and monitor construction, environmental, social and health and safety performance.
- The contractor will immediately agree and implement a rectification plan to bring the contractor back into compliance where inspections, audits and monitoring identify issues that are not in compliance with the ESMP as included in the contract.