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

11 May 2016
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<th>ACRONYM</th>
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<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>
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<td>EVD</td>
<td>Ebola Virus Disease</td>
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<td>Government of Malawi</td>
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<td>IPC</td>
<td>Infection Prevention Control</td>
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<td>KCH</td>
<td>Kamuzu Central Hospital</td>
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<td>MoH</td>
<td>Ministry of Health</td>
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<tr>
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<td>National Construction Industry Council of Malawi</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental Organisation</td>
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<td>National Environmental Action Plan</td>
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<td>Personal Protective Equipment</td>
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<td>TCE</td>
<td>Technical Committee on the Environment</td>
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EXECUTIVE 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. Mchinji is one of the border districts where an EVD Quarantine Centre will be constructed at Mchinji 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 Mchinji 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 Mchinji EVD Quarantine Centre.

Methodology for the study

In order to predict the impacts of construction of the EVD quarantine centre at Mchinji 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 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 Mchinji EVD quarantine centre will emanate from the project activities during the construction, operation and maintenance and decommissioning phase. The following are identified as potential positive impacts of the project:

i. Increase in knowledge and skills

ii. Employment opportunities

iii. Acquisition of skills in construction of prefabricated buildings
iv. Income to material/equipment suppliers
v. Increased rooms for medical services
vi. Improved medical services
vii. Reduced environmental pollution

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

i. Accidents to workers, staff and public on construction sites
ii. Noise disturbances
iii. Landscape degradation
iv. Fear of being infected with EVD
v. Increased air pollution from smoke from incinerators
vi. Water pollution
vii. Increase in water demand
viii. Occupation safety and health risks
ix. Air, land and water contamination
x. Risk of infection from contaminated equipment

Management of the Impacts
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 to 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 Mchinji EVD quarantine centre 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 sick and deceased.

The recent Ebola Virus Disease (EVD) outbreak started in March 2014 in 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 began, 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 4×4 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.

The EVD quarantine centres being proposed at Karonga, Dedza, Mchinji and Mwanza Districts are 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 outbreak. The activities started during the recent outbreak in East Africa and for 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 work includes construction of a septic tank and an ash pit in addition to provisions for 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 EVD quarantine centre for Mchinji District Hospital. The ESMP predicts and describes impacts of the project; and outlines the enhancement and mitigation measures to be implemented by MoH 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 centre; 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 of EVD quarantine centre at Mchinji 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 anticipated positive and negative impacts of the proposed project activities on the biophysical and socio-economic environment, and provides mitigation measures for the negative impacts; 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 for Mchinji EVD quarantine centre, 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 (sewage ponds, incinerators, placenta pits and solid waste disposal sites) 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 the District Health Officer, District Medical Officer, District Environmental Health Officer, Environmental Health Officer, the Hospital Administrator and a ground labourer.
e)  a public meeting with community members and interviews with key informants from the surrounding communities; and
f)  assessment of socio-economic 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 for Mchinji Hospital 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 Centre at Mchinji 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 Mchinji District Hospital must sustainably safeguard the 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 ESIA 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 Treatment centre at Mchinji District Hospital 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 the EVD quarantine centre at Mchinji 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 Mchinji 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 centre for Mchinji Hospital. 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.

Where applicable for the proposed project, preparation of ESIAAs will have to comply 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.

Part XII, Section 69 of the EMA, 1996 provides for the Establishment of the Environmental Appeals Tribunal, which shall among others consider appeals against any decision or action of the Minister, Director or inspector under this Act; appeals against the revocation by the Minister or Director, of a license issued under this Act; and shall consider such other issues relating to the protection and management of the environment and the conservation and sustainable utilization of natural resources as the Minister, the Director or any person may refer to it. Hence, any conflicts or differences on the environmental and social management process during the implementation of the project must be referred to the Environmental Appeals Tribunal. Complainants are allowed to appeal at the high court within 30 days, where they are not satisfied with the decision of the Environmental Tribunal.

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 centre will generate both solid and liquid waste; hence there is need for the developer and contractors 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 (ESMP) 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.

The construction activities for the Mchinji 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. Managing of the EVD quarantine centre during the operation phase will be done by Mchinji District Hospital, 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 and social impact assessment is to ensure that the 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 MCHINJI

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 Mchinji 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 0.1 Main rooms in the Mchinji EVD Quarantine Centre

<table>
<thead>
<tr>
<th></th>
<th>1. Nurses Station</th>
<th>To be used as an office for nurses. The room has no direct door to the isolation ward as an infection control measure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Change room</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>
<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>
<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>
<td>For keeping drugs</td>
</tr>
<tr>
<td>6.</td>
<td>Sluice Rooms</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>
<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>
<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 WHO guidelines, all liquid waste from an EVD quarantine/treatment centre are not supposed to go into the public sewage system. Therefore a separate septic tank will be constructed for the EVD centre at Mchinji 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 to be constructed near the incinerator. The architectural design of the ash pit is provided in Annex 6.

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 Guidelines.² Considering the infectious nature of the wastes, the expected volume and the air pollution impacts of incineration, the following specifications have been proposed for the incinerator.

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>100 kg 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/bc554d80488658b6b6e66a6515bb18/Final%2B-%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&id=1323161961169](http://www.ifc.org/wps/wcm/connect/bc554d80488658b6b6e66a6515bb18/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-%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES)
### 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>

#### 3.2.3. Location of the incinerator

At Mchinji District Hospital, three sites A, B and C as shown in figure 3.3 were considered for the installation of the incinerator and construction of the ash pit by the hospital administration team:

1. **Site A** was considered potential, as it is near where the EVD quarantine centre is to be located. Considering that wastes from the EVD centre are infectious, the World Health Organisation (WHO) guidelines, recommend having a waste disposal area in its vicinity to minimise risk of exposure. However, during the consultation on 9th April, 2015 it was observed that the site is in the middle of hospital buildings (as can be seen in figure 3.3). Hence, it was decided that it was not ideal for waste disposal, in view of smoke and smell that may affect people in the hospital buildings.

2. **Site B** is where there are the current hospital incinerator and placenta pit. The site was considered potential, as it is on the northern side of the hospital fence and exposed to the south-westerly winds, which would remove smoke from the hospital area. In addition, the presence of structures such as ash pit, fence and a concrete slab at the site would ensure minimal construction works and costs. However access to the site was seen to be a challenge due to the hospital departments positioned along the way; and since the site is far away from the proposed EVD centre.
3. Finally Site C was considered the most appropriate as it is adjacent to the EVD quarantine centre and is directly accessible. It also meets the WHO recommendation. In addition, the site is on the fence and there are fewer hospital buildings close to it, as compared to Site A. The site is also exposed to south-westerly winds, such that smoke from incineration is likely to be blown away from settlements that are about 30 meters east of the fence. It was therefore concluded that the incinerator for the EVD quarantine centre should be installed at site C.

The internal meeting with the hospital staff was followed with a community meeting on 6 May, 2016. The community members had no objection to installing the incinerator at Site C. Minutes of the meeting and a signed confirmation of the meeting are in Annexes 4 and 5 respectively.

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>Plaster and steel windows</td>
<td>burnt bricks, sand, steel, paint</td>
</tr>
<tr>
<td>Roof</td>
<td>Roof sheets and trusses</td>
<td>corrugated iron sheets, timber 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 Mchinji construction activities started in December 2015 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.
3.5 LABOUR FOR CONSTRUCTION

One international contractor has been engaged by the Ministry of Health to construct the EVD treatment/quarantine centres in all the sites except at Kamuzu Central Hospital in Lilongwe District. 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 Mchinji District Hospital EVD centre project.
CHAPTER 4 ENVIRONMENTAL AND SOCIAL SETTING OF MCHINJI EVD CENTRE

4.1 BIO-PHYSICAL CHARACTERISTICS OF THE PROJECT AREA

4.1.1. Project Location

Mchinji District is located in the Central Region of Malawi, about 109 Kilometres (km) from Lilongwe and the Boma is about 12 Km from the Zambian border. Figure 4.1 shows the location of Mchinji District in the Central Region of Malawi.

![Map of Central Region of Malawi depicting Mchinji District Boundaries](image)

Figure 0.1: Map of Central Region of Malawi depicting Mchinji District Boundaries
Source: Mchinji District Socio-Economic Profile

The proposed EVD quarantine centre will be developed within Mchinji District Hospital premises at approximately the following coordinates: 36L 487932 m E and 36L 8474088 m S. Figure 4.2 is the satellite image for Mchinji District Hospital and also shows the project site:
The site is near the Physical Asset Management (PAM) Office at the north-eastern side, the Out-patients Department (OPD) and the Male Ward on the western side as shown in figure 4.3. There are also 6 small buildings (some of them are shown in figure 3.3 and figure 4.5) at the south of the slab for the EVD centre. The buildings are a small house and a kitchen currently being used as a storage room for the contractor, a bigger house currently not being used and 3 toilets. None of the buildings will be demolished as a result of the construction or operation of the EVD quarantine centre. The toilets are however used by patients, staff and guardians which may result in problems of isolation of the facility during the operation phase hence a wire fence is proposed around the building.

Figure 0.2: Satellite image of Mchinji District Hospital and the site for the EVD centre

Figure 0.3: Structures around the EVD site at Mchinji District Hospital
4.1.2. Site Selection and Accessibility

The site was selected considering its accessibility and availability of space. There were not any other options for the site due to lack of free space within the hospital premises. Apart from the main entrance, the site can be accessed using the rear entrance which is next to PAM offices. Suspected EVD, cases will be brought to the centre using this entrance. The entrance is normally used by patients and others to a small market outside the hospital. During an outbreak, the entrance will be closed for other users but EVD suspected and confirmed patients to ensure there is no contact with the others.

4.1.3. Topography and Drainage

Mchinji has two district terrains and lies between 1,200 and 1,829 meters above sea level. The hilly western part, consists of Mchinji Mountain ranges, with gentle slopes that are 1,600 to 830 metres above sea level. The remaining part, which forms the largest part of the district, lies within a plain of mostly arable land. Dambos and waterways drain the plains into Bua and Rusa rivers. The site for the EVD quarantine centre is in the flat plain at an elevation of 1206 metres above sea level; while the outlet for the oxidation ponds for Mchinji District Hospital is in the Bua River. Figure 4.4 shows the topography and drainage of Mchinji District.
4.1.4. Geology and Soils

Mchinji is underlain by Precambrian basement rocks comprising mainly unmetamorphosed sandstones and conglomerates. The soils are Latosols of the Ferrallitic soil group. They are yellowish red in colour and sandy in texture; and are moderately permeable, hence wastewater must be managed carefully to avoid ground water pollution. The area is a low to moderate aquifer.

4.1.5. Biodiversity

The project site is mainly covered by a lawn. There are also 3 Toona ciliate trees at the project site as shown in figure 4.5. The trees are over 15 metres away from the slab for the EVD quarantine centre and are not likely to affect EVD quarantine activities. Hence it is anticipated that they will not be cut down. If it is determined that trees have to be cut down as a result of activities related to the EVD treatment centre construction however, then replacement trees must be planted on a two for one basis. Being a developed area, there are no significant population of fauna at the site other than an insignificant population of ants and grasshoppers.

4.1.6. Temperature and Rainfall

The district (and the project area) generally has a warm tropical climate with average annual maximum temperatures varying from 21 to 26 °C and the annual minimum temperatures ranging from 10 degrees to 16 degrees Celsius. The months of October and November are the hottest while June and July are the coldest in the year. The EVD quarantine centre will require an air conditioning system to maintain the temperatures at constant and comfortable levels.
The rainy season starts from November and ends in April. The district receives an average rainfall ranging from 21 to 250 mm per month. Annual average rainfall is about 1022 mm. Figure 4.6 shows the average temperature and rainfall for Mchinji District. An effective drainage system must therefore be constructed for the quarantine to avoid flooding during the rainy season.

Figure 0.6: Temperatures and Average Rainfall for Mchinji District

4.1.7. Air Quality/ Air Pollution

Air pollution is not a significant environmental problem for Mchinji as there are no major industries and the number of cars is small as compared to the Cities in Malawi. However an increase in cross-border trade between Malawi and Zambia has seen an increase in the number of vehicles in the district transiting from Zambia to Lilongwe and other parts of Malawi. At the district hospital, air pollution is a result of smoke from the incinerator and open burning of wastes.

4.2 SOCIO-ECONOMIC ASPECTS

4.2.1. Population

As at 2008 population census, Mchinji District had a population of 458,556. The district had a population density of 136 persons per square kilometre which is much lower than the national average of 139 person per square kilometre. The population was however fast growing with an average growth rate of 2.5% per annum. The average number of persons per household is 4.5. contrary to national and central region averages, sex distribution of the district population reveals that there are more males than females. According to NSO, the projected population is a total 610,781 of which are males 306,402 and 304,379 are females.
4.2.2. Migration Pattern

Mchinji experiences more immigration than emigration. The district has several tobacco estates where workers from other districts come to work as labourers or tenants. In addition, other ethnic groups move to Mchinji to conduct businesses. In 2008 the district had over 15 known households of non-assisted refugees, most of them Burundians. These are authorized by UNHCR to do business in urban areas.

The district shares borders with Zambia and Mozambique. Hence there is also a considerable inflow and outflow of people. There are two recognised border posts namely Mchinji to Zambia and Namizana to Zambia and Mozambique. Movement of people is seasonal. Most people travel for businesses or shopping at Mchinji Boma or in Lilongwe City. Currently due to the food shortage situation, Malawians are crossing the border to buy Maize flour in Zambia. The nearest trading centre in Zambia is Chipata.

4.2.3. Economy

Agriculture is the mainstay for People in Mchinji. Main crops grown are tobacco followed by Maize. There are a number of large estates where tobacco is grown. Groundnuts, beans, potatoes and other crops are also grown either for food or for sale. The crops are sold in formal and informal markets. Formal markets are those which are registered with and recognized by the government as well as the District Council. Informal markets are those not recognized by the government. In addition to agriculture, a large population supports themselves through businesses and employment.

4.2.4. Water and Electricity Supply

Water at Mchinji Boma is supplied by the Central Region Water Board (CRWB). The water intake is at Ludzi and Mchinji Rivers and a gravity fed system is used to supply water to the Boma population and institutions. However due to a small size of the water supply scheme and vandalism, CRWB is unable to supply water fully to the Boma. Water supply problems worsen during the dry season as CRWB is unable to get enough water at its intake. As a result the water board supplies water in rations (3 hours water supply/area/day). The 3 hours water supply ration also applies to the hospital as it does not have a special dedicated water line.

The hospital has a 24,000 Litres water reservoir to cover for periods when there is no water supply. However during the times when water is available for 3hrs only, the tank is never filled to capacity thereby failing to cover for the whole day. The tank was also not in use for about a year until recently due to maintenance problems. Considering that providing health-care services for EVD cases requires a lot of water (approximately 250L a day per person), there is a need for a borehole at the hospital. However the hospital will have to get

3 The tank has been maintained using government provisions and donations from Nation Newspaper. Refer to http://mwnation.com/mchinji-hospital-to-benefit-from-fun-run/
a permit from CRWB first as the water board has monopoly over water supply in the district. There is also need to have a dedicated water line, starting from the main water supply point to the hospital, which is about 5 km. Such a project will be very expensive, needing a grant or donations.

Electricity in the district is supplied by Electricity Supply Corporation of Malawi. Again like the rest of the district and Malawi, the project area experiences intermittent supply of electricity. The district hospital has an electricity generator which has been installed recently and is used when there is no electricity. However it is expensive to use the generator as it uses 40 litres of diesel for about an hour.

4.3 HEALTH SERVICES

4.3.1 Health Services and Challenges

Mchinji District Hospital focuses on the priority problems of malaria, acute respiratory infections including tuberculosis (TB), HIV/AIDS, maternal mortality, and diarrhoea diseases. These are also priority health problems at national level as well as priorities laid down in the Malawi Growth and Development Strategy (MGDS; Malawi DHS 2004)

The health-care system in Mchinji District, like in other districts, 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.

According to Mchinji District Socio-economic Profile (2008 -2012), the health-care system was faced with a number of problems which include:

i. High prevalence of preventable killer diseases such as malaria, respiratory infections;
ii. Diarrhoea diseases, HIV/AIDS, malnutrition and skin infections;
iii. High maternal morbidity and mortality rates;
iv. Limited number of health facilities which are inequitably distributed across the district;
v. Congested health facilities due to cross border patients;
vi. Limited space and bed capacity for patients requiring admission;
vii. Inadequate staffing levels and high staff attrition rates;
viii. Inadequate transport and communication facilities;
ix. Erratic drugs and medical supplies; and
x. Inadequate financial resources.

During consultations with the hospital staff it was established that the problems continue to exist. For example it was reported that while the bed space is about 250, the hospital usually takes in about 300 - 400 people especially in the months of April, May, June and July. Therefore it is likely that in the absence of EVD the hospital may use the EVD facility and resources for other diseases. It is important therefore to sensitize the District Hospital Office
to ensure that resources for EVD are not used for any other cases and that the facility is well taken care of so that the hospital is always ready for an EVD case.

The hospital is also faced with a challenge to maintain equipment such as sterilisers, autoclaves and other machines. Drugs, protective equipment and waste carrier bags are mostly in short supply, mainly due to inadequate funding.

4.3.2 Mchinji District Hospital Existing Infrastructure

The main structures for the hospital include 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 ward, kitchen, laundry, mortuary and mourners shed, maintenance workshop, cooking and guardian shelter. For waste Management, the hospital has oxidation ponds, brick incinerators, placenta pit and refuse pit.

The hospital was opened in 1989 and is old, but the buildings are in a good state and require minor maintenance such as painting. The major infrastructure problem is related to the electricity wiring which is decayed and needs to be replaced. In 2014 the Kitchen caught fire due to the same wiring problems and it has not been reconstructed. The hospital is currently using a makeshift kitchen.

4.3.3 Waste Management Services

4.3.3.1. Solid waste collection and disposal

Healthcare solid waste is segregated into hazardous waste (infectious waste) and non-infectious wastes and disposed in receptacles with bin liners. The receptacles are labelled appropriately and have covers as shown in figure 4.7. However, the segregation is not effectively done and results in some of the medical waste being mixed up with general waste. Bin liners are also inadequate, and as a result some of the receptacles are used without the liners.
The healthcare waste is carried by members of staff, from the different points of generation, in the receptacles or bin liners, to the waste disposal area where it is burnt in an incinerator (a batch burner). The incinerator at Mchinji Hospital is cracked and does not have a door hence not capable of reaching required high temperatures to burn the waste completely. As a result, the incinerator ash, which is thrown into an ash pit, contains remains of unburnt medical waste. During incineration, some wastes also fall out of the chamber (see figure 4.8).

The food waste disposal pit is not fenced, is full and has overgrown bush. The pit is a source of environmental and health risk as dogs and scavengers are able to easily access the wastes. In addition the wastes are sometimes washed away by rain water. There is a need to close the pit, rehabilitate the area and construct a new and well protected pit.

**4.3.3.2. Liquid waste management**
The hospital has 3 oxidation ponds which are overgrown with bush and are not working properly. Figure 4.9 shows one of the oxidation ponds which practically had no access. The outlet of the ponds is an open channel that finally discharges the effluent into Bua River. The untreated effluent pollutes the receiving waters.

Figure 0.9: One of the oxidation ponds for Mchinji District Hospital
CHAPTER 5  IMPACTS OF THE PROJECT AND SIGNIFICANCE RATING

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

5.1 IDENTIFICATION OF THE POTENTIAL IMPACTS

5.1.1. Literature review

The consultant reviewed a number of documents including the World Health Organisation (WHO) manual for the care and management of patients in Ebola Care Units. The list of documents reviewed is indicated in the references. The documents were reviewed to assess the conditions of the socioeconomic environment in which the project will be implemented and to describe the activities during the operational phase. WHO has guidelines for environmental management and infection control in Ebola Units and these were also reviewed and have been considered in the mitigation measures for the project impacts.

5.1.2. Site Investigations

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

5.1.3. Stakeholder Consultations and public awareness

Stakeholder consultations were held with the District Health Officer, District Medical Officer, District Environmental Health Office, Hospital Administrator, Environmental Health Officer, Health Promotion Officers, Waste Management Officers, Laboratory Technicians and grounds labourers. Consultations were also held with the Architects for the quarantine/treatment centres and the officer from the Ebola Coordination Unit for more information on the designs and operation of the EVD quarantine centre. These consultations were held on 5th February, 2015 and 9th April, 2015. The list of people consulted is provided in annex 2.

The consultant also held a meeting with community members on 6th May, 2015 to discuss the proposed location of the incinerator for the EVD quarantine centre. Minutes of the consultations are in annex 4.

5.1.4. Study of satellite images

Satellite images were produced for assessment of fine details of the site. This was important as project area of influence is too small to be fully assessed on 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.

Most of the activities have already started and the following were identified as positive environmental and social impacts:

5.2.1.1. Increase in 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 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 more people are trained and sensitised;
ii. Trained people must be encouraged and motivated to be available during an outbreak;
iii. 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
iv. 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.

The following are the anticipated positive impacts:
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 local labourers will be engaged. The local labourers are expected to acquire new skills from their counterparts through observation and on the job 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 quarantine 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.

Enhancement Measure

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 that will 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 the phase as the activities are limited and 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 public from going to the construction site during and outside working hours by placing posters, reflecting tapes and erecting barriers;
- Workers must wear protective gear; and
- Provide first aid kit.
5.3.2.2. Noise disturbances

Noise disturbances may result from metal fabrication activities and from other machinery. The noise will be a source of discomfort to the construction team and the users of the pharmacy, the cholera shelter and the nearby ward. The construction team may also make significant noise (through loud chatting) which can be a disturbance to others.

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 ensure that noisy activities, which cannot be avoided, are limited to normal working hours.

5.3.2.3. Landscape degradation

Landscape degradation may result from excavation of septic tanks and the footprint for the EVD Centre. To mitigate the impact, the contractor must confine vegetation and soil removal to areas that are directly affected by the construction. Excavated soils must be used to rehabilitate eroded areas near the hospital or to cover solid waste in the disposal pits. After construction, the contractor must rehabilitate the area, restoring it to its original state or a state agreed with the client.

5.3.2.4. 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.

5.3.2.5. 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.

Mitigation measures include:
- Ensuring that no paint containing lead or lead products are used.
- Provide facemasks to workers if a surface with lead paint is rubbed and scraped for removal.
5.3.2.6. Dust nuisance

Construction of the concrete slab will require digging the foundation, cement and concrete mixing. These activities will likely lead to generation of dust, which can reach the nearby hospital wards, depending on the wind direction.

To avoid or mitigate the impact:

- The construction team must wear dust masks during site clearing and levelling;
- The contractor must erect a barrier around the work sites to break or reduce wind and dust movement to the nearby hospital ward and departments; and
- The contractor must spray water on the activity area to suppress dust.

5.3.2.7. Water pollution

Water pollution is likely to result from cement, paints, lubricants and fuels where these fall or spill onto the ground.

The impact can be mitigated by:

- Lining surfaces where cement, paints and oils will be stored to catch any spillage;
- Lining or covering the floor during painting and use of lubricants;
- Sensitizing the workers to appropriately manage construction materials and wastes; and
- Close supervision of the workforce.
- Ensuring that no lead paints are used which may cause health and safety risks as well as environmental risks.

5.3.2.8. 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.

5.3.2.9. Waste generation

Solid waste will be generated at the site during construction. The waste may consist of metal cuttings, excavated materials during digging of foundation, 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. paints and cement while others like plastic are not biodegradable.

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 for rehabilitation of the waste disposal area or for covering waste in the disposal pits.
- Designate appropriate 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 handling (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:

5.3.2.10. Fear of being infected with EVD

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

5.3.3.1. Air pollution and operational risk from incineration of wastes

During operation, there will be additional health-care wastes at Mchinji 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 two chamber, mechanical incinerator which is designed to produce low emissions. However, 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 the impact are as follows:

- Install a high temperature, mechanical incinerator as specified for the EVD Centre;
- Ensure that international industry best 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.\(^4\)
- Train staff on how to operate the incinerators
- Orient 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

5.3.3.2. 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 surface and ground water pollution. Overflows and/or outflows through either the manholes or broken pipes; and through leaks may also occur.

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;
- Ensure wastewater does not spill onto the ground surface by regular preventive maintenance;
- Construct the septic tank according to the design specifications;
- Properly site the soak-pit ensuring that there are no chances of ground water contamination from effluent;
- Sensitize people to properly use the wastewater system to avoid blockages; and

\(^4\) 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%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 septic tank should be regularly monitored to ensure early detection of overflow incidences.

5.3.3.3. Creation of stagnant pools of water

The roof of the EVD Quarantine Centre will act as a water collector, thereby increasing amount of rainwater on some areas around the centre. This is mainly because the area is flat and the soils have a high water retaining characteristic.

To mitigate or avoid the impact:
• Carefully design the drainage for the EVD quarantine centre and site; and
• Keep all drains clear of silt and debris.

5.3.3.4. Increase in water demand

Currently, Mchinji Hospital has water and electricity problems due to intermittent supply. Although the hospital has a 24,000 Litres water reservoir, during lean periods it is not filled to capacity due to water rationing by CRWB. In this regard, operation of the EVD quarantine centre will create additional water demand which will affect operation of the hospital.

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.

5.3.3.5. Occupation safety and health risks

The main health and safety issues will relate to the following:

i) Working in a confined space and on a 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).

The impact can be avoided or mitigated as follows:

• Mchinji District Hospital shall be responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;
• The MoH and Mchinji District Hospital will need to 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\textsuperscript{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\textsuperscript{6}. Other relevant infection prevention and control guidelines provided by WHO should further inform operational procedures;

- 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 monitor performance of equipment and carry out maintenance;
- Ensure there is enough medical supplies including PPEs;
- Regularly train staff on how to use PPE;
- Ensure the EVD quarantine centre is connected to the hospital water reservoir electricity generator; 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.

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

\textsuperscript{5} \url{http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1}
\textsuperscript{6} \url{http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1&ua=1&ua=1}
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 Mchinji District Hospital before mitigation. After implementation of the mitigation measures, the impacts are assessed as low to nil.
Table 0.1: Significance rating for negative impacts

<table>
<thead>
<tr>
<th>SN</th>
<th>Impact</th>
<th>Likelihood of occurrence (L)</th>
<th>Spatial Distribution (SD)</th>
<th>Time (duration) of impact Distribution (TD)</th>
<th>Severity of Impact (LxSDxTD)</th>
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<tr>
<td></td>
<td></td>
<td>Very likely to occur=-3</td>
<td>Regional=-3</td>
<td>Long term= -3</td>
<td>High: -8 to -27</td>
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<td></td>
<td></td>
<td>May occur=-2</td>
<td>National =-2</td>
<td>Medium term= -2</td>
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<td></td>
<td></td>
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<td>Local=-1</td>
<td>Short term= -1</td>
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<td>1.</td>
<td>Construction Phase</td>
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<td>1.1</td>
<td>Accidents to workers, staff and public on construction sites</td>
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<td>-1</td>
<td>-1</td>
<td>-2</td>
</tr>
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<td>Use of lead-based paint products.</td>
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<td>Risk of Spread of STIs and HIV/AIDS</td>
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<td>-1</td>
<td>-3</td>
<td>-6</td>
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<td>1.9</td>
<td>Waste generation</td>
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<td>Operational and Maintenance phase</td>
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<td>Fear of being infected</td>
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<td>Increased air pollution from smoke from incinerators</td>
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<td>-3</td>
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<td>Increase in water demand</td>
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<td>Risk of infection from contaminated equipment</td>
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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 quarantine centre at Mchinji District Hospital. 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. Hence, the contractor has to include the cost for the impact mitigation measures in the project bid price.

The aim of the ESMP is to ensure that the Ministry of Health (MoH) 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 Mchinji 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 related to this project, it is recommended that Mchinji 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, need to be 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Construction Phase</strong></td>
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<td></td>
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</tr>
<tr>
<td>1.1</td>
<td>Accidents to workers, staff and public on construction sites</td>
<td>• Train workers on prevention and managing incidences&lt;br&gt;• Restrict hospital staff and public from going to the construction site during and outside working hours by placing posters, reflecting tapes and erecting barriers;&lt;br&gt;• Labourers must wear protective gear&lt;br&gt;• Provide first aid kit</td>
<td>Contractor</td>
<td>Throughout the construction phase</td>
<td>Included in the project bid for the Contractor</td>
</tr>
<tr>
<td>1.2</td>
<td>Noise disturbances</td>
<td>• The Hospital Administrator must sensitize the contractor to minimise noise;&lt;br&gt;• The contractor must use efficient machines that do not make loud noise;&lt;br&gt;• The contractor must provide appropriate PPE (e.g. ear muffs) to workers;&lt;br&gt;• The contractor must ensure that noisy activities, which cannot be avoided, are limited to normal working hours.</td>
<td>Contractor</td>
<td>Throughout the construction phase</td>
<td>Included in the project bid for the Contractor</td>
</tr>
<tr>
<td>1.3</td>
<td>Landscape degradation</td>
<td>• Confine vegetation and soil removal to areas that are directly affected by the construction&lt;br&gt;• Excavated soils must be used to rehabilitate eroded areas near the hospital or to cover solid waste in the disposal pits&lt;br&gt;• The contractor must rehabilitate the area after construction works, restoring it to its original state or a state agreed with the client.</td>
<td>Contractor</td>
<td>Throughout the construction phase</td>
<td>Included in the project bid for the Contractor</td>
</tr>
<tr>
<td>1.4</td>
<td>Utilizing unlicensed quarry sites</td>
<td>• The Contractor will identify materials from existing licensed quarries with the suitable materials for construction.&lt;br&gt;• Procurement of construction material only from permitted sites and licensed / authorized quarries.</td>
<td>Contractor</td>
<td>Throughout the construction phase</td>
<td>Include in the project bid for the Contractor</td>
</tr>
<tr>
<td>No.</td>
<td>Potential Environmental or social Impact</td>
<td>Proposed Mitigation Measure</td>
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<tr>
<td>1.5.</td>
<td>Use of lead-based paint products.</td>
<td>• The Contractor shall ensure that no paint containing lead or lead products is used.</td>
<td>Contractor</td>
<td>Throughout the construction phase</td>
<td>Include in the project bid for the Contractor</td>
</tr>
</tbody>
</table>
| 1.6.| Dust nuisance                         | • The construction team must wear dust masks during site clearing and levelling;  
• The contractor must erect a barrier around the work sites to break or reduce wind and dust movement to the nearby hospital ward and departments; and  
• Spray water on the activity area to suppress dust. | Contractor                  | Throughout the construction phase | Included in the project bid for the Contractor |
| 1.7.| Water pollution                        | • Lining surfaces where cement, paints and oils will be stored to catch any spillage;  
• Lining or covering the floor during painting and use of lubricants;  
• Sensitizing the workers to appropriately manage construction materials and wastes; and  
• Close supervision of the workforce. | Contractor                  | Throughout the construction phase | Included in the project bid for the Contractor |
| 1.8.| Risk of Spread of STIs and 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 |
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Environmental or social Impact</th>
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<th>Source of Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9</td>
<td>Waste generation</td>
<td>• 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 for rehabilitation of the waste disposal area and for covering waste in the pits. • Designate disposal sites in the contract and cost unit disposal rates accordingly; and • All wastes must be taken to the approved disposal area.</td>
<td>Contractor</td>
<td>Throughout the construction phase</td>
<td>Included in the project bid for the Contractor</td>
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<tr>
<td>2.</td>
<td>Operational and Maintenance phase</td>
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<tr>
<td>2.1</td>
<td>Fear of being infected with EVD</td>
<td>• 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 centre</td>
<td>Mchinji District Hospital, Local District Council</td>
<td>Once every month</td>
<td>Included in the project budget</td>
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<tr>
<td>No.</td>
<td>Potential Environmental or social Impact</td>
<td>Proposed Mitigation Measure</td>
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</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;  
• 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, Mchinji District Hospital | Once during construction phase | Included in the project budget |
<table>
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<tr>
<td>2.3</td>
<td>Water pollution</td>
<td>• Construct the septic tank according to the design specifications;</td>
<td>Contractor</td>
<td>Once during construction of the septic tank</td>
<td>Included in the project bid for the Contractor</td>
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<tr>
<td></td>
<td></td>
<td>• Properly site the soak-pit ensuring that there are no chances of ground water contamination from effluent;</td>
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</table>

7 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/bc554d80488658b66b6e6f66a6515bb18/Final%2BHealth%2BCare%2BFacilities.pdf?MOD=AJPERES&id=1323161961169](http://www.ifc.org/wps/wcm/connect/bc554d80488658b66b6e6f66a6515bb18/Final%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/532ff48048863ab4d66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/532ff48048863ab4d66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES).
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<th>Source of Funds</th>
</tr>
</thead>
</table>
| 2.4 | 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. | Mchinji District Hospital | Once | To be included in the hospital’s development budget |
|     |                                        | • Ensure wastewater does not spill onto the ground surface by regular preventive maintenance;  
• Sensitize people to properly use the wastewater system to avoid blockages; and  
• The septic tank should be regularly monitored to ensure early detection of overflow incidences.  
• 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; | | Throughout the operation phase | Mchinji District Hospital | To be included in the hospital’s recurrent budget |
<table>
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<th>Institutional Responsibility</th>
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<th>Source of Funds</th>
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</thead>
</table>
| 2.5 | Occupation safety and health risks      | • Mchinji District Hospital shall be responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;  
• The MoH and Mchinji 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;  
• 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;  
• Regularly monitor performance of equipment and carry out maintenance;  
• Ensure there is enough medical supplies including PPEs; and  
• Regularly train staff on how to use PPE; | Mchinji 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](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_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)
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</table>
|     |                                          | • 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 the EVD Quarantine centre is connected to the hospital electricity generator and the water reservoir. | Contractor                  | Once during construction                       | Included in the project bid for the Contractor       |
| 3.  | 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            | Mchinji District Hospital    | Throughout the decommissioning phase         | To be included 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.                                  | Mchinji District Hospital    | Throughout the decommissioning phase         | To be included 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 0.2: Environmental and Social Monitoring Plan

<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>1.</td>
<td><strong>Construction Phase</strong></td>
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<td></td>
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</tr>
</tbody>
</table>
| 1.1 | Accidents to workers, staff and public on construction sites | • 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  
• Provide first aid kit | • Number of workers trained  
• Number of posters and barriers elected  
• Number of workers wearing protective gear  
• Types and number of supplies in the first aid kit | Contractor, District Health Office, Local Assembly, MoH (DPPD) | Once every month during the construction phase | 1,000 USD (for transport and allowances for officials from Department Planning and Policy Development) |
| 1.2 | Noise disturbances | • 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 ensure that noisy activities, which cannot be avoided, are limited to normal working hours. | • Complaints/reports on loud chatting  
• Efficiency ratings of machines  
• Number of workers using ear muffs and other appropriate PPEs  
• Time of the day when noise making activities are carried | Contractor, District Health Office, Local Assembly, MoH (DPPD) | Once every month during the construction phase | Included in 1.1 |
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<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>
| 1.3 | Landscape degradation | - Confine vegetation and soil removal to areas that are directly affected by the construction  
- Excavated soils must be used to rehabilitate eroded areas near the hospital or to cover solid waste in the disposal pits  
- The contractor must rehabilitate the area after construction works, restoring it to its original state or a state agreed with the client. | - Area of removed vegetation and soils  
- Area for disposal excavated soils  
- Area that is rehabilitated and restored to its original state after construction activities | Contractor, District Health Office, Local Assembly, MoH (DPPD) | Once every month during the construction phase | Included in 1.1 |
| 1.4 | 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. | - Evidence provided upon request demonstrating source of construction materials | Contractor, DHO, DPPD | As appropriate during the construction phase | Included in 1.1 |
<p>| 1.5 | Use of lead-based paint products | - The Contractor shall ensure that no paint containing lead or lead products is used. He shall provide facemasks for use to the workers when paint is applied in the form of spray or a surface having lead paint is rubbed and scraped. | - Evidence of using non lead-based paint. | Contractor, DHO, DPPD | As appropriate during the construction phase | Included in 1.1 |</p>
<table>
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<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>1.6</td>
<td>Dust nuisance</td>
<td>• The construction team must wear dust masks during site clearing and levelling;                                                                                               • The contractor must erect a barrier around the work sites to break or reduce wind and dust movement to the nearby hospital ward and departments; and • Spray water on the activity area to supress dust.</td>
<td>• Use of mouth and nose masks • Presence of a barrier during dust making activities • Area sprayed with water</td>
<td>Contractor, District Health Office, Local Assembly, MoH (Planning Department)</td>
<td>Once every month during the construction phase</td>
<td>Included in 1.1</td>
</tr>
<tr>
<td>1.7</td>
<td>Water pollution</td>
<td>• Lining surfaces where cement, paints and oils will be stored to catch any spillage;                                                                                               • Lining or covering the floor during painting and use of lubricants;                                          • Sensitizing the workers to appropriately manage construction materials and wastes; and • Close supervision of the workforce.</td>
<td>• Area lined during application of cement and paints • Area lined for storage of paints etc. • Records of sensitizations • Number of hours the supervisor is available on site</td>
<td>Contractor, District Health Office, District Council, DPPD</td>
<td>Monthly</td>
<td>Included in 1.1</td>
</tr>
<tr>
<td>1.8</td>
<td>Risk of Spread of STIs and HIV/AIDS</td>
<td>• Sensitize the workers to avoid the sex trade or use condoms</td>
<td>• Records of sensitization</td>
<td>Contractor; DEHO; Environmental District Officer.</td>
<td>Monthly</td>
<td>Included in 1.1</td>
</tr>
<tr>
<td>No.</td>
<td>Potential Impact</td>
<td>Proposed Mitigation Measure</td>
<td>Monitoring indicator</td>
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</tbody>
</table>
| 1.9 | Waste generation | • 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 for rehabilitation of the waste disposal area and for covering waste in the pits.  
• Designate disposal sites in the contract and cost unit disposal rates accordingly; and  
• All wastes must be taken to the approved disposal area. | • Volume of waste segregated and reused  
• Use of approved waste disposal area  
• Area rehabilitated | Contractor, District Health Office, Local Assembly, MoH (Planning Department) | 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 with EVD | - 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 centre | - Number of times sensitization 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  
- Number of reports on activities at the EVD Quarantine Centre | District Health Office, Local Assembly, Local NGO’s, MoH (Ebola Coordination Unit) | Once every month | 2000 USD (for transport and allowances for officials from Department Planning and Policy Development) and 20,000 USD for infectious disease management training and surveillance programs under Component 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>Implementation cost</th>
</tr>
</thead>
</table>
| 2.2 | Air pollution and operational risk from incineration of wastes incineration | • 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;  
• Plant trees around the incinerator to absorb carbon dioxide from the incinerator; and | • Specifications of the incinerator installed; and  
• Number of trees planted | Contractor, District Health Office, Local Assembly, MoH (Ebola Coordination Unit) | Once at the end of construction | Included in 2.1 |
<table>
<thead>
<tr>
<th>No.</th>
<th>Potential Impact</th>
<th>Proposed Mitigation Measure</th>
<th>Monitoring indicator</th>
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<th>Monitoring frequency</th>
<th>Implementation cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• Train staff on how to operate the incinerators</td>
<td>• Number of staff trained in how to operate the incinerator</td>
<td>District Health Office, Local Assembly, MoH (Ebola Coordination Unit)</td>
<td>Once every month</td>
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<td></td>
<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.¹⁰</td>
<td>• Number of staff oriented in infection control and waste management</td>
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<tr>
<td></td>
<td></td>
<td>• Orient laboratory and health-care staff to the infection control and waste management practices</td>
<td>• Number of staff trained in waste sorting and volume of waste segregated appropriately</td>
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<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;</td>
<td>• Records of maintenance of incinerators</td>
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<td>• Regularly maintain the incinerators to ensure they are working properly</td>
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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/bc554d8d488658b6b6e6f66a6515bb18/Final%20Healthcare%20Facilities.pdf?MOD=AJPERES&ID=1333161961168](http://www.ifc.org/wps/wcm/connect/bc554d8d488658b6b6e6f66a6515bb18/Final%20Healthcare%20Facilities.pdf?MOD=AJPERES&ID=1333161961168) and the General Environmental Health and Safety Guidelines 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)
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<th>Institution/person to monitor</th>
<th>Monitoring frequency</th>
<th>Implementation cost</th>
</tr>
</thead>
</table>
| 2.3 | Water pollution | • Ensure wastewater does not spill onto the ground surface by regular preventive maintenance;  
  • Construct the septic tank according to the design specifications;  
  • Properly site the soak-pit ensuring that there are no chances of ground water contamination from effluent;  
  • Sensitize people to properly use the wastewater system to avoid blockages; and  
  • The septic tank should be regularly monitored to ensure early detection of overflow incidences.  
  • 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  
  • Reports of spillages in inappropriate places  
  • Specifications of constructed septic tanks  
  • The site characteristics for the soak pit and septic tank  
  • 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 | | District Health Office, Local Assembly, Local NGOs, MoH (Ebola Coordination Unit) | Once every month | Included in 2.1 |
| 2.4 | 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. | • Presence of borehole  
  • Presence of dedicated water line for the hospital | District Health Office, MoH (Ebola Coordination Unit) | Once every month | 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 | - Mchinji District Hospital shall be responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;  
- The MoH and Mchinji 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;  
- 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 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 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  
- Number of staff trained in use of PPE | 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>3.</td>
<td>Decommissioning Phases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Air, land and water contamination</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 Planning Department)</td>
<td>Twice during decommissioning phase</td>
<td>400 USD for transport and allowances for officials from the planning Department; no costs applicable for the officers at the district level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Incinerate contaminated solid waste and dispose ash in approved landfill sites</td>
<td>- Volume of solid waste incinerated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>Risk of infection from contaminated equipment</td>
<td>- Provide appropriate PPE for staff for destroying equipment used in the centre; and</td>
<td>- Reports of use of PPE during cleaning</td>
<td>District Health Office, MoH (Ebola Coordination Unit, Planning Department)</td>
<td>Twice during decommissioning phase</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Destroy all equipment used in the EVD Quarantine/Treatment Centres.</td>
<td>- Number of equipment destroyed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.3 INSTITUTIONAL RESPONSIBILITY FOR IMPLEMENTATION OF THE ESMP

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 to ensure that the ESMP and the monitoring plan are 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 7.

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. **Mchinji 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. He will familiarise himself 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. He 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 monitor the contractor during construction, ensuring that the contractor is adhering to the ESMP. The Maintenance Supervisor will be reporting (through the Hospital Administrator) to 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 construction contract and the ESMP. The contractor will also adhere to the regulations and environmental standards for Malawi.

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

4. **The District Council**, has a District Environmental Sub-Committee (DESC) which has the responsibility of 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 Mchinji 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 with the ESMP, the DESC will recommend
the revision of the ESMP or discontinuing of the project. The DEC has the authority to 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 has inspectors who may inspect the project for compliance with the Environmental Standards in accordance with the Environment 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 0.3: 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 and Planning Department of Ministry of Health</td>
<td>1,000</td>
<td>10,000</td>
<td>400</td>
<td>11,400</td>
</tr>
<tr>
<td>Infectious disease management training and surveillance programs targeting district health officials, frontline staff and community members</td>
<td></td>
<td>20,000</td>
<td></td>
<td>20,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,000</td>
<td><strong>30,000</strong></td>
<td><strong>400</strong></td>
<td><strong>31,400</strong></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 Mchinji 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 sustainable implementation of the project, the following summary of requirements are made:

Implementation of the ESMP

1. The ESMP is adopted and effectively applied;
2. Mchinji District Hospital is be responsible for ensuring an adequate and sustainable supply of water and electricity to the EVD treatment centre;
3. A borehole will 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;
4. The MoH and Mchinji 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.
5. During construction, operation and maintenance phases, the MoH and the Mchinji District Hospital will implement international industry best practices related to hazardous waste incineration that are provided in the International Finance Corporation’s environmental, health, and safety technical (EHS) guidelines for waste management facilities.
6. The Ministry of Health (MoH) must ensure that funds are available for implementation of the ESMP;
7. MoH must include the ESMP in the construction activities contract;
8. The district health office must 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;
9. The contractor and monitoring authorities must comply with all relevant legal provisions outlined in this report and any other provisions that may arise due to new activities that may be implemented; and
10. The District Health Office and the District Council must be open to the communities in updating them on the EVD preparedness activities.

**General environmental management recommendations**

11. The hospital must rehabilitation the sewage system and replace the existing incinerator;
12. The environmental health management staff must be encouraged and supported by the Hospital Administrator to be vigilant in the management of the environment as some of the activities do not require a lot of funds, for example trimming of grass; and
13. Adequately budget for waste management, the hospital must explore other options for funding waste management activities.
REFERENCES

3. World Health Organization (2014). **Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings, with Focus on Ebola.** Geneva, Switzerland.
19. 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>Bright Mkomba</td>
<td>Environmental Health Officer</td>
<td>Mchinji District Hospital</td>
<td>0999443217</td>
</tr>
<tr>
<td>Emily Mitochi</td>
<td>Clinician</td>
<td>Mchinji District Hospital</td>
<td>0888319208</td>
</tr>
<tr>
<td>Aaron Bita</td>
<td>Waste Management Coordinator</td>
<td>Mchinji District Hospital</td>
<td>0999603012</td>
</tr>
<tr>
<td>Frank Kaphanso</td>
<td>Health Education Promotion Officer</td>
<td>Mchinji District Hospital</td>
<td>0999391381</td>
</tr>
<tr>
<td>Sydney Kazembe</td>
<td>Maintenance Manager</td>
<td>Mchinji District Hospital</td>
<td>0999352346</td>
</tr>
<tr>
<td>Weluzan Divala</td>
<td>Community Member</td>
<td>Mchinji Town</td>
<td></td>
</tr>
<tr>
<td>Justin Mikunguza</td>
<td>Community Member</td>
<td>Mchinji Town</td>
<td></td>
</tr>
<tr>
<td>Edwin Nyoni</td>
<td>Community Member</td>
<td>Mchinji Town</td>
<td></td>
</tr>
<tr>
<td>Agness Phiri</td>
<td>Community Member</td>
<td>Mchinji Town</td>
<td>0995968663</td>
</tr>
<tr>
<td>Dorothy Yesaya</td>
<td>Community Member</td>
<td>Mchinji Town</td>
<td></td>
</tr>
<tr>
<td>Set Kanyanda</td>
<td>Epidemiologist</td>
<td>Ebola Coordination Unit</td>
<td>0888356599</td>
</tr>
<tr>
<td>Arthur Chiphiko</td>
<td>Architect</td>
<td>Planning Department - MoH</td>
<td></td>
</tr>
</tbody>
</table>

Some of the community members interviewed immediately outside Mchinji Hospital.
# ANNEX 3: MAIN ISSUES RAISED BY STAKEHOLDERS

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Issues</th>
</tr>
</thead>
</table>
| Group discussions in the Environmental Health Officer Office | - Awareness and sensitization have started; targeting managers, influential people and top business men. The whole community is yet to be sensitized.  
- Very few hospital staff have received training in the wearing of the Ebola Suit.  
- Safety of health workers at the border must be included in the project concept.  
- Hospital staff are afraid of Ebola – some are likely to refuse to work in the EVD quarantine centre in the event there is Ebola.  
- There is limited involvement of hospital staff in the development of the EVD Quarantine Centre.  
- The Hospital Staff was involved in the location of the EVD Centre site.  
- The site was selected as it is free, is near the rear entrance of the hospital and is isolated  
- 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.  
- The community has never complained about smoke from the incinerator.  
- The sewage ponds are very old and broken – one pond has been bypassed. There is need for funding to rehabilitate them.  
- No tests are carried on the quality of effluent from the sewage oxidation ponds.  
- The incinerator is old and needs to be replaced.  
- The hospital has a bed space of 300 but usually takes in more than 400 patients – a large number of patients are children.  
- A heavy duty electricity generator was procured for the hospital but it is waiting for PVHO to install it.  
- Not all meat sold at the market place is inspected, this is an issue with Ebola disease transmission.  
- The District Council and TAs are involved in Ebola Preparedness activities. |
| Meeting in the Laboratory | - A number of laboratory equipment including the autoclave, steriliser, and receptacle are not working due to lack of maintenance.  
- Equipment is very old and needs to be replaced.  
- Waste handling materials e.g. hazardous waste bags are usually in short supply.  
- Donors do help with supplies sometimes. |
- Waste is put in appropriately labelled bins and carried to the incinerators at least two times in a day.
- Personal Protective Equipment are in short supply.
- Funding is a big challenge and is the main reason for the operation problems in the laboratory.

| Meeting at the Ebola centre construction site | - Construction started in December but was stopped to pave way for preparation of environmental safeguards.
- Local people are involved in the construction of the Centre
- The Hospital Administration does not know the number of people that are working at the site – there is little engagement with the contractor.
- Some old buildings and pit latrines near the construction site will be demolished |

| Community Meeting | - Community members just hear about Ebola on the radio.
- The community welcomes the EVD Quarantine Centre.
- Some members may stop visiting the Hospital in the event of an EVD outbreak for fear of infection.
- The Hospital does not give the community adequate healthcare.
- There are inadequate resources such that the hospital does not provide X-ray services and encourages the community to buy drugs at a local pharmacy.
- The sewage ponds discharge effluent into Bua River. There are no agriculture activities near the outlet.
- The sewage and effluent in the outlet channel smells – farmers near the channel and women at the guardian shelter complain;
- There are no problems with smoke from the incinerator. |
ANNEX 4: MINUTES FOR THE MEETING WITH THE COMMUNITY MEMBERS HELD ON 6 MAY 2015 AT MCHINJI DISTRICT HOSPITAL

A. AGENDA:

1. To show the community members the proposed site for installation of an incinerator for the EVD quarantine centre and alternative sites which were considered;
2. To seek community members’ views (including concerns) regarding the proposed site for the incinerator; and
3. To get consent from community members on the suitability of installation of the incinerator at the proposed site.

B. MEMBERS PRESENT:

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visiting members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Matthews Kagoli</td>
<td>Epidemiologist, Deputy Director/Head of Ebola Coordination Unit</td>
<td></td>
</tr>
<tr>
<td>Dr. Francis Adatu Kagoli</td>
<td>Technical Advisor to Ministry of Health and Ebola preparedness</td>
<td>0999899441</td>
</tr>
<tr>
<td>Precious Chaponda</td>
<td>Consultant’s representative (taking minutes)</td>
<td>0999619354</td>
</tr>
<tr>
<td>Mchini District Hospital Staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chimwemwe M.K. Banda</td>
<td>DHO – Mchini District Hospital</td>
<td>0999528642</td>
</tr>
<tr>
<td>Robson Kayira</td>
<td>DEHO – Mchini District Hospital</td>
<td>0888504467</td>
</tr>
<tr>
<td>Rodrick Kathithi</td>
<td>HRMO – Mchini District Hospital</td>
<td>0884444226</td>
</tr>
<tr>
<td>Hackson Banda</td>
<td>PHSA – Mchini District Hospital</td>
<td>0999368969</td>
</tr>
<tr>
<td>Community Members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. Bwanali</td>
<td>Village Headman (VGH)</td>
<td></td>
</tr>
<tr>
<td>Z. Makatani</td>
<td>Minister to the VGH</td>
<td>0999628831</td>
</tr>
<tr>
<td>W. Makuta</td>
<td>Minister to the VGH</td>
<td>0999462873</td>
</tr>
<tr>
<td>Mrs. Mfukula Nkhoma</td>
<td>Community member and Business woman at a market place near the site for the EVD centre</td>
<td></td>
</tr>
<tr>
<td>Precious Phiri</td>
<td>Community member</td>
<td>0999610657</td>
</tr>
<tr>
<td>Gerald Nkhoma</td>
<td>Community member</td>
<td></td>
</tr>
<tr>
<td>Chisomo Chisupe</td>
<td>Community member</td>
<td></td>
</tr>
<tr>
<td>Kondwani Sambo</td>
<td>Community member</td>
<td>0884211830</td>
</tr>
<tr>
<td>Royzio Sylvester</td>
<td>Community member</td>
<td>0999605894</td>
</tr>
<tr>
<td>Benson Zingalume</td>
<td>Community member</td>
<td></td>
</tr>
<tr>
<td>Joseph Chigalamuka</td>
<td>Community member</td>
<td></td>
</tr>
</tbody>
</table>
C. OPENING REMARKS
The meeting was called to order at 9:30 am by Mr. Kayira, the District Environmental Health Officer (DEHO). He thanked the chief, his two ministers and the community members present for coming to the meeting, after receiving the invitation. He introduced the visitors and hospital staff to the community member and asked them for self-introductions.

After the introductions, the DEHO gave a brief background of Ebola Virus Disease (EVD) and what the Government of Malawi is doing to prepare for the disease, including the construction of the EVD quarantine centre at Mchinji District Hospital. He then introduced the agenda for the meeting and asked if there were any objections to proceed. A no objection vote was given and hence discussions continued.

1. The proposed site for the incinerator and alternative sites which were considered
   - The District Environmental Health Officer (DEHO) showed the community members the proposed site for the incinerator (it was where the meeting was taking place). As shown in figures A4.3 and A4.4 the site is adjacent to the Physical Assets Management (PAM) offices and the proposed EVD quarantine centre which is about 50 metres away. The ground is covered by grass and weeds. There are two large *Toona ciliata* trees, which will not be touched in the vicinity, if the incinerator is to be installed. There is also a brick wall which separates the hospital area from the community area.
Mr Chaponda reported that that the site for the incinerator was selected during consultations held at the hospital on 9\textsuperscript{th} April, 2016. These consultations were led by an Environmental Specialist for the World Bank (Raymond). However there was no community representation during the site selection process. Hence the need to hold the community meeting.

He explained that the site was selected because it is near the EVD quarantine centre and it is directly accessible (there is no building in between). The alternative site which was considered is also near and on the opposite side of the EVD quarantine centre. The site is surrounded by hospital buildings. Hence not ideal for managing hospital wastes, as smoke and smells may affect other departments. The other option was to install the incinerator at the site where there is the current hospital incinerator and placenta pit; but access would be a challenge, as it is far away and there are hospital buildings in between. Considering that wastes in the EVD quarantine centre will be highly infectious, it will not be ideal to be carrying the wastes for a long distance, passing through hospital departments.

2. **Community members views regarding the proposed site for the incinerator**

- Mr Chaponda wanted to know more about the community area before conducting a field assessment and hence had two questions. Firstly, he wanted to know the types and directions of the wind which is experienced in the area. The members responded that mostly the area experiences south-westerly winds, which blow from the settlements to the hospital area. When the rain season is near, they experience ‘Mpoto winds’ (north-easterly winds) which from the front of the hospital area to the back. Secondly, he wanted to know the structures and activities which occur in the community area and near the hospital fence close to the proposed incinerator area. The community responded that near the fence is a graveyard, the chief’s house just opposite the site for the incinerator (about 30 metres away) and a small market near the main road (about 50 meters).
Mr. Chaponda thanked the community for the information, adding that it would be used for further assessment of the incinerator area for the ESMP. He then asked the community members to freely give comments and ask questions about the project and the proposed site for the incinerator on the area as the Ministry of Health and World Bank does not want to have any problems with the community when the incinerator is installed and is operational.

- Members from the community wanted to know the type of incinerator which will be installed. The DEHO answered that it will be an approved and recommended incinerator; admitting that the incinerator which the hospital currently has is a batch burner, it does not attain very high temperatures and produces a lot of smoke. The incinerator to be installed will be mechanical, capable of attaining very high temperatures and producing minimal smoke.

- The Chief (Mr Bwanali) wondered whether the heat from the incinerator will not affect the ESCOM power lines. Mr Chaponda answered that the heat of the incinerator will be inside the chamber; not be felt outside, such that the power line, people passing by and workers at the incineration area will not be affected in any way. In addition the incinerator area will be fenced to ensure that animals and people do not trespass.

- Joseph Chagalamuka asked if there will be someone to guard the incinerator. The DEHO answered that there will be a guard and two workers. There will always be someone as most of the incineration will be done in the evening and at night to ensure that communities are not affected by smoke.

- Mr Katani wanted to find out the height of the chimney of the incinerator. Mr Chaponda answered that the chimney will be much higher than all the buildings at the hospital to ensure that the hospital buildings, which are in the windward area are not affected in any way.

- Mr. Makuti asked whether a placenta pit will also be constructed at the site. Mr. Chaponda answered that it will not be constructed, as the site is far away from the maternity wing. It is recommended to construct a placenta pit near a maternity wing.

3. In conclusion as to whether to proceed or not with installation of the incinerator at the proposed site:

- Mr Chaponda said that from what he had heard about the community area and wind directions, installation of the incinerator at the proposed site would not have significant negative impacts. The community members agreed to this, adding that they do not have anything against installation of the incinerator at the site so long as the chimney will be high.

- Dr. Adatu and Dr Kagoli asked the community to sign a letter to give consent to the installation of the incinerator and as evidence that they had been consulted. (The letter is included in annex 5).

D. CLOSING REMARKS
The DEHO closed the meeting by thanking everyone for attending the meeting. He encouraged the community members to come to the administration in future should there be problems or concerns once the incinerator is operational.

ANNEX 5: CONFIRMATION OF COMMUNITY CONSULTATION ON THE LOCATION OF THE INCINERATOR
CONFIRMATION OF CONSULTATION WITH THE COMMUNITY AROUND MCHINJI DISTRICT HOSPITAL REGARDING LOCATION OF A NEW INCINERATOR TO SERVE THE EBOLA/INFECTIOUS DISEASES TREATMENT FACILITY

We the undersigned acknowledge that a team from the Ministry of Health Headquarters and the Mchinji District hospital held a consultation meeting with us and ably explained the new project (Installation of a new incinerator to serve the Ebola / Infectious diseases facility being built in the hospital compound). We have been reassured and have no fears or concerns regarding on this project.

The visiting team comprised the following;

Dr. Francis Adatu Engwayu – TA to MOH VMMC and Ebola Preparedness.  
Dr. Matthew Kagoli – Epidemiologist, Deputy Director / Head of ECU  
Mr. Precious – Local Consultant Water and Waste Management  
Dr. Chimwemwe Banda – District Health Officer  
Mr. Hackson Banda – Hospital Administrator  
Mr. Robson Kayira – District Environmental Health Officer  
Mr. Willy Makuta – Maintenance Officer for Mchinji District Hospital  
Mr. Rodrick Kanthiti – Human Resource Management Officer

The Community Members present were:

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Signature</th>
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</thead>
<tbody>
<tr>
<td>J. Bisamala</td>
<td>community leader</td>
<td></td>
</tr>
<tr>
<td>Z. Katani</td>
<td>Community leader</td>
<td></td>
</tr>
<tr>
<td>Mtawuwa Nkhoma</td>
<td>Business Manager</td>
<td></td>
</tr>
<tr>
<td>Precious Pliau</td>
<td>Guard DHO</td>
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<tr>
<td>Gerald Nkhoma</td>
<td>Gerald Nkhoma</td>
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<tr>
<td>Christine Chiange</td>
<td>Estate Manager DHO</td>
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<tr>
<td>Kandwimwe Sambiri</td>
<td>Estate Manager DHO</td>
<td></td>
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<tr>
<td>Kayiza Silverati</td>
<td>Al labwani</td>
<td></td>
</tr>
<tr>
<td>Benson Zingulume</td>
<td>Community member</td>
<td></td>
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<tr>
<td>J. Chiselinaus</td>
<td>Carpenter DHO</td>
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ANNEX 6: ARCHITECTURAL DESIGN OF ASH PIT FOR THE EVD CENTRES
ANNEX 7: 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.

• 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 walkways, 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.