



Government of the Republic of Malawi

Ministry of Health

**SOUTHERN AFRICA TB AND HEALTH SYSTEMS SUPPORT PROJECT**

# Environmental and Social Management Framework for Malawi

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SOUTHERN AFRICA TB AND HEALTH SYSTEMS  
SUPPORT PROJECT

Draft Environmental and Social Management  
Framework for Malawi

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## LIST OF ACRONYMS

AIDS	Acquired Immuno Deficiency Syndrome
ART	Anti-retroviral Therapy
DC	District Council
DEHO	District Environmental Health Officer
DEAs	Director of Environmental Affairs
EDO	Environmental District Officer
EMA	Environmental Management Act
EMP	Environmental and Social Management Plan
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
EMP	Environmental and Social Management Plan
ER	Environmental Review
EVD	Ebola Virus Disease
EQA	External Quality Assessment
HIV	Human Immuno-deficient Virus
ICWMP	Infection Control and Waste Management Plan
IPC	Infection Prevention Control
LEA	Limited Environmental Assessment
MDR-TB	Multidrug-resistant TB
MNREM	Ministry of Natural Resources, Energy and Mining
MoH	Ministry of Health
MDR-TB	Multi Drug Resistant Tuberculosis
NAC	National Aids Commission
NCE	National Council for the Environment
NCIC	National Construction Industry Council of Malawi
NEAP	National Environmental Action Plan
NGOs	Non-Governmental Organization
PPE	Personal Protective Equipment
PLWA	People Living with HIV
STI	Sexually Transmitted Infection
TB	Tuberculosis
TCE	National Technical Committee on the Environment
WHO	World Health Organization

## **EXECUTIVE SUMMARY**

### **Introduction**

The World Bank is supporting the Southern Africa TB and Health Systems Support Project. Malawi is one of the four participating countries and the others are Lesotho, Mozambique and Zambia. The project is important for the region as Southern Africa contributes significantly to the global burden of TB. A highly preventable and curable disease, the communicable disease is claiming a lot of lives. Southern Africa also has some of the highest TB/HIV co-infection rates in the world, which is tricky to treat; and there is an increasing threat of the Multidrug-resistant TB (MDR-TB) to the sub-region's health and development gains. In addition the region faces the challenges of a disease burden tied to movement within and across borders among miners. Drivers of TB in mining among others include poor accommodation facilities, poor nutrition, poor ventilation and dust in the mines.

### **Project Development Objectives**

The project seeks to help ease the TB burden in the Southern Africa region by achieving the following overarching goals: (i) increase utilization of key TB control and occupational lung diseases services in targeted geographic areas of the four participating countries (Lesotho, Malawi, Mozambique and Zambia) and (ii) strengthen the sub-region's capacity to address such conditions.

Specifically the project seeks to address the following in the sub-region:

- i) Improve TB detection and care;
- ii) Improve treatment of TB and Multidrug Resistant TB (MDR-TB); and
- iii) Improve cross-border care and within country referral between mining areas and labour sending areas.

The main components of the Malawi project are:

1. Prevention, detection and treatment of TB;
2. Regional capacity for disease surveillance, diagnostics and management of TB and occupational lung diseases; and
3. Learning, knowledge and innovation

In Malawi, the project also includes an Ebola Virus Disease (EVD) Preparedness Plan with Infection Prevention and Control interventions; particularly provision and use of Personal Protective Equipment (PPE) and construction/rehabilitation of quarantine/treatment centres etc.

### **Project Areas of Influence**

The project will involve the establishment of community sputum collection points, transportation of samples to microscopy sites, gene expert services, refurbishment of laboratories, refurbishment of a one-stop shop service centre, renovation of MDR TB centres, installation of mobile X-ray machines, refurbishment of TB isolation rooms and construction of Ebola quarantine/treatment centres.

The activities under renovations, refurbishments and construction will have negative environmental and social consequences. Therefore the project has triggered OP/BP 4.01 (Environmental Assessment) and has been assigned to the World Bank environmental category B.

Other consequences will arise during the sputum collection and transportation, operation of microscopy sites and the mobile X-ray machines. Medical wastes, which will be hazardous and will have to be treated adequately (e.g. by incineration) are also expected to be generated from the laboratories. Hence the project will require the establishment or expansion of incineration plants, which requires an ESIA, according to the Guidelines for Environmental Impact Assessment for Malawi (EIA Guidelines, 1997).

Potential safeguard issues and areas of influence will be on the environmental components of soil, air and water. Safeguard issues on social components will relate to traffic accidents, safety of workers and potential for spread of HIV and AIDS as well as potential TB infection. The areas to be affected include public places where people gather in large numbers; poorly ventilated public places and laboratories; points or places of collection, transportation, storage and analysis of specimens; as well as places for disposal of laboratory and hospital waste. To ensure that measures to address these consequences or impacts are implemented, this Environmental and Social Management Framework, (ESMF) has been prepared; to conform to; and to be in line with the requirements of Malawi as well as the World Bank.

### **Objectives of the ESMF**

This ESMF is prepared to ensure that activities for the project are carried out in an environmentally and socially sustainable manner. It covers environmental and social issues related to refurbishment of laboratories and TB isolation rooms; and construction of Ebola quarantine/treatment centres. Issues related to management of community sputum collection points, transportation and the operation of the Mobile X-rays, management of medical waste; and infection prevention and control are covered in the Infection Control and Waste Management Plan (ICWMP) which has been prepared as a separate document.

Among other things, the ESMF outlines an environmental and social screening process, focusing on the completion of the Environmental and Social Screening Form. It includes a generic Environmental and Social Management Plan (EMP), guidelines for monitoring and development of appropriate monitoring indicators, capacity building measures for environmental management and cost estimates for the environmental work. The generic Environmental and Social Management Plan recommendations will be incorporated into the design and cost estimates of the Southern Africa TB and Health Systems Support Project in Malawi. The ESMF also includes (as annexes) Environmental Guidelines for Contractors, a summary of the Bank's Safeguard Policies, an Environmental and Social Checklist and Generic EIA Terms of Reference, to be used in the event that the screening results indicate the need for preparation of an ESIA report.

### **Justification for the ESMF**

The ESMF is in line with the World Bank's Operational Policies for environmental management of projects where specific details are not yet known. For the Southern Africa TB and Health Systems Support Project in Malawi, the precise type and location of proposed project activities are not known at this time. Therefore the potential social and environmental impacts of the project activities cannot be identified and mitigation measures cannot be determined in the context of a traditional EIA, for the specific sub-projects.

Once the exact locations and project activities for the project are known, the Malawi Environment Management Act (EMA) 1996 and the Environmental Impact Assessment (EIA) Guidelines 1997 will help prescribe the conduct for Environmental Impact Assessment. However the EMA and EIA guidelines may not sufficiently provide and support the screening process for identification, assessment and mitigation of potential localized impacts as required by the World Bank. This ESMF therefore provides mechanisms

to complement the Malawi's EIA procedures for meeting the environmental and social management requirements.

## **Approach and Methodology for Preparation of the ESMF**

In the development of this ESMF, a high degree of consultation with various key stakeholders was employed. The rationale of these extensive consultations was to solicit views of a cross section of key stakeholders including key officials of Government Departments involved in the project and the EIA process. Information for the preparation of the ESMF has been collected through a number of research methods, which include review of related literature from published and unpublished documents, field investigations and consultation with key stakeholders.

## **Summary of Features of the ESMF**

The ESMF has given a general overview of TB in Africa and Southern Africa Region and the effects of TB combined with the HIV/AIDS, according to WHO recent statistics. It has also stressed the problem of inadequately treating TB in Southern Africa, which creates resistance to first-line drugs or MDR-TB and the challenge of treating TB among miners.

The ESMF has given the legal, regulatory and administrative framework to support environmental management of the Southern Africa TB in Mining in Malawi. The project triggers the World Bank's Operational Policy, OP 4.01 on Environmental Assessment.

The ESMF presents typical Environmental and Social Impacts in the project phases of Construction and Demobilization. The impacts in the Operation and Maintenance Phase, which are related to health-care wastes and infection control are covered in the ICWMP. The planning phase is expected to have no significant impacts as the project will primarily constitute refurbishment activities to existing structures. The decommissioning phase is also expected to have no significant impacts, since the facilities are likely to continue operating after the end of the project. The identified typical impacts include:

- 1 Soil erosion
- 2 Soil contamination
- 3 Impeded water flow and creation of stagnant water pools
- 4 Water pollution
- 5 Surface water siltation
- 6 Air pollution
- 7 Temporary obstruction of walkways and access to services during construction
- 8 Disturbance of traffic and movement of people on the hospital premises
- 9 Temporary loss of services such as water, electricity and telephone services
- 10 Accidents to staff and the public on construction sites and project activity areas
- 11 Noise & vibration disturbances

Management of these environmental and social impacts will be through Environmental and Social Management Plans (EMP), which will details mitigation measures for the impacts and responsible institutions for carrying out these measures.

In general, the civil works elements of the project would not normally require an Environmental Impact Assessment (as the type of project activities would be considered minor). However discharge of medical

wastes would attract some strict environmental control and therefore, in this respect, preparation of an EIA may be a necessity.

This ESMF will assist in determination of the level of environmental and social work required for the sub-projects. The principle and process of carrying out this determination are very well described and would be applicable to any situation in the project areas, especially in view of the fact that the project activities would basically be the same. Minor differences might occur where the project sites are not environmentally similar and in these cases, the Screening Form would assist in determining the area or sub-project specific environmental impacts and their mitigation measures. The World Bank environmental policy insists that all projects whose exact activities and locations are not known should be subjected to the screening process.

### **Key Recommendations of the ESMF**

This ESMF recommends that for successful implementation of the project, there is need to ensure that the existing environmental regulations are adhered to. Specifically, the recommendations made in this ESMF should be implemented and for its successful application, involvement and participation of all stakeholders and local communities is very important. The ESMF further recommends that:

- The screening process and the screening forms should be used for all the sub-project activities of the Southern Africa TB and Health Systems Support Project in Malawi;
- The Ministry of Health should be adequately supported to strengthen or set up the proposed Environmental and Social Unit, to oversee the implementation of this ESMF as well as the ICWMP;
- Environmental and social awareness and training, as presented in the capacity building proposal, for the key stakeholders and communities should be implemented;
- Regular updating of this ESMF, to respond to changing designs and local conditions in all the project districts is very important and should be done as appropriate;
- Building of capacities at the district level, for appropriate information management, to facilitate the environmental and social management process should be supported by the project;
- At the district level, the necessary resources and equipment for producing the required documentation and completing the screening forms, as well as preparing reports for the implementation of the ESMF, should be provide; and
- Staff at all levels should be empowered to adequately administer the ESMF throughout the project implementation.

## **CHAPTER 1 INTRODUCTION**

### **1.1 PROJECT BACKGROUND**

The Government of Malawi, with support from World Bank, is implementing the Southern Africa TB and Health Systems Support Project in Mining Project. The project is being implemented in the four Southern Africa countries of Malawi, Lesotho, Mozambique and Zambia.

The project has targeted the region for a number of reasons: Southern Africa contributes significantly to the global burden of TB. According to the World Health Organisation (WHO), (2015), out of the 22 high TB burden countries, about 25% are in Southern Africa. A highly preventable and curable condition, TB remains one of the world's deadliest communicable diseases. In 2014, 9.6 million people in the world developed the infection (28% from Africa) out of which 1.5 million people died (1.1 million HIV-negative and 0.4 million HIV-positive).

The TB cases are also related to the HIV pandemic; and in Southern Africa the TB/HIV co-infection rates are more than 50%. TB/HIV co-infection is extremely tricky to manage and presents many challenges for the traditional approach of combating TB. As a result TB is inadequately treated and this creates resistance to first-line drugs or MDR-TB. Subsequently, inadequate treatment of MDR-TB leads to a highly lethal form of extremely drug resistant TB or XDR-TB. Resistant forms of TB require the use of much more expensive drugs, which also have higher levels of toxicity and higher case fatality and treatment failure rates. Individuals who are treated inappropriately continue to transmit TB, and Southern Africa countries are ill equipped to respond efficiently to such outbreaks. With the growth in regional migration, global travel, and the emergence of lethal forms of the disease, TB poses a major regional and global public health threat. The cost-effectiveness of addressing drug-responsive TB is therefore unquestionable.

The sub-region also faces challenges of a disease burden tied to movement within and across borders among miners. Migration often disrupts TB detection and care. Miners often have multiple treatment episodes, with inappropriate therapy and high default rates which can lead to multidrug resistant TB. Cross-border care and within country referral between mining areas and labour sending areas is often inadequate or non-existent, contributing to significantly greater rates of extensive and multi-drug resistance in miners, ex-miners, their families, and communities.

### **1.2 PROJECT GOALS AND OBJECTIVES**

The Southern Africa TB and Health Systems Support Project has the following overarching goals:

- i) Increasing utilization of key TB control and occupational lung diseases services in targeted geographic areas of the four participating countries (Lesotho, Malawi, Mozambique and Zambia); and
- ii) Strengthening the sub-region's capacity to address such conditions.

Specifically the project seeks to address the following in the sub-region:

- i) Improve TB detection and care;
- ii) Improve treatment of TB and Multidrug Resistant TB (MDR-TB); and
- iii) Improve cross-border care and within country referral between mining areas and labour sending areas.

The project will ultimately contribute to reducing detection and treatment gaps of TB and hence significantly reducing the TB burden in Southern Africa. This is in line with goal number 3 of the Sustainable Development Goals: “Ensure healthy lives and promote well-being for all at all ages”. One of the targets of this goal is the ending of tuberculosis by 2030 (UN, 2015) and the activities in this project will make significant contribution toward achieving it.

### 1.3 DESCRIPTION OF THE PROJECT IN MALAWI

In Malawi the Southern Africa TB and Health Systems Support Project has the following three main components:

- 1 Prevention, detection and treatment of TB;
- 2 Regional capacity for disease surveillance, diagnostics and management of TB and occupational lung diseases; and
- 3 Learning, knowledge and innovation

The components and sub-components of the project in Malawi are presented in Table 1.1.

Table 1.1: Components of the TB in Mining Project in Malawi and Budget Cost

<b>Component 1</b>	<b>Prevention, Detection and Treatment of TB</b>	<b>(USD 4,276,320.86)</b>
1.1	Improved community TB interventions in the mining population	(USD 1,877,503.71)
1.1.1	Forming grouping of former miners and others to improve knowledge and health seeking behaviour among the mining population	
1.1.2	Coordination and collaboration among different stakeholders in communities to enhance efficiency and effectiveness	
1.1.3	Developing and implementing a behavioural change strategy for the mining and other vulnerable population	
1.1.4	Community sputum collection & transportation to microscopy sites: Karonga, Lilongwe, Mzimba, Blantyre, Rumphi, Nsanje, Balaka and Kasungu	
1.2	TB and TB-HIV services delivery (facility based support)	(USD 1,611,948.66)
1.2.1	Implement systematic TB screening and contact investigation in health facilities	
1.2.2	Establish one-stop shop service centre	
1.2.3	Improve patient adherence to treatment	
1.2.4	Rolling out TB/HIV services in targeted districts cross-border areas	
1.2.5	Strengthening patient referrals and follow-up	
1.2.6	TB infection control in health care settings	
1.3	Improve MDR TB service	(USD 221,226.89)
1.3.1	Improve case detection	
1.3.2	Improve patient management and support (including nutritional support)	
1.3.3	Renovate MDR TB centres	
1.4	Strengthen and improve occupational health	(USD 565,641.60)
1.4.1	Equipment for mine health inspection	
1.4.2	Equipment for pre- in- and post-service medical examinations for occupational health and safety	
1.4.3	Strengthening IT systems for occupation health	
<b>Component 2</b>	<b>Regional Capacity for Disease Surveillance, Diagnostics and Management of TB and Occupational Lung Diseases</b>	<b>(USD 6,868,544.57)</b>
2.1	Human Resources for Health	(USD 4,052,049.94)
2.1.1	Regional Field Epidemiology Training Program (Malawi component) and funding for advanced academic training/research in epidemiology	
2.1.2	Laboratory Training (mycobacterial and disease surveillance experts pre-service and in-service)	
2.1.3	MDR-TB Management Training (clinical and management staff)	
2.1.4	Attend Post Graduate Training in OHS	
2.1.5	Mine Health Inspectors Training/ in-service skills upgrading	

2.1.6	In-service skills upgrading for management on TB and TB-HIV	
2.2	Disease Surveillance	(USD 314,625.03)
2.2.1	Conduct short courses for a multidisciplinary team on surveillance and outbreak investigation	
2.2.2	Develop Guidelines, SOPs for relevant information sharing across GoM Ministries, other stakeholder and also Regional players.	
2.2.3	Support staff to attend local, regional and international meetings for sharing surveillance information	
2.3	Strengthening Diagnostic Capacity	(USD 2,365,885.97)
2.3.1	Develop/ strengthen lab information systems & networking	
2.3.2	Ensure Microscopy and Gene Expert sites undergo quarterly EQA	
2.3.3	Sample transportation	
2.3.4	Expand lab network	
2.3.5	Expand X-ray facilities	
2.4	Strengthening Regulatory Capacity	(USD 135,983.64)
2.4.1	Regulatory capacity	
<b>Component 3</b>	<b>Learning, knowledge and Innovation</b>	<b>(USD 4,562,707.26)</b>
3.1	Program management	
3.1.1	Review meeting	
3.1.2	Coordination	
3.1.3	Procurement	
3.1.4	Capacity building	
3.2	Experience sharing and learning	(USD 378,022.91)
3.2.1	Regional TWG	
3.2.2	Exchange program (experience sharing )	
3.2.3	Regional meeting	
3.3	Support evidence-based policy analysis	(USD 1,803,271.35)
3.3.1	Monitoring and evaluation	
3.3.2	Operations Research	
3.3.3	Baseline assessment mapping	
3.3.4	Advocacy	
3.4	Innovation and centre of excellence	(USD 548,034.93)
3.4.1	TB screening among miners/ex-miners	
3.4.2	Practical Approach To Lung Health	
<b>GRAND TOTAL</b>		<b>(USD 15,707,572.69)</b>

In Malawi, the ongoing Bank funded project also includes an Ebola Virus Disease (EVD) Preparedness Plan which has the following components:

**Component 1:** Infection Control interventions, particularly provision and use of Personal Protective Equipment (PPEs). Health-care workers will also be trained in the use of PPEs, provision of care and treatment to Ebola patients, infection prevention and control and waste management.

**Component 2:** Construction/rehabilitation of quarantine/treatment centres.

The Ministry of Health is designing the Ebola Treatment/Quarantine Centres by adapting the World Health Organisation designs provided in Annex 7, figure A7.1. Main features of the designs include triage rooms for rapidly assessing patients suspected of Ebola and if there is an urgent need for treatment; two wards (for suspected cases and for isolation of confirmed cases); a room for storing PPE, a changing room and laundry rooms. Because of the way Ebola Virus Disease is spread the designs have included the following:

- 1) An area for burning and burying wastes near the facilities;
- 2) A high temperature incinerator;
- 3) Spacious rooms, at least 1.5 meters space between the beds;

- 4) The wards will only be able to accommodate about 5 to 6 beds only; and
- 5) A septic tank for sewage waste;

The construction materials for example bricks or cement blocks, timber and iron sheets will be sourced locally. However in the event that there is an Ebola outbreak, the Ebola preparedness plans encourage the use of prefabricated materials which can be procured quickly on the international market.

The proposed districts for the construction of the Ebola quarantine/treatment centres are Mzuzu, Karonga, Lilongwe, Dedza, Mchinji, Mwanza and Blantyre. The districts were selected strategically as they are border districts (Karonga, Dedza, Mwanza and Nchinji); and major cities (Blantyre, Lilongwe and Mzuzu). In Lilongwe the Ebola facility is already under construction at Kamuzu Central Hospital, a referral hospital. Construction, using burnt bricks, is at an advanced stage (see figure A7.2 in annex 7 for a WHO standard design). The Ebola Treatment/quarantine centre is slightly different from the standard design in figure A6.1 in that it will have a ward for suspected cases built separately from the treatment ward. The construction sites will be on existing sites and will not require land acquisition or resettlement. The use of the Environmental and Social Screening Form will be necessary for each site within districts once identified.

The Southern Africa TB and Health Systems Support Project, will be implemented in collaboration with the Ministry of Health (MoH), the overseer of the health sector. The National Aids Commission (NAC) and the National Tuberculosis Control Programme will however lead in the implementation of their respective technical areas of the project.

#### **1.4 PROJECT AREAS OF INFLUENCE**

It is anticipated that upgrading, rehabilitation, construction and operation of laboratories and Ebola quarantine/treatment centres will generate waste which will have negative environmental and social consequences. Therefore the project has triggered the World Bank's OP/BP 4.01 (Environmental Assessment); and has been assigned to the World Bank environmental category B.

In Malawi, establishment or expansion of an incineration plant falls under the prescribed list of projects, which require an ESIA (EIA Guidelines, 1997). Part VII, Section 38 (1) and Section 38 (4) of the Environment Management Act of 1996 requires that no person should handle, store, transport, classify or destroy waste other than domestic waste, or operate a waste disposal site or plant, or generate waste except in accordance with a license issued by the Minister in accordance with the section. Since some of the medical waste generated from the laboratories will be hazardous and will require incineration, an ESIA (for new incinerator installations) or an EMP (for refurbishment of existing incinerators) will be required.

Potential safeguard issues and areas of influence related to laboratory and Ebola quarantine/treatment centres refurbishment and operation will be on the environmental components of soil, air and water. These safeguard issues will mainly be related to contamination and pollution from construction, general and laboratory wastes. Safeguard issues on social components will relate to traffic accidents, safety of workers and potential for spread of HIV and AIDS as well as potential TB and Ebola infection.

The areas to be affected include public places where people gather in large numbers; poorly ventilated public places and laboratories; points or places of collection, transportation, storage and analysis of specimens; as well as places for disposal of laboratory and hospital waste.

## 1.5 OBJECTIVES OF THE ESMF

This ESMF is prepared to serve as a safeguard framework to examine the environmental and social impacts of the components of the Southern Africa TB and Health Systems Support Project in Malawi. The objectives of the ESMF are:

- i) To establish clear procedures and methodologies for the environmental and social review, approval and implementation of the activities under the project;
- ii) To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to the project;
- iii) To determine the training and capacity building needs; and
- iv) To establish the budget required to implement the ESMF.

The ESMF outlines an environmental and social screening process, focusing on the following steps:

- (i.) completion of the Environmental and Social Screening Form (ESSF);
- (ii.) carrying out the appropriate level of environmental work;
- (iii.) review and clearance of the screening results;
- (iv.) preparation of EIA reports, where this may be necessary and;
- (v.) Preparation of Environmental and Social Management Plan

The ESMF includes an Environmental and Social Management Plan (ESMP), guidelines for monitoring and development of appropriate monitoring indicators, capacity building measures for environmental management and cost estimates for the environmental work. It also includes (as annexes) Environmental and Social Screening Form, Environmental and Social Checklist, and Generic EIA Terms of reference and Summary of World Bank's Safeguard Policies.

A comprehensive Infection Control and Waste Management Plan (ICWM) has been prepared as a separate document. The ICWMP has identified all possible impacts of project activities, and defined mitigation measures for all the impacts within operating facilities, highlighting where possible improvements can be implemented. The ICWM Plan has also included specific aspects on Ebola Virus Disease preparedness.

## 1.6 JUSTIFICATION FOR THE ESMF

For the Southern Africa TB and Health Systems Support Project, the precise type and location of proposed project activities are not known at this time. Therefore the potential social and environmental impacts of the project activities cannot be identified and mitigation measures determined in the context of a traditional EIA, for the specific sub-projects. Once the locations for development activities are known, the Malawi Environment Management Act (EMA) 1996 and the Environmental Impact Assessment (EIA) Guidelines 1997 will prescribe the conduct for Environmental Impact Assessment.

In addition, where the project details and specific project sites are **not** known, the EMA and EIA guidelines may not sufficiently provide and support the screening process for identification, assessment and mitigation of potential localized impacts as required by the World Bank. This ESMF provides mechanisms for ensuring that potential environmental and social impacts are identified, assessed and mitigated as appropriate, through the environmental and social screening process. This ESMF would therefore, complement Malawi's EIA procedures for meeting the environmental and social management requirements. The ESMF complements and is in line with the World Bank Operational Policies for

environmental management of projects where specific details are not yet known. The Environmental Assessment Reports would also be prepared in compliance with the Bank's safeguard policies.

## **1.7 POTENTIAL USERS OF THE ESMF**

The ESMF has been prepared as a reference manual for use by key stakeholders to be involved in the planning, implementation, management and operation of the proposed Southern Africa TB and Health Systems Support Project in Malawi. As reference material, the ESMF would be useful to the following project key stakeholders, ministries and departments:

- Ministries of Health; National TB control program; National Aids Commission (NAC);
- Ministry of Labour;
- Ministry of Natural Resources, Energy and Mining; Environmental Affairs Department;
- Minister of Foreign Affairs and International Cooperation;
- Participating Countries of the Regional Health Systems Strengthening and TB Support Project;
- Funding and Donors Agencies;
- Town & Country Planning Committees and District Executive Committees in the selected cities and districts of the participating countries;
- Politicians and Local Traditional Leaders;
- Senior Government officials responsible for policy making and development planning; and
- National Healthcare Waste Management Programmes for the participating countries

## **1.8 APPROACH AND METHODOLOGY FOR ESMF PREPARATION**

One of the key objectives of the ESMF is to provide a screening process for potential environmental and social impacts for planned future project activities of the Southern Africa TB and Health Systems Support Project and to recommend generic management and monitoring plans for addressing the potential negative impacts. In the development of this ESMF a high degree of consultation with various key stakeholders was employed. The rationale of these extensive consultations was to solicit views of a cross section of key stakeholders including key officials of Government Departments involved in the project and the Environmental and Social Impact process.

The strategies for executing this assignment followed the six steps listed below:

- review of documents for project concept and implementation processes for the proposed project activities;
- review of other relevant literature and government regulations for environmental management and preparation of EIAs;
- identification and analysis of potential generic environmental and social impacts the project activities are likely to trigger and generate within and around the project sites;
- identification of appropriate generic mitigation measures for the negative environmental and social impacts
- development of the appropriate screening process for project sites and project activities; and
- compilation of a generic management and monitoring plan for addressing the impacts during implementation, operation and maintenance of the project activities.

Information for preparation of the ESMF has been collected through a number of research methods, which include review of related literature from published and unpublished documents, field investigations and consultation with key stakeholder.

## **CHAPTER 2 LEGAL, REGULATORY AND ADMINISTRATIVE FRAMEWORK**

### **2.1 POLICIES**

Malawi is a signatory to the 1992 Rio Declaration on Environment and Development. Principle 17 of the declarations commits Malawi to undertaking environmental impact assessments (as a national instrument for environment management), subject to a decision of a competent authority, on all proposed activities likely to have significant adverse impact on the environment. Following the declarations, several policies and legislations on environmental management have been developed of which 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, to be called Guidelines for Environmental and Social Impact Assessment.

The Environmental Affairs Department, in the Ministry of Natural Resources, Energy and Mining (MNREM) is the responsible authority for development and enforcement of environmental policy and legislation. The Department, with the support of the National Technical Committee on the Environment (TCE); and in line with the provisions of the Environment Management Act (1996) as well as the Environmental Impact Assessment Guidelines (1997), determines whether an ESIA is required or not, for all projects. On request by the Director of Environmental Affairs, the 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.

Several other institutions and legislations are also used in preparation of an ESIA depending on the nature of the project. The Malawi national policies relevant to the Southern Africa Tb and Health Systems Support Project include:

#### **2.1.1 The Constitution of the Republic of Malawi (1995)**

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). As such the reviewed policies and legislations, relevant to the project activities for the upgrading, rehabilitation, and/or construction of laboratories as well as management of medical waste, have to be in line with the constitution.

Section 13 provides principles of the national policy which have to be followed (through policy implementation and legislation) to actively promote the welfare and development of the people of Malawi. 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; something which the upgrading, rehabilitation, and/or construction of laboratories as well as management of medical waste aims to achieve. The proposed project must help improve rural life (section 13, e).

Sections 13 (d) defines the role of the State as to manage the environment 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
- Conserve and enhance the biodiversity of Malawi.

The proposed project must not hinder 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.

The project also has to promote gender equality and human rights. Under Section 13 (e), it is the responsibility of the State to achieve gender equality for women through: full participation of women in all spheres of the Malawian society, on the basis of equality with men; implementation of principles of non-discrimination and such other measures as may be required; and implementation of policies to address social issues such as domestic violence, security of the person, maternal benefits, economic exploitation and rights to property. Women and the youth must participate in the ESIA consultations to ensure their views are considered. Human Rights are covered in Chapter V of the Constitution and they must all be adhered to.

### **2.1.2 The National Environmental Action Plan (2002)**

The National Environmental Action Plan (NEAP), developed in 1994 and updated in 2002, provides a framework for integrating the environment into all socio-economic development activities of the country. The NEAP 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. In order to protect the environment from further degradation; the NEAP outlines actions that need to be undertaken to ensure adequate environmental protection.

The proposed project must aim to prioritize strategies to protect the environment by avoiding as many of the significant impacts as possible in the first place. Where this is not possible, mitigation measures are to be implemented through management plans and monitoring has to be done effectively.

### **2.1.3 The National Environmental Policy (2004)**

The National Environmental Policy (NEP) was developed in 1996 and revised in 2004. The policy advocates sustainable social and economic development through sound management of the environment and natural resources. It highlights areas of priority, including efficient utilization and management of natural resources; through involvement of the private sector, NGOs and communities to achieve sustainable environmental planning and 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 to integrate environmental management and protection during project planning and implementation. Where appropriate for the project, the screening process and preparation of safeguard documents will provide a conduit for the participation of the private sector, NGOs and local communities in the management and protection of natural resources and the environment on and around the project area.

#### **2.1.4 Malawi Growth and Development Strategy (2011 – 2016)**

The Malawi Growth and Development Strategy II (MGDS II) is the second medium term national development strategy that represents a decisive and strategic single reference document to be followed by all stakeholders to achieve the goal of wealth creation through sustainable economic growth and infrastructure development. Under the theme of social development, the MGDS II acknowledges that a healthy population is key to increased productivity and sustainable economic growth. The MGDS II notes the following as challenges facing the health sector: 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 inadequate health infrastructure.

The objectives of the proposed project include refurbished laboratories with modern equipment, medical supplies and well trained staff. All these will help tackle the challenges mentioned.

#### **2.1.5 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. 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. Under section 26 (3), the guidelines require that no licensing authority issues any license for a project for which an ESIA is required, 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. To confirm whether an ESIA is required or not, a developer may prepare a Project Brief and submit it to the EAD for review by the Technical Committee on the Environment.

Where activities of the proposed project fall under those requiring an ESIA, the developer has to prepare the ESIA report for review and approval by the Environmental Affairs Department.

#### **2.1.6 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 (District/City Council) 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 by the Ministry of Health must not sideline the District/City Council in the sub-projects' implementing area. 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.

### **2.1.7 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.

### **2.1.8 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, in order to provide water of acceptable quality and in sufficient quantities; and ensure availability of efficient and effective water and sanitation services that satisfy the basic requirements of every Malawian; and for the enhancement of the country's natural ecosystems. In line with this policy, the project developers and administrators must:

- Advocate for effective and 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 disposing materials that can pollute water resources;
- Promote public awareness on guidelines and standards for water quality, public health and hygiene; and pollution control.

### **2.1.9 National HIV and AIDS Policy (2003 – 2008)**

This is the second edition of the National HIV and AIDS policy, formulated to guide and sustain implementation of HIV and AIDS national response. It aims to:

- i) Target key drivers of the epidemic;
- ii) Address the existing and emerging national and global issues; and

iii) Achieve Zero New HIV infections

To sustain the National Responses, one of the key priority areas identified by the policy is 'Treatment, care and support'. Under this priority area, the policy statements are as follows:

- i) Ensure universal access, uptake and retention of quality ART services, including provision of services for STI, Tuberculosis and HIV co-infection and other HIV related illness; and
- ii) Ensure that only certified and proven forms of HIV and AIDS, STIS and Tuberculosis medication, treatment and cure are administered within the boundaries.

The Southern Africa TB and Health Systems Support Project in Malawi recognises that TB/HIV co-infection is extremely tricky to manage and presents many challenges for the traditional approach of combating TB. As such it is necessary to use the provisions in the policy and involve institutions in combating the HIV and AIDS pandemic in the project. TB and HIV treatment must be universal and only proven medication must be administered.

#### **2.1.10 National Construction Industry Policy, 2015**

Renovation (construction activities) of MDR TB triggers the Construction Industry Policy, whose broad policy goal is to develop an internationally competitive construction industry that will be able to undertake most of the construction projects in Malawi. The Policy also aims to export its services and products and ensure value for money to industry client as well as promote environmental sustainability in the implementation of construction projects. In accordance with the policy goal, the Southern Africa TB and Health Systems Support Project in Malawi implementers must:

- Prioritise awarding construction contracts to qualified and registered Malawian Construction Companies, in a bid to help increase participation of local construction players in local and international market.
- Ensure that the contractor protects and harnesses the environment, in line with national and international policies for environmental sustainability.

Environmental sustainability is also identified as a key cross cutting issue by the policy. Other cross cutting issues include disaster risk management; Occupational health and welfare; Gender; and HIV and AIDS. The consultants must ensure that the designs can withstand disasters; there no or very few occupational safety risks and hazards at the construction site; equal work opportunity are offered to men and women; and that HIV and AIDS is not overlooked.

#### **2.1.11 National Gender Policy (2008)**

The National Gender Policy recognises the importance to deal with socio-cultural, political, legal, and economic challenges, which include: persistent unequal power relations between men and women, boys and girls due to strong patriarchal attitudes; increasing cases of gender based violence; high HIV and AIDS infection rates especially among women and girls; limited male involvement in reproductive health, HIV and AIDS care and support services.

In the area of HIV and AIDS, the National Gender Policy advocates for integration of gender concerns and issues in the prevention, treatment, care, support and mitigation of the impact of the pandemic. The Policy therefore advocates for ensuring that gender concerns and issues are mainstreamed throughout all activities relating to HIV and AIDS. It also requires effective participation of vulnerable groups

particularly women, girls, People Living with HIV (PLWAs) and people with disabilities in all decision making processes.

The Policy further requires that the rights and dignity of those living with and affected by HIV and AIDS; particularly women and children are respected, protected and upheld in a conducive legal, political, economic, social and cultural gender friendly environment. It aims to promote access to non-discriminatory, confidential and gender friendly HIV and AIDS services, appropriate for and accessible to women, the youth and other vulnerable groups.

TB/HIV co-infection is known to be extremely tricky to manage and presents many challenges for the traditional approach in combating TB. It is therefore important to recognise this important co-infection relationship and its gender implications when implementing the Southern Africa TB and Health Systems Support Project.

#### **2.1.12 Malawi Health Sector Strategic Plans (2011-2016)**

The Malawi Health Sector Strategic Plan presents the TB Case detection rate at 65%<sup>63</sup>. It points out that lack of access to diagnosis and treatment; poor health status (HIV, malnutrition, mental illness) environmental conditions (housing and overcrowding) behavioural patterns (lifestyle (alcohol, drugs, hygiene) and economic challenges (insufficient food as a result of poverty) are some of the key drivers of TB infection.

#### **2.1.13 Infection Prevention and Control Policy (2006)**

This policy was formulated to provide guidance to health facilities in development and implementation of infection prevention and control programs. The policy emphasises that implementation of infection prevention and control programs be done at various levels of health care delivery system within the public and private sectors. Under the Infection Prevention Control (IPC) section, the policy stipulates that all health care facilities (public and private) 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.

The ESMF must not contradict the programs under infection prevention and control. The EMP must be implemented together with the ICWMP which has been developed together with this document.

#### **2.1.14 Mines and Minerals Policy of Malawi, 2013**

The Mining Policy was adopted in March 2013 in order to enhance the contribution of mineral resources to the economy of the country. Chapter 5 of the policy is Environmental Management and it encourages the preparation of an Environmental Management Plan (EMP) before starting mining operations. The Policy in this chapter recognises that sometimes mining companies do not comply with international standards in Occupational Health and Safety. The TB in Mining Project must therefore, conform to the policy statement in this chapter. Chapter Six of the policy also presents social issues that must be addressed in order to enhance the contribution of mining in Malawi. These social issues include child labour, occupational health, HIV and AIDS, gender and other social injustices. TB is not explicitly mentioned – but it is an occupational health issue. Thus the project is in line with the policy.

#### **2.1.15 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), 2005) is to ensure water of acceptable quality for all needs in Malawi.

Wastewater and solid waste will be generated in the laboratories and in the TB isolations rooms as well as in the treatment centres. The refurbishments and renovations therefore must ensure there are adequate waste water disposal facilities.

#### **2.1.16 Malawi Standards (MS) 615: 2005: Waste within healthcare facilities, handling and disposal (code of practice)**

This standards provides criteria for segregation, collection, movement, storage and on-site disposal of waste within healthcare units, biological research facilities, abattoirs and veterinary surgeries. The standards must be observed at the TB service centres, laboratories, isolation rooms and in general, the hospitals involved in the project.

## **2.2 LEGAL FRAMEWORK**

Typical national legal framework relevant to the Southern Africa TB and Health Systems Support Project in Malawi would include:

### **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 (l) 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 ESIAs 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. These diseases may be identified during the construction phase among the project staff and among patients in the operation phase. The Act dictates notifying the Ministry of Health, when diseases such as T.B., Cholera and Measles are identified. A full list of notifiable disease is presented in Part III. Medical personnel, project managers, family members have to follow the provisions given in the Act when handling the diseases, which among others include isolating the patients and allowing medical personnel to attend to the patients.
- Part VIII discusses venereal diseases such as syphilis and acute and chronic gonorrhoea. The Act discourages employing people found with the diseases or keeping employees found with the diseases. This is however in conflict with the Constitution of the Republic of Malawi 1994 which is much more recent than the Public Health Act 1966. The constitution gives everyone the right to employment and hence cases will have to be treated differently depending on the nature of work, the employee is involved in.
- Part IX of the Act relates to sanitation and prohibited nuisances. Following Part IX, the contractor has to ensure that there are sanitary structures; vehicles and 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 encourage 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 throwing or emptying waste that may injure the sewer, affect free flow of contents or affect treatment of sewage; emptying waste of higher temperature than 110°F; and emptying petroleum, spirit or carbide of calcium.

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 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 refurbishment works and operation of the laboratories 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 Framework 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.

#### **2.2.4 The Town and Country Planning Act (1988)**

This Act, administered by the Commissioner for Physical Planning provides for regulation of development with respect to location, to ensure compatibility of land use over a project area. It promotes protection and sustainable utilization of natural resources through optimal use of land and related service infrastructure. The Act provides guidelines for physical development planning and development control and has provisions for environmental protection. It prescribes measures for approval of plans for any development.

In Section 40, local councils must ensure that negative environmental impacts of projects are avoided or mitigated. The planning committees, under the local councils, use this provision as a condition for the granting of development planning permission. The Town and Country Planning Act also provides guidance to ensure that the developer optimally utilizes and manages land resources and that the proposed development activities are compatible with the land use planning. In this respect, the project developer may have to work with the respective district councils to obtain the appropriate development approvals for the project, in line with the requirements of this Act.

#### **2.2.5 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. For the proposed project, 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.

### **2.2.6 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 have to comply with the Occupational Safety, Health and Welfare Act when implementing the various project activities for refurbishment of the laboratories. 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 the Act (Sections 58, 59, 60).

### **2.2.7 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, promoting research and development, encouraging competitions; and standardising quality control, contract documentation, 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.

### **2.2.8 Mines and Minerals Act Cap 61:01 (1981)**

This Act, under section 37 section h, stipulates that the mining licence be accompanied by a statement of any particular risks (whether to health or otherwise) associated with mining operations. Thus, mining companies have the obligation to ensure that mining operations take into consideration health risks of people involved. The Act clearly states that companies applying for a grant of a mining licence should give a statement of proposals for the prevention of pollution, the treatment of wastes, the safeguarding of natural resources, the progressive reclamation and rehabilitation of land disturbed by mining and for the minimization of the effects of mining on surface water and ground water and on adjoining or neighbouring lands.

Part V section 33 (underground operations) states that; All necessary measures shall be taken to ensure that all persons underground are in an atmosphere which does not contain gas or dust in quantities that are dangerous to health, and which in circulation, temperature and relative humidity creates conditions in which work can be performed without distress.

## **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. It has the directorate of Clinical Services, Physical Assets Management, Nursing Services, Pharmaceutical Services, Preventive Health Services (PHS) and 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) and the District Medical Officer (DMO).

The Southern Africa Region TB in Mining Malawi project will be implemented by the National TB Control Programme which is under the TB control unit of the PHS directorate. The TB control unit is led by a Deputy Director responsible for Tuberculosis control and he reports to the Director of Preventive Health Services. The TB control programme is led by a manager who reports to the TB control 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) (**TRIGGERED**)
- 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)

The Southern Africa Tb and Health Systems Support Project in Malawi triggers only OP 4.01 on Environmental Assessment, since laboratory refurbishment and construction works, as well as waste management activities will be confined to within the existing hospital building premises and within existing government hospital infrastructure. There will be no new sites for which land acquisition would be necessary. Details of the ten World Bank's safeguard policies are provided in Annex 6, for reference.

### **2.4.1 Environmental Assessment (OP/BP 4.01)**

The objective of Environmental Assessment is to ensure that projects 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 and rehabilitation of laboratory buildings may have negative environmental impacts, which require mitigation. In addition, laboratory waste management practices may have potential health impacts. Therefore, in line with this Operational Policy, ESMF, for screening of the Southern Africa Tb and Health Systems Support Project activities and sites has been prepared.*

#### **2.4.2 The World Bank's Categorization of Projects**

Environmental consequences should be recognized early in the project cycle; and taken into account in project selection, siting, planning and design. In so doing, adverse environmental and social impacts may be prevented, minimized, mitigated and/or compensated for; and positive impacts may be enhanced. The World Bank's Environmental Assessment includes the process for mitigating and managing environmental and social impacts throughout project implementation and the Environmental Assessment Sourcebook (1993) and its updates (1996, 1997) provide technical guidance. The World Bank's categorization of projects, with respect to significance of environmental impacts is as follows:

- 1) **Category "A":** A proposed project is classified as Category "A" if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subjected to the physical works. Environmental Assessment for a Category "A" project examines the project's potential negative and positive environmental and social impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental performance. For a Category "A" project, the borrower is responsible for preparing a report, normally an EIA (or a suitably comprehensive or sectoral EIA) that includes as necessary, elements such as environmental audits or hazard or risk assessments.
- 2) **Category "B":** A proposed project is classified as Category "B" if its potential adverse environmental and social impacts (on human populations or environmentally important areas including wetlands, forests, grasslands, and other natural habitats) are less adverse than those of Category "A" projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category "A" projects. The scope of EIA for a Category "B" project may vary from project to project, but it is narrower than that of Category "A" EIA. Like Category "A" EIA, it examines the project's potential negative and positive environmental and social impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.
- 3) **Category "C":** A proposed project is classified as Category "C" if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category "C" project.
- 4) **Category "FI":** A proposed project is classified as Category "FI" if it involves investment of Bank funds through a financial intermediary, in subprojects that might result in adverse environmental impacts.

#### **2.4.3 Malawi Categorisation of Projects versus World Bank Categorisation**

As compared to World Bank, Malawi categorises projects into two; the main considerations being project type, size and the environmental and social sensitivity of the project location.

- a. Category A: A full ESIA is required, including an Environmental and Social Management Plan to address the management of impacts. This is similar to Category A of World Bank in respect of the level of significance of the environmental and social impacts and the ESIA requirement.
- b. Category B: The developer is asked to prepare an Environmental and Social Management Plan. This is similar to Category B of the World Bank. Category C of the World Bank is also included in this category whereas Category FI can be in Category A or Category B depending on the significance of the impacts.

To categorise the projects, in accordance with the EMA (1996) and the Guidelines for Environmental Impact Assessments (1997), screening is done by the EAD after the project developer has prepared the Project Brief. The Project Brief contains specific details of the project, including a description of activities and project site location which are not available at this stage of the Southern Africa TB and Health Systems Support Project. The screening tool which is used by the EAD as provided by 1997 Guidelines for ESIA is provided in Annex 3.

Construction and rehabilitation of infrastructure under the Southern Africa TB and Health Systems Support Project is likely to have moderately significant adverse, environmental and social impacts, which require mitigation. However the screening tool for Malawi is not comprehensive, hence, in line with the Operational Policy, this ESMF has prepared a screening form for the project activities. Given that the Southern Africa TB and Health Systems Support Project has been classified as a Category B under World Bank categories, the project will not fund any investments classified as Category A, based on the screening results.

## **CHAPTER 3 ENVIRONMENTAL AND SOCIAL IMPACTS ASSESSMENT PROCESS**

### **3.1 DEFINITION AND IDENTIFICATION OF SOURCES OF GENERIC IMPACTS**

Impacts of the proposed Project are defined as changes on the environmental and social components, resulting from implementation of the proposed project activities. For the ESMF, the generic impacts are classified as either negative or positive. Negative or adverse environmental and social impacts are those that are harmful and undesirable, while positive impacts are those that are beneficial to the biophysical and socio-economic environment.

At the framework level, negative and positive impact analysis of the proposed Southern Africa TB and Health Systems Support Project in Malawi were determined using the following:

- i) available information on the environmental and social situation at the project area of influence (described in Section 1.4);
- ii) typically known impacts of the proposed project activities; and
- iii) information gathered and analysed.

The consultant assessed the environmental and social aspects of the project components described in section 1.3; and using professional experience from similar projects, ESIAs for infrastructure projects and similar ESMFs, the following were identified as potential sources of impacts:

- refurbishment of the laboratories;
- expansion of X-ray facilities; and
- Construction of new Ebola Virus Diseases Quarantine/Treatment Centres.

### **3.2 STAKEHOLDER CONSULTATIONS**

Consultations were held with a number of key stakeholders including staff of the World Bank, the National Aids Commission (NAC) and staff of the TB control Programme who provided details of the project. Consultations were also held with a number of officers in the Ministry of Health; Ministry of Natural Resources, Energy and Mining; and the departments responsible for labour, social welfare and immigration. The discussions centred on health-care waste management, Ebola virus preparation plans, health sector reforms and health services infrastructure including existing laboratories and proposed designs for the facilities to be constructed or renovated. Also discussed were the existing set up, processes and regulations for health-care waste management, infection control in the mining sector, and biosafety and occupational safety of health-care waste management. Elaborate discussions were held on the environmental laws, regulations and procedures with the Environmental Affairs Department (EAD).

The consultant also held discussions with officials from the Environmental Health Unit to discuss implementation of the ESMF and capacity building and training needs. These officials included the Principal Environmental Health Officer at National Level and the District Environmental Health Officers as well as the Health Surveillance Officers at the District and Health Centre level.

A list of persons met and discussed with is included in Annex 10.

### 3.3 FIELD INVESTIGATIONS

Field investigations involved a 3 tier process:

- selecting sites for investigations;
- carrying out observations and surveys; and
- administering key informant questionnaires.

The consultant selected Kaziwiziwi and Mchenga Coal Mines in Rumphi District as they are large and well established. The mines were visited on 10<sup>th</sup> and 11<sup>th</sup> December 2015 and information was gathered using checklist matrix and semi-structured questionnaires for key informant interviews. The people that were interviewed included the Managers, Human Resources Officers; and Environmental Health and Safety Officers. The visits to the mine aimed at finding out the current practices for TB prevention, detection and treatment among the miners, ex-miners and communities surrounding the mines. The visits also sought to find out the environmental and occupational health and safety practices. During these visits it was established that the mines do not have a standard system in place for detecting, treating and preventing TB. The mining companies also do not have good record keeping for the health of the workers.

The consultant also visited the private clinics owned by the two mining companies; Jalawe Health Centre, a rural health centre near Mchenga coal mine; David Gordon Memorial Hospital, a Christian Health Association of Malawi (CHAM) hospital, used by the miners as a referral; and Mzuzu Central Hospital, a referral hospital. The Ebola Quarantine/Treatment Centre, which is still under construction at Kamuzu Central Hospital (KCH), was also visited on 22<sup>nd</sup> December 2015. The consultant selected Rumphi, Mzimba and Lilongwe districts for the study since they have large scale mining activities or Ebola quarantine/treatment potential.

At the selected hospitals, key informant interviews using semi-structured questionnaires and field surveys using checklists were conducted to gather information. Key findings included the following:

- 3 Clinics owned by the mining companies are ill-equipped and staff are not well trained;
- 4 There are no scheduled medical check-ups for miners and the companies rely mostly on Health Surveillance Assistants for Health Education;
- 5 Jalawe Health Centre is only able to treat minor cases such as injuries and malaria. Rural Health Centres do not have equipment for testing TB but can be appropriate centres for sputum collection;
- 6 David Gordon Memorial Hospital, has treated a number of TB cases and other chest problems among the miners from Mchenga and Kaziwiziwi coal mines. The hospital has a TB isolation and treatment ward as well as a laboratory. It also manages sputum collection centres and a TB surveillance programme that will need to be strengthened;
- 7 Central hospitals do not run sputum collection centres. There are managed by District Hospitals. However the programme is faced by financial problems and relies mostly on volunteers; and
- 8 TB isolation wards faces shortages personal protective equipment and staff.

The consultant also collected information on management of environmental and social impacts for infrastructure development projects at the hospitals. At both Mzuzu Central Hospital and KCH there were constructions going on. At KCH the Ebola quarantine/treatment centre construction is at an advanced stage (see Annex A6.2). Hence, the consultant had the opportunity to observe the sizes and proposed uses of the rooms, apart from appreciating the environmental management practices. Management of environmental and social impacts from construction activities was found to be inadequate and there seemed to be unsatisfactory monitoring of the same by the Ministry of Health. Therefore, capacity building in environmental management and awareness will be a crucial component of the project.

### 3.4 CATEGORIZATION OF THE IMPACTS

The typical project activities to be implemented under the Southern Africa TB and Health Systems Support Project in Malawi can be broadly categorised into the following phases of the project cycle:

1. Planning and Design
2. Construction and Implementation
3. Demobilisation
4. Operation and Maintenance

This categorisation will facilitate systematic identify of the significant potential environmental and social components that would be impacted by the proposed project activities. Each of the project phases listed above has environmental and social consequences on the different environmental components such as soil, water, air and the society. Table 3.1 relates the project activities of the four project phases to the environmental components. As can be seen from the table, most of the impacts are likely to be felt during the construction and demobilization phases of the project.

Table 3.1 Potential Impacts and affected environmental components

ENVIRONMENTAL COMPONENTS PROJECT ACTIVITIES	Soils	Surface water resources	Surface water quality	groundwater quality	Air quality	Livelihoods	Existing infrastructure and services	Health and safety	Aesthetic and amenity values
PLANNING & DESIGN									
CONSTRUCTION	X	X	X	X	X		X	X	X
DEMOBILIZATION					X	X		X	
OPERATION & MAINTENANCE	X		X	X	X	X		X	

### 3.5 SOURCES AND SUMMARY OF SIGNIFICANT GENERIC IMPACTS

The Southern Africa TB and Health Systems Support Project in Malawi will generally benefit the participating countries in the areas of improved health at country and regional level. Positive and negative environmental and social impacts are also expected from implementation of the project activities (e.g. refurbishments of laboratories). Negative impacts are likely going to be minor, short term and localised while positive impacts will be major and long term. The generic impacts are expected to include the following:

#### 3.5.1. Generic Positive Impacts

##### 3.5.1.1. Improved Health

The project will positively impact on the health of the Malawians through:

- (a) Improved health-care and laboratory services
- (b) Trained human resources for health;
- (c) Ease of access to quality health and laboratory services;
- (d) Improvement in TB, TB-HIV and MDR-TB cases management;

- (e) Improved community TB interventions in the mining population;
- (f) Improved knowledge and health seeking behaviour among the mining population;
- (g) Improved coordination and collaboration among different stakeholders;
- (h) Improved case detection and TB surveillance;
- (i) Improved occupational health and safety as well as community health;
- (j) Strengthened patient referrals and follow-up; and
- (k) Strengthened infection control and waste management.

### 3.5.1.2. Employment opportunities

The refurbishment of laboratories will require local labour and hence create employment opportunities for the local people, although this will be short term. During the operation phase, the hospitals may also require skilled personnel (e.g. nurses and laboratory assistants); and unskilled workforce (e.g. guards and cleaners).

### 3.5.1.3. Improved aesthetics and life of healthcare facilities

Refurbishment activities will include repairing walls and painting, which will improve the appearance of the health-care facilities and surroundings. The structural renovations will also increase the operational life span of the facilities.

### 3.5.1.4. Reduced environmental pollution

Implementation of the Infection Control and Waste Management Plan will result in reduction of wastes and improve waste management. This will contribute to reduction in air, land and water pollution.

## 3.5.2. Generic Negative Impacts and Mitigation Measures

### 3.5.2.1. Impacts during Planning and Design

No significant impacts are expected in the planning and design phase as most of the activities will be done at the client and consultant's offices. In addition, there will be minor or no rigorous surveying in the planning and design stage.

### 3.5.2.2. Impacts during Construction

Anticipated impacts during the construction phase are likely to emanate from the following activities:

- Mining and delivery of construction materials;
- Refurbishment and construction activities (e.g. breaking and building walls and painting); and
- Installation of machines and equipment.

The anticipated impacts and mitigation measures are described as follows:

#### Impact on Soil

##### i. Soil erosion

Soil exposure, loosening and breaking up will result from clearing, excavations, grading and landscaping activities on new construction sites and rehabilitation of buildings. The exposure and loosening of soils will make it easy for run-off to carry away the soils, hence increasing soil erosion. Soil erosion will also be enhanced on sloppy grounds.

The impact is expected to be localised moderate and short-term duration and can be mitigated by:

- Limiting site clearing to the required space;
- Avoiding deposits/piling of loose soils on sloppy ground or near drainage channels;
- Implementing temporary erosion control measures (e.g. sedimentation retention mechanisms such as protection nets and wooden stakes) to minimize loss of soil;
- Using excavated soils to rehabilitate eroded areas; and
- Replanting grass on cleared sites.

**ii. Soil contamination and land degradation** may result from the following:

- Construction wastes such as rubble, packaging materials, cement, oils and paints.
- Accidental or deliberate disposal of construction waste and chemicals.
- Soils from digging of the ground and excavations for structures such as septic tanks and pipes.
- Inadequate management of construction material sources – such as quarries and river banks.
- Use of artisanal bricks made by unregistered manufacturers.

The impact is expected to be localised, minor and long term and can be mitigated by:

- Storing and containing rehabilitation and construction materials on lined surfaces, in covered areas;
- Collection and disposal of wastes in designated disposal sites as required by the Local Authority;
- Use of excavated soils to construct storage mounds that are less than 3 meters high;
- Use of soils from excavations and digging to rehabilitate eroded areas; and
- Enforcing the use of licenced construction materials suppliers through the civil workers contracts.

## **Impacts on Water Resources**

**i. Impeded water flow and creation of stagnant water pools**

Debris and rubble will be generated from the demolition and construction of walls and other structures. These may clog water drainage systems and natural water ways, resulting in impeded water flow and creation of stagnant water pools where mosquitoes, flies and other insects might breed. The nature of these anticipated impacts will be localised, short term and moderate due to the small nature of the construction and rehabilitation works. The impact can be mitigated by keeping all drains and natural water ways clear of silt and debris and avoiding creation of puddles of water on site.

**ii. Water pollution**

During the construction phase, surface water pollution is anticipated to result from the following:

- Rubble, cement, paints, lubricants and fuels, where they fall or spill on the ground and are washed to the drainage or surface water bodies;
- Careless disposal of human and domestic wastes and where they are washed to water surfaces;
- Failure to remove contaminated soil or spills such that run-off washes the spills to the water bodies;
- Chemicals and oil for generator, vehicles, cement mixers and other machines. spillages;
- Siting storage areas near watercourses; and

- Carrying construction activities near water courses.

Groundwater pollution is anticipated to occur where the spills and contaminants are mixed with water and seep into the ground. Construction of a pit latrine near the groundwater table or near a water course will also result in groundwater or surface water pollution.

In the operational phase, infectious waste may also be a source of water pollution.

The impact is anticipated to be localised, moderate and moderate term. Mitigation measures include to:

- Mix cement in areas not connected to natural drainage systems
- Store cement, paints, lubricants and fuels in lined and covered areas
- Line surfaces where cement, paints and oils will be stored and connecting the drainage systems to oil interceptors.
- Provide appropriate facilities for the collection of wastes on site such that they will not come into contact with soils or water bodies.
- Collecting and disposing of wastes in designated disposal sites as required by the Local Authority.
- Provide appropriate spill kits when working near water courses;
- Site all material storage areas at least 10m from watercourses;
- Provide appropriate barriers to separate worksites from water resources in order to prevent accidental spillage into water courses;
- Provide materials to quickly and effectively clear up spills and dispose of to the appropriate disposal areas;
- Construct a pit latrine that is at least 1.5 meters deep, lined at the base, and 30 metres from a water body; and
- Include proper design and location for management of infectious wastewater in the plans for the refurbishments activities.

### **iii. Surface water siltation**

Surface water siltation will occur as a result of loosening of soils from clearing or construction activities and movement of vehicle which will result in soils being washed away to water courses. Surface water siltation is also expected from mining of building materials e.g. sand. The impact is anticipated to be localised, moderate and short term and can be mitigated by:

- Moderately spraying water on roads and construction sites;
- Compacting loose soils;
- Limiting clearing activities to the sites that will be used; and
- Enforcing the use of licenced construction materials suppliers through the civil workers contracts.

## **Impact on Air Quality**

### **i. Air pollution**

Air pollution will result from emissions from vehicles, earthmoving equipment and dust. Air pollution from paint smells, dust and particulate matter from refurbishment activities is also likely to occur. Air pollution has a secondary impact of affecting workers health through causing coughs and being a nuisance. Dust particulates also degrade the quality of foliage and vegetation.

The impact is anticipated to be short term, minor and localised and can be mitigated by the following:

- Maintaining construction machinery regularly as recommended by dealer;
- Providing workers with breathing masks; and
- Enclosing or shielding work areas to prevent spreading of dust and smell.

### **Impacts related to Existing infrastructure and services**

The following impacts are likely to occur during the construction phase:

- i. Temporary obstruction of walkways and access to services** due to safety barriers around the buildings under refurbishment;
- ii. Disturbance of traffic and movement of people on the hospital premises** due to increased number of vehicles as a result of movement of construction vehicles; and
- iii. Temporary loss of social services such as water, electricity and telephone services** for patients, staff and other users when the contractor is extending or improving the services in the refurbished buildings.

The impact is anticipated to be minor, short term, and localised.

Mitigation measures for the impacts would include to:

- Provide alternative routes with adequate and appropriate directional signs around safety barriers for external service users to access services;
- Provide alternative routes and passages with appropriate directional signs for the patients and staff;
- Provide alternative rooms to be used for temporary laboratory space and other affected services; and
- Inform the Client well in advance (a week) before disconnecting services and provide clear and accurate timeline of when services will be reinstated.

### **Impacts related to Health and safety**

#### **i. Accidents to workers, staff and public on construction sites and project activity areas**

Accidents to staff, patients and the general public on construction sites and project activity areas could also be expected during the construction phase. The impact is anticipated to be minor, localised and short term and can be mitigated by the following:

- Providing appropriate protective clothing for staff (e.g. boots, vest, helmet and gloves, ear defenders, breathing masks available for particular activities) and ensure they use them safely;
- Providing appropriate directional and safety signs for staff and public;
- Providing appropriate marking or fencing of construction site to exclude non-construction personnel;
- Providing first aid kit;
- Acquiring appropriate workman's compensation and liability insurance;
- Providing alternative routes and passages with adequate and appropriate directional signs;
- Transferring patients to rooms where there are no construction activities.

## **ii. Noise & vibration disturbances**

Noise and vibration disturbances are expected from activities such as breaking down walls, drilling and metal fabrications, concrete mixing, operating of machineries and vehicle movement. The impact is anticipated to be minor, short term and localised. The impact can be mitigated by the following interventions:

- Construction works must be done during official government working hours;
- Use machines that do not make a lot of noise; and
- Vehicles, plant and machinery must be regularly maintained as recommended by dealers.

## **iii. Spread of TB, STIs, HIV/AIDS and other communicable diseases**

During construction and refurbishment, people are expected to gather together and associate to accomplish the project tasks. Some of the people may come from surrounding communities and outside the neighbourhood. These gatherings and associations between migrants and local residents may lead to casual sexual relationships, thereby increasing chances of contracting and spreading STI and HIV/AIDS. Contractors working on or near the existing laboratories and TB testing centres may also be exposed to TB or other infection. The impact is anticipated to be moderate, long term and localised and can be mitigated by conducting awareness meetings, involving construction managers in the awareness and mitigation processes, and providing condoms to staff and other exposed persons.

## **iv. Increased pressure on sanitary structure**

During construction it expected that a workers camp will be constructed in the hospital fence where refurbishments will occur. Most hospitals have inadequate sanitary structures e.g. pit latrines and sanitation is generally a problem due to intermittent water supply. Therefore the use of the existing toilets by construction workers will lead to increased pressure on the facilities. The impact is anticipated to moderate, short term and localised. It can be mitigated by:

- Ensuring that labour camps for construction workers have own provisions for water supply, sanitation and waste management facilities;
- Ensure that pit latrines are at a safe distance (between 20 – 30 meters depending on hydrological conditions) from any water abstraction points; and
- Including stringent conditions on proximity of labour camps to communities, housing and wards in contracts with construction contractors.

## **Impacts related to Aesthetic and amenity values**

### **i. Defacing and degradation of the appearance of the project area**

Defacing and degrading of the appearance of the project area and surroundings will result from demolished buildings and spills of construction and demolition wastes. Some flowers and shrubs may also be destroyed. Defacing can also occur when construction materials are sourced from illegal and nearby quarries. The impact is anticipated to be minor, short term and localised.

It can be mitigated by rehabilitating affecting areas after the construction.  
The impact can be mitigated through the following measures:

- Providing appropriate containers across the works areas for waste disposal and easy collection to disposal site;
- Removing and dispose wastes regularly in appropriately designated disposal site;
- Using shields to isolate and enclose construction sites;
- Properly landscaping the site after construction is completed;
- Restoring the site to its former condition or to a condition agreed with the client prior to contract completion;

### 3.5.2.3. Impacts During Demobilization

Activities during this stage include site clearing, rehabilitation of the sites, demolition and removal of the workers camp, closure and demolition of temporary sanitary facilities; and transporting construction equipment and surplus materials away from the site. These activities, during demobilization stage, will be done in a short duration and will have few significant impacts on the environment. The impacts will likely be minor, short term and localised. These impacts are discussed as follows:

#### i. Air pollution from dust and contaminated wastes

Site clearing activities such as removal of construction waste and left over construction materials is anticipated to generate dust which will degrade the air quality. The impact can be mitigated by spraying water in the impact areas and on the materials being removed.

#### ii. Injuries may result from object falling on the workers and other accidents

Objects may fall on the workers and public, or the people may step on sharp objectives resulting in injuries. To mitigate this impact, workers must continue wearing protective gear during the demobilization. Also maintain an appropriate marking or fencing of construction site to exclude non-construction personnel; and construction workers must also be obligated to follow safety procedures when removing the structures.

### 3.5.2.4. Impacts During Operation and Maintenance

During operation and maintenance negative impacts are anticipated to result from the following activities:

- Sample handling (collection, transportation to laboratories and analysis);
- Conducting x-rays and laboratory tests;
- Waste management (collection, transportation, treatment and disposal)
- Quarantine and isolation of Ebola patients

The anticipated impacts will be related to infection control and waste management practices and these are discussed in the ICMWP.

## **CHAPTER 4 ENVIRONMENTAL AND SOCIAL SCREENING**

### **4.1 ENVIRONMENTAL AND SOCIAL SCREENING PROCESS**

The environmental and social screening process helps to:

- assess whether sub-projects are likely to have potential negative environmental and social impacts;
- determine appropriate mitigation measures for activities with significant adverse impacts, for incorporating them into the sub project design;
- review and approve sub-project proposals; and
- monitor environmental parameters during project implementation.

The extent of environmental and social work required, to mitigate adverse impacts for the sub-projects, will depend on the outcome of the screening process. For the Southern Africa TB and Health Systems Support Project, environmental screening will be done by completing the Environmental and Social Screening Form attached as Annex 1.

### **4.2 COMPLETING THE ENVIRONMENTAL AND SOCIAL SCREENING FORM**

Once the sub-project activity is defined and the location is selected, the Environmental and Social Screening Forms will be filled by the Project Proponent, Ministry of Health. The forms will be filled at district level by the District Environmental Health Officer. The Environmental District Officer (EDO) representing the District Environmental Sub-Committee (DESC) of the Local Council will provide guidance and facilitate completion of the Environmental and Social Screening. Members of the DESC, depending on their areas of expertise will also participate in filling the form.

The Sub-project Environmental and Social Checklist in Annex 2 will guide to identify appropriate mitigation measure for the sub projects to be implemented. The refurbishment, rehabilitation of laboratories and the construction of Ebola Treatment/ Quarantine centres would take place at existing facilities and therefore, no land will be acquired, no property will be affected and involuntary resettlement or compensation would not be required.

### **4.3 REVIEW OF SCREENING FORMS AND SAFEGUARD OPTIONS**

After the Environmental and Social Screening Form, and the sub project environmental checklist are filled, the DESC will review the forms and determine the extent of environmental and social work required (i.e. whether application of mitigation measures outlined in the environmental checklist will suffice or not). Some design modifications can be incorporated in the project costs at this stage, in order to minimize or avoid environmental impacts.

Depending on the magnitude of the environmental impacts identified review process will lead to four safeguard options:

- No further action, if the sub project has no significant impacts on the environment;
- Simple Environmental Review to be carried out for sub-projects likely result in a few minor environmental problems that can easily be mitigated.

- Limited Environmental Review for sub-projects that may create minor environmental problems, requiring frequent site visit or construction modifications to minimize or eliminate impact.
- Full Environmental Impact Assessment for sub projects resulting in potentially significant direct or indirect adverse impact.

Where the safeguard option is an Environmental Review (ER) or Limited Environmental Assessment (LEA) the District Environmental Health Officer with assistance from the EDO will be required to carry out the ER or LEA and prepare mitigation measures and monitoring plan. The generic EMP of the he ESMF for the Southern Africa TB and Health Systems Support Project will be used as a template or reference point for the mitigation measures and monitoring plan.

Where results of the environmental and social screening process indicate the need to carry out an EIA, the procedure for preparation of the EIA, up to issuing of an EIA certificate (as provided for in the Environment Management Act and the Environmental Impact Assessment Guidelines) shall be followed. This includes the preparation of a Project Brief which is reviewed by the TCE to determine whether a project is Category A or Category B. Where it is determined that it is Category B the Ministry of Health will hire an Environmental Specialist to prepare an Environmental and Social Management Plan (ESMP); and where it is Category A, the specialist will carry out a comprehensive ESIA and prepare an ESMP. The consultant will work with the Environmental District Officer, Environmental Health Officers, District Environmental Management Committee and the general community.

The Southern Africa TB and Health Systems Support Project will pay for the ESIA study, to be done by approved consultants and also pay for the review and approval costs charged by the institution responsible for environmental matters.

#### 4.4 REVIEW AND APPROVAL

For sub-projects activity assessed as **no further action, ER and LEA** and approval will be done at district level and the Technical Committee on Environment at national level will only receive a report. In line with the Revised Decentralized Environmental Management Guidelines (2012), the DESC will review the Environmental and Social Screening Form, as well as the Environmental Checklists, completed during preparation of the subprojects, to ensure that all environmental and social impacts have been identified and a mitigation management plan proposed. The DESC will also ensure that an appropriate monitoring plan, for implementation of the impact mitigation plan has been prepared.

If the application has satisfied all the environmental requirements on the screening form and the check list, the DESC will make a recommendation to the District Executive Committee to clear the project and recommend to the Ministry of Health for approval and subsequent funding.

If the DESC finds that the submitted design is not consistent with the requirements of the environmental screening form and the environmental checklist, the Southern Africa TB and Health Systems Support Project would be requested to make appropriate design modifications. Thereafter, the sub-project will, once again, be subjected to another screening process until it conforms to the environmental requirements; after which it will then be re-submitted for review and approval.

For projects requiring an **ESMP or a comprehensive ESIA**, the ESMP or ESIA report will be reviewed by the TCE. The TCE, upon review will make recommendations to the Director of Environmental Affairs will report to the National Council for the Environment (NCE). The NCE will consider the

recommendations and advise the Minister of Natural Resources, Energy and Mining for approval and issuing the environmental certificate for the project to proceed.

Any proposed sub-projects that do not comply with the requirements of this ESMF, the completed screening form and the World Bank safeguards policies will not be cleared for approval.

#### **4.5 PUBLIC CONSULTATION AND DISCLOSURE**

Public consultations are critical in preparing an effective and acceptable sub-project. All sub-project applications, planning reports and appraisal reports have to be available for public examination at suitable and accessible locations including the district council offices and the offices of the ministry responsible for health.

Consultation with the local communities and all other interested parties is important during the screening process. Relevant standing committees of the Local Government Authorities and of the Township, Wards and Villages as provided for in the environmental management regulation or Act and the EIA Guidelines shall be appropriately involved or consulted.

The consultations should identify key issues and determine how the concerns of all parties will be addressed. To facilitate meaningful consultations, the Southern Africa TB and Health Systems Support Project team and the consultant will provide all relevant material and information concerning the sub-projects in a timely manner, prior to the consultation. This material and information must be in a form and language to be easily accessible and understood by the people being consulted and a form that will enable all potential Project Affect Persons to be informed and able to respond to the consultation. Depending on the extent of public interest in the potential impacts of the sub projects, a public hearing will be called, to better convey public concerns and to facilitate elaboration of the sub-project activities and their impacts.

The Environmental District Officer at the district or his appointed staff will be responsible for taking the minutes of the public hearing or disclosure meeting. The office will also produce and distribute copies of the minutes to offices at the district/municipal councils, ward and village, political parties, NGOs, and other civil societies in the community, as appropriate. A summary of the outcome of this public consultation or disclosure meeting will be posted at appropriate public places and will be provided to the PIU. Any interested individual or group has the right of appeal, if dissatisfied with the decision reached at any stage in the EIA process. The appeal process will be according to the Environmental Management Act 1996.

Once the sub-project has been reviewed and cleared by the DEC at district level, or the Minister at National Level, key stakeholders and the general public will be informed about the results of the review. The Environmental Screening results, together with any impact mitigation plans or ESMPs will therefore be disclosed in appropriate public places, including at the offices of Regional and District Commissioners as well as the Info-shop of the World Bank.

## **CHAPTER 5 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN**

### **5.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

This generic Environmental and Social Management Plan (ESMP) for the Southern Africa TB and Health Systems Support Project in Malawi provides a template for measures to be taken to ensure that environmental and social impacts identified through the screening process are eliminated, mitigated, or controlled; through planned activities to be implemented in all the phases of the project (Planning and Design, Construction and Decommissioning). Basically the generic ESMP:

- 1) is a list of the likely potential environmental impacts;
- 2) provides the mitigation measures against each impact;
- 3) assigns the responsible institutions to carry out the mitigation measures; and
- 4) gives an estimate of the cost for implementing the mitigation measures

The generic ESMP (Table 5.1) was developed based on the potential environmental and social impacts anticipated from the proposed Southern Africa TB and Health Systems Support Project in Malawi project activities. The impacts were determined from the general project description, stakeholder consultations and professional judgment. Hence the list of impacts however, is by no means exhaustive.

It is to be appreciated however, that the generic management plan may need to be adjusted to suit changes or emergencies that may occur in the project design and on specific sites at the time of project implementation. The plan therefore should be considered as the template to be followed to ensure that the key potential negative impacts are kept minimal or under control. In this regard, the screening forms and checklists will help in the preparation of site specific ESMPs.

To complement the generic ESMP, an Infection Control and Waste Management (ICWM) Plan is also being developed as a separate document. The Ministry of Health, all other stakeholder institutions and personnel for the Southern Africa TB and Health Systems Support Project will implement it together with the generic ESMP or site specific ESMPs to ensure best results for environmental management and infection control.

Table 5.1: Generic Environmental and Social Management Plan				
Project Stage / Environmental Components	Impacts	Mitigation Measures	Responsible persons/Institution	Estimated Cost per Site (USD)
<b>During Construction</b>				
Soil and land	Soil erosion	<p>Limit clearing activities to the required space;</p> <p>Avoid deposits/piling of loose soils on sloppy ground or near drainage channels;</p> <p>Implement temporary erosion control measures (e.g. sedimentation retention mechanisms such as protection nets and wooden stakes) to minimize loss of soil;</p> <p>Use excavated soils to rehabilitate eroded areas; and</p> <p>Replant grass on cleared sites.</p>	Contractor	To be included in the Contractor's bill of quantities
	Land degradation and Soil Contamination	<p>Store and contain rehabilitation and construction materials on lined surfaces and in covered areas.</p> <p>Dispose of waste as required by the Local Authority</p> <p>Use soils to rehabilitate eroded areas</p> <p>Use excavated soils to construct storage mounds that are less than 3 meters high</p> <p>Enforcing the use of licenced construction materials suppliers through the civil workers contracts.</p>	Contractor	To be included in the Contractor's bill of quantities

Table 5.1: Generic Environmental and Social Management Plan				
Project Stage / Environmental Components	Impacts	Mitigation Measures	Responsible persons/Institution	Estimated Cost per Site (USD)
Water Resources	Impeded water flow and creation of stagnant water pools	Keep all drains and natural water ways clear of silt and debris  Avoid creation of puddles of water on site	Contractor	To be included in the Contractor's bill of quantities
	Water pollution	Mix cement in areas not connected to natural drainage systems  Store cement, paints, lubricants and fuels in lined and covered areas;  Lining surfaces where cement, paints and oils will be stored and connecting the drainage systems to oil interceptors.  Provide appropriate facilities for the collection of wastes on site such that they will not come into contact with soils or water bodies.  Provide appropriate spill kits when working near water courses;  Collect and dispose of wastes in designated disposal sites as required by the Local Authority.  Provide appropriate spill kits when working near water courses;	Contractor	To be included in the Contractor's bill of quantities

Table 5.1: Generic Environmental and Social Management Plan				
Project Stage / Environmental Components	Impacts	Mitigation Measures	Responsible persons/Institution	Estimated Cost per Site (USD)
		<p>Site all material storage areas at least 10m from watercourses;</p> <p>Provide appropriate barriers to separate worksites from water resources in order to prevent accidental spillage into water courses;</p> <p>Construct a pit latrine that is at least 1.5 meters deep, lined at the base, and 30 metres from a water body; and</p> <p>Including proper design and location for management of infectious wastewater in the plans for the refurbishments activities.</p>		
	Surface water siltation	<p>Moderately spraying water on roads and construction sites;</p> <p>Compacting loose soils;</p> <p>Limiting clearing activities to the sites that will be used; and</p> <p>Enforcing the use of licenced construction materials suppliers through the civil workers contracts.</p>	Contractor	To be included in the Contractor's bill of quantities

Table 5.1: Generic Environmental and Social Management Plan				
Project Stage / Environmental Components	Impacts	Mitigation Measures	Responsible persons/Institution	Estimated Cost per Site (USD)
Air Quality	Air pollution	Maintain construction machinery regularly as recommended by dealers	Contractor	To be included in the Contractor's bill of quantities
		Workers must be provided with breathing masks to protect them from air pollution from paint smells, dust and particulates from refurbishment activities		
		Enclose/shield work areas to prevent spreading of dust and smell		
Existing infrastructure and services	Temporary obstruction of walkways and access to services	Provide alternative routes with adequate and appropriate directional signs around safety barriers to access services  Provide alternative rooms to be used for temporary laboratory space and other services	Contractor	To be included in the Contractor's bill of quantities
	Disturbance of traffic and movement of people on the hospital premises	Provide alternative routes and passages with appropriate directional signs	Contractor	To be included in the Contractor's bill of quantities
	Temporary loss of services such as water, electricity and telephone services	Inform the Client well in advance (a week) before disconnecting services.	Contractor	N/A
Health and Safety	Accidents to workers, staff and public on construction sites and project activity areas	Provide appropriate protective clothing for staff (boots, Hi Vis vest, helmet and gloves, with ear defenders, breathing masks available for particular activities) and ensure they use them safety	Contractor	To be included in the Contractor's bill of quantities

Table 5.1: Generic Environmental and Social Management Plan				
Project Stage / Environmental Components	Impacts	Mitigation Measures	Responsible persons/Institution	Estimated Cost per Site (USD)
		<p>Provide appropriate danger warning and other signs for staff and public.</p> <p>Provide appropriate marking or fencing of construction site to exclude non-construction personnel;</p> <p>Provide first aid boxes.</p> <p>Acquire appropriate workman's compensation and liability insurance</p> <p>Provide alternative routes and passages with adequate and appropriate directional signs</p> <p>Transfer patients to rooms where there are no construction activities.</p>		
	Noise & vibration disturbances	<p>Construction and rehabilitation works must be carried out during the official government working hours. Use machines that do not make a lot of noise.</p> <p>Vehicles, plant and machinery must be regularly maintained as recommended by dealers.</p>	Contractor	To be included in the Contractor's bill of quantities

Table 5.1: Generic Environmental and Social Management Plan				
Project Stage / Environmental Components	Impacts	Mitigation Measures	Responsible persons/Institution	Estimated Cost per Site (USD)
	Spread of TB, STIs, HIV and Aids and other communicable diseases	Conduct awareness meetings  Provide condoms to staff at the work place	MOH in collaboration with National Aids Commission	1,746.58 For awareness meetings  178.57 for condoms
	Increased pressure on sanitary structures	Ensuring that labour camps of construction workers contain own provisions for water supply and sanitation and waste management.  Include stringent conditions on proximity of labour camps to communities, housing and wards in contracts with construction contractors.	Contractor and MoH	To be included in the Contractor's bill of quantities
Aesthetic and amenity values	Defacing and degradation of the appearance of the environment	Provide appropriate containers across the works areas for waste disposal and easy collection to disposal site.  Remove and dispose wastes regularly in appropriately designated disposal site.  Use shields to isolate and enclose construction sites.  Properly landscape the site after construction is completed.	Contractor	To be included in the Contractor's bill of quantities

<b>Table 5.1: Generic Environmental and Social Management Plan</b>				
Project Stage / Environmental Components	Impacts	Mitigation Measures	Responsible persons/Institution	Estimated Cost per Site (USD)
		Restore the site to its former condition or to a condition agreed with the client prior to contract completion.		
<b>During Demobilization</b>				
Air quality	Air pollution resulting from dust and contaminated wastes	Spray water in areas which are being cleared and where vehicles are passing	Contractor	To be included in the Contractor's bill of quantities
Health and safety	Injuries may result from object falling on the workers and other accidents	Workers must wear protective gear.  Provide appropriate marking or fencing of construction site to exclude non-construction personnel.  Sensitize workers to be following safety procedures when removing the structures.  Ensure that all work force wear the appropriate protective gear for the tasks being undertaken.	Contractor	To be priced by the Contractor

## **5.2 ENVIRONMENTAL AND SOCIAL MONITORING**

### **5.2.1. Objectives for Environmental and Social Monitoring**

The objectives for environmental and social monitoring are to:

- To help measure the level of success in the implementation of the mitigation measures, as provided in the EMP
- Alert the project developer and controlling authorities and to provide timely information about the environmental and social screening process as outlined in the ESMF. This will facilitate changes to be made in the implementation of the sub-projects where appropriate;
- Make a final evaluation, to determine whether the mitigation measures designed for the sub-projects have been successful. This evaluation compares the pre-sub-project environmental and social condition with that after completion of the sub-project, to determine whether the original environmental and social conditions have been restored, improved or made worse;
- Ensure that the project activities are being carried out in a manner that protects the environmental and social conditions as well as the health and social wellbeing of the workers including the general public;
- Ensure that changes if any, to the ESMF and additional training capacity building required to improve the performance of the framework are implemented.

The environmental and social monitoring plan assists to measure the level of success in the implementation of the mitigation measures, as provided in the EMP. The environmental and social monitoring plan (example given in Table 5.1) provides a link to the mitigation measures in the EMP and specifies the activities to be undertaken to ensure that the mitigation measure are efficiently, effectively and timely implemented.

To assess whether the goals of the Environmental and Social Management Plan are being met, the environmental monitoring plan will indicate parameters to be monitored, institute monitoring milestones and provide resources necessary to carry out the monitoring activities. Specifically, the environmental and social monitoring plan provides:

- actions or mitigation measures to be undertaken;
- a description or list of parameters to be measured and monitoring locations where appropriate;
- indicators to measure and verify level or extent of implementation of the mitigation measures;
- Time schedule measuring and verifying the indicators; and
- institutions of persons responsible for carrying out the monitoring
- cost estimates for monitoring

### **5.2.2. Monitoring Indicators**

Monitoring indicators are a very important part of the monitoring plan. The indicators have to be:

- 1) specific to avoid ambiguity of items being measured;

- 2) measurable to facilitate quantification, and
- 3) quantifiable to be easily translated into units of measurement and to facilitate verification

Indicators can be measures in units of, for example, time (duration), frequency (how often), extent (distance, area or volume) and quantity or magnitude (how much, strength or how many) and quality (e.g. water or air quality)

Two main broad socioeconomic indicators, by which to evaluate the successful implementation of the environmental management plans are:

- the pre-subproject environmental state has been maintained or improved; and
- the local communities are consulted with and remain supportive of the project.

The following are some of the general parameters and verifiable indicators that could be used to measure the overall project's success in terms of implementing the intended mitigation plans and achieving the desired environmental and social performance.

- number of sub-projects adopted after screening as required by the ESMF;
- percent improvement or degradation in the environmental health of the communities using or affected by the sub-projects;
- percent improvement or degradation of bio-physical state of the environment;
- number and types of the key benefits to the community from the project, as a result of using the ESMF and the screening process;
- percent decrease in patients' TB cases, as a result of adoption of safeguard guidelines;
- numbers of women trained.

Table 5.2: Generic Environmental and Social Monitoring Plan

Project Stage / Environmental Components	Impacts	Mitigation Measures	Monitoring indicator	Institution to monitor and Officers	Time Schedule for implementation or frequency (per year)	Cost Estimate per site per year
<b>During Construction</b>						
Soil and land	Soil erosion	<p>Limit clearing activities to the required space;</p> <p>Avoid deposits/piling of loose soils on sloppy ground or near drainage channels;</p> <p>Implement temporary erosion control measures (e.g. sedimentation retention mechanisms such as protection nets and wooden stakes) to minimize loss of soil;</p> <p>Use excavated soils to rehabilitate eroded areas; and</p> <p>Replant grass on cleared sites.</p>	<p>Area that is cleared</p> <p>Area for depositing soils from excavations</p> <p>Presence and number of wooden stakes and other sedimentation retention mechanisms that are used</p> <p>Area that is rehabilitated using eroded soils;</p> <p>Area where grass is replanted</p>	District Health Office (Infrastructure Manager and Environmental Health Officer); Contractor (supervisor/environmental officer); Local Council (Environmental District Officer); MoH (Projects Engineer)	Monthly	5,967.86 for transportation and allowances of national level staff
	Land degradation and Soil Contamination	Store and contain rehabilitation and construction materials on	Presence and use of lined and covered areas for storage	District Health Office (Infrastructure Manager and	Monthly	

Project Stage / Environmental Components	Impacts	Mitigation Measures	Monitoring indicator	Institution to monitor and Officers	Time Schedule for implementation or frequency (per year)	Cost Estimate per site per year
		<p>lined surfaces and in covered areas.</p> <p>Dispose of waste as required by the Local Authority</p> <p>Use soils to rehabilitate eroded areas</p> <p>Use excavated soils to construct storage mounds that are less than 3 meters high</p> <p>Enforcing the use of licenced construction materials suppliers through the civil workers contracts.</p>	<p>Number of times the local authority disposal site is used</p> <p>Area that is rehabilitated</p> <p>Size of storage mounds that are constructed using excavated soils</p> <p>Clause in contracts, and the types of suppliers that are used</p>	<p>Environmental Health Officer); MoH (Projects Engineer); Contractor (supervisor/environmental officer); Local Council (Environmental District Officer)</p>		
Water Resources	Impeded water flow and creation of stagnant water pools	<p>Keep all drains clear of silt and debris</p> <p>Avoid creation of puddles of water on site</p>	<p>Amount of silt and debris in drains</p> <p>Sites for water puddles</p>	District Health Office (Infrastructure Manager and	Monthly	

Project Stage / Environmental Components	Impacts	Mitigation Measures	Monitoring indicator	Institution to monitor and Officers	Time Schedule for implementation or frequency (per year)	Cost Estimate per site per year
	Water pollution	<p>Mix cement in areas not connected to natural drainage systems</p> <p>Store cement, paints, lubricants and fuels in lined and covered areas.</p> <p>Connecting the drainage systems to oil interceptors.</p> <p>Provide appropriate facilities (bins/skip) for the collection of wastes on site such that they will not come into contact with soils or water bodies.</p> <p>Provide appropriate spill kits when working near water courses.</p> <p>Collect and dispose of wastes in designated disposal sites as required by the Local Authority.</p>	<p>Presence and size of cover and surface lining</p> <p>Number of oil interceptors used</p> <p>Number of facilities used for disposing and collecting of wastes</p> <p>Availability (and number) of spill kit available</p> <p>Number of times waste is collected and disposed of on designated sites</p> <p>Presence and use of lined and covered areas</p>	<p>Environmental Health Officer); MoH (Projects Engineer); Contractor (supervisor/environmental officer); Local Council (Environmental District Officer, District Water Officer)</p>	Monthly	

Project Stage / Environmental Components	Impacts	Mitigation Measures	Monitoring indicator	Institution to monitor and Officers	Time Schedule for implementation or frequency (per year)	Cost Estimate per site per year
		<p>Provide appropriate spill kits when working near water courses.</p> <p>Site all material storage areas at least 10m from watercourses.</p> <p>Provide appropriate barriers to separate worksites from water resources in order to prevent accidental spillage into water courses.</p> <p>Construct a pit latrine that is at least 1.5 meters deep, lined at the base and 3 metres from a water body.</p> <p>Including proper design and location for management of infectious wastewater in the plans for the refurbishments activities.</p>	<p>Distance between storage area and watercourse</p> <p>Presence of barrier separating work site and water resources</p> <p>Specifications of pit latrines</p> <p>Type of waste water management systems included in the designs</p>			
	Surface water siltation	<p>Moderately spray water on roads and construction sites.</p> <p>Compacting loose soils.</p>	<p>Volume of water that is sprayed</p> <p>Area of compacted soils</p>			

Project Stage / Environmental Components	Impacts	Mitigation Measures	Monitoring indicator	Institution to monitor and Officers	Time Schedule for implementation or frequency (per year)	Cost Estimate per site per year
		Limiting clearing activities to the sites that will be used. Enforcing the use of licenced construction materials suppliers through the civil workers contracts.	Area that is cleared Number of registered suppliers used			
Air Quality	Air pollution	Maintain construction machinery regularly as recommended by dealers  Workers must be provided with breathing masks.  Enclose/shield work areas to prevent spreading of dust and smell	Vehicle maintenance record indicating adherence to recommended maintenance frequency  Percent of workers using masks  Total area enclosed with shield as compared to the total area that requires shield	District Health Office (Infrastructure Manager and Environmental Health Officer); MoH (Projects Engineer); Contractor (supervisor/environmental officer); Local Council (Environmental District Officer)	Monthly	
Existing infrastructure and services	Temporary obstruction of walkways and access to services	Provide alternative routes with adequate and appropriate directional signs around safety barriers to access services	Provision of alternative laboratory space area  Number of posters and notices displayed in appropriate places	District Health Office (Infrastructure Manager and Environmental Health Officer);	Monthly	

Project Stage / Environmental Components	Impacts	Mitigation Measures	Monitoring indicator	Institution to monitor and Officers	Time Schedule for implementation or frequency (per year)	Cost Estimate per site per year
	Disturbance of traffic and movement of people on the hospital premises	Provide alternative routes and passages with appropriate directional signs.	Provision of alternative laboratory space  Number of posters and notices displayed in appropriate places	MoH (Projects Engineer); Contractor (supervisor/environmental officer); Local Council (Environmental District Officer,)		
	Temporary loss of services such as water, electricity and telephone services	Inform the Client well in advance (a week) before disconnecting services	Number of complaints against loss of service			
Health and Safety	Accidents to staff and public on construction sites and project activity areas	<p>Provide appropriate protective clothing for staff (boots, Hi Vis vest, helmet and gloves, with ear defenders, breathing masks available for particular activities) and ensure they use them safety</p> <p>Provide appropriate danger warning and other signs for staff and public.</p> <p>Provide appropriate marking or fencing of construction site to exclude non-construction personnel;</p>	<p>Number of workers provided with protective clothes and using them</p> <p>Number of posters and notices displayed in appropriate places</p> <p>Area marked or fences</p>	District Health Office (Infrastructure Manager and Environmental Health Officer); MoH (Projects Engineer); Contractor (supervisor/environmental officer); Local Council (Environmental District Officer,)	Monthly	

Project Stage / Environmental Components	Impacts	Mitigation Measures	Monitoring indicator	Institution to monitor and Officers	Time Schedule for implementation or frequency (per year)	Cost Estimate per site per year
		<p>Provide first aid boxes.</p> <p>Acquire appropriate workman's compensation and liability insurance</p> <p>Provide alternative routes and passages with adequate and appropriate directional signs</p> <p>Transfer patients to rooms where there are no construction activities.</p>	<p>Number of first aid boxes in appropriate places</p> <p>Compensation clause in contracts and number of workers insured</p> <p>Provision of alternative routes</p> <p>Number of posters and directional signs</p>			
	Noise & vibration disturbances	<p>Construction and rehabilitation works to be during official government working hours.</p> <p>Use machines that do not make a lot of noise.</p> <p>Vehicles, plant and machinery to be regularly maintained as recommended by dealers.</p>	<p>Record of working hours marked on the time sheets</p> <p>Levels of noise from machines</p> <p>Number of times machines are serviced compared with the recommended times</p>	District Health Office (Infrastructure Manager and Environmental Health Officer); MoH (Projects Engineer); Contractor (supervisor/environmental officer); Local Council	Monthly	

Project Stage / Environmental Components	Impacts	Mitigation Measures	Monitoring indicator	Institution to monitor and Officers	Time Schedule for implementation or frequency (per year)	Cost Estimate per site per year
				(Environmental District Officer,)		
	Spread of TB, STIs, HIV and Aids and other communicable diseases	Conduct awareness meetings and provide condoms to staff	Number of awareness meetings conducted	District Health Office (Infrastructure Manager and Environmental Health Officer); MoH (Projects Engineer); Contractor (supervisor/environmental officer); Local Council (Environmental District Officer,)	Monthly	
	Increased pressure on sanitary structures	Ensuring that labour camps of construction workers contain own provisions for water supply and sanitation and waste management;  Include stringent conditions on proximity of labour camps to communities, housing and wards in contracts with construction contractors.	Number of sanitary structures, special for the workers  Volume of water stored by contractor  Distance between construction camp and wards or settlements			
Aesthetic and amenity values	Defacing and degradation of the appearance of the environment	Provide appropriate containers across the works areas for waste disposal and easy collection to disposal site.  Remove and dispose wastes regularly in	Number of waste disposal containers and position where they are placed  Total area of land that is cleared of wastes	MoH and Contractor, District Council	Monthly	

Project Stage / Environmental Components	Impacts	Mitigation Measures	Monitoring indicator	Institution to monitor and Officers	Time Schedule for implementation or frequency (per year)	Cost Estimate per site per year
		<p>appropriately designated disposal site.</p> <p>Use shields to isolate and enclose construction sites.</p> <p>Properly landscape the site after construction is completed.</p> <p>Restore the site to its former condition or to a condition agreed with the client prior to contract completion.</p>	<p>Sites used for disposal of wastes</p> <p>Total area enclosed shielded as compared to the total area that require shield</p> <p>Total area where landscaping has been done.</p> <p>Total area restored</p>			
<b>During Demobilization</b>						
Air quality	Air pollution resulting from dust and contaminated wastes	spray water in areas which are being swept	Number of complaints against dust	District Health Office (Infrastructure Manager and Environmental Health Officer);  Local Council (Environmental District Officer,)	Once during the demobilization phase once before the operation phase	1,193.58 USD for transportation and allowance of National Level team
Health and safety	Injuries may result from object falling on the workers and other accidents	<p>Workers must wear protective gear.</p> <p>Provide appropriate marking or fencing of construction site to exclude non-construction personnel.</p>	<p>Percent of staff wearing protective gear</p> <p>Area marked or fenced</p>			

Project Stage / Environmental Components	Impacts	Mitigation Measures	Monitoring indicator	Institution to monitor and Officers	Time Schedule for implementation or frequency (per year)	Cost Estimate per site per year
		<p>Sensitize workers to be following safety procedures when removing the structures.</p> <p>Ensure that all work force wear the appropriate protective gear for the tasks being undertaken.</p>	<p>Number of sensitization meetings conducted and level of awareness by workers</p> <p>Number of workers wearing appropriate protective gear.</p>			

### 5.2.3. Monitoring and Responsibilities

Environmental and social monitoring and reporting procedures will facilitate early detection of conditions that necessitate particular attention or modification, to achieve the desired levels of impact mitigation at any particular time during project implementation. Monitoring and reporting will also provide information on the progress and results of mitigation.

Monitoring for implementation of the sub-project activities will facilitate a systematic measurement of how the sub-projects are being implemented and therefore must be part of the overall supervision of a sub project implementation. It will also ensure that contractual agreements are being adhered to, in accordance with the approved designs; and that no unforeseen negative impacts are occurring as a result of sub project implementation. Environmental monitoring needs to be carried out during the construction and operational and maintenance phase of the sub-projects. In the operational and maintenance phase, environmental management and monitoring will be done following the provisions of the Infection Control and Waste Management Plan (ICWM) which has been developed as a separate document.

Day to day monitoring will be done at district level. The District Health Office has an Infrastructure/Maintenance Manager and a District Environmental Health Officer (DEHO), who will be responsible for the day to day monitoring and reporting of feedback to the District Environmental Sub-Committee (DESC) of the Local Council, throughout the life of the sub-project. Specific attention is to be placed on monitoring of environmental management and the civil works contractor during construction. The contractor will also be responsible for monitoring his activities to ensure adverse impact are avoided and mitigated or reduced where they cannot be avoided. Since the scope of sub-project activities is likely to be small, the contractor may not be asked to have an environmental and health officer; however the foreman/supervisor will be asked to familiarise and use the ESMP.

The DEHO will be assisted by the Environmental District Officer, representing the DESC. The District Water Officer will also work with the DEHO especially on sites where impacts on water resources are anticipated.

The DESC will undertake compliance monitoring to check whether prescribed actions are being carried out by MoH. The DESC will report to the District Executive Committee (DEC) of the Local Council. The DEC has powers to fine or stop project where a project is not meeting environmental standards.

At National Level, Monitoring will be done by the Planning and Policy Department of the Ministry of Health. The department has project engineers and architects with training in environmental management and they will supervise all construction activities and report to the Director of buildings.

The Ministry of Health also has the Preventive Health Department, to which the National TB Control Program hence has an interest in the project. The Environmental Health Officer will work with the DEHO in the monitoring of the construction activities and implementation of the ESMF. The Environmental Health Officer will report to the Chief Environmental Health Officer who will report to the director of the Preventive Health Department. Table 5.3 shows the monitoring officers and reporting arrangements.

Table 5.3: Monitoring and responsibilities

<b>Institution</b>	<b>Officer</b>	<b>Component to monitor</b>	<b>Reporting responsibilities</b>
<b>District level Monitoring</b>			
Ministry of Health	Infrastructure Maintenance Manager	Supervise the construction works	Reporting to the District Health Officer
	District Environmental Health Officer	Implementation of the ESMF	Consolidate reports and submit to the District Health Officer and the DESC of the local council
	Environmental health officer	Provide assistance to the DEHO	Reports to the DEHO
Contractor	Foreman/ Supervisor or Environmental/ Health and Safety Officer	All activities	District Environmental Health Officer
<b>National Level Monitoring</b>			
Ministry of Health (Planning and Policy Department)	Project Engineer	Construction activities and Compliance to the ESMP	Reports to the Director of Buildings
Ministry of Health (Preventive Health)	Environmental Health Officer	Monitor all activities; Provide assistance to the DEHO when needed	Reports to Chief Environmental Health Officer who reports to the Director

## CHAPTER 6 IMPLEMENTATION OF THE ESMF AND CAPACITY BUILDING

### 6.1 ENVIRONMENTAL HEALTH SERVICES UNIT

Implementation of the Environmental and Social Management Framework (ESMF) should be placed in the directorate of Preventive Health Services (PHS). The PHS has the Environmental Health Services unit which should among other things, be responsible for ensuring:

- (a) that all environmental matters (e.g. Environmental Screening, Conducting ESIA's and Developing EMPs) are implemented and submitted to the Environmental District Officer and/ or Environmental Affairs Department;
- (b) environmental compliance of the project developer as required by the Environment Management Act 1996;
- (c) compliance with the relevant environmental standards set by the Malawi Bureau of Standards and the Environmental Affairs Department;
- (d) coordination with the Environmental Affairs Department and other institutions at national and districts level; and
- (e) smooth implementation of the Infection Control and Waste Management Plan (ICWMP).

The core function of the Environmental Health Unit is to manage the environment with the aim of preventing diseases. The unit has the following officers:

National Level: Director of preventive health services  
Deputy Director of preventive health (Environmental Health)  
Chief Environmental Health Officer  
Principal Environmental Health Officer  
Environmental Health Officer

District Level: Chief Preventive Health Officer  
Principal Environmental Health Officer  
District Environmental Health Officer

Health Centre Level: Assistant Environmental Health Officer  
Health Surveillance Assistant (HSAs)

HSAs are responsible for creating awareness about environmental health issues, such as (in relation to TB) the advantages of coughing using a handkerchief, stopping spitting into the open environment, encouraging sanitary practices such as hand-washing hygiene and other issues. The HSAs are also responsible for TB surveillance and monitoring people that have been released from the hospital to take TB treatment from the homes. They also help manage sputum collection centres in the communities. The HSAs are assisted by the Village Health Committees and volunteers.

The District Environmental Health Officer (DEHO), at district level, and the Assistant Health Officer at the Health Centre level; together with stakeholders, coordinate the interventions implemented by the HSAs. Similarly the officers at national level share responsibility for coordinating environmental health interventions. Specifically they are responsible for the following: developing policies, standards and guidelines; providing technical support to districts and lower levels; building the capacity of people involved in implementation of environmental health interventions; diagnosing and investigating outbreaks through the epidemiology section and the public health laboratories.

## 6.2 INSTITUTIONAL ARRANGEMENT FOR IMPLEMENTING THE ESMF

The following arrangement should be used to manage the Environmental and Social Impacts of the project in Malawi:

Table 6.1: Implementation arrangement for the ESMF

LEVEL	OFFICER	RESPONSIBILITIES
National	Chief Environmental Health Officer	<ul style="list-style-type: none"> <li>• Provide overall guidance, coordination, and monitoring of the implementation of the ESMF</li> <li>• Supervise and monitor environmental management activities at health facilities</li> </ul>
District	District Environmental Health Officer	<ul style="list-style-type: none"> <li>• Enforce and ensure compliance with statutory regulations and standards on environmental management;</li> <li>• Budget for the ESIAs at district level</li> <li>• Ensure ESMPs are developed for construction activities at specific sites;</li> <li>• Promote inter-sectoral and community collaboration and co-operation in the development and implementation of the ESMPs</li> <li>• Supervise and monitor implementation of the ESMPs</li> </ul>
	Environmental Health Officer	<ul style="list-style-type: none"> <li>• Create awareness about environmental health issues at district level;</li> <li>• Participate in the development of the ESMPs</li> <li>• Lead in the management of Environmental and Social impacts for construction works at specific sites in the district; and</li> <li>• Monitor implementation of ESMPs in the sites.</li> </ul>
Health Centre	Health Surveillance Assistant	<ul style="list-style-type: none"> <li>• Create awareness about environmental health issues in the communities;</li> <li>• Participate in the development of the ESMPs</li> <li>• Lead in the management of Environmental and Social impacts for construction works at health centre level;</li> <li>• Monitor implementation of ESMPs in the health centres.</li> </ul>

## 6.3 SUPERVISION OF THE CONTRACTOR

In the Ministry of Health, contracts for hospital infrastructure development are drafted by the department of Planning and Policy Development. Among others the department is also responsible for architectural designs, procurement of building materials where necessary and supervising the contractor. In the Southern Africa TB and Health Systems Support, the department will work with the EHU in the implementation of the ESMF through ensuring impact mitigation measures in the ESMP are included in the contracts and supervising the engineers/contractor. The Projects Engineer in the department in the at National Level and the Infrastructure Manager at District Level will be responsible for monitoring the implementation of the ESMPs and they will report to the Director of Buildings in the department.

## **6.4 TRAINING**

The key personnel that should lead in managing and monitoring environmental and social impacts for the Southern Africa TB and Health Systems Support Project in Malawi are the DEHO, Assistant Environmental Officers and the HSAs. However these officers are well trained in managing of the environment to prevent disease and not ensuring that infrastructure projects are implemented in an environmentally and socially sustainable manner. As such they should be trained and enabled to manage Environmental Screening, Environmental Review, Limited Environmental Work or Full Environmental Impact Assessment by either internal staff or consultants. They should also be trained in the implementation and monitoring of the Infection Control and Waste Management Plan.

Specifically the district level staff should be trained to be able to:

- discuss the role of the various players in implementation and monitoring of the EMP and ICWMP
- conduct or supervise the screening process;
- carry out or supervise the Environmental Review process;
- carry out or supervise Limited Environmental Assessments;
- select, recommend and supervise appropriate contractors to conduct full ESIs and/or EA;
- monitor implementation of the EMP by the civil works contractor;
- monitor implementation of laboratory environmental work and ICWMPs; and
- Prepare sub-project interim and final environmental and ICWMP evaluation reports.

Members of the Village Health Committee, Volunteers, and community leaders (who will in turn relay messages to their communities) should also be sensitized on the implementation and management of the mitigation measures; and on their roles in achieving environmental and social sustainability; and to sensitize the committees on linkages between environmental and social impacts and health; as well as on the ICWMP.

It is also important to sensitize top level management of the ministry and other stakeholders, on the importance of environmental management and Infection Control and Waste Management, so that they can appreciate and approve the needs and activities of front line staff, when implementing future environmental management activities and training programmes.

In addition to the above training, it is recommended that exchange visits to other participating countries be undertaken by staff representatives of the Ministry of Health, local government and the Environmental Affairs Department to learn and share how environmental and Infection Control and Waste Management of their project is handled and to draw lessons that can be applied in their own situation.

## **6.5 CAPACITY BUILDING**

The proposed areas of training should be based on the topics outlined in Table 6.1 and the training material should be prepared to suit the three different levels at the indicated estimated costs.

Table 6.2: Training Areas for key Stakeholders of the Project

Type of training, target group and training duration	Training topics	Cost (\$) per session
Sensitization of top level management staff of the Ministry of Health  Half day	<ul style="list-style-type: none"> <li>• Introduction to the Southern Africa Tb and Health Systems Support Project in Malawi</li> <li>• Introduction to ESMF and EMP for the Southern Africa Tb and Health Systems Support Project in Malawi Potential Environmental and Social (including Gender and Nutrition impacts) of TB, MDR-TB, HIV and AIDS by the Southern Africa TB and Health Systems Support Project in Malawi.</li> <li>• Relevant environmental legislation and World Bank Safeguards; and compliance requirements</li> <li>• Importance of environmental management, Infection Prevention and Control; and Waste Management</li> <li>• Importance of approving and supporting the needs and activities of front line staff to implement environmental management activities and training programmes</li> </ul>	200
Sensitization of National Level staff of the Ministry of Health, Environmental Health Unit  1 day	<ul style="list-style-type: none"> <li>• Introduction to the Southern Africa Tb and Health Systems Support Project in Malawi</li> <li>• Relevant environmental legislation and World Bank Safeguards; and compliance requirements</li> <li>• Importance of environmental management, Infection Prevention and Control; and Waste Management</li> <li>• Potential Environmental and Social (including Gender and Nutrition impacts) of TB, MDR-TB, HIV and AIDS by the Southern Africa Tb and Health Systems Support Project in Malawi</li> <li>• Introduction to ESMF and EMP for the Southern Africa Tb and Health Systems Support Project in Malawi <ul style="list-style-type: none"> <li>○ Roles of various players in developing, implementing and monitoring of ESIAs, EMPs, Laboratory and ICWMP;</li> <li>○ Conducting or supervising the screening process</li> <li>○ Carrying out and supervising the Environmental Review process</li> <li>○ Selecting and supervising an appropriate contractor;</li> <li>○ Monitoring implementation of the EMP by the civil works contractor;</li> <li>○ Monitoring implementation of the Infection Control and Waste Management Plan;</li> <li>○ Preparing sub-project interim and final evaluation reports; and</li> <li>○ General coordination of environmental management and the infection prevention and control; and waste management activities</li> </ul> </li> </ul>	800
Training district and health centre level staff of the Ministry of Health	<ul style="list-style-type: none"> <li>• Introduction to the Southern Africa Tb and Health Systems Support Project in Malawi</li> </ul>	20,000 (in all 6 implementation districts)

and other stakeholder ministries	<ul style="list-style-type: none"> <li>• Relevant environmental legislation and World Bank Safeguards and compliance requirements</li> <li>• Importance of environmental management, Infection Prevention and Control and Waste Management</li> <li>• Potential Environmental and Social (including Gender and Nutrition impacts) of TB, MDR-TB, HIV and AIDS by the Southern Africa Tb and Health Systems Support Project in Malawi.</li> <li>• Introduction to the ESMF, ESIA and EMP processes for the Southern Africa Tb and Health Systems Support Project in Malawi.</li> <li>• Roles of various players in implementation and monitoring of the EMP;</li> <li>• Conducting and supervising the screening process (including practical sessions);</li> <li>• Carrying out and supervising the Environmental Review process (including practical sessions);</li> <li>• Selecting a contractor and supervising contractors' work;</li> <li>• Monitoring implementation of the ESMF and EMP by the civil works contractor</li> <li>• Preparing sub-project interim and final evaluation reports; and</li> <li>• Monitoring construction/refurbishments environmental work and Infection Control and Waste Management activities</li> </ul>	
2 Days session		
Sensitize representatives and leaders of community groups, village health committees and volunteers	<ul style="list-style-type: none"> <li>• Introduction to the Southern Africa Tb and Health Systems Support Project in Malawi and Infection Control and Waste Management Plan</li> <li>• Community roles in achieving environmental sustainability</li> <li>• linkages between environmental, health and social impacts to socio-economic development;</li> <li>• Potential Environmental and Social (including Gender and Nutrition impacts) of TB, MDR-TB, HIV and AIDS by the Southern Africa Tb and Health Systems Support, Malawi Project</li> <li>• Mitigation and enhancement measures for impacts of the Southern Africa Tb and Health Systems Support Project in Malawi</li> <li>• Implementation and monitoring of the EMP and the Infection Control and Waste Management Plan</li> </ul>	8,000 (in all 6 implementation districts)
1 Day session		

## 6.6 IMPLEMENTATION TIMELINE

The Environmental and Social Management Framework should be implemented in the 5 year period for project implementation. The timeline for the activities is provided in Table 6.3 following:

**Table 6.3: Implementation timeline for the ESMF**

Serial No.	Activity	Year 1				Year 2				Year 3				Year 4				Year 5			
		Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
1.	Formalizing the role of the Environmental Health Unit, responsibility and scope of the unit in carrying environmental activities for the project.																				
2.	Identification of Inter-sectoral Coordination measures and implementation and monitoring frameworks																				
3.	Finalization of Roadmap for implementation																				
4.	Training and capacity building for environmental management members at national, district and health centre level																				
5.	Carrying out environmental screening																				
6.	Hiring consultants and conducting limited ESIAs, full ESIAs and developing ESMPs for specific sites for construction activities																				
7.	Review of the ESMF, ESIA reports and EMPs																				
8.	Enforce and monitor compliance to the ESMPs																				
9.	Midterm evaluation of ESMPs																				
10.	Independent final evaluation of ESMP																				

Q= Quarter

## 6.7 IMPLEMENTATION BUDGET

The budget for implementing the ESMF is provided in Table 6.4 below:

Table 6.4: Budget for ESMF implementation

Serial No	Activity	Cost in USD
2	Capacity building and sensitization	38,800.00
3	Conducting limited ESIAs, ESIAs and preparing ESMPs	30,0000
4	Implementation of the EMP	11,550.00
5	Monitoring and reporting of the EMP	2268.36
6	Independent final evaluation of ESMP	12,000.00
<b>Total</b>		<b>94,618.36</b>

## CHAPTER 8 CONCLUSION AND RECOMMENDATIONS

This ESMF, for the Southern Africa TB and Health Systems Support in Malawi, should be understood as the dynamic framework that will guide the development of appropriate environmental and social safeguards to respond to the impacts of specific project activities and sites to be defined at a later stage.

It is therefore anticipated that the precisely defined project activities, for refurbishment and upgrading of laboratories; and for mining operations will facilitate identification of specific environmental and social impacts on the receptors within the project areas of influence. Based on the identified environmental and social impacts, the level of environmental work required will be determined through the screening process, using the screening form provided as Annex 1.

Successful implementation of this ESMF will, to a large extent, depend on the involvement and participation of local communities. It is therefore recommended that experts to be involved in the implementation of the project and the ESMF will widely consult with the local communities and provide the necessary community awareness on all matters related to implementation of the ESMF. In this way, the project would reap maximum benefits towards improvement of health for the local communities, which need these initiatives the most, as well as the majority of the Malawians.

Implementers of this ESMF, in consultation with all the stakeholders and the local communities, should adopt and adapt (where appropriate) the screening process, checklists and the EMP to suit local conditions.

Specifically it is recommended that:

- The screening process and the screening forms should be used for all the sub-project activities of the Southern Africa TB and Health Systems Support Project in Malawi;
- The Ministry of Health should be adequately supported to implement this ESMF as well as the ICWMP;
- Regularly updating of this ESMF, to respond to changing designs and local conditions is very important and should be done as appropriate;
- Building capacities at the district level, for appropriate information management, to facilitate the environmental and social management process should be supported by the project;
- At the district level, the necessary resources for producing the required documentation and completing the screening forms as well as preparing reports for the implementation of the ESMF should be provided; and
- Staff at all levels should be empowered to adequately administer the ESMF throughout project implementation.

The screening process will facilitate identification, assessment and mitigation of potential negative environmental and social impacts for proper mitigation through comprehensive ESIA or EMP as appropriate. Hence appropriate sections of the specific ESIA or EMP and the Environmental and Social Screening form and checklists should be included in the Project Implementation Manual.

## References

- AIDS and Rights Alliance for Southern Africa. (2008). *The Mining Sector Tuberculosis and Migrant Labour In Southern Africa*.
- Government of Malawi. (2011 – 2016). *Malawi Health Sector Strategic Plan*. Lilongwe: Ministry of Health
- Government of Malawi. (2009). *Guidelines for Infection Prevention and Control for tuberculosis*. Lilongwe: Ministry of Health, Lilongwe
- Government of Malawi (1997). *Guidelines for Environmental Impact Assessment (EIA) In Malawi*. Lilongwe: Department for Environmental Affairs.
- Government of Malawi (1996), *Environmental Management Act*. Lilongwe: Environmental Affairs Department.
- Kafatia Kent (2009). *Environmental and Social Management Framework for Tanzania, Kenya and Uganda: Regional health systems strengthening and TB support project*.
- Republic of Sierra Leone (2015). *Environmental and Social Management Framework: Ebola emergency response project*
- UN. (2015, November 11). *Sustainable Development Goals*. Retrieved from [www.un.org: http://www.un.org/sustainabledevelopment/health/](http://www.un.org/sustainabledevelopment/health/)
- World Health Organisation, (2015). *Manual for the care and management of patients in Ebola Care Units/Community Care Centres* (Ref. :WHO/EVD/Manual/ECU/15.1): Geneva, World Health Organization.
- World Health Organisation. (2015). *Global Tuberculosis Report*. Geneva: World Health Organisation. Retrieved November 11, 2015, from [http://apps.who.int/iris/bitstream/10665/191102/1/9789241565059\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/191102/1/9789241565059_eng.pdf?ua=1)
- World Health Organisation. (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, World Health Organization.
- World Health Organisation. (2012). *Working together with businesses: Guidance on TB and TB/HIV Prevention, diagnosis, treatment and care in the workplace*. Geneva. World Health Organisation
- World Health Organization. (1998). *Communicable Diseases Prevention and Control. Laboratory Services in Tuberculosis Control*. Edition 1. Geneva, World Health Organization.
- World Health Organization. (1999). *Guidelines for the Prevention of Tuberculosis in Health Care Facilities in Resource-Limited Settings*. Geneva, World Health Organization.

## ANNEXES

### ANNEX 1: ENVIRONMENTAL AND SOCIAL SCREENING FORM

The Environmental and Social Screening Form (ESSF) has been designed to assist in the evaluation of sub projects for the Southern Africa TB and Health Systems Support Project in Malawi. The form is designed for assessment of environmental and social impacts and their mitigation measures, if any, so that requirements for further environmental analysis can be determined.

This form must be completed by the officer responsible for environmental management at the district or an appropriately trained representative in consultation with the affected communities as well as key stakeholders of the sub-project. The form will be part of the approval requirements for implementation of the sub-project activities of the Southern Africa TB and Health Systems Support Project in Malawi.

#### PART A: GENERAL INFORMATION

1. Name of sub-project: .....

2. Sector: .....

3. Project location: .....

4. Name of Ward .....

5. Name of District .....

6. Name of Executing Agent .....

7. Name of the Approving Authority .....

Details of the Person Responsible for Completing this ESSF:

8. Name: .....

9. Job title: .....

10. Telephone Number: .....

11. Fax Number: .....

12. E-mail Address: .....

13. Date: .....

14. Signature: .....

## PART B: BRIEF DESCRIPTION OF THE SUB-PROJECT

Please provide information on the type and scale of the sub-project (area, required land and approximate size of total building floor area).

Provide information about the nature of activities during construction of the facilities including support/ancillary structures and activities required for construction, e.g. need to quarry or excavate borrow materials, laying pipes/lines to connect to energy or water source, access road etc.

## PART B: BRIEF DESCRIPTION OF THE ENVIRONMENTAL SITUATION AND

### IDENTIFICATION OF ENVIRONMENTAL AND SOCIAL IMPACTS

Describe the sub-project location, siting, surroundings (include a map or a sketch map)

Describe the land formation, topography, vegetation in and adjacent to the project area.

Estimate and indicate where vegetation may have to be cleared.

PART C. ENVIRONMENTALLY SENSITIVE AREAS OR THREATENED SPECIES THAT COULD BE ADVERSELY AFFECTED BY THE PROJECT				
No	Description	Yes	No	Not known
1	Intact natural forests			
2	Riverine forest and river banks			
3	Surface water courses, natural springs			
4	Wetlands (lakes, rivers, swamp, seasonally inundated areas)			
5	Distance to the nearest wetland (lakes, river, seasonally inundated areas) less than 30 km:			
6	Area is of high biodiversity			
7	Habitats of endangered/threatened species for which protection is required under participating countries' Laws.			
PART D. GEOLOGY, TOPOGRAPHY AND SOIL				
1	Direct cause or worsening of soil loss or erosion by the project			
2	Project will lead directly or indirectly to practices that could cause soil loss or erosion			
3	Need to consult a soil scientist on the project			
4	Modification of slopes is required by the project			
5	Project will affect stability of slopes directly or indirectly			
6	Project is located where existing unstable slopes could be a hazard			
7	Soil instability in the project area black cotton soil, earthquake, landslide, subsidence			
8	Project will cause substantial increase in soil salinity			
9	Increase in chances of floods, poorly drained, low-lying, depression or block run-off – water			
10	Soil contamination and pollution hazards will result from the project			
11	Risks of contamination and pollution from latrines, dump sites, industrial discharge etc.			

12	Need to consult a geo-technical engineer			
<b>PART E. LAND, VEGETATION AND PROPERTY</b>				
1	There are farm lands in the project area			
2	Project will reduce or damage farm land			
3	Project will cause loss of vegetation, crops and fruit trees animals and livestock			
4	Project will cause loss of houses, infrastructures (shed, toilets, granaries)			
5	Project will cause loss or interference with access, routes for people, livestock etc			
6	Land in the project area is intensively developed			
7	The project will increase pressure on land resources			
8	The project will result in decreased holdings by small land owners			
9	The project will result in involuntary land take			
10	A land use planner should be consulted			
<b>PART F. SURFACE WATER QUANTITY AND QUALITY</b>				
1	Project will increase demand or cause loss of available surface water			
2	Need to consult a hydrologist			
3	Project will lead to additional discharges into surface water			
4	Project could cause deterioration of surface water quality			
5	Need to consult a hydrologist and/or water quality expert			
<b>PART G. GROUNDWATER QUALITY AND QUANTITY</b>				
1	Project will increase demand or cause loss of available ground water resources			
2	Project will cause natural or man-made discharge into ground aquifer			
3	Project could cause deterioration of ground water quality			
4	Need to consult a hydrologist and/or water quality expert			
<b>PART H. AIR QUALITY</b>				
1	Project will pollute air directly			
2	Project will lead to practices that worsen air quality			
3	Project will lead to a change in engine or fuel use that could cause serious air problems			
4	Project will result in polluted and hazardous working environments for staff			
<b>PART I. NOISE</b>				
1	Noise is a problem in the project area			
2	Project will result in increase in noise generation			
3	Project could make people to move to high noise level locations			
4	Project could result in noisy working environments for staff			
<b>PART J. AQUATIC ECOSYSTEMS</b>				
1	Significant aquatic ecosystems (wetlands, rivers, streams, lakes or ponds) are in the project area			
2	Project will affect the condition and use of ecosystems for human consumptions			
3	Significant wetland ecosystems (marsh, swamp, flood plains, or estuary) are in the project area			
4	Project will affect the use or condition of such wetlands			
<b>PART K. TERRESTRIAL ECOSYSTEMS</b>				
1	There are significant terrestrial ecosystem (forest, savannah, grassland or desert) in the project area			

2	Project will affect the use or condition of such ecosystems			
<b>PART L. ENDANGERED/ THREATENED/RARE/ENDEMIC/SPECIES</b>				
1	Endangered species exist in the project area			
2	Project will affect the habitat and number of such species			
<b>PART M. MIGRATORY SPECIES</b>				
1	Migratory fish, birds, or mammals use the project area			
2	Project will affect the habitat and numbers of such species			
<b>PART N. BENEFICIAL PLANTS, ANIMALS, INSECTS, PESTS AND VECTORS</b>				
1	There are non-domesticated plants and/or animals, used or sold by local people in the project area			
2	Project will affect these species by reducing their numbers or habitat			
3	There are currently problems with pest (plants or animals) in the project area			
4	Plants or animals might become pests due to ecological changes brought by the project in the area			
5	There are known disease problems in the project area transmitted through vectors			
6	Project will increase vector habitat or population			
7	Need to consult a public health officer			
<b>PART O. ENERGY SOURCE</b>				
1	The project will increase demand for conventional energy sources			
2	The project will create demand for demand for other energy sources (wood and charcoal)			
3	The project will promote supply of conventional energy sources			
<b>PART P. LAND ACQUISITION AND LIVELIHOODS</b>				
1	Land will be acquired			
2	People's assets or livelihoods will be affected			
3	People will lose access to natural resources			
<b>PART Q TOURISM AND RECREATION</b>				
1	There is, at present, a significant degree of tourism in the area			
2	There is unexploited tourism or recreation potential in the area			
3	The project will adversely affect existing or potential tourist or recreation attractions			
<b>PART R HAZARDOUS WASTES</b>				
1	The project will produce hazardous wastes requiring special handling, storage, treatment and disposal methods			
2.	The project will cause spread of infection within and outside the facility requiring adherence to standard precautions			

## CONCLUSION:

Summary of possible safeguard options:

If all the above answers are "No", there is no need for further action and adopt the generic ESMP

If there is at least one "Yes", a limited environmental impact assessment, an environmental mitigation or action plan (EMP or EAP) or an environmental audit may be required.

Guide on possible action to be taken

No further action if sub-project has no impacts on environment

An Environmental Audit if the sub-projects may create a few minor environmental impacts which can be easily mitigated.

Simple Environmental Review (ER) and site specific ESMP if sub-projects may create a few minor environmental impacts which can be easily mitigated. The ER will also identify any unknown impacts and where they are assessed as adverse, a Limited Environmental Review or Comprehensive Environmental Impact Assessment will be carried out depending on the severity of the anticipated impact.

Limited Environmental Review and site specific ESMP if sub-projects may create minor environmental problems that require site visit or construction modifications to minimize eliminate impacts or when the simple Environmental Review identifies adverse impacts.

Environmental Screening and site specific ESMP if the subproject may create moderate environmental problems that require site visit or construction modifications to minimize eliminate impacts.

Comprehensive ESIA and site specific ESMP where at least one major is identified or the Environmental Screening identifies unknown impacts.

This form has been completed by:

Name: .....Title: .....

Date: .....Signature: .....

Approved by District Executive Director

Name: .....Title: .....

Date: .....Signature: .....

## ANNEX 2: SUBPROJECTS ENVIRONMENTAL AND SOCIAL CHECKLIST

This Environmental and Social Checklist can be used or adapted to the particular project activities on the different sites for the Southern Africa TB and Health Systems Support Project in Malawi. The checklist will be completed by a member of the project facilitation team at the district level. The member would have received training in environmental assessment and use of the Screening Form. Members of Village Development Committee (VDC) in the project area will also participate in filling the form and all parties participating will have to sign the form. The District Environmental Officer must also be present during the completion of this form.

The checklist can also be used by monitoring officers. However it should not be confused with the monitoring plan.

**Table A2.1 Environmental Checklist for the Southern Africa Tb and Health Systems Support Project in Malawi**

Impacts	Mitigation Measures	Tick as Relevant	Responsible Person
<b>During Construction</b>			
Land degradation and Soil Contamination	Limit site clearing site to the required space		
	Avoid deposits/piling of loose soils on sloppy ground or near drainage channels		
	Implement temporary erosion control measures (e.g. sedimentation retention mechanisms such as protection nets and wooden stakes) to minimize loss of soil		
	Use excavated soils to rehabilitate eroded areas		
	Replant grass on cleared sites.		
Land degradation and Soil Contamination	Store and contain rehabilitation and construction materials on lined surfaces, in covered areas.		
	Dispose of waste as required by the Local Authority		
	Use soils to rehabilitate eroded areas		
	Use excavated soils to construct storage mounds that are less than 3 meters high		
	Enforcing the use of licenced construction materials suppliers through the civil workers contracts.		
Impeded water flow and creation of stagnant water pools	Keep all drains clear of silt and debris		
	Avoid creation of puddles of water on site		
	Mix cement in areas not connected to natural drainage systems		
	Store cement, paints, lubricants and fuels in lined and covered areas;		
	Lining surfaces where cement, paints and oils will be stored and connecting the drainage systems to oil interceptors.		

Impacts	Mitigation Measures	Tick as Relevant	Responsible Person
	Provide appropriate facilities for the collection of wastes on site such that they will not come into contact with soils or water bodies.		
	Provide appropriate spill kits when working near water courses;		
	Collect and dispose of wastes in designated disposal sites as required by the Local Authority.		
	Provide appropriate spill kits when working near water courses;		
	Site all material storage areas at least 10m from watercourses;		
Surface water siltation	Moderately spraying water on roads and construction sites;		
	Compacting loose soils;		
	Limiting clearing activities to the sites that will be used;		
	Enforcing the use of licenced construction materials suppliers through the civil workers contracts.		
Air pollution	Maintain construction machinery regularly as recommended by dealers		
	Workers must be provided with breathing masks.		
	Enclose/shield work areas to prevent spreading of dust and smell		
Temporary obstruction of walkways and access to services	Provide alternative routes with adequate and appropriate directional signs around safety barriers to access services		
Disturbance of traffic and movement of people on the hospital premises	Provide alternative routes and passages with appropriate directional signs.		
Temporary loss of services such as water, electricity and telephone services	Inform the Client well in advance (a week) before disconnecting services		
Accidents to staff and public on construction sites and project activity areas	Provide appropriate protective clothing for staff (boots, Hi Vis vest, helmet and gloves, with ear defenders, breathing masks available for particular activities) and ensure they use them safety		
	Provide appropriate signs for staff and public		
	Provide appropriate marking or fencing of construction site to exclude non-construction personnel;		
	Provide first aid boxes		
	Acquire appropriate workman's compensation and liability insurance		

Impacts	Mitigation Measures	Tick as Relevant	Responsible Person
	Provide alternative routes and passages with adequate and appropriate directional signs		
Noise & vibration disturbances	Construction and rehabilitation works to be done during normal working hours.		
	Use machines that do not make a lot of noise.		
	Vehicles, plant and machinery to be regularly maintained as recommended by dealers.		
Spread of TB, STIs, HIV and Aids and other communicable diseases	Conduct awareness meetings and provide condoms to staff		
Defacing and degradation of the appearance of the environment	Provide appropriate containers across the works areas for waste disposal and easy collection to disposal site.		
	Remove and dispose waste regularly in appropriately designated disposal site		
	Use shields to isolate and enclose construction sites		
	Properly landscape the site after construction is completed.		
	Restore the site to its former condition or to a condition agreed with the client prior to contract completion.		
<b>During Demobilization</b>			
Air pollution from dust and contaminated wastes	spray water in areas which are being swept and cleared		
Injuries may result from object falling on the workers and other accidents	Workers must wear protective gear		
	Injuries may result from object falling on the workers and other accidents		
	Sensitize workers to be following safety procedures when removing the structures.		

This form has been signed by:

Chairperson of the District Executive Committee (Full Name).....Signature. ....Date.....

Chairperson for VDC (Full Name) ..... Signature. ....Date.....

Member of VDC (Full Name) .....Signature. ....Date.....

### **ANNEX 3: PROJECT SCREENING CRITERIA FOR MALAWI**

Once a Project Brief has been received and reviewed by DEA, a prescribed project is exempted from further compliance with EIA requirements if all of the following conditions are satisfied.

- D.1 The project will not substantially use a natural resource in a way that pre-empts the use, or potential use, of that resource for any other purpose.
- D.2 Potential residual impacts on the environment are likely to be minor, of little significance and easily mitigated.
- D.3 The type of project, its environmental impacts and measures for managing them are well-understood in Malawi.
- D.4 Reliable means exist for ensuring that impact management measures can and will be adequately planned and implemented.
- D.5 The project will not displace significant numbers of people, families or communities.
- D.6 The project is not located in, and will not affect, any environmentally-sensitive areas such as:
  - D.6.1 national parks
  - D.6.2 wet-lands
  - D.6.3 productive agricultural land
  - D.6.4 important archaeological, historical and cultural sites
  - D.6.5 areas protected under legislation
  - D.6.6 areas containing rare or endangered flora or fauna
  - D.6.7 areas containing unique or outstanding scenery
  - D.6.8 mountains or developments on or near steep hill-slopes
  - D.6.9 dry tropical forests (e.g Brachystegia woodlands)
  - D.6.10 development near Lake Malawi or its beaches
  - D.6.11 development providing important resources for vulnerable groups such as fishing communities along the lake-shore.
  - D.6.12 development near high population concentrations or industrial activities  
Where further development could create significant environmental problems.
  - D.6.13 prime ground-water re-charge areas or areas of importance for surface run off of water
- D.7 The project will not result in and/or:
  - D.7.1 Policy initiatives which may affect the environment such as changes in agricultural pricing subsidies or the tobacco liberalization
  - D.7.2 major changes in land tenure
  - D.7.3 changes in water use through irrigation, drainage promotion or dams, changes in fishing practices
- D.8 The project will not cause:
  - D.8.1 adverse socio-economic impact
  - D.8.2 land degradation
  - D.8.3 water pollution
  - D.8.4 air pollution

- D.8.5 damage to wildlife and habitat
- D.8.6 adverse impact on climate and hydrological cycle
- D.8.7 air pollution
- D.8.8 creation of by-products, residual or waste materials which require handling and disposal in a manner that is not regulated by existing authorities.
  
- D.9 The project will not cause significant public concern because of potential environmental changes. The following are guiding principles:
  - D.9.1 Is the impact positive, mainly benign or harmful?
  - D.9.2 What is the scale of the impact in terms of area affected, numbers of people or wildlife?
  - D.9.3 What is the intensity of the impact?
  - D.9.4 What will be the duration of the impact?
  - D.9.5 Will there be cumulative effects from the impact?
  - D.9.6 Are the effects politically controversial?
  - D.9.7 Have the main economic, ecological and social costs been quantified?
  - D.9.8 Will the impact vary by social group or gender?
  - D.9.9 Is there any international impact due to the proposed projects?
  
- D.10 The project will not necessitate further development activity which is likely to have a significant impact on the environment.

**Source: Guidelines for Environmental Impact Assessment, 1997**

## **ANNEX 4: 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 requirement of the participating countries.

The contractor shall take all measures necessary to implement the requirements of the ESMP (generic or specific) and protection measures specified in any ESIA that is 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/ 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 contravenes 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 and drains 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.
- The Contractor shall 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 representative will ensure that any affected third party

is content before confirming they are content with the restoration enacted by the contractor.

- 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.
- The contractor shall 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 operations and sites shall be used as sources of construction materials.

### 5. Prevention of Soil Erosion.

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

### 6. Control of Social Impacts

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

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

#### 7. Noise Control and Regulation

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

#### 8. Environmental Monitoring

- The Contractor shall be responsible for monitoring all his activities and ensuring that all environmental requirements and the above conditions are met at all times.
- Contractor shall also facilitate regular environmental, social and Health and Safety monitoring by the Client, the Clients 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, monitoring identifies issues that are not in compliance with the ESMP as included in the contract.

## **ANNEX 5:       GENERIC ESIA TERMS OF REFERENCE FOR PREPARATION OF AN ESIA**

1. Provide a full description of the nature of the project with respect to the name of the proponent, the postal and physical address, the spatial location of the potential site for the project, the estimated cost of the project, and size of land for the project site, including water reticulation, waste disposal and access roads.
2. Provide a site-specific map of the area (Scale 1:50,000) showing the proposed project site and existing establishments in the area and surrounding areas. A site plan for the project should also be provided.
3. Examine the existing conditions of the proposed site identifying and analysing:
  - Geological and soil conditions of the area;
  - The scope of vegetative resources of the area;
  - Existing land uses within the area and within adjacent villages;
  - Ecologically important or sensitive habitats and resources e.g. water resources, biodiversity elements; and
  - Suitability of the site for the proposed development.
4. Describe the major activities to be undertaken for the construction and operation of infrastructure services. This should include the size and type of infrastructure, the type of equipment to be used, the method and duration of construction, nature and quantity of wastes to be generated, the facilities for appropriate disposal and management of waste, number of people to be employed and.
5. State the reasons for selecting the proposed site, the consequences of not undertaking the project at the proposed site and any alternative sites considered.
6. Predict the major short, long-term and cumulative environmental impacts of the project. Examine both the positive and negative impacts as well as impacts on the biophysical, social, economic and cultural components of the environment. The potential impacts must include those related to:
  - project location (e.g. resettlement of people, loss of forest land, loss of agricultural land, impact on flora and fauna);
  - construction works (e.g. soil erosion, disposal of construction spoils, drainage and access roads)
  - project operation (e.g. solid waste disposal, sewage disposal)
7. Prescribe measures to eliminate, reduce or mitigate the negative effects identified and the measures to enhance the positive effects in 6.
8. Propose an Environmental and Social Management Plan (EMP) in tabular form by which all of the mitigation/enhancement measures prescribed will be carried out, specifying who will be responsible for implementing these measures and the schedule for implementation, cost of implementing the measures and the source of funding. An environmental monitoring plan should

also be prepared including the indicators to be used for monitoring the impacts and responsible persons and institutions that will conduct the monitoring.

9. Undertake public consultations to ensure that all interested and affected parties are involved in the ESIA process and incorporate their views into the ESIA. Evidence of consultation should be provided in the report.
10. Provide an account of all statutory and regulatory licenses and approvals obtained for the project to ensure that they are in line with sound environmental management practices and are in compliance with all relevant existing legislation. Reference should be made, but not limited to the Environment Management Act and other relevant and other relevant legislation.

## ANNEX 6: SUMMARY OF THE BANK'S ENVIRONMENTAL SAFEGUARD POLICIES

<b>OP/BP 4.01 Environmental Assessment</b>	<p>The objective of this policy is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is triggered if a project is likely to have potential (adverse) environmental risks and impacts on its area of influence. OP 4.01 covers impacts on the natural environment (air, water and land); human health and safety; physical cultural resources; and trans-boundary and global environment concerns.</p>	<p>Depending on the project, and nature of impacts a range of instruments can be used: EIA, environmental audit, hazard or risk assessment and environmental management plan (EMP). When a project is likely to have sectoral or regional impacts, sectoral or regional EIA is required. The Borrower is responsible for carrying out the EIA.</p> <p>Under the Southern Africa TB and Health Systems Support Project in Malawi the Government is preparing an Environmental and Social Management Framework to guide the process of environmental screening, leading to preparation of the necessary and appropriate safeguard instruments assess the social and environmental impacts of the program.</p>
<b>OP/BP 4.04 Natural Habitats</b>	<p>This policy recognizes that the conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The Bank therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. Natural habitats comprise many types of terrestrial, freshwater, coastal, and marine ecosystems. They include areas lightly</p>	<p>This policy is triggered by any project (including any sub-project under a sector investment or financial intermediary) with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project).</p> <p>The policy is not triggered as it is not expected that there will be significant conversion of natural habitats since the project is targeting smallholder farmers within their existing agricultural lands.</p>

	modified by human activities, but retaining their ecological functions and most native species.	Project activities that could negatively impact on protected areas will not be funded
<b>OP/BP 4.36 Forests</b>	The objective of this policy is to assist borrowers to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development and protect the vital local and global environmental services and values of forests. Where forest restoration and plantation development are necessary to meet these objectives, the Bank assists borrowers with forest restoration activities that maintain or enhance biodiversity and ecosystem functionality. The Bank assists borrowers with the establishment of environmentally appropriate, socially beneficial and economically viable forest plantations to help meet growing demands for forest goods and services.	<p>This policy is triggered whenever any Bank-financed investment project (i) has the potential to have impacts on the health and quality of forests or the rights and welfare of people and their level of dependence upon or interaction with forests; or (ii) aims to bring about changes in the management, protection or utilization of natural forests or plantations.</p> <p>The policy is not triggered as it is not expected that there will be project activities impacting on forests.</p> <p>Project activities that could negatively impact on forests will not be funded</p>
<b>OP 4.09 Pest Management</b>	The objective of this policy is to (i) promote the use of biological or environmental control and reduce reliance on synthetic chemical pesticides; and (ii) strengthen the capacity of the country's regulatory framework and institutions to promote and support safe, effective and environmentally sound pest management. More specifically, the policy aims to (a) Ascertain that pest management activities in Bank-financed operations are based on integrated approaches and seek to reduce reliance on synthetic chemical pesticides (Integrated Pest Management (IPM) in agricultural projects and Integrated Vector Management (IVM) in public health projects. (b) Ensure that health and environmental hazards associated with pest management, especially the use of pesticides are minimized and can be properly managed by the user. (c) As necessary, support policy reform and institutional capacity	The policy is triggered if : (i) procurement of pesticides or pesticide application equipment is envisaged (either directly through the project, or indirectly through on-lending, co-financing, or government counterpart funding); (ii) the project may affect pest management in a way that harm could be done, even though the project is not envisaged to procure pesticides. This includes projects that may (i) lead to substantially increased pesticide use and subsequent increase in health and environmental risk; (ii) maintain or expand present pest management practices that are unsustainable, not

	development to (i) enhance implementation of IPM-based pest management and (ii) regulate and monitor the distribution and use of pesticides.	<p>based on an IPM approach, and/or pose significant health or environmental risks.</p> <p>Under the Project, the policy will not be triggered as it will not involve any Pest Management</p>
<b>OP/BP 4.11 Physical Cultural Resources</b>	The objective of this policy is to assist countries to avoid or mitigate adverse impacts of development projects on physical cultural resources. For purposes of this policy, “physical cultural resources” are defined as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above ground, underground, or underwater. The cultural interest may be at the local, provincial or national level, or within the international community.	<p>This policy applies to all projects requiring a Category A or B Environmental Assessment under OP 4.01, project located in, or in the vicinity of, recognized cultural heritage sites, and projects designed to support the management or conservation of physical cultural resources.</p> <p>The policy is not triggered as it is not expected that physical cultural resources will be affected.</p> <p>Project activities that could negatively impact on physical cultural resources will not be funded</p>
<b>OP/BP 4.10 Indigenous Peoples</b>	The objective of this policy is to (i) ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples; (ii) ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and (iii) ensure that indigenous peoples receive culturally appropriate and gender and inter-gene rationally inclusive social and economic benefits.	<p>The policy is triggered when the project affects the indigenous peoples (with characteristics described in OP 4.10 para 4) in the project area.</p> <p>For this project, the policy is not triggered as it is not expected that indigenous peoples will be affected.</p> <p>Project activities that could negatively impact on indigenous peoples will not be funded</p>
<b>OP/BP 4.12 Involuntary Resettlement</b>	The objective of this policy is to (i) avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; (ii) assist displaced persons in improving their former living standards, income earning	This policy covers not only physical relocation, but any loss of land or other assets resulting in: (i) relocation or loss of shelter; (ii) loss of assets or

	<p>capacity, and production levels, or at least in restoring them; (iii) encourage community participation in planning and implementing resettlement; and (iv) provide assistance to affected people regardless of the legality of land tenure.</p>	<p>access to assets; (iii) loss of income sources or means of livelihood, whether or not the affected people must move to another location.</p> <p>This policy also applies to the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.</p> <p>The policy is not triggered as no involuntary resettlement will take place under Project.</p> <p>Any investments involving involuntary resettlement will not be funded.</p>
<b>OP/BP 4.37 Safety of Dams</b>	<p>The objectives of this policy are as follows: For new dams, to ensure that experienced and competent professionals design and supervise construction; the borrower adopts and implements dam safety measures for the dam and associated works. For existing dams, to ensure that any dam that can influence the performance of the project is identified, a dam safety assessment is carried out, and necessary additional dam safety measures and remedial work are implemented.</p>	<p>This policy is triggered when the Bank finances: (i) a project involving construction of a large dam (15 m or higher) or a high hazard dam; and (ii) a project which is dependent on an existing dam. For small dams, generic dam safety measures designed by qualified engineers are usually adequate.</p> <p>The policy is not triggered as no dams are involved under Project.</p> <p>Any investments involving dams will not be funded</p>
<b>OP 7.50 Projects in International Waters</b>	<p>The objective of this policy is to ensure that Bank-financed projects affecting international waterways would not affect: (i) relations between the Bank and its borrowers and between states (whether members of the Bank or not); and (ii) the efficient utilization and protection of international waterways.</p>	<p>This policy is triggered if (a) any river, canal, lake or similar body of water that forms a boundary between, or any river or body of surface water that flows through two or more states, whether Bank members or not; (b) any tributary or other body of</p>

	<p>The policy applies to the following types of projects: (a) Hydroelectric, irrigation, flood control, navigation, drainage, water and sewerage, industrial and similar projects that involve the use or potential pollution of international waterways; and (b) Detailed design and engineering studies of projects under (a) above, include those carried out by the Bank as executing agency or in any other capacity.</p>	<p>surface water that is a component of any waterway described under (a); and (c) any bay, gulf strait, or channel bounded by two or more states, or if within one state recognized as a necessary channel of communication between the open sea and other states, and any river flowing into such waters.</p> <p>The policy is not triggered as the Project will not have activities in international waters.</p> <p>Any investments involving international waters will not be funded</p>
<b>OP 7.60 Projects in Disputed Areas</b>	<p>The objective of this policy is to ensure that projects in disputed areas are dealt with at the earliest possible stage: (a) so as not to affect relations between the Bank and its member countries; (b) so as not to affect relations between the borrower and neighbouring countries; and (c) so as not to prejudice the position of either the Bank or the countries concerned.</p>	<p>This policy is triggered if the proposed project will be in a “disputed area”. Questions to be answered include: Is the borrower involved in any disputes over an area with any of its neighbours. Is the project situated in a disputed area? Could any component financed or likely to be financed as part of the project be situated in a disputed area?</p> <p>The policy is not triggered as no project activities will take place in disputed areas under Project.</p> <p>Any investments involving disputed areas will not be funded</p>

## ANNEX 7: EBOLA FACILITIES DESIGN LAYOUT

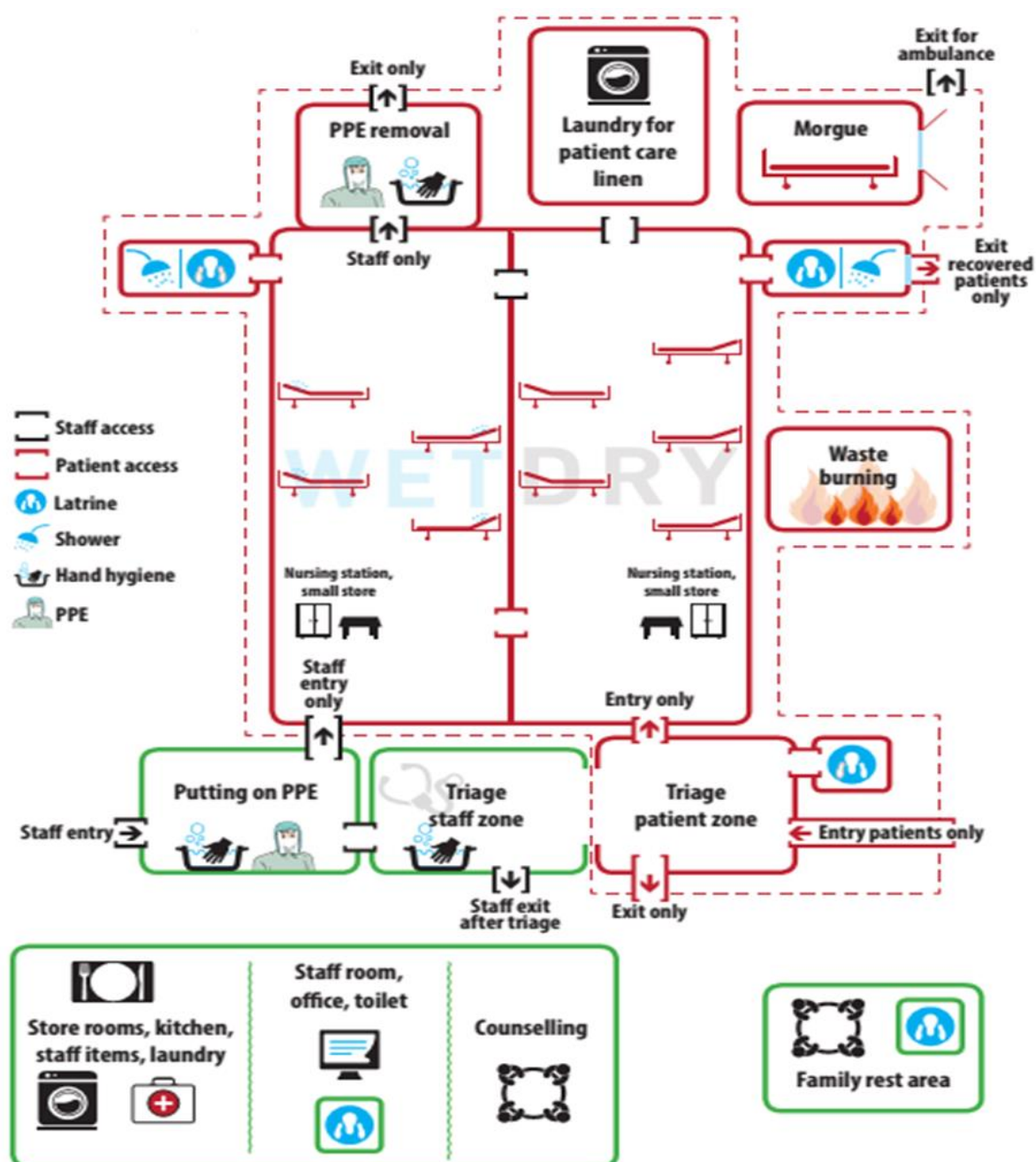


Figure A7.1: WHO standard designs for Ebola quarantine/treatment centres <sup>1</sup>

<sup>1</sup> Source: World Health Organisation, (2015). Manual for the care and management of patients in Ebola Care Units/Community Care Centres.



Figure A7.2: The Ebola facility under construction at Kamuzu Central Hospital

## ANNEX 8: EMP COST CALCULATIONS

### A8.1 Environmental and Social Management Cost

#### SUMMARY OF COSTS

Activity	Cost in USD
Cost for awareness/sensitization meeting	1,746.58
Cost for condoms	178.57
Total	1,925.15
Total for 6 sites	11,550.90

#### Costs for awareness/sensitization meeting

Description	Unit	QTY	RATE (\$)	No	TOTAL (\$)
Officer(s)	No	2	35.71	3	214.29
Stationary and Equipment	Sum	1	37.68	3	113.04
Refreshments	No	50	0.63	3	93.75
Driver Allowance	No	1	26.79	3	80.36
Transportation	No	3	26.79	3	241.07
Fuel	Litres	185.7	1.32	3	736.22
Vehicle Hire	No	1	89.29	3	267.86
<b>Total</b>					<b>1,746.58</b>

#### Cost for condoms

Description	Unit	QTY	RATE (\$)	No	TOTAL (\$)
Condoms	No	1000	0.17	1	178.57

### A8.2 Environmental and Social Monitoring Costs

Cost for local transportation and allowance per site					
Description	Unit	QTY	RATE (\$)	Visits	TOTAL (\$)
Officer(s)	No	3	71.43	12	2,571.43
Fuel	Litres	100	1.33	12	1,590.00
Vehicle hire	Days	2	125.00	12	3,000.00
Total					7,161.43

## ANNEX 9: CALCULATIONS FOR CAPACITY BUILDING

### Total cost for Capacity Building and Sensitization

	Total Cost in USD
Sensitization of top level staff at Ministry of Health	200
Sensitization of National level staff of Environmental Health Unit	800.00
Capacity building for District and Health Centre level staff	20,000.00
Sensitizations of community members	8,000.00
<b>Total</b>	<b>38,800.00</b>

### Sensitization of top level management

Item	Cost in USD	Qty	Total MK	Total
Refreshments	2.14	15	18000	32.14
Copies of the ESMF	8.04	15	67500	120.54
<b>Total</b>				<b>152.68</b>
Round figure				200.00

### Sensitization of National Level staff

Activity/Item	Unit		Qty	Cost in MK	Total	Total in USD
Consultant fees	Sum	1	1	200,000.00	200,000.00	357.14
Transport	Sum	1	1	60,000.00	60,000.00	107.14
Food	Day	1	10	5,000.00	50,000.00	89.29
Modules	No	1	10	4,500.00	45,000.00	80.36
Writing material	Sum	1	10	2,250.00	22,500.00	40.18
Other stationary		1	1	27,000.00	27,000.00	48.21
<b>Total</b>						<b>722.32</b>
<b>Round figure</b>						<b>800.00</b>

### Capacity building for District and Health Centre Level

Activity/Item	Unit	No	Qty	Districts	Cost in USD	Total
Preparing Modules	General	1	1	1	2,678.57	2,678.57
Consultant fees	General	1	1	6	446.43	2,678.57
Transport	General	1	1	6	357.14	2,142.86
Food	Day	2	25	6	892.86	5,357.14
Accommodation for junior staff	Day	2	20	6	392.86	2,357.14
Accommodation (senior staff)	Day	2	5	6	267.86	1,607.14
Transport refunds	General	1	15	6	53.57	321.43
Writing materials	Sum	1	30	6	120.54	723.21
Other stationary items	Sum	1	1	6	48.21	289.29
Photocopy of Modules	No	1	30	6	241.07	1,446.43
<b>Total</b>						<b>19,601.79</b>
<b>Round figure</b>						<b>20,000.00</b>

**At District and Health Centre**

Activity/Item	Unit		Qty	Usd	Sites	
Transport	Sum	1	1	35.71	6	214.29
Consultant fees	Sum	1	1	446.43	6	2,678.57
Allowances	Day	2	30	321.43	6	1,928.57
Writing material	General	1	30	120.54	6	723.21
Other stationary items		1	1	48.21	6	289.29
Photocopying Modules		1	30	241.07	6	1,446.43
<b>Total</b>						<b>7,280.36</b>
<b>Round figure</b>						<b>8,000.00</b>

**Community sensitization**

Activity/Item	Unit		Qty	Cost in USD	Sites	Total
Transport	General	1	1	357.14	6	2,142.86
Consultant fees	General	1	1	357.14	6	2,142.86
Allowance	Day	1	30	160.71	6	964.29
Stationary	General	1	30	120.54	6	723.21
		1	1	48.21	6	289.29
Modules		1	30	241.07	6	1,446.43
<b>Total</b>						<b>7,708.93</b>
<b>Round figure</b>						<b>8,000.00</b>

**ANNEX 10: LIST OF INDIVIDUALS/INSTITUTIONS CONSULTED**

<b>Name / Position</b>	<b>Position</b>	<b>Institution</b>	<b>Contact</b>	<b>Areas of Discussion</b>
Dr James Mpunga	TB Programme Manager	National TB Control Programme	0888314914	TB in Mining
Flora Dimba	Principal Environmental Officer, Ministry of Health	Ministry of Health	0888891574	Health Care Waste Management
Holisterious Kafanikhale	Principal Environmental Officer (Sanitation and Hygiene)	Ministry of Health	0888851089	Health Care Waste Management
B. G. Nyirenda	Chief Inspector of Mines	Department of Mines	0993181946	Health Care Waste Management
Precious Phiri	Principal Environmental Officer for Primary Health Care	Ministry of Health	0999203449	Health Care Waste Management
Caseby Banda	Principal Environmental Officer	Ministry of Health	0881743511	Health Care Waste Management, Environmental Health
Dr Chipolombwe	Medical Doctor	Mzuzu Central Hospital	jochipolombwe@yahoo.co.uk	Ebola Centres, Prevention and Treatment
Dr Shumba	District Health Officer	Mzimba North	0995625592 Kshumba03@yahoo.com	Institution framework for Environmental Health at district level
Mrs Florence Chisi	TB Officer/ Nurse	Mzuzu Central Hospital	09999370164	TB prevention, detection and treatment in the mining areas
Mr Chiwaula	Deputy Director, Clinical	Kamuzu Central Hospital	0999511882	Ebola treatment centre
Agness Mtambo	Health Surveillance Assistant	Mzuzu Health Centre	0999265823	Community Environmental Health and TB surveillance
Mr Nyirenda	Administrative Officer	Kaziwiziwi Coal Mine	0999127859	TB among miners and in the labour sending areas
Kenani Mushani	Environmental Supervisor	Mchenga Coal Mine	0881583136	Environmental Health in the Mines and TB
Mr Silumbu	TB Officer	David Gordon Memorial Hospital	0884300156	TB cases at and around the Mine and Environmental Health