



MINISTRY OF MINES AND MINERAL DEVELOPMENT

**ENVIRONMENTAL AND SOCIAL MANAGEMENT
FRAMEWORK**

**Zambia Mining Environment Remediation and
Improvement Project**

June 2016

EXECUTIVE SUMMARY

Project background and rationale for Environmental and Social Management Framework

1. *Project description.* The proposed Mining and Environment Remediation and Improvement Project (ZMERIP) in Zambia will contribute to reducing environmental health risks and lead exposure to the local population related to mining activities in critically polluted areas in Kabwe and Copperbelt province. This will be done through: (a) Optimizing existing financial mechanisms to identify, finance, implement and monitor feasible environmental and social measures for prioritized contaminated areas; (b) Strengthen environmental management in the mining sector through improved regulatory and institutional capacity of regulatory agencies (ZEMA, MSD, RPA) and the local governments to strengthen environmental management in the mining sector; and (c) Targeted health interventions and improved job opportunities for affected people, particularly women and youth through collaborative partnership with local government and neighboring communities, through improved capacity of the key institutions at the national, subnational and local levels. The Project includes the following components: (i) Investments for remediation of contaminated sites and environmental infrastructure improvements; (ii) Enhancing Institutional capacity to strengthen environmental governance and compliance; (iii) Reducing environmental health risks through localized interventions; and (iv) Project Management.

Rationale for ESMF

2. The majority of the proposed project activities are expected to have mostly moderate environmental impacts, which can be readily mitigated through an environment and social impacts assessment process. However, the project was categorized as A, as the Project through Component I, will support a number of higher risk activities, such as the closure or rehabilitation of tailing dams; remediation of contaminated hotspots in Kabwe; upgrading/development of solid and hazardous waste disposal facility in Kabwe; and improving the drainage and flow of Kabwe canal. Such sub projects would be screened when location details are available for environment and social risks, requiring full scale Environment and Social Impact Assessment. Other planned activities under Component II and component III are likely to have low to moderate risks include capacity building interventions, lab equipment upgrading, lead poisoning treatment program for target population in Kabwe, and small scale community driven projects in support of environmental health outcomes (nutritional support, income generation small grants). All site specific details and design will be informed through a demand driven and consultative approach. The two investments i.e. lining of Kabwe Canal and waste management facility will require pre-feasibility studies to establish various technological and construction alternatives. The environmental and social risks and impacts will relate to final site selection which will be the basis for a detailed Environmental and Social Impact Assessment (ESIA) and preparation of Management Plan. Since the exact locations of the activities and scope of works are not yet identified, the relevant instrument is an Environmental and Social Management Framework (ESMF). The ESMF provides project description, environment and social baseline, identification of anticipated risks and impacts, management and monitoring plan and institutional arrangements.

3. The negative environmental impacts that are likely to be caused by the proposed subprojects will include, but not limited to: loss of vegetation due to earth works and land clearance, increase in noise levels due to construction, structural failure risks from the rehabilitation of tailing dams and overburden dumps from earth movement and stabilization, alteration of top soils, contamination of surface and ground water, increased effects on aesthetics, visual intrusion and landscapes.

4. The ESMF which has been prepared, consulted upon, disclosed prior to appraisal, includes procedures for screening of the sub-projects and their categorization and also the development of ESIA and/or ESMP once specific activities and locations have been identified. The ESIA/ESMPs will be prepared, consulted with local communities and disclosed prior to commencement of detailed planning and physical works, consistent with the World Bank policy on Environmental Impact Assessment (OP4.01). Management and supervision requirements for the physical, chemical and biological environment (waste, water and sanitation etc.), health and safety of construction workers and safety and security of neighboring communities are built into the ESMF.

5. The project envisions a number of positive social impacts as the project aims to contribute to reduction of environmental health risks and lead exposure to the local population related to mining activities in critically polluted areas in Kabwe and selected towns on the Copperbelt province. In addition, the project has a dedicated subcomponent for providing livelihood improvement opportunities to communities affected by lead exposure. Since the specific project activities and locations are not yet known (they will be identified through a consultative process during project implementation), the proposed environmental assessment instrument is an Environmental Social Management Framework (ESMF).

Main provisions of the ESMF

6. The types of sub-project activities that might cause significant adverse impacts, proposed for funding starting with the second year of the project include: (a) the closure or rehabilitation of tailing dams and remediation of contaminated hotspots; (b) upgrading of the existing dump site as a solid and hazardous waste disposal facility in Kabwe; and (c) improving the drainage and flow of Kabwe canal to reduce the risks of flooding in the neighboring community. Based on the application of the procedures outlined in the ESMF, site specific ESIA and/or ESMP will be prepared for all sub projects based on the screening, and publicly disclosed, prior to finalization of the design and commencement of construction. During subproject preparation, the project implementing teams will use an opportunity to use the ESIA/ESMP findings to further improve project designs and minimize adverse impacts while maximizing positive impact on people and environment.

The negative environmental impacts that are likely to be caused by the proposed subprojects will include, but not limited to: loss of vegetation due to earth works and land clearance, increase in noise levels due to construction, structural failure risks from the rehabilitation of tailing dams and overburden dumps from earth movement and stabilization, alteration of top soils, contamination of surface and ground water, increased effects on aesthetics, visual intrusion and landscapes.

7. A potential risk would be that the upgraded infrastructure is not maintained by the local government, which may cause the reversal of environmental conditions to the pre-project level. Copperbelt Environment Project provided a lesson learned for ZMERIP which will take participatory approach for all of its planned activities, including involving the public in the operation and maintenance of the project infrastructure post project closure. All subproject activities will be subjected to environmental and resettlement screening, using a series of protocols and templates. A separate protocol was developed for CDD activities under Component 3 as described in the project ESMF and RPF. These procedures will allow project implementers at the national and municipal levels to identify, minimize or treat any potential adverse impacts, where needed by calling upon subject specialists to modify designs or propose alternatives. All project activities' design will be reviewed to avoid or minimize involuntary resettlement and land acquisition. Another risk is related to insufficient policy and regulatory support to tailing dump closures and overall management of environmental liabilities from past and present mining. The Component 2 of ZMERIP is dedicated to reduce this risk and provide support to a more sustainable approach for managing such liabilities, engaging MoM, MSD, ZEMA and other relevant agencies.

8. The Capacity Building and remedial measures required for the ESMF and RPF will be funded by ZMERIP under Component 4. The implementation of the measures to address safeguards policy issues include (1) development of ESIA/ESMPs and, where required, RAPs, once the subprojects are designed; (2) knowledge sharing and ongoing capacity building for environmental and social management at all levels of project implementation including the communities; (3) environmental and social monitoring and reporting, including annual audits for Component 3 activities conducted by participating Municipalities. The training requirements for the implementation of the recommendations of the safeguard documents and for overall environmental management have been factored into the project budget. The project will be implemented by 3 PIUs (MSD, ZEMA and Kabwe MC), which will include dedicated environmental and social staff responsible for the implementation and monitoring of the ESMF and RPF. The responsibilities will include screening, preparation of the subproject specific documents, consultations, monitoring, auditing, training for other implementation partners and stakeholders.

9. The project stakeholders include relevant ministries at the national level (including MOM, MOH, Ministry of Environment), agencies (ZEMA, MSD, RPA), communities in the target areas – Kabwe, Kitwe, Chingola and Mufulira, especially the poor and vulnerable, living in contaminated areas affected by mining activities. The interventions will target about 500 women and unemployed youth in these communities through direct support for income generating activities and enhancements of livelihoods using a community based approach in order to reduce their current exposure to hazardous employment activities. Project stakeholders will also include more than 3,000 children who have been impacted by lead pollution, primarily in Kabwe, through direct health interventions including blood lead level testing, treatment and nutritional supplements. In Kabwe, remediation activities and management of contaminated hotspots will benefit around 70,000 people living in hotspots and an estimated 30,000 children will be beneficiaries of education and awareness building campaigns.

10. ZMERIP design is built on a participatory approach which requires community development activities to be defined, designed, planned and implemented by the local community groups. The project supports Government's decentralization agenda, whereby decision making has been devolved to the Municipal councils. The Municipal Councils of Kabwe, Kitwe, Chingola and Mufulira are the implementing agencies for their respective components and will be responsible for designing and implementing activities within their jurisdiction and also be the interlocutors with the local communities for the community development livelihood enhancement activities. All Component 3 activities will be preceded with an active communication and education campaign providing information about the risks of exposure to lead, proposed remedial actions and available project interventions such as the decentralized health program to reduce environmental health risks associated with chemical contamination and support to local income generation and livelihood activities.

11. Overall the project envisions a number of positive social impacts as the project aims to contribute to reduction of environmental health risks and lead exposure to the local population related to mining activities in critically polluted areas in Kabwe and selected towns on the Copperbelt province. In addition, the project has a dedicated subcomponent for providing livelihood improvement opportunities to communities affected by lead exposure. The ESMF identifies broad mitigation, monitoring and institutional measures to be undertaken in order to ensure that the implementation of the project activities avoids as much as possible adverse social and environmental impacts, and when avoidable, mitigates such impacts. For potential loss of vegetation associated with construction, constructors and communities should minimize the loss of natural vegetation, and re-vegetate any plant loss with native species to protect susceptible soil surfaces. Contractors will be required to mitigate increased air pollution and noise levels during construction/ or rehabilitation of roads or other infrastructure by employing dust control measures, e.g. by spraying and moistening the ground, and limiting construction noise to restricted times agreed to in the permit. Possible contamination of water sources should be mitigated through disposal of contaminated water in addition to decisions on site locations location done in collaboration with relevant planning authorities, and in consultation with surrounding communities (where possible siting of building in locations previously used for infrastructure) to minimize negative environmental impacts.

Implementation and Monitoring System

12. Implementation of the ESMF will be coordinated by Project Coordination Unit (PCU) at the Ministry of Mines and Mineral Development and managed by three Project Implementation Unit, each at Mines Safety department; ZEMA and Kabwe municipal Council. The PCU and PIUs include well trained and experienced safeguards specialists, familiar with World Bank safeguards policies. For environmental infrastructure to that involve larger scale physical works, a detailed and specific assessment to identify impacts are required. ESIA and resulting ESMPs will be contracted to be available during the design phase of these infrastructure works, and cleared by ZEMA, facilitated by the environmental and social safeguards responsible at the PIU. The ESIA will be reviewed and cleared by the World Bank Safeguards Advisor. The safeguard instruments for these infrastructure sub-projects are required to be sent in consultation with stakeholders. These works and safeguard measures will be monitored by ZEMA and the PIU through routine and independent audits. For sub-projects under the CDD process the management of safeguards will be embedded in the participatory identification of projects. The screening for environmental and social impacts is included in the process for submitting proposals for sub-projects.

ESMF outline

13. The first three Chapters (Chapters 1 to 3) of the ESMF provide background information that starts with a description of the proposed project which is followed by a brief explanation of the methodology used in formulating the ESMF as well as baseline information obtained in the target project areas. Chapter 4 provides an overview of the World Bank Operational Policies and national environmental management policies and regulations. The last four chapters of the ESMF provide guidelines on potential environmental and social impacts that are anticipated for various proto-type sub-projects, respective possible mitigation measures as well as relevant institutional arrangements for implementation and monitoring of safeguards. Chapter 8 of the ESMF takes into account prevailing institutional capacities and needs and recognizes the need for capacity building in safeguards application and monitoring.

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ACRONYMS

AER	Agro-Ecological Regions
AIDS	Acquired Immune Deficiency Syndrome
CBE's	Community Based Enterprises
CBO's	Community Based Organizations
CEEC	Citizens Economic Empowerment Commission
CEMP	Consolidated Environmental Management Plan
CEP	Copperbelt Environmental Project
CSO	Central Statistical Offices
DG	Director General
DMMU	Disaster Management and Mitigation Unit
DRC	Democratic Republic of Congo
EA	Environmental Assessment
ECZ	Environmental Council of Zambia
EMA	Environmental Management Act
EPF	Environmental Protection Fund
ESIA	Environmental Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental Social Management Plan
GBV	Gender Based Violence
GIP	Grassroot Initiative Program
GRZ	Government of the Republic of Zambia
HIV	Human Immunodeficiency Virus
IEC	Information Education Communication
ITCZ	Intertropical Convergence Zone
KCM	Konkola Copper Mines
MCM	Mopani Copper Mines
METS	Misenge Environmental and Technical Services
MLGH	Ministry of Local Government and Housing
MOM	Ministry of Mines
MSD	Mines Safety Department
MTEF	Medium Term Expenditure Framework
NGO's	Non-Governmental Organizations
NHCC	National Conservation Commission
NWASCO	National Water Supply and Sanitation Council
OB's	Over Burden
OP/BP	Operational Bank Policy
PCU	Project Coordinating Unit
PEF	Permanent Environmental Fund
PIU's	Project Implementing Units
PMC	Project Management Consultants
PPE	Personal Protective Equipment
PSC	Project Steering Committee
R&D	Research and Development
RAP	Resettlement Action Plan
RPA	Radiation Protection Authority
RPF	Resettlement Policy Framework
R-SNDP	Revised Sixth National Development Plan
SADC	South African Development Community

STI's	Sexually Transmitted Infections
TD's	Tailing Dams
ZCCM	Zambia Consolidated Copper Mines
ZCCM-IH	ZCCM – Investment Holdings
ZDA	Zambia Development Agency
ZEMA	Zambia Environmental Management Agency
ZMERIP	Zambia Mining Environmental Remediation and Improvement Project
ZPPA	Zambia Public Procurement Authority

1.1 Project Background

The Government of Republic of Zambia has requested World Bank financing of the Mining and Environmental Remediation and Improvement Project (ZMERIP). The Project is consistent with the long-term development objectives of the Government Republic of Zambia (GRZ), as articulated in the National Vision 2030. Its objective is to reduce environmental health risks and lead exposure to the local population related to mining activities in critically polluted areas in Kabwe and Copperbelt province. ZMERIP is designed to fund a variety of investments from infrastructure upgrading to lead exposure medical treatment interventions to a number of small-scale, community-based subprojects that will be identified and planned by the communities that will be approved for funding by local government authorities. The project is building on the experience acquired through implementation of a previous World Bank funded project (Copperbelt Environment Project (CEP) 2003-2011) with similar objectives and planned project activities. The GRZ has acquired experience in implementing World Bank Safeguard policies. Under the current project, ZMERIP, the GRZ has prepared a set of investment activities that include policy and regulatory interventions, health interventions, livelihood interventions and public awareness activities. These activities are expected to have moderate impacts which will be managed through the implementation of a screening procedure and environmental management plans. The key infrastructure interventions include waste management facility in Kabwe town and lining of Kabwe canal to improve drainage and reduce flooding risk. The infrastructure activities would require undertaking detailed environment and social impact assessments. However the site details, specific locations and conceptual design of such investments will be available during the second year of project implementation. Therefore an Environmental and Social Management Framework (ESMF) has been prepared to fulfil the safeguards policy requirements of the World Bank and the GRZ.

1.2 ESMF Objectives

The objectives of this ESMF are:

- To establish clear procedures and methodologies for the environmental and social planning, review, approval and implementation of subprojects to be financed under the ZMERIP;
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to subprojects;
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF;
- To establish the project funding required to implement the ESMF requirements;
- To provide practical resources for implementing the ESMF, including general guidance on development of Environmental Social Impact Assessment (ESIA), Environmental Social Management Plans (ESMPs) and their implementation

1.3 Project Description

The Project Development Objective is to reduce environmental health risks and lead exposure to the local population in critically polluted mining areas in Kabwe and in the Copperbelt province. All project components will contribute to reduction of environmental health risks and lead exposure to the local population related to mining activities in critically polluted areas in Kabwe and selected locations in Copperbelt province. This will be done through:

- (a) Optimizing existing financial mechanisms to identify, finance, implement and monitor feasible environmental and social measures for prioritized contaminated areas;
- (b) Strengthening environmental management in the mining sector through improved regulatory and institutional capacity of regulatory agencies (Zambia Environmental Management Agency (ZEMA), Mines Safety Department (MSD) and the Radiation Protection Authority (RPA)) and the local governments to strengthen environmental management in the mining sector; and
- (c) Improving job opportunities for affected people, particularly women and youth through collaborative partnership with local government and neighboring communities through improved capacity of the key institutions at the national, subnational and local levels.

1.4 Description of Project Components

The Project includes the following components:

- (a) Investments for remediation of contaminated sites and environmental infrastructure improvements;
- (b) Enhancing Institutional capacity to strengthen environmental governance and compliance;
- (c) Reducing environmental health risks through localized interventions; and
- (d) Project Management.

14. The project will benefit communities, especially the poor and vulnerable, living in contaminated areas affected by mining activities. The interventions will target about 500 women and unemployed youth in these communities through direct support for income generating activities and enhancements of livelihoods using a community based approach in order to reduce their current exposure to hazardous employment activities. Project beneficiaries will also include more than 3,000 children who have been impacted by lead pollution, primarily in Kabwe, through direct health interventions including blood lead level testing, treatment and nutritional supplements. In Kabwe, remediation activities and management of contaminated hotspots will benefit around 70,000 people living in hotspots and an estimated 30,000 children will be beneficiaries of education and awareness building campaigns. Through enhancement of skills, testing and environmental monitoring facilities, the project will strengthen capacity of regulatory authorities in monitoring of compliance, which will have longer-term benefits for the country.

Component 1 – Remediation of Contaminated Hotspots and Improvement of Environmental Infrastructure: (Estimated budget US\$ 19million)

15. The component will finance specific remediation activities and associated environmental infrastructure in Kabwe and Copperbelt areas. These interventions would be prioritized based on a standard set of social, environment and economic criteria including assessment of

environmental health risks. This component will finance prioritized investments to remediate contaminated hotspots that present immediate and medium term environmental health risks to the community. A comprehensive environmental management plan will be prepared/updated, detailing appropriate remediation plans for all contaminated sites in Kabwe and Copperbelt province. A simple and straightforward methodology will be utilized under the project for evaluating and comparing sites, assessing environmental health risks and for prioritizing cost effective interventions. Opportunities to collaborate with the private mining companies in legacy clean-up operations will be explored. Some of the key investments include:

- **Sub component 1.1: Remediation of contaminated hotspots and improvement of environmental infrastructure in Kabwe. (Estimated budget US\$10m)** This will include identification, characterization and remediation of known hotspots of contamination in Kabwe, primarily sites that are in the proximity of the communities. This will include a voluntary in-situ remediation program for households that are highly exposed. An appropriate technique using a combination of preventive and curative approach would be used, such as confinement, containment and treatment. A consultative and voluntary approach would be used to prevent any displacement or land acquisition. The subcomponent will also support associated environmental infrastructure designed to improve the environmental health of the surrounding environment. There is a demand for improved environmental infrastructure for better management of hazardous and solid waste that contributes to exposure to contaminated material that was determined through a process of consultations with affected communities. Two first potential priority areas identified for engineering interventions are: 1) The Kabwe Canal, which is a conduit for storm water containing hazardous material and wastes from the closed mining areas, passing through densely populated residential areas. The canal is prone to overgrowth and flooding on an annual basis, which results in overflow of hazardous material into residential backyards; 2) The Kabwe solid waste dump site, which needs to be upgraded to an integrated scientific hazardous and solid waste management facility to provide a location for safe disposal of contaminated material from the residential areas.
- **Sub-component 1.2: Rehabilitation of Tailing Dams (TDs) and Mine Closure in Copperbelt Province. (Estimated budget US\$ 9m)** This component aims to assist the GRZ to address some of the accrued environmental liabilities, by piloting closure of few old mine tailing dams. This would be the first time such closure will be undertaken in Zambia and will allow the demonstration of technical, economic, and institutional feasibility. The choice of the TDs would be determined using an agreed criteria of ownership¹; immediate environmental health impacts and costs to communities; economics of closure; and potential benefits and future use.

Component 2 – Enhancing Institutional capacity to strengthen environmental governance and compliance (Estimated budget US\$ 13.5 million)

16. This component will strengthen the environmental governance of the mining sector and compliance through a variety of interventions: a) policy support to the Ministry of Mines and Minerals Development (MoM) to improve the effectiveness of the national Environmental Protection Fund (EPF) and prepare subsidiary legislation to support the Mines and Minerals Development Act (2015); b) policy support to the Ministry of Environment to prepare regulations to support the Environment Management Act (2011); c) strengthen the capacity of

¹ Project funds will not be used to subsidies or remediate private sector environmental or social liabilities.

MSD to implement the new Mines and Minerals Development Act (2015) that has shifted new responsibilities to MSD, including assessment of environment health risks, and inspection of mine safety risks to communities; d) build capacity of the RPA to improve identification and mapping of health risks in critical residential areas where exposure to radioactive material (i.e. Uranium) may be high; e) strengthening the capacity of ZEMA to improve effectiveness of monitoring, compliance, enforcement; and f) improve disclosure of environmental information and public awareness of mining-environmental governance issues through GRZ and the Zambia Extractive Industries Transparency Initiative (EITI).

- **Subcomponent – 2.1: Improving environmental governance in the mining sector. (Estimated budget US\$ 5.5 million).** This subcomponent will enhance Mining-Environmental Governance and Operationalize Environmental Surety Mechanisms for Mine Closure. The activities will comprise of a combination of interventions involving policy support; strengthening mining and environmental regulations; capacity building support to assist the mining sector agencies, including MoM, MSD and RPA. The component will strengthen operational effectiveness of the existing EPF, including mechanisms to identify, finance, implement and monitor feasible environmental and social measures for prioritized contaminated hotspots related to past, present and future mining operations in Central and Copperbelt provinces. Improving the EPF's operationalization will help delineate roles and accountability for past, current and future environmental and environmental-health risks from mining operations; accounting for financial resources needed to meet government obligations to address environmental health risks and liabilities; and clarify the distinction between government-owned liabilities verses private sector responsibilities to regularly and progressively address environmental problems by financing the costs of their mitigation. The policy support would involve review of the EPF regulations with a view of identifying gaps and weaknesses in the legislation; identifying any omissions, inconsistencies or errors; assessment of the performance and effectiveness of the EPF from its inception in terms of contributions to the fund, securing of bonds and investment of funds; assessment of accuracy of the EPF closure cost calculation guidelines applicable to Zambian conditions; assess the criteria of allocating EPF performance categories. This support would help set up mechanisms on how to conduct and compile an EPF audit report for mining operations in Zambia; engagement of key stake holders on improvements to be made on administering of the EPF Regulations; and suggest measures to strengthen the EPF Regulations or changes to the regulations.
- The capacity of MSD will be strengthened to enable it to implement its new responsibilities under the 2015 Mines and Minerals Development Act, including assessment of environment health risks; providing guidance to mining companies on mine closure and progressive maintenance of tailing dams so as to minimize risks to the neighboring communities. Capacity building in MSD will consist of a range of training and a review of upgrading equipment and facilities. The activity would assist the MoM to draft mining regulations supporting the 2015 Mines and Minerals Development Act and would assist the Ministry of Environment and ZEMA to develop regulations to support the Environment Management Act (2011). The activity will review international good practices with respect to benefit distribution from extractive industries and propose regulation to support the Mines and Minerals Development Act (2015). The RPA would be assisted to improve identification and mapping of health risks in critical residential areas where exposure to radioactive waste material may be high. Building a broad support base for improved environmental performance by mining companies requires increased awareness and engagement in sector issues by the general public and policy-makers. The activity will also provide support to Zambia EITI regarding mining-environmental health and mining-

environmental governance issues. More detail for the activity can be found in the PAD Annex.

- **Subcomponent 2.2: Improving environmental compliance, enforcement and public disclosure. (Estimated budget US\$ 8 million).** This component will strengthen the quality and effectiveness of Environmental Monitoring and Disclosure. The activities will focus on ZEMA to strengthen the quality and effectiveness of environmental monitoring including support to enforcement/legal actions. This will include strengthening ZEMA's capacity to review ESIA's, negotiate (and, when necessary, update) ESMPs with investors, issue pollution permits, monitor compliance, and collect fees and fines. The capacity building will include use of modern information tools and GIS based techniques for effective inspection and compliance management. This will be accomplished through a series of enabling interventions, focused on improving availability of monitoring equipment and tools, training of both members of staff and identified honorary inspectors from local authorities. In addition, reporting and public disclosure of area specific environmental information will be designed to provide the general public, private sector and other stake-holders access to environmental information to enable informed decision making. Specific activities will include:
 - Designation and appointment of honorary inspectors;
 - Procurement and operationalization of environmental monitoring equipment;
 - Developing a comprehensive environmental monitoring program;
 - Improving enforcement of non-compliant facilities;
 - Developing standards and legislation to enhance environmental management;
 - Increasing access to and public disclosure of environmental information;
 - Operationalizing the Permanent Environment Fund; and
 - Environmental management mainstreaming into sectoral ministries and local government agencies.

Component III: Reducing environmental health risks through localized interventions (Estimated budget US\$ 13.5 million).

17. The Municipal councils of Kabwe, Kitwe, Mufulira and Chingola would be supported in identifying areas where environmental health risks to residents relate to lack of environmental services, such as disposal of hazardous and contaminated solid waste material; access to clean drinking water; lack of medical interventions for children and women exposed to lead contamination; and loss of agricultural soil productivity due to acidic exposure from Sulphur di-oxide emission from the past copper smelting operations. However, no specific investments are planned under this component to finance waste disposal or sanitation facilities. Most activities under this component would be to provide technical assistance to Municipalities to improve collection and promote behavioral change. The outreach and capacity of citizen monitoring at the local level as well as management of public Information, Education and Communication (IEC) would be strengthened through municipal councils in Kabwe and Copperbelt provinces. The component is also aimed to introduce income generation opportunities in contaminated areas that would enhance community involvement in addressing environmental health risks. A pre-agreed set of selection criteria will be used to identify and implement sub-projects, working closely with the private sector, particularly the mining companies in the project area to identify locally relevant livelihood activities that would enhance income generation opportunities. Specific attention will be given to women and

vulnerable community groups in the target areas. All activities will be relatively small, technically simple, and cost effective. Collaboration with the private sector on outreach, consultations and community stakeholder engagement will also be explored.

- **Subcomponent – 3.1: Strengthening decentralized health and education interventions to reduce environmental health risks.** This component will target (more than 10,000) people that are already affected by lead poisoning by conducting testing and assessments, screening, case management and surveillance. This will include assisting local, district, provincial government hospitals and clinics to collect existing data on health related to lead exposure in Kabwe; evaluate project data to strengthen the intervention strategy on health and education of affected population; evaluate the ongoing project to develop a sustainable health and communication strategy to prevent, diagnose and treat lead related problems in Kabwe; evaluate the remediation projects by comparing pre- and post-remediation lead levels; identify risk groups such as pregnant women, older children, scavengers in the targeted areas; identify additional hotspots to be included in the health intervention program. Treatment and nutritional supplements will be provided according to test results while health promotion shall also be conducted regularly in the affected communities. The project will support the development of a case based reporting system, an M&E system and a data management system, including support for testing of lead levels in food, using existing laboratory systems and processes.
- **Subcomponent 3.2: Support to local income generation and livelihood activities in targeted areas.** The component is aimed to introduce income generation opportunities in contaminated areas that would enhance community involvement in addressing environmental health risks. It will provide support to community groups in a form of small grants to organize themselves around productive activities identified in partnership with the private sector in the area, the nature of which will be determined by the beneficiaries based on their demand. The sub-grants will target up to 10 priority communities per year identified in the targeted wards affected by pollution, including support to the efforts of intermediaries and pollution affected people in Kabwe and Copperbelt Province. This will include community-based project implementation and management such as financial and supervisory support to enhance their managerial and technical capacities. Specific attention will be given to women and vulnerable community groups in the target areas and these activities will be relatively small, technically simple, and cost effective, with support for establishing value chain linkages. This sub-component will also support the development of a “local content” policy and associated regulations to encourage the development of local suppliers for the mining sector. Collaboration with the private sector and community stakeholder groups will also be explored.

Component 4:

18. Project Management, Monitoring and Evaluation (Estimated US\$ 4 million): This Component will cover the cost for project management, implementation and supervision of project activities, administration of procurement and financial management, monitoring and evaluation, and safeguards compliance monitoring. The component will cover cost of a unified Project Coordination Unit (PCU) established under the MoM, and three Project Implementation Units (PIUs) set up respectively under MSD, Kabwe Municipal Council (KMC) and the ZEMA. A Project Management Consultant (PMC) working with PIU would be responsible for preparing, implementing and monitoring approved investments plans in Kabwe and Copperbelt province.

19. Anticipated Sub Projects/investments: The anticipated sub –projects have been categorized in 3 broad thematic areas as detailed in table below. The detailed component description along with baseline information is provided in Chapter 3.

Table 1: Anticipated Sub-Projects/investments

Project Category	Project Component	Anticipated Sub-Projects
Infrastructure/Construction related	Component 1	<ul style="list-style-type: none"> • Upgrade and Concrete Lining of Kabwe Canal • Tailing Dams (TD) Stabilization/Closure • Remediation of hazardous waste sites
		<ul style="list-style-type: none"> • Construction of a waste management site • Establishment of recycling sites
Health Interventions	Component 3	<ul style="list-style-type: none"> • Lead pollution treatment program
Income Generating Activities	Component 3	<ul style="list-style-type: none"> • Community level agro-processing • Small scale agricultural support projects • Demonstration/nutrition gardens • Community nurseries • Greenhouses

Lessons Learned and Reflected in the Safeguards Approach:

20. The earlier Bank funded CEP was assigned Category A and included similar interventions. An Environment and Resettlement Framework was prepared and was satisfactorily implemented for various interventions. This included preparation of various ESMPs. There are a number of lessons from CEP that are incorporated into the design of this project. These include:

- *Enhanced participation of affected mining communities in planning and implementation of environmental health management interventions:* One of the key weaknesses noted in the ICR included lack of public participation and ownership of investments by the local municipal councils. IEG mentioned that “*projects such as this, which benefit a prosperous and burgeoning extractive sector, should make a strong effort to ensure that local communities share in the benefits*”. Therefore, the proposed project design is built on a participatory approach which requires community development activities to be defined, designed, planned and implemented by the local community groups. The project supports Government’s decentralization agenda, whereby decision making has been devolved to the Municipal councils. The Municipal Councils of Kabwe, Kitwe, Chingola and Mufulira are the implementing agencies for their respective components and will be responsible for designing and implementing activities within their jurisdiction and also be the interlocutors with the local communities for the community development livelihood enhancement activities. The approach increases the complexity of execution of the project and associated costs of project management, but improves stakeholder buy-in and sustainability of activities.
- *Increasing social inclusion and accountability:* Increased sensitization and awareness activities, along with involvement of the Education department to mainstream messages

on Lead Exposure are expected to enhance sustainability. The project also has a distinct component for improving livelihood and income generation opportunities for vulnerable sections of community who are also affected by lead pollution, particularly targeting women, widows, single-women headed households etc. The design builds in strong “supply and demand side” governance through increased access to information, improved pollution monitoring, transparency in environmental compliance, in collaboration with ZEMA, RPA, MSD and EITI.

- *Improving sustainability of investments:* The earlier CEP was implemented by the Ministry of Finance with assistance from ZCCM Investment Holdings Plc (ZCCM-IH) (a then wholly government owned company²), which resulted in poor ownership of results by Ministry of Mines, health or local municipal councils. The proposed project is housed in the Ministry of Mines, which will also include elements of policy intervention and operationalization of an Environmental Protection Funds that will ensure full costing and financing of environmental liabilities associated with tailings and mine closure.
- *Involvement of a multi-sectoral Bank team:* The World Bank’s Independent Evaluation Group (IEG) noted that there were several changes in the task management during CEP. The proposed project involves specialists from 5 sectors – Environment; Mining; Health; Social; and Jobs. The team brings prior experience and appropriate sector knowledge, relevant for the project design, implementation and monitoring.

21. The project also considers lessons from similar remediation project in India, China and Poland. The lessons reveal three key aspects that are relevant for this project design – a) The focus on underlying sector and environmental policies and regulation that regulate the “stock” and “flow” of environmental liabilities; b) the need for strong ownership by sector ministry to lead a rather complex set of institutional, technical and financial challenges; and c) the need to focus on simple site specific and localized interventions to demonstrate quick results to generate community buy-in.

Safeguards Approach:

22. The project includes a number of activities i.e. a) CDD types of activities under Component III for which screening will be required leading to preparation of ESMP b) Infrastructure investments under Component I such as waste management facility and lining of Kabwe canal and rehabilitation of tailings. The ESMF provides the procedures to address the environment and social risks; however for Component I activities, the site details, including designs are expected to be available in year 2. Therefore the detailed ESIA based on the procedures provided for in the ESMF will be taken up after a prefeasibility and pre-design study are completed which will inform the detailed engineering and ESIA.

² Since the CEP, ZCCM-IH has sold 40% of its equity to private investors. ZCCM-IH is now a publicly traded company that is listed on the Lusaka Stock Exchange, Paris Euronext and London Stock Exchanges under ISIN number ZM0000000034.

23. Construction and rehabilitation of infrastructure, contaminated site remediation, waste management facilities, and livelihood initiatives, may have time-bound negative environmental impacts with possible cumulative effect is expected as they are similar facilities in the area for Tailing Dams and Overburden rock dumps. Potential negative impact are likely to include; loss of vegetation and habitats, increased health risks from working in contaminated sites; increased structural failure associated with stabilization/closure of tailing dams and overburden rock facilities, increased level of noise and dust during earthmoving works, foul odors from waste management activities and possible contamination of surface and ground water.

24. Potential negative social impacts could include; possible conflicts with illegal landfill site scavengers, increased interaction between contractor and the local communities that may lead increased incidences of HIV/AIDS and Sexually Transmitted Infections (STI's) and potential dissatisfaction with lead treatment program. Since most of the specific project activities and locations have not yet been agreed on, the proposed environmental assessment instrument is an Environmental Social Management Framework (ESMF). The ESMF also includes provisions related to compliance with the World Bank safeguard policies:

- ***OP/BP 4.01 - Environmental Assessment***

The policy is triggered in relation to construction and infrastructure upgrade, development of solid waste management facilities, natural resources management initiatives, and livelihood activities.

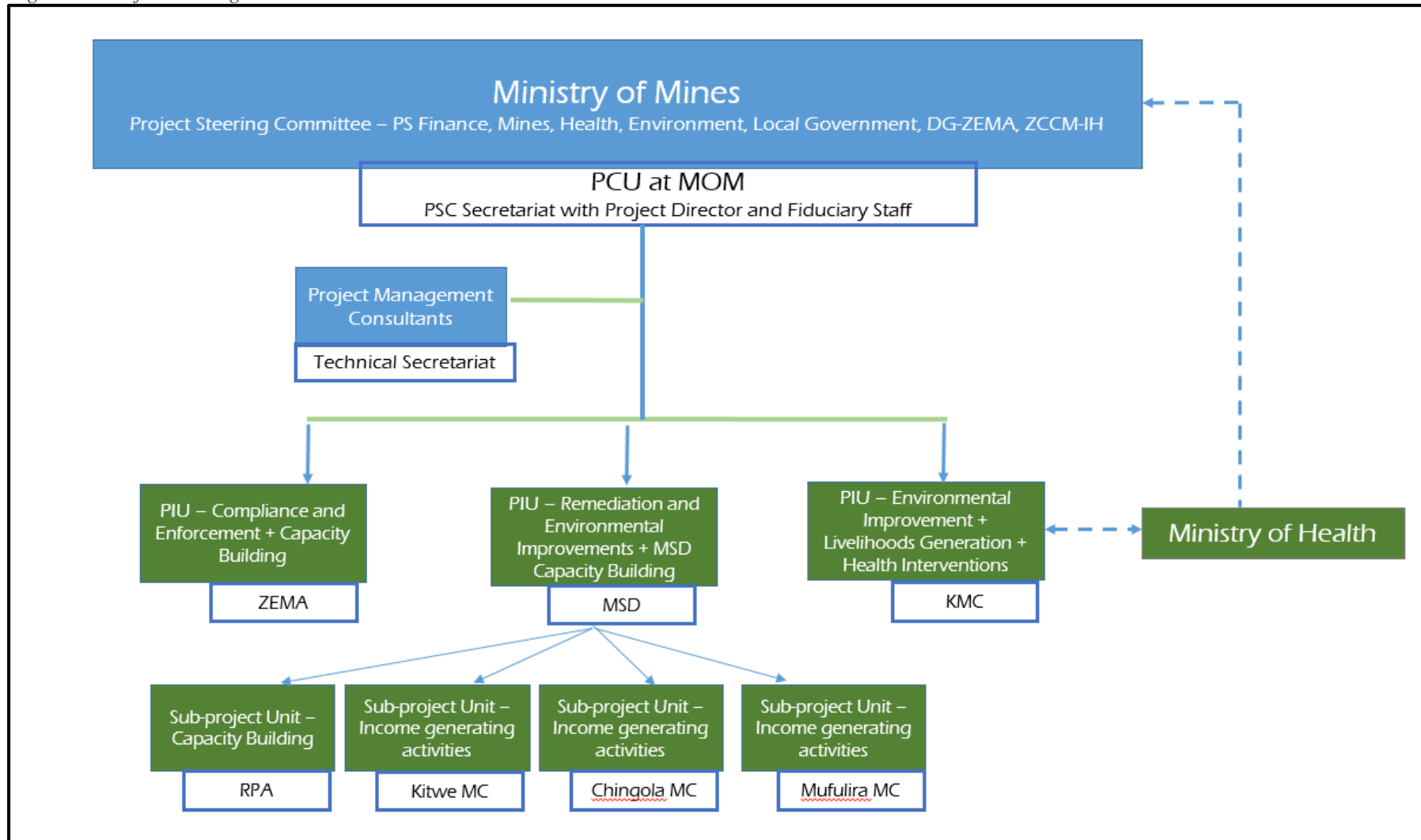
- ***OP/BP 4.12 – Involuntary Resettlement:***

The policy is triggered for a possibility that there may be temporary impacts on livelihoods due to restriction of access under Component 1 or Component 3, such as closing and rehabilitation of tailing dams, community driven income generation projects; or as part of voluntary in-situ remediation program for backyards of households in contaminated areas, based on voluntary participation by house owners. A Resettlement Policy Framework (RPF) has been prepared, consulted upon, and disclosed prior to project Appraisal. The RPF will guide the development of site specific Resettlement Action Plans, which will be developed as needed during project implementation. The RPF also provides detailed guidelines on processes for undertaking, documenting, and keeping records of voluntary land donations, if any.

Institutional Arrangements

25. The project will be implemented by the MoM in collaboration with the Ministry of Lands, Natural Resources and Environmental Protection (MLNREP), Ministry of Health (MOH) and Ministry of Local Government and Housing (MLGH). The MoM has established a Project Steering Committee (PSC) chaired by the Permanent Secretary – Mines. The PSC comprises the Permanent Secretaries of Ministry of Finance (MOF), MLNREP, MOH, MLGH, Central Province, as well as Director General (DG) of ZEMA and ZCCM-IH. A Project Coordination Unit (PCU) has been established at the MoM with a designated Project Coordinator. For the purposes of implementation, three Project Implementation Units (PIUs) with Designated Project Accounts, would be set up at MSD, ZEMA and KMC, who would be responsible for planning, procurement, implementation and monitoring of various activities. The PSC will be mainly responsible for approval of Annual Plans submitted by the PIUs and consolidated by the PCU. The PCU will act as the technical Secretariat for the PSC. A Project Management Consultant (PMC) will provide implementation support to the PCU and PIUs. Specifically PIUs will be responsible for: (a) preparation of procurement plans and the management of the designated accounts; (b) accounting, financial management and reporting on the overall project sub-components; (c) ensuring the execution of the audit of the project; (d) preparation of quarterly financial and technical progress reports; (e) the management of the environmental and social safeguards aspects; and (f) undertaking all procurement and contract management activities for all components. The PCU will have no direct line authority over the PIUs – instead, its role is mainly to facilitate the aggregation of PIU activity for reporting to the World Bank and the PSC and provide services to the PIUs where certain skills may need to be centralized and shared across PIUs. The following chart below describes the project management structure.

Figure 1: Project Management Structure

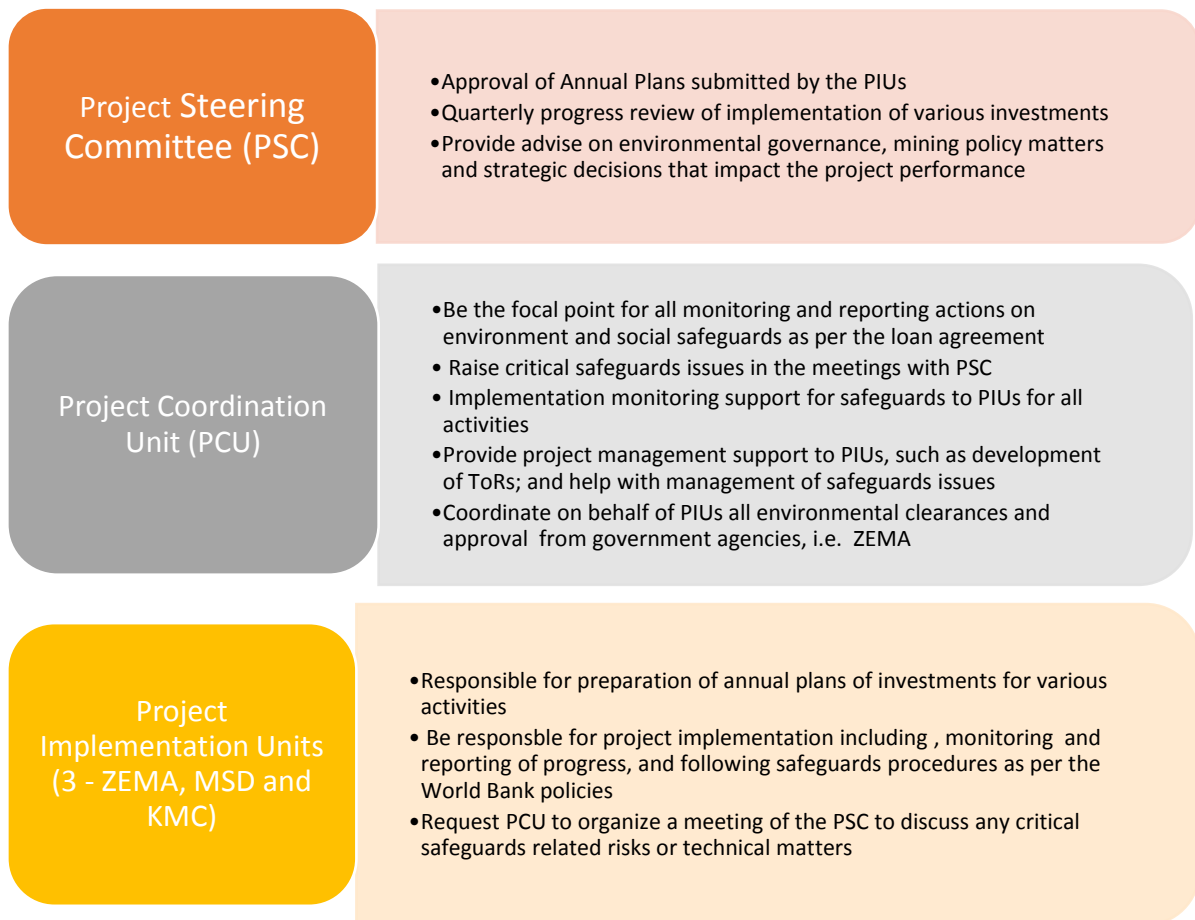


Results Monitoring and Evaluation

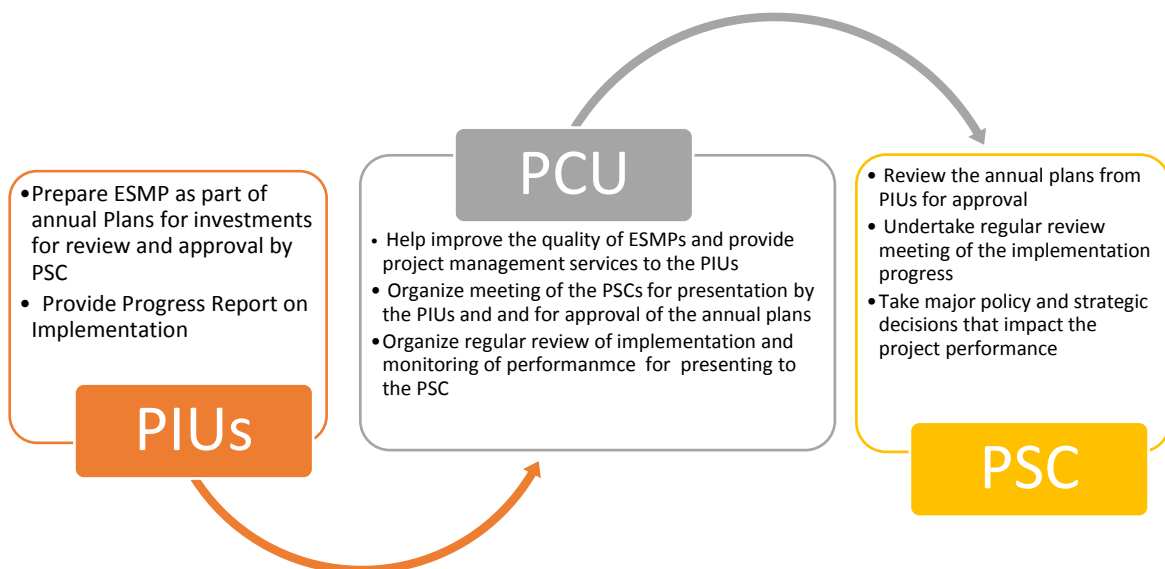
26. The PCU will coordinate with the PIUs at MSD, Kabwe MC and ZEMA to develop data collection, analysis and dissemination mechanisms to generate information on program progress. At the same time, the M&E system will be a means to generate much-needed quantitative and qualitative data on the baseline of contamination and outcomes achieved and resulting from the project level interventions. It is recognized that currently there is a dearth of good environmental health and environmental quality data in several contaminated areas, especially when it comes to demographic and socio-economic changes resulting from exposure to pollution. This undermines the ability of governments to make evidence-based policy decisions on establishing specific health impacts or assigning individual accountability. For this reason, all sub-projects will invest in the generation of new baseline data on diurnal changes in environmental quality and health impacts. Project finances will be allocated to baseline surveys, impact surveys and population profiles of communities affected by lead and other chemical pollution. The project involves improving capacity of MSD, ZEMA and Municipal Councils to monitor the results on the ground in terms of tracking environmental indicators such as quality of water, soil and health. Project-level Monitoring and Evaluation (M&E) systems will be complemented by close World Bank implementation support. The following four types of key environmental and health data would be monitored for evaluation of performance of various interventions:

Type of data	Data sources	Responsible institution
Health related: Blood Lead Levels (BLL)	Testing of blood samples by local doctors	Ministry of Health
Pollution-related (ambient pollution): Soil quality; Water quality; Air quality (lead)	Testing of soil, water and air samples	Zambia Environmental Management Agency
Jobs, livelihoods: People engaged in alternative livelihood activities	Project and activity records	Project Coordination Unit - Ministry of Mines
Compliance-related (pollution point source): Emission (soil, water, air)	Testing of soil, water and air samples	Zambia Environmental Management Agency

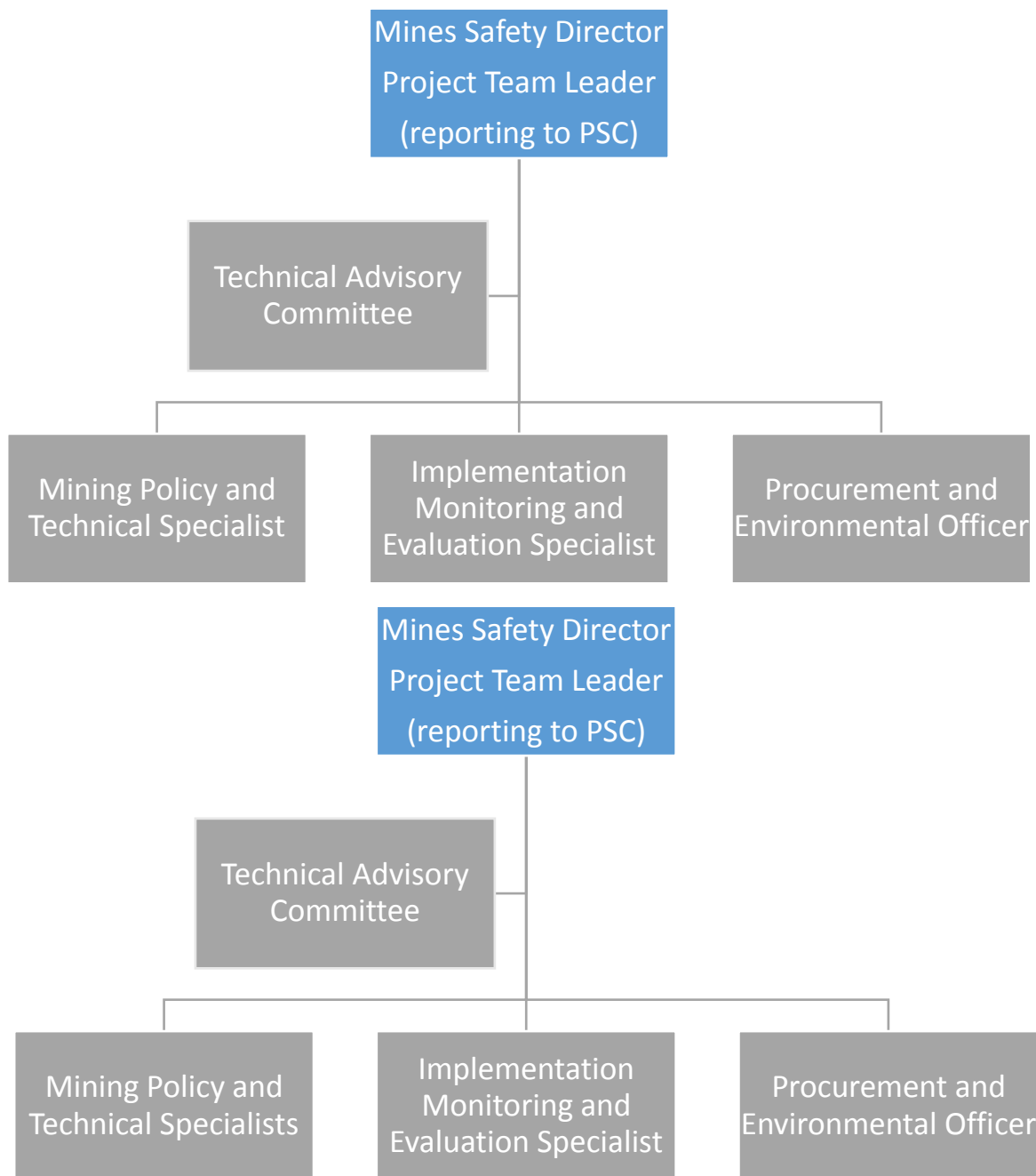
27. **Responsibility matrix of institutions during implementation.** There are three layer structure for project management – the PSC; the PCU; and the PIU. The following chart described their responsibilities and accountabilities for Environment and Social Safeguards



Organogram for Decision Meeting

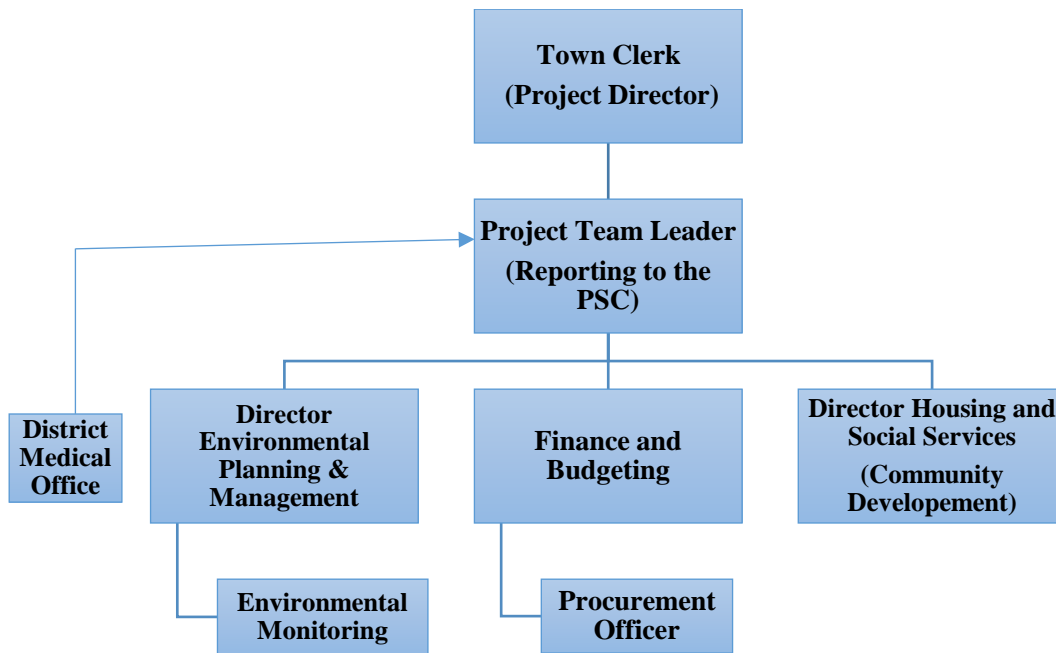


28. **Institution arrangement for PIU at Mines Safety Department in Kitwe (PIU-1).** The following chart described their responsibilities and accountabilities.



29. Institutional arrangement for PIU at Kabwe Municipal Council (PIU-2). The Project Implementation Unit at Kabwe Municipal Council would be chaired by a Project Team Leader, and supported by a team of specialists responsible for sub component on a) Environmental Infrastructure; b) Health interventions; c) Livelihood interventions; and d) Education and information interventions. The following chart described their responsibilities and accountabilities.

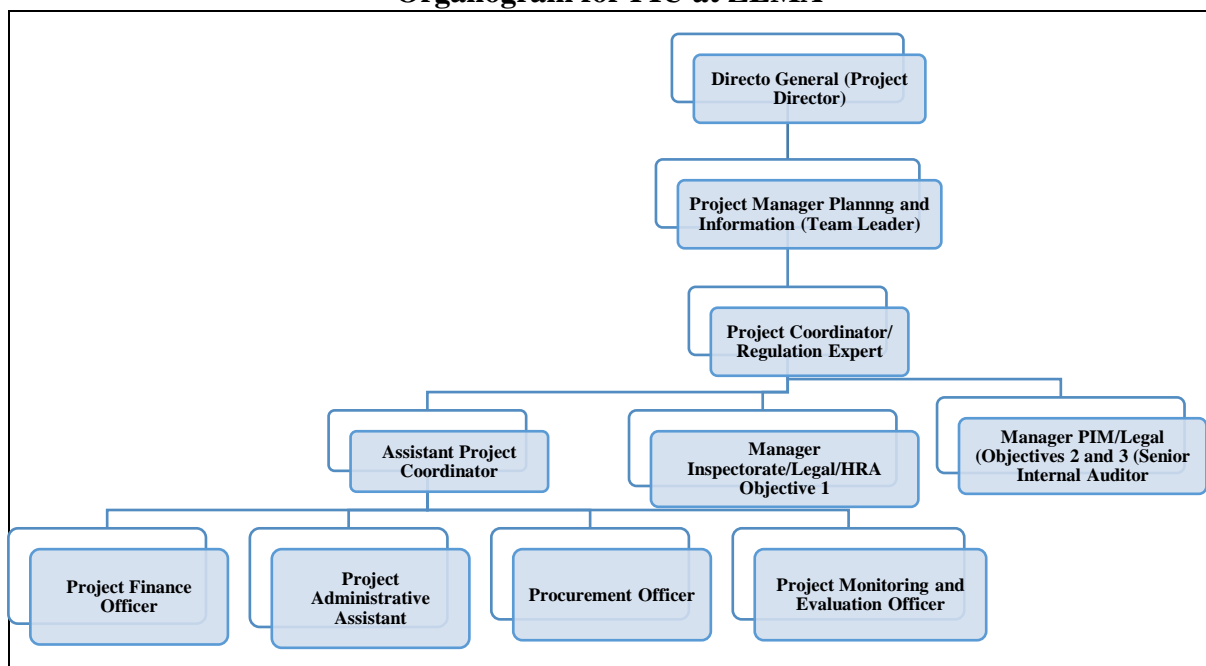
Organogram for PIU at Kabwe MC



30. Institution arrangement for PIU at ZEMA (PIU-3).

The Project Implementation Unit at ZEMA will be headed by the Director General as Project Team Leader, and supported by a team of specialists who include Manger - Planning and Information as a Project Manager assisted by a Project Coordinator. The Project Coordinator will be supported by Manager Inspectorate/Legal/HRA for implementation of Objective 1 and Manager PIM/Legal for implementation of Objectives 2 and 3. The Manager PIM/Legal will also be responsible for Internal Audit. Under the Project Coordinator will also be aassisted by a Project Finance Officer, Procurement Officer and a Project Monitoring and Evaluation Officer. The following chart described their responsibilities and accountabilities.

Organogram for PIU at ZEMA



31. Third Party Monitoring of Environment and Social Mitigation Plans. During the project implementation, the project will apply third-party monitoring tools to ensure the project’s various investments are technically, socially, and environmentally compliant. This will in particular be done by engaging NGO and community during implementation for monitoring of technical, social, and environmental compliance. The budget for environment and social monitoring is included in the project’s M&E budget at PIU level.

2.1 Review of Literature

Secondary sources of information were obtained through a review of available documents, as well as consultations held with key stakeholders on the Copperbelt, Kabwe and Lusaka. Existing literature was the primary source for describing institutional, policy and legal frameworks. From the literature, all possible envisaged environmental and social impacts were listed and evaluated based on policy and legal requirements using matrices and maps. The data on geology and soils, climate, water resources, biodiversity, human and ecosystems were obtained from existing literature.

2.2 Analysis of Baseline Environmental Data

The ESMF recognizes the existence of available environmental baseline information. This data was compiled with the purpose of describing and evaluating the current environmental status of targeted project districts in Kabwe located in Central province, while Chingola, Kitwe and Mufulira are located on the Copperbelt province. The baseline information included environmental information relevant to all project components, drawing on existing information from projects in the targeted areas. The description of the baseline environment was based on the following data:

- Physical environment: the information collected included geology, topography, soils, climate and ecosystem and hydrology.
- Biological environment: data on flora, fauna, endemic and endangered species, critical/sensitive habitats, including protected areas and reserves was collected.

2.3 Site Visits, Workshops and Field Assessments

Site visits and field assessments were intended to gather relevant data and information on the ground, as well as to fill gaps identified during literature review. Several site visits were conducted as part of the design process of the project and preparation of the ESMF, to the interventions areas in Chingola, Kabwe, Kitwe and Mufulira as well as in the surrounding districts. Field visits focused both on environmental and social assessments, workshops and stakeholder consultations (Annex 8).

2.4 Analysis of Safeguard Policies and Regulations

Projects funded by the World Bank, should fully comply with the World Bank safeguard policies and the legislation in Zambia. The relevance of safeguard policies on this project's planning and implementation of the components and associated sub-projects in Chingola, Kabwe, Kitwe and Mufulira was assessed. The World Bank Safeguard policies also require compliance to all relevant local, national and international policies and legal requirements. The Chapter 3 provides the rationale for triggering the policies. The relevant national polices and legislation have been reviewed in the subsequent Chapter 4. In the Zambian context, the Zambia Environmental Management Agency (ZEMA) is the competent authority in the approval of safeguards instruments and post-approval monitoring. Chapter 5 outlines the analytical work, management and monitoring instruments for each of the relevant policies.

stones. The Copperbelt enjoys a fair share of industries in the manufacturing sector. However, the sector, which was prosperous in the 1990s, is experiencing a slump in the supply of locally manufactured products. This zone is highly urbanised, with wage employment (in mining, manufacturing, banking, etc.) and trading representing the main livelihood options for most people. Staple food production is minimal. Its characteristic features are the high numbers of retired miners and workers/settlers whose livelihood is trading, sale of clothes and vegetables production. The Mpongwe farming system is found in the rural districts of the province, including Luanshya, Masaiti, Mpongwe and Lufwanyama, where a wide-range of starch staples including maize, sorghum, cassava and millet are grown. Cash crops such as soya beans, cotton and sunflower and, to a limited extent, coffee are also important. The stream water flows without interruption throughout the year and can be utilized for small-scale irrigation. Development of freshwater fish and aquaculture are also found.³

3.3.1 Topography

The gently undulating topography of the Zambian Copperbelt has elevations of 1250 to 1400 m. The proposed projects and subprojects are likely to be implemented within the Kafue River drainage basin, which has a well-developed dendritic drainage pattern. The headwaters of the Kafue River arise at the northern end of the Copperbelt, close to the DRC border. The area is underlain by crystalline and meta-sedimentary rocks of various lithologies and degrees of metamorphism, deposited during the Proterozoic era. The red lateritic soils in the Copperbelt generally have sandy topsoil overlying more loamy clayey subsoil. These soils are susceptible to erosion by water if soil conservation practices are not used. Because of the high rainfall in the Copperbelt, the soils are all strongly leached, have a low reserve of plant nutrients and a low base saturation. The soils are acidic with pH ranging from 5.5 - 6.1, with no discernible change in pH down to a depth of +3 m. The majority of the lateritic soils have a low fertility status. They are only suitable for climatically adapted crops under fertilization and good management⁴. The high rainfall in the Copperbelt, rather than the soils, has induced vigorous tree growth which permits the establishment of sparse ground vegetation.

3.3.2 Hydrogeology

The aquifers on the Copperbelt may be divided into two types, characterised as low yielding aquifers with limited potential and aquifers where flow is mainly in fissures, channels or discontinuities, which in turn may be divided into locally productive aquifers and highly productive aquifers. The low yielding aquifers dominate the area. They consist of Karroo Basalts and older basement rocks, which are represented throughout the Copperbelt. The locally productive aquifers consist of the Lower Roan quartzite, the Muva sediments and the Kundelungu formations, which are also distributed throughout the area. The highly productive aquifers consist of the Upper Roan dolomite and the Kundelungu limestone, which are present in limited parts of the Copperbelt only. Thus, only a small fraction of the study area is covered by highly productive aquifers. The locations of these aquifers are, however, often in the vicinity of urban centres and they may therefore represent a potential source for future urban water supply. As a result of the mining activities there is considerable interaction between surface water and groundwater. Thus, pumping from the mine shafts are in the order of one million

³ Livelihood Zones Analysis, Mukelabai Ndiyoi & Mwase Phiri, Farming Systems Association of Zambia (FASAZ), Lusaka, Zambia, in consultation with FAO, 2010.

⁴ http://eusoiils.jrc.ec.europa.eu/esdb_archive/eudasm/africa/maps/afr_zm20011_so.htm

cubic metres per day. The constant pumping creates extensive areas of groundwater draw down, which significantly affects groundwater recharge. Given the geology of the region, the principal groundwater-quality problems are likely to be pollution problems associated with metal mining. Trace metals such as copper and zinc in particular, but also chromium, nickel, cadmium and arsenic may be present in increased concentrations in groundwater and surface water affected by inputs from mine adits, slimes dams and tailings piles. Parts of the Copperbelt are potentially most vulnerable.

3.3.3 Hydrology

The Copperbelt Province is drained by several streams that ultimately discharging their water into the Kafue River, the principal river in the region. The Kafue River originates at the eastern end of the Zambezi – Congo Watershed in the Copperbelt Province, near the country's border with the Democratic Republic of the Congo and meanders generally southward as it flows close to the Copperbelt mining towns of Chililabombwe, Chingola and Mufulira, and through the outskirts of Kitwe where its tributaries receives multiple contamination sources from mining discharges that contribute to contamination of surface water and stream sediments. It then turns west near the Lukanga Swamp (which it drains). It then turns southwards or south-westwards and flows into the Itezhi-Tezhi Dam reservoir. Afterwards it turns eastwards and travel across the Kafue Flats and into the Kafue Gorge Dam reservoir. From the hydropower station, it flows through the steep Kafue Gorge before joining the Zambezi Main River near Chirundu. It is one of Zambia's major rivers and its waters are used for irrigation as well as domestic uses. Located north of Chingola on the Kafue River is the Hippo Pool a protected national monument.

3.3.4 Climate

The climate of the Copperbelt Province is controlled largely by the north-south migration of the Inter Tropical Convergence Zone (ITCZ) with seasons. The ITCZ migrates between the equator and the Tropic of Capricorn (23° S) between November and February. In winter, it is located over the northern tropics. The summer rains are brought by the southward migration of the ITCZ, and are characterized by thunderstorms, which are occasionally severe, with excessive lightning and sometimes hailstorms. Total annual average rainfall is approximately 1,309.1mm, with the majority falling during the summer months of November to April. Annual evaporation exceeds the average annual precipitation in the Copperbelt region with an average evaporation of approximately 2,073mm against the average precipitation of 1,309.1mm. On month-by-month basis evaporation exceeds precipitation for three quarters of the year. The mean annual temperature measured is 19.1 °C, experiencing warm to hot summers, reaching 31.9 °C in October and warm winter days, but cold at night. The predominant wind direction in the Copperbelt is northeast to southwest.

3.4 Kabwe

Kabwe was once the centre of economic activities in Central Province. However, the closure of the lead mines in 1994, resulted in nearly 1,200 direct job losses and an additional 5,000 jobs by contractors. Other manufacturing industries including the Zambia-China Mulungushi Textiles plant established with Chinese investment in the 1980s, also closed at the beginning of 2007 after suffering huge losses. As the headquarters of Zambia Railways, additional jobs were lost due to the concession of Zambia Railways. The local economic activities such as Kabwe Industrial Fabrics, pharmaceuticals, milling and Dunavant cotton ginning, and leather tanning were directly impacted by the closure of the mine and non-performance of the Zambia Railways. However, the area is slowly awakening economically with the opening of steel factories, expansion of the Lunsemfwa Hydro Power Company, revamping of Zambia

Railways, recapitalisation of Sable Zinc Kabwe by Glencoe and the proposed KLRP Copper Cement Plant on the mine site. Kabwe has a developing agriculture sector and a well-developed infrastructure system including road and railway networks, schools, hospitals, recreational facilities, and an industrial area.

3.4.1 Climate

The town of Kabwe lies in the tropical zone but the climate is governed by its relatively high altitude above mean sea level (in excess of 1,100m. Three climatic seasons are distinguished – a rainy season, a dry cool season and a warm season. The rainy season lasts from about the beginning of November and lasts up until the end of April and is characterized by torrential rains and frequent thunderstorms. The dry cool season begins in the first half of May and continues until the end of August accompanied by breezes. Precipitation during this season is negligible. The warm season lasts from September until the end of December. Rainfall frequently occurs in heavy thunderstorms producing precipitation events of 20 to 40mm. Temperatures are defined by the two distinct seasons. The lowest temperatures occur in June and July when temperatures vary between an average minimum temperature of 9.0°C and an average maximum of 24.0°C. The predominant wind direction in Kabwe and around the mining townships is from the southeast direction. During the wet summer months and particularly during storm activity the wind direction may temporarily shift to the west and northwest directions. South-easterly to easterly winds with a speed of 52 m/s most of the times prevails across the area especially during storm events. (African Mining Consultants, 2013)

3.4.2 Topography

Kabwe lies on a plateau between 1,180m and 1,210m amsl on a slight but noticeable, NW-SE trending dolomite ridge. The topography of the land to the north and south of the ridge is generally flat and poorly drained with extensive dambos (wetland areas). One of these dambos is the Reed Dambo that forms part of the source of the Muswishi River (African Mining Consultants, 2013). All surface water drains into the Muswishi River, a tributary of the Mulungushi River. The Mulungushi River flows into the Lunsemfwa River which is drained by the Luangwa River the tributary of the Zambezi River.

The geology of the Kabwe area is poorly exposed with few rock outcrops, except for the original mineralised kopjes. A stratigraphic record has evolved from exploration work over the last 95 years and can be seen in Figure 4 below. Rock formations range in age from the Basement Complex (oldest) to the Upper Kundelungu (youngest). The Basement rocks consist of early Pre-Cambrian granite-gneisses and late Precambrian quartzites. The Basement Complex is estimated to be between 2680 and 2050 million years old. There are three lithotypes present at Kabwe:-

- Coarse porphyroblastic gneiss with feldspar porphyroblasts of several centimetres in length, generally growing across the foliation in a groundmass of quartz, feldspar and biotite;
- Granoblastic medium-grained recrystallized gneiss of quartz feldspar and biotite; and
- Coarse pegmatite gneiss.

The granite-gneiss is not exposed in the Kabwe mine area, and the nearest outcrop is 5km east of the mine. Outcrops of late Pre-Cambrian quartzite's and schists occur to the south of the mine site. The Katanga Supergroup is solely represented by the Roan Group in Kabwe. It consists of a succession of quartzite and schist overlain by a pelite dominated succession. A metacarbonate unit, Kabwe Massive Dolomite, within the quartzite and schists hosts the lead and zinc deposits. It is also responsible for the Chiwanda deposits which are 6km west of Kabwe. Major structures are developed in a SW-NE orientation in Kabwe, such as the

Chitakaka Antiform in the north and the Sebembere and Kabwe Mine Synforms in the northwestern and south-eastern dolomite outcrops respectively (African Mining Consultants, 2013).

Figure 4: Geology of Zambia including areas around the Copperbelt and Central Provinces.

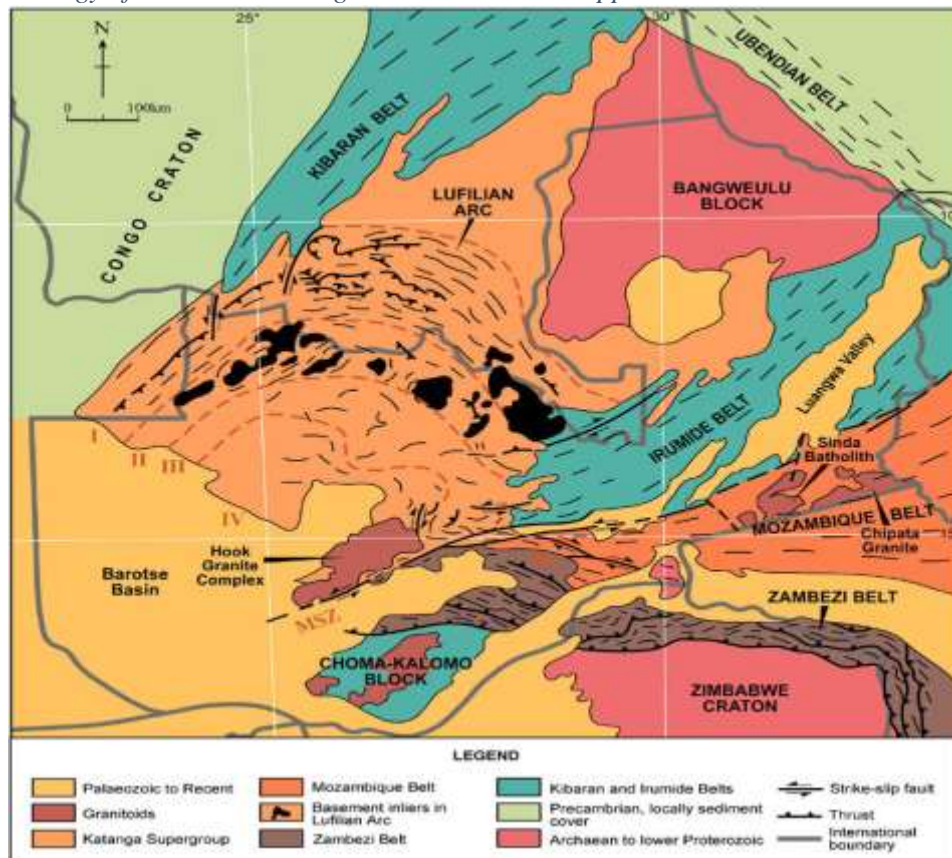


Figure 5: Geology of Zambia including the Copperbelt and Central Provinces

3.4.3 Hydrogeology

Kabwe town lies on the boundary of the Kafue and Lunsemfwa watersheds and is underlain by rocks of the Basement Complex. The Basement Complex does not yield significant quantities of ground water. The main aquifer is the Central Dolomite Aquifer, usually referred to as the Makululu Aquifer. The Makululu Aquifer supplies the former mine townships. Domestic water supply for Kabwe Municipality is pumped from Kalulu water field in the west of the Central Dolomite Aquifer. It is supplemented by the Mulungushi dam. The water table fluctuates between 4 and 8m below ground level during the wet and dry seasons respectively.

3.4.4 Hydrology

The terrain in the environs of Kabwe is slightly undulating with an altitude of 1100 – 1200 m a.s.l. Kalulu hill (1223 m a.s.l.) located 10 km north of the town is the highest point in the whole area. The terrain slopes gently from the Kalulu hill in all directions giving rise to a radial drainage pattern consisting of small streams that have their source in this area and form part of the catchment of the Kafue and Lunsemfwa rivers (see Figure 6 below).. The major stream in the town is called the Mine Canal into which mine waters from the closed Kabwe Mine (formerly Broken Hill) are emptied. Waters drain from the Mine Canal into large marshes east of the town and then are discharged into the Muswishi River (Czech, 2008).

3.5 Flora and Fauna

Kabwe and Copperbelt Province

Ecologically, the study area falls in part of the Miombo Eco-region which associated with high rainfall, more than 1,000mm/annum and well developed Miombo woodlands. The common vegetation which covered the area before the infrastructure development took place was mainly Miombo woodland made up of *Brachystegia boehmi*, *Brachystegia longifolia*, *Julbernardia paniculata*, and *Isoberlinia angolensis*. Other associated woodlands are Lake-Basin Chipya, Swamp and Riparian forests found in the Kafue Headwaters. Generally the plant diversity of the Copperbelt province is estimated at between 600 to 700 plants with the woody component representing almost 30%. The ecoregion has suffered extensive deforestation, especially in the highly urbanised areas due to charcoal production and clearing for farming.

Mammals

Kabwe and the Copperbelt Province being mostly urban and industrialized part of Zambia's lacks wildlife, except rodents and rabbits and in the south-west where in flooded grassland habitats interspersed with miombo woodland (see Figure 6 below).

Birds

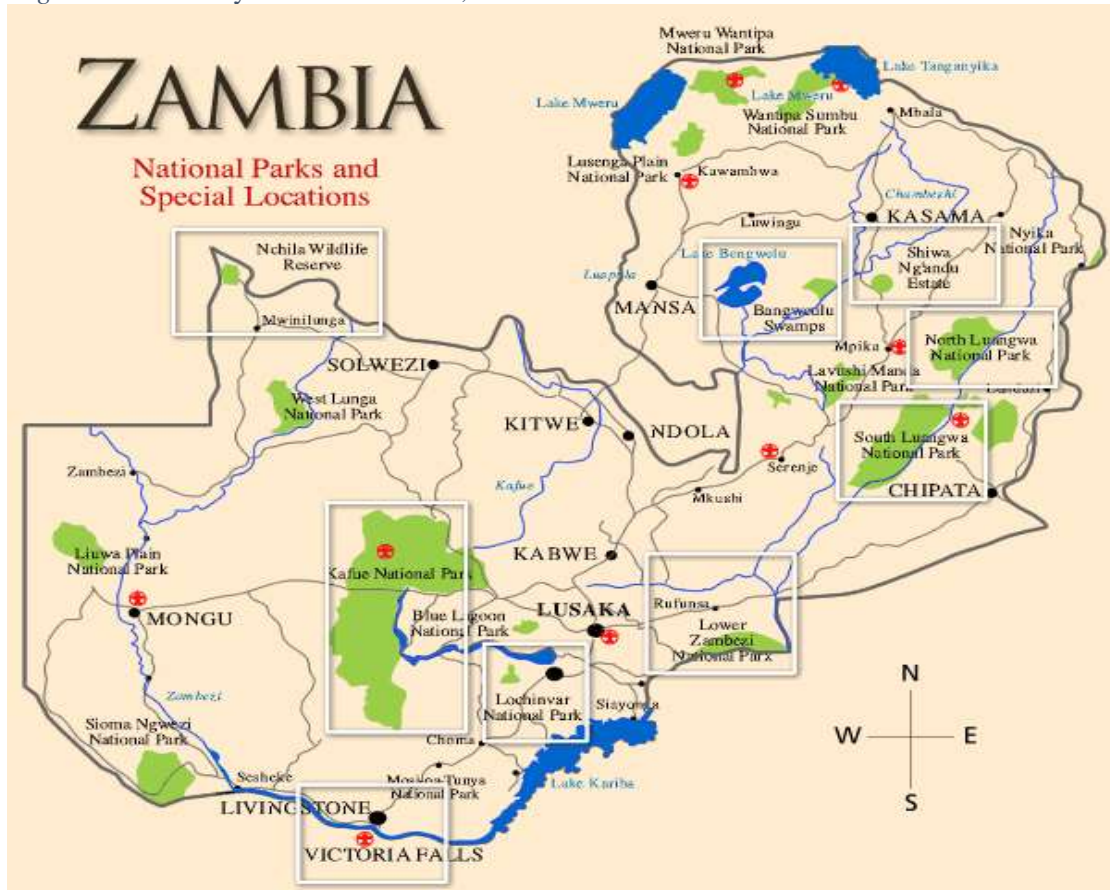
Since the area covers both the plateau and the valley, both waterfowl and woodland bird species are common. Woodland bird species common in the area. A great threat to birds and other biodiversity in general is the continuing erosion of quality and extent of habitats across entire landscapes. The loss and degradation is driven by increasing intensity of human uses of the environment. According to criteria established by Birdlife International, the following list describes the birds recorded in Zambia. However, the project activities are not expected to cause any adverse direct or indirect impacts on existing avifauna population in the project area.

- Extinct: none
- Threatened: critical: none
- Threatened: endangered: White-winged Flufftail, Black-cheeked Lovebird
- Threatened: vulnerable: Slaty Egret, Cape Vulture (only a migrant to Zambia), Lesser Kestrel, Taita Falcon, Corn Crake, Wattled Crane, White-chested Tinkerbird (may be aberrant Golden-rumped Tinkerbird), Blue Swallow, Papyrus Yellow Warbler
- Near-threatened: Madagascar Squacco Heron, Shoebill, Lesser Flamingo, Pallid Harrier, Black-winged Pratincole, Great Snipe, Chaplin's Barbet, Grimwood's Longclaw, Churring Cisticola.

Reptiles

Reptile species that occur in many part of the Copperbelt Province and Kabwe include representatives of the lizards, chameleons, tortoise and various species of snakes, such black mamba (*Dendroaspis polylepis*), black-necked spitting cobra (*Naja nigricollis*), Boemslang (*Dispholidus typus*), and puff adder (*Bitis arietans*). The Nile crocodile (*Crocodylus niloticus*) and water monitor (*Varanus niloticus*) are also present in some rivers. The map below shows national parks, rivers and lakes across Zambia and the proximity to the project sites in Kitwe – Copperbelt Province and Kabwe.

Figure 6: Proximity of National Parks, Rivers and Lakes to the Kitwe and Kabwe



Sourced from <http://victoriafalls24.com>

Fish

The only fish species found are Philander, these are robust species and survive in most aquatic environments. The streams and rivers in the area have a variety of fish species which are caught by fishermen, although the fish stocking levels are low. Common fish species include barbel fish (*Clarias gariepinus*), red breasted bream (*Tilapia rendalli*), dwarf bream (*Taplochromis philander*) and green headed bream.

Aquatic Resources

The aquatic resources in the vicinity of the project area revolve around the Kafue River, which flows north to south, to the east of the project area, as illustrated on Figure 6. The Kafue tributaries responsible for the drainage of the project area are the Kitwe, Uchi and Chibuluma Streams. All of these streams with the exception of the Kitwe Stream which originates in a dambo area, drain from developed areas with inputs from storm water drains, tailings dams and process water effluents from mine operations at MCM and KCM. The fish in the streams and rivers in the Copperbelt area are primarily bream, barbel fish, and catfish and tiger fish. While a detailed survey of aquatic resources has not been carried out for this phase of the work, it is considered that the fish populations are likely to have been threatened by polluted water associated with poor quality discharges from the mine operations.

3.6 Soils

The soils in the Kabwe area generally belong to the lixisols soil group. Acrisols and Lixisols are amalgamated lixisol group. Lixisols are located in the drier parts of Kabwe while acrisols are found in the wetter areas. They are characterised by increasing levels of clay with increasing

depth in the soil profile. Clay is washed through the profile and accumulates at depth. The soil depth and permeability is usually determined by the underlying rock formations. Soils derived from acidic rocks of the Basement Complex and the Lower Roan schists, are shallow and well drained. These Sandveld type soils are light yellowish brown in colour and sandy, with clay content increasing with depth. Soils derived from the Roan Dolomites, which underlie the Kabwe mine site extend to 30m depth, are less well drained and darker in colour. Both soil types have a sandy-loamy upper horizon and illuviated clay in subsurface horizons. The soils are moderately leached and prone to rapid erosion if left exposed or unprotected. Soils in the low lying dambo areas (wetlands) are clayey, poorly drained and waterlogged during the summer months. One specific dambo area is the Reed Dambo through which the runoff from the mine site is filtered. The geochemical composition of soils is controlled by the spatial influence of mineralisation and laterite development (Lead – Zinc Project, 2013). Three conditions appear to exist in the Kabwe area:-

- There is natural lead and metal enrichment in the soils due to gossan development over the deposits in Kabwe;
- There is a geochemical anomaly in the soil orientated to the E-W which elongates to the west of the mine site; and
- Laterite development occurs at or near the surface on the mine site and continues westward. This encourages the enrichment of heavy metals associated with hydrous oxides of iron, manganese and aluminium. There appears to be elevated lead concentrations where laterite is exposed at the surface.

3.6.1 Lead, Zinc and Cadmium Levels in the Dolomite Host Rocks

Geochemical analysis of the dolomitic host rocks of the Kabwe area indicates background metal levels of 0.02% lead, 0.1% zinc and 0.005% cadmium. The near surface lateritic soils formed by the tropical weathering and leaching of the limestone rocks are likely to have natural lead, zinc and cadmium levels similar to or lower than those of the host rock. The average crustal abundance of lead, zinc and cadmium in the earth's limestone rocks is 0.008% lead, 0.0025% zinc and 0.00001% cadmium respectively. The above background metal levels for the Kabwe rocks and the earth's crust indicate that the lead, zinc and cadmium levels recorded in the near surface soils around the Kabwe mine are elevated. Sources of metal contamination found in the Kabwe surface soils are spatial distribution and concentration of metal levels strongly reflect the prevailing east and south-east wind direction. There are three principal sources of metal contamination in soils. All three sources are related to mining activities. These sources are:-

- particulate emissions from smelter stacks
- fugitive dust from the tailings dumps and plant area, and
- dumping of mineralised waste rock

Particulates emitted from the Kabwe mine smelter stacks have been deposited onto the surrounding land over several decades and are likely to have affected the health of inhabitants and flora and fauna in the area. Fugitive dust from the dried out leach residue tailings is picked up by strong southeasterly winds and carried into the Kasanda Township area and beyond. Low grade mineralised waste rock has been dumped in the Kasanda Township. Part of the township is built over waste rock. Dumping of waste rock over many years has probably contributed to the elevated metal levels in the surface soils. In 1994 a computer air dispersion model was developed to estimate the extent of air borne particles at Kabwe mine. The computer model was used to predict the ground level concentrations at specified distances from the smelter stacks. Modelling indicated that maximum ground level concentrations (100%) would occur about 800 metres from the base of the stack in a north-westerly direction. At 5,600 metres

distance from the stack concentrations dropped to 36% of the maximum level. The computer model confirmed that the highest ground level contamination was likely to occur in the Kasanda Township (Lead – Zinc Project, 2013).

3.6.2 Near Surface Soil Contamination in the Kabwe Plant Area

In 1994 a geochemical soil survey was undertaken in the Kabwe Mine Plant Area to determine the level of metal contamination there. Soil samples were taken at 40 locations across the site at depths of 0 to 0.1 metres and 0.5 metres. The mean lead, zinc and cadmium surface soil values (top 10cm) were Pb 6.4%, Zn 8.3% and Cd 0.0095% respectively. At 0.5 metres depth the mean metal values were Pb 1.9%, Zn 2.3% and Cd 0.0033%. The results indicate the plant area soils to be heavily contaminated with lead and zinc and to a lesser degree cadmium. The high level of contamination is attributed to plant spills and upsets, leaks, general poor house-keeping, fugitive windblown dust from dumps and stack emissions.

Contamination of Stream Sediments

Kabwe mine water, plant area surface runoff and plant effluent from the 1940's until now is discharged into the Mine Canal. The Mine Canal conveys effluent away from the mine area and into the upper Muswishi River which starts several kilometres downstream from the mine site. Solids contained in plant effluent have settled and accumulated in the canal for over 50 years. In the 1980's and early 1990's the canal was dredged and the sediments dumped alongside the canal for collection and reprocessing in the plant. Approximately 500 tonnes (about 1,000 tonnes has been collected during ZCCM-IH CEMP programme) of fine sand and silt material has been deposited along the 5 kilometre canal length. In 1994, four samples of dredged material from the canals were analysed for lead, zinc and cadmium content, and their leaching potential. The four sediment samples exhibited higher metal levels than all other waste and soil samples collected across the mine site and surrounding areas (30% lead and 25% zinc). Leachate tests indicated that the zinc is soluble and readily leached from the dredged material. Test results indicated that the lead and cadmium contained in the dredged material had little or no leaching potential. The presence of lead in dredged sediments is still a cause for concern for Katondo and Chowa Township residents living close-by the canal, and children playing in the area (Lead – Zinc Project, 2013).

3.7 Air Quality

Copperbelt Province and Kabwe

The major sources of air pollution on the Copperbelt and Kabwe are smelters, acid plants and refineries, mining and quarrying, construction, other industries, motor vehicles and forest burning. The major industries that contribute to air pollution include, the smelters at Chambishi, Mufulira and Chingola, Ndola Lime Company and Larfarge Cement (Ndola Works). Others are tanneries and food processing industries. Major pollutants include sulphur dioxide (SO₂), oxides of nitrogen (NO_x), particulate matter, carbon monoxide (CO), dust, Carbon dioxide, offensive odors and black smoke. However, seasonal variation as well as localized and temporal deterioration in air quality does occur. Grassland and forest fires, charcoal production and traditional *Chitemene* slash and burn agriculture during the dry season generates smoke and dust. This smoke hangs over the area and forms a distinctive haze. The haze layer is mainly visible from the air and worst during the coolest months (June and July) when temperature inversions tend to trap the smoke near ground level. The haze lasts until the arrival of the rains in November. Localized and temporal air quality deterioration is also associated with village domestic fires. Vehicular emission also contributes to increased air pollution. Charcoal production, bush clearing for agricultural purposes and bush fires are the

other major sources of smoke that affects the quality of air in the Copperbelt Province and Kabwe.

3.8 Environmental and health impacts linked to copper mining operations in the Copperbelt

Copper smelters have been responsible for substantial amounts of Sulfur Dioxide (SO₂) emissions into the atmosphere, which have caused acid rain, soil erosion, crop damage and air and water pollution. The contamination from ongoing mining operations, in further aggravated by wind-borne dust particles (from dry tailing dams) resulting in accumulation of metals (copper and cobalt and other elements) in soil. Most of the Copperbelt has 50 times higher concentrations of copper in surface soil than in subsurface samples⁵, while SO₂ concentrations in the air range between 500 and 1000 µg/m, well exceeding the Zambian guideline of 50 µg/m³⁶. Particulate matter less than 10 µm in size (PM10) originating from smelters, and dusting of tailing dams and unpaved roads have left significant environmental impacts resulting from exposure to acidic fumes. It is estimated that in the early 2000s, the total SO₂ emissions in Zambia was 346,700 ton/year, of which the mining industry (mostly the copper smelters) contributed to over 98%. Areas northwest and west of the large Nkana and Mufulira smelters have SO₂ concentrations between 500 and 1000 µg/m, which exceed the Zambian guideline of 50 µg/m³⁷. This is the case with most residential areas in the Copperbelt cities of Mufulira and Kitwe.

The Kafue River has shown highly elevated concentrations (<0.45 µm) of dissolved copper and cobalt within the mining areas. Leaves and roots of cassava and sweet potato grown in the contaminated areas of the Copperbelt contain elevated metal concentrations⁸, while backyard vegetables gardens are affected by necrosis due to accumulation of heavy metals in the soil and SO₂ on plant leaves. A study of SO₂ concentrations in flue gases and on the bark of the Australian red cedar in the Copperbelt showed levels of 1,402 µg/m³ in raw flue gases (exceeding the threshold value of 1,000 µg/m³) at almost 25 km away from the emissions source⁹. Copper smelting activities on the Copperbelt result in atmospheric emissions between 300,000 and 700,000 tons/year, far exceeding the WHO limit of 125,000 tons/year¹⁰. Surface soil samples contain ten 50 times higher concentrations of copper than subsurface samples in most of the Copperbelt. Recent incidents of accidental breaks in leaching tanks of mining companies resulted in over 100 hectares of maize and vegetable crops being destroyed by SO₂ emissions along the Kitwe-Chingola roads on the Copperbelt¹¹. Root crops tend to generally contain more lead than leaf or fruit crops. In the less contaminated areas of the Copperbelt, only leaves of cassava and sweet potato contain elevated metal concentrations. However in heavily contaminated soils, even the roots showed high metal concentrations. People residing in some areas in Kitwe on the Copperbelt are unable to grow backyard vegetables gardens, which are being affected by necrosis due to accumulation of heavy metals in the soil and SO₂

⁵ Air Pollution on the Copperbelt Province of Zambia: Effects of Sulphur Dioxide on Vegetation and Humans: Ncube et al; School of Mines and Mineral Science, Copperbelt University, 2012

⁶ Towards better environmental management and sustainable exploitation of mineral resources : Joanna Lindahl; Geological Survey of Sweden, July 2014

⁷ Ibid

⁸ Ibid

⁹ Air Pollution on the Copperbelt Province of Zambia: Effects of Sulphur Dioxide on Vegetation and Humans: Ncube et al; School of Mines and Mineral Science, Copperbelt University, 2012

¹⁰ Ibid

¹¹ Lusaka Times, January 2013

on plant leaves¹². The project will explore interventions to demonstrate livelihood opportunities and treat soils in areas affected by Sulphur dioxide contamination.

3.9 Environmental and health impacts linked to lead mining operations in Kabwe

The old mining town of Kabwe show unacceptably high levels of lead in the soil due to past lead mining in the area. While the closure of several old lead smelters and mining operation in 1994 resulted in loss of employment and income generation opportunities, it also left an unattended legacy of unhealthy environment in certain parts of Kabwe town. The content of lead¹³ in soil in certain areas is as high as 26,000 mg/kg in most polluted areas and generally land up to 14 km from Kabwe has been found to unsuitable for agricultural purposes¹⁴. Studies done in 2003-2006 found median concentrations of high concentrations of lead in catchment areas of Kabwe Kasanda (3008 mg/kg), Makandanyama (1613 mg/kg), Chowa (1233 mg/kg), Mutwe Wansofu (1148 mg/kg), Makululu (870 mg/kg) and Luangwa (507 mg/kg) all exceeding recommended levels for residential areas (< 400 ppm)¹⁵. The residual environmental health problems in Kabwe are serious due to such widespread lead contamination. It is estimated that tens of thousands of residents (including more than 3,000 children) may be affected by high lead levels in the soil, both from naturally occurring mineralization and the impact of the smelting and reprocessing of existing tailings. The Figure 7 shows interpolated distribution of lead in soil in Kabwe¹⁶. More recent data from 2015 show that the situation in Kabwe has not changed in last 5 years. The townships next to the mining areas still have lead levels in soil. Surface soil lead concentrations ranged from 139 mg/kg to 62,142 mg/kg, with a geometric mean concentration of 1470 mg/kg. Of the 339 soil tests, 86 readings (25.4%) showed concentration more than 400 ppm¹⁷. Data show that in one affected residential area, Chowa, the lead contamination differ from compound to compound considerably (400-5000 mg/Kg), possibly due to different contamination levels, e.g. use of contaminated soils indoors/outdoors, and/or different past remediation.

¹² Lindahl: Czech Geological Survey 2007

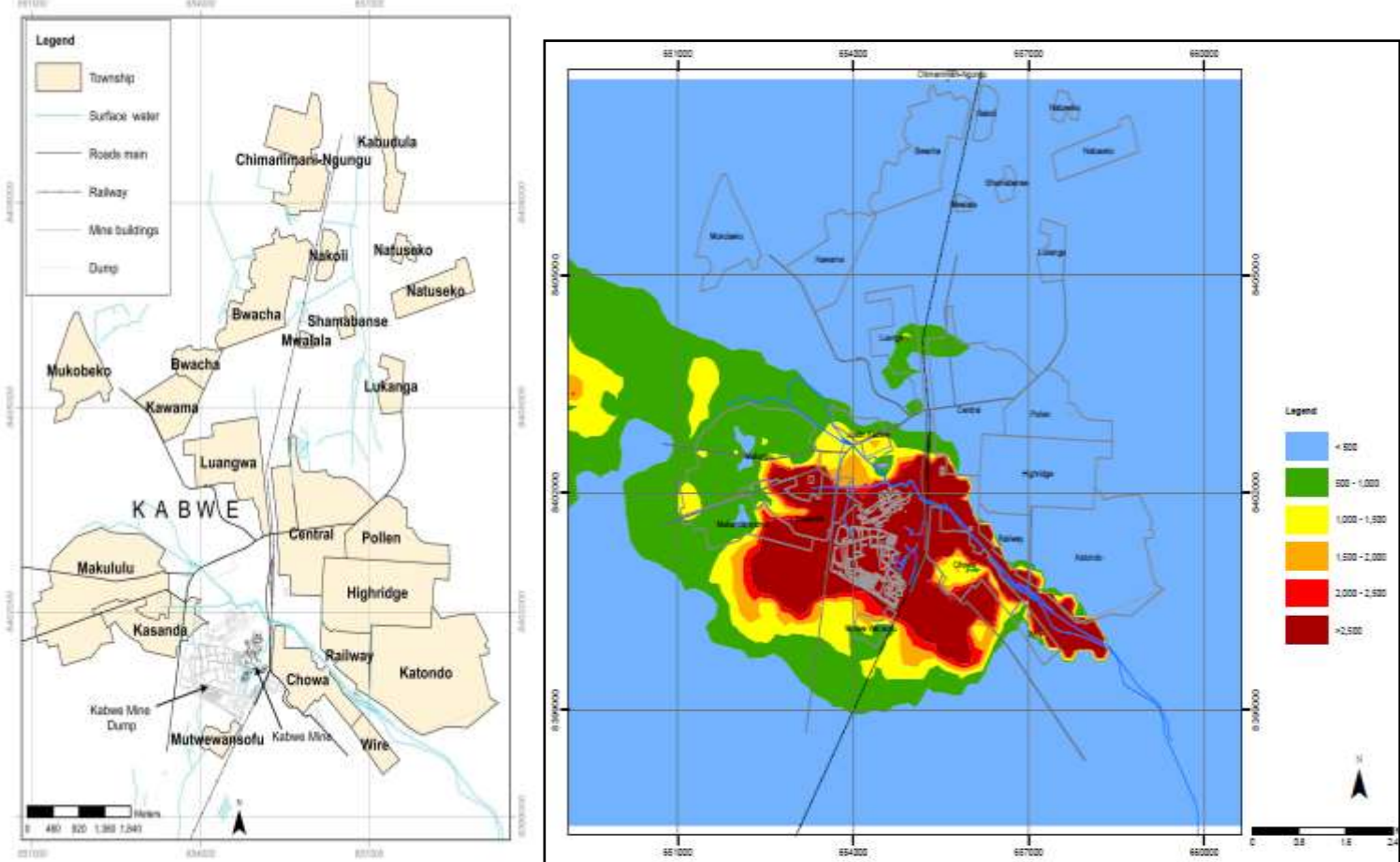
¹³ Lead is a toxic substance and chronic exposure causes serious negative health effects. Main sources of lead exposure are in general: lead from an active industry, such as mining and smelting via contaminated soil; lead contamination as a legacy of historical contamination from former industrial sites via lead contaminated soils; drinking-water systems with lead solder and lead pipes; lead-based paints and pigments; and lead in electronic waste (e-waste)

¹⁴ Ibid Czech Geological Survey 2007

¹⁵ Studies undertaken under the previous Bank funded Copperbelt Environment Project (CEP)

¹⁶ Baseline study under CEP

Figure 7: Interpolated distribution of lead in soil in Kabwe



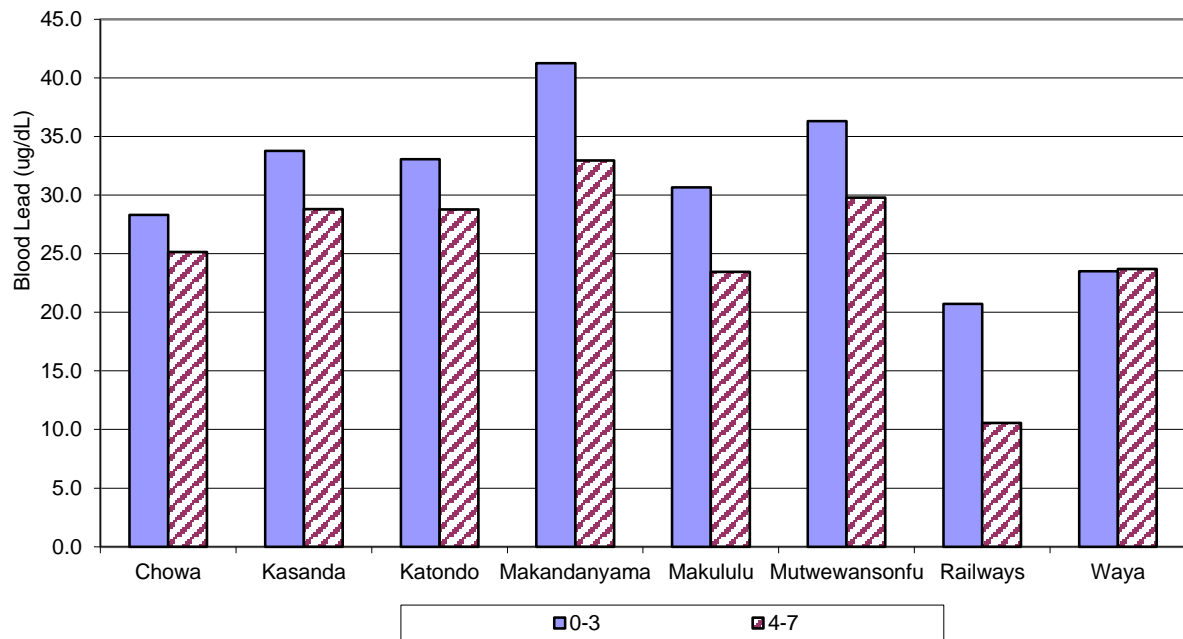
High lead concentration in soil is reflected in high Blood Lead Levels (BLLs) of Kabwe residents. The dominant exposure pathway for lead has been found to be airborne and from direct ingestion of soil and dust, with extended pathways through groundwater or surface water and irrigated crops. A study done in 2013 indicated mean concentrations of lead and cadmium in tissues of free-range chickens exceeded maximum recommended levels for human consumption in contrast to lower levels in commercial broiler chickens. Atmospheric lead pollution has been found to be a major contaminator of food crops in Kabwe, particularly maize, which is the primary staple food crop grown in backyards.

Lead is a silent killer, which results in non-specific clinical conditions such as abdominal pains, neurological symptoms, seizures, anemia, headaches etc. While there is lack of systematic data on health impacts, local health officials in four critically contaminated catchment areas in Kabwe reported high numbers of such clinical conditions, especially in children below 15 years (see Figure 8).

It is estimated that more than 15,000 residents (including more than 3,000 children) may still be affected by high lead levels in the soil, both from naturally occurring mineralization and the impact of the smelting and reprocessing of existing tailings (see Figure 8). Lead contamination¹⁷ is particular concerning for young children as it affects cognitive development and can cause serious health problems, including death in serious cases. The public health risks fall disproportionately on the poor, and in particular on the vulnerable population including the women and children who are exposed to toxic pollution and live in poor, degraded and abandoned mining areas. Although acute lead poisoning of young children has been the most immediate and severe consequence, older children, adult workers, pregnant women and their unborn children, and breastfeeding infants are also at risk.

¹⁷ Exposure to lead has many known health effects, which include neuropsychological impacts in children (developmental and behavioral problems, lower IQ, attention deficit disorder, learning problems, and anemia) and increased blood pressure and cardiovascular disease among adults, chronic kidney disease, anemia and gastrointestinal symptoms. Anemia and gastrointestinal symptoms generally occur at high blood lead levels (BLL), e.g., greater than 60 micrograms of lead per deciliter of blood ($\mu\text{g}/\text{dL}$). The residual environmental health problems in Kabwe are still serious due to widespread lead contamination. It is estimated that tens of thousands of residents (including more than 3,000 children) may still be affected by high lead levels in the soil, both from naturally occurring mineralization and the impact of the smelting and reprocessing of existing tailings. Air pollutants, such as SO_2 have a correlation with respiratory problems. Children, the elderly and those already suffering from respiratory ailments such as asthma are especially at risk.

Figure 8: Blood Lead Geometric Mean by Age Group for Each Community in 2007



While lead is the primary contaminant of concern in Kabwe, there are also high levels of Cadmium and Arsenic in the soils and sediments in some catchment areas. Studies have indicated levels amounting to about 18.7 and 51.5 mg/kg dry-wt, respectively, which could have potential for poisoning, as the trigger values are higher than internationally recommended guidelines. (USEPA: 35 mg/kg dry weight in sediment and 10.0 mg/kg respectively)¹⁸. Lesser but still significant pathways (and problematic) include consumption of water and contaminated foodstuffs. Certain types of plant species are capable of acting as lead pollution pathways, but the quantity of lead uptake varies according to type of plant and species and different root systems and amount of soluble lead available. Root crops tend to generally contain more lead than leaf or fruit crops. Even in areas, like Kabwe, where there is relatively low levels of soluble lead, atmospheric lead pollution is a major contaminator of food crops, particularly maize, which is the primary staple food crop and often grown in backyards. Soils used to make adobe bricks (from ore washing areas) also have the potential of having lead levels as high as 58,900 ppm¹⁹. A recent study revealed the presence of large quantities of lead and cadmium in edible organs of free-range chickens in Kabwe, with mean concentrations of 7.62 mg/kg and 3.51mg/kg respectively (exceeding the maximum recommended level of 0.5mg/kg of lead in offal for human consumption and 1.0mg/kg of cadmium in chicken kidneys)²⁰. Mean lead levels in liver and kidneys of cattle in Kabwe was found to be 0.42mg/kg and 0.58mg/kg (dry weight) respectively²¹.

3.10 Socio-Economic Baseline of Kabwe and Copperbelt Province

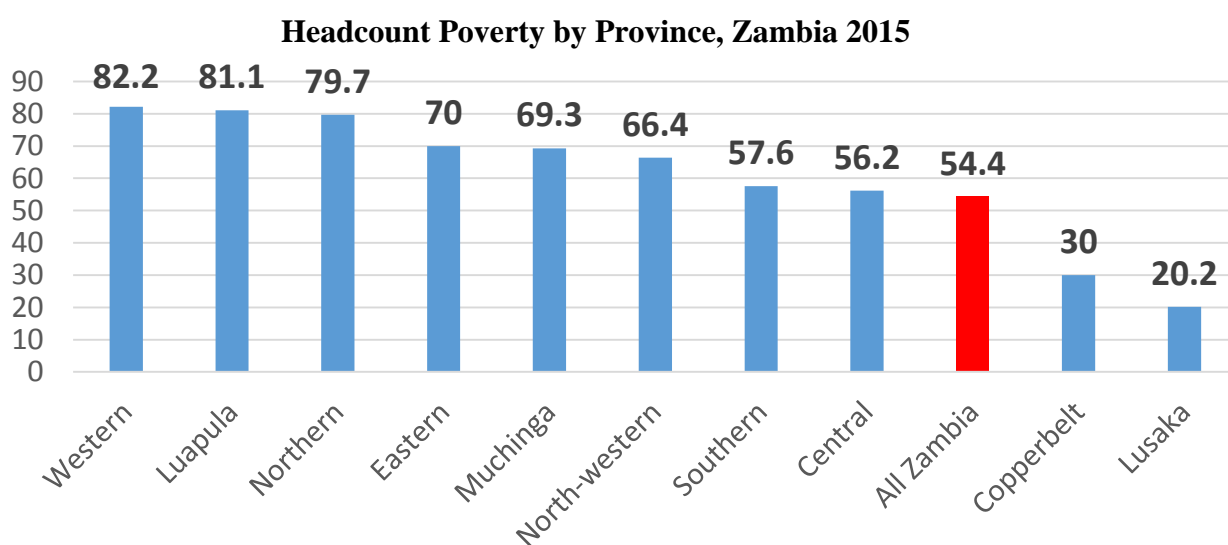
¹⁸ Heavy metal contamination of soil and sediment in Zambia: Ikenaka et al; October 2010

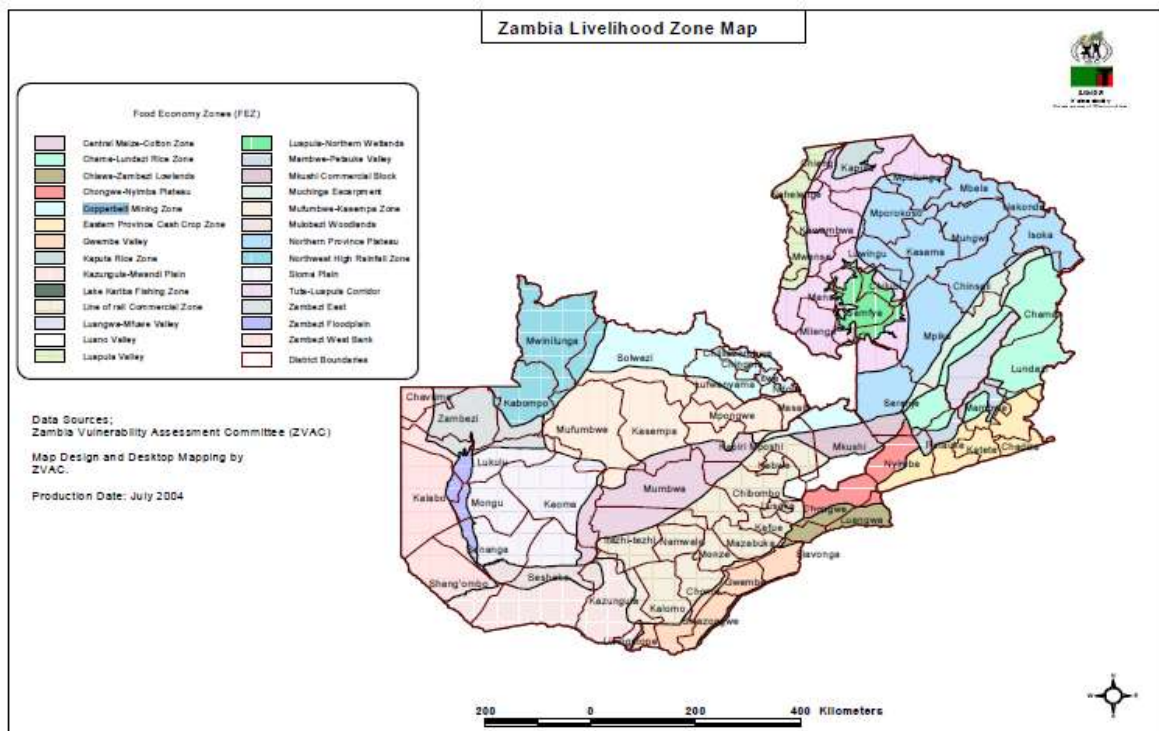
¹⁹ Ibid

²⁰ Metal distribution in tissues of free-range chickens near a lead-zinc mine in Kabwe, Zambia: John Yabe et al 2012.

²¹ Uptake of lead, cadmium, and other metals in the liver and kidneys of cattle near a lead-zinc mine in Kabwe, Zambia: John Yabe et al 2011

District	Pop census 2010	Pop projection 2016
Kabwe	1,307,111	1,557,000
Kitwe	517,543	668,668
Chingola	216,626	266,478
Mufulira	162,889	188,444





Zambia Vulnerability Assessment Committee September 2004

Copperbelt Province: This zone is highly urbanised, with wage employment (in mining, manufacturing, banking, etc.) and trading representing the main livelihood options for most people. Staple food production is minimal. Copper mining is the main economic activity in the zone, although due to the recent sale of mines, a number of people have been retrenched and have migrated to other zones however new buyers of the mines are increasing operations in the southern and eastern parts of the zone. Apart from mining other common livelihood activities are charcoal burning and game, the zone has relatively good infrastructure.

Central Province including Kabwe: The main characteristics in this zone are the growth of rain fed and irrigated crops. The soils are good and a lot of different crops are grown. Access to agro inputs is good because of the proximity to towns. Access to markets is fairly good. In the south west part of the zone where road infrastructure and the general terrain is poor (Kafue River flat plains), fishing and game form the major sources of food and income. However the north-eastern parts of the zone is characterised by commercial production of maize, cotton, tobacco, sugarcane and grain legumes. The area has good infrastructure, thereby promoting trade. The population is large and livestock diseases are common hazards. Lately the area has been prone to drought. Deforestation is prominent due to charcoal sales and curing of tobacco.

Copperbelt Province

Copperbelt province covers an area of 31,328km², representing 4.2% of the total area of Zambia. It forms boundaries with North-western province on the western side and Central province in the south. It also shares borders with DR Congo in the north. Ndola is the administrative capital of the province and administratively, the province is divided into 10 districts, namely: Chililabombwe, Chingola, Luanshya, Kitwe, Kalulushi, Lufwanyama, Masaiti, Mpongwe, Mufulira and Ndola.

The population for Copperbelt Province stands at 1,958,623. Of this population 49.7 percent were males and 50.3 percent were females. The average annual population growth rate for the province was 2.2 percent in the 2000 – 2010 inter-censal periods.

Table 2: Population Share and Density by District on the Copperbelt (CSO, 2010)

District	Male (%)	Females (%)	Total (number)	Population Share	Population Density persons/ km ²
Chililabombwe	51	49	90, 530	4.6	88.2
Chingola	50	50	210,073	10.7	125.2
Kalulushi	50	50	96, 206	4.9	132.7
Kitwe	50	50	522,092	26.7	671.9
Luanshya	49	51	153,117	7.8	188.8
Lufwanyama	50	50	75, 542	3.9	7.7
Masaiti	50	50	102,503	5.2	19
Mpongwe	50	50	91, 765	4,7	11
Mufulira	50	50	161,601	8.3	98.7
Ndola	49	51	455,194	23.2	412.7
Total	50	50	1,958,623	100	62.5

Kabwe

Kabwe district is located in the Central Province of Zambia and covers approximately 1,570km² land area. It is bordered by Chibombo District in the south and Kapiri Mposhi in the north. It lies on the Great North Road 139 km from the capital Lusaka. Central Province is divided into seven districts namely Itezhi Tezhi, Chibombo, Kabwe, Kapiri-Mposhi (Ngabwe district is still affiliated to Kapiri-Mposhi), Mkushi, Mumbwa and Serenje. Kabwe is the provincial headquarters of the Central Province. The Provincial Minister who is assisted by the Provincial Permanent Secretary (the chief civil servant) heads the Provincial Administration.

The population of Central Province is recorded as 1,267,803 in 2010, with an annual average growth rate of 2.6 per cent. The population density is estimated at 27.8 persons per km².

Table 3: Population Share and Density by District - Central Province (CSO, 2010)

District	Male (%)	Females (%)	Total (number)	Population Share	Population Density persons/km ²
Chibombo	50	50	293,765	22.0	21.9
Itezhe Tezhi	49	51	64,593	4.8	4.0
Kabwe	49	51	202,914	15.2	129.1
Kapiri	49	51	240,841	18.1	14.0
Mkushi	50	50	151,803	11.4	8.6
Mumbwa	50	50	218,328	16.4	10.3
Serenje	49	51	160,152	12.0	6.9
Total	50	50	1,332,396	100.0	27.8

4.1 Introduction

This chapter reviews the World Bank safeguard policies, national strategic plans and policies, the Environmental Management Act (EMA), ZEMA EIA regulations and other relevant country acts. The World Bank safeguards policies and national legislation apply to all the proposed intervention areas.

4.2 World Bank Safeguard Policies Overview

As a key financing institution, the World Bank is committed to supporting developmental projects, while eliminating or minimizing any adverse impacts or risks on the environment, society and human health. These impacts can be severe or moderate, localized or regional, short or long term. In order to minimize and manage environmental and social impacts, the Bank's operational policies are triggered and the environmental impact assessment (EIA) is key process of the Bank due diligence. These safeguards provide a mechanism and tools for ensuring integration of environmental concerns and social issues into the planning and implementation of development projects financed by the Bank.

The Bank has a total of ten safeguard policies which can be triggered depending on the nature and complexity of the proposed projects or sub-projects. In the context of the proposed mining remediation and improvement project, and the associated sub-projects, two (2) of the ten (10) safeguard policies have been triggered. The table below shows the World Bank safeguard polices that have been triggered to mitigate possible impacts during the project and in associated sub-projects.

Table 4: World Bank Safeguards Polices and their relevance to Mining Remediation and Improvement Project

Safeguard Policies	Triggered	Relevance of World Bank Safeguards polices to the mining remediation and improvement project and associated sub-projects
Environmental Assessment OP/BP 4.01 including Environmental Health and Safety Guidelines	Yes	Kabwe displays significant effects on health due to lead contamination, primarily in soil and possibly food. In Copperbelt primary risks include exposure to sulphur dioxide and particulate emissions in the towns of Mufulira, Kitwe and Chambishi. Sulphur dioxide emissions from Mufulira, Nkana, Chambishi and Luanshya smelters. Lack of management of contaminated sites leads to stream siltation. Site-specific ESMPs and ESAs will be required to be prepared based on procedures outlined in the ESMF once site details are available. The project will include small-scale construction activities which will require preparation and implementation of site-specific Environment, Health and Safety Management Plans
Natural Habitats OP/BP 4.04	No	The policy is not triggered as the project will not finance activities that may impact natural habitats or downstream habitats. Most project areas are in urban/peri-urban areas of Kabwe, Kitwe, Chingola and Mufulira that are not known to have any natural habitats.
Forests OP/BP 4.36	No	The policy is not triggered as the loss of natural habitat is not significant. This will be further clarified once feasibility, baseline studies and engineering designs have been finalized.
Pest Management OP 4.09	No	The policy is not triggered as the possible use of pesticides and fertilizers on the livelihood agro initiatives and greening are negligible.
Physical Cultural Resources OP/BP 4.11	No	The policy is not triggered as it is unlikely to discover or disrupt PCR due to the scale and location of sub-projects; However chance find procedures have been included in the ESMF
Indigenous Peoples OP/BP 4.10	No	The Bank policy on indigenous people is not triggered as the proposed project do not have grouping that meet the criteria defined by the policy.
Involuntary Resettlement OP/BP 4.12	Yes	The proposed project activities do not include building any major infrastructure that may require displacement or involuntary land taking. The nature, scope and design of the project interventions provide an opportunity to avoid involuntary resettlement and land acquisition. The project however triggers OP/BP 4.12 for a possibility that there may be temporary impacts on livelihoods due to restriction of access under Component 1 or Component 3, such as closing and rehabilitation of tailing dams, community driven income generation projects; or as part of voluntary in-situ remediation program for backyards of households in contaminated areas, based on voluntary participation by house owners. The project will also develop a Social Assessment to identify livelihood enhancement opportunities and support the community based jobs initiatives.
Safety of Dams OP/BP 4.37	No	The policy is not triggered as the project activities will not (as per para 7 of the OP 4.37) finance <i>any new dam or rely on the performance of an existing dam or a dam under construction (DUC). The project also does not include financing power stations or water supply systems that draw directly from a reservoir controlled by an existing dam or a DUC; diversion dams or hydraulic structures downstream from an existing dam or a DUC, where failure of the upstream dam could cause extensive damage to or failure of the new Bank-funded structure; and irrigation or water supply projects that will depend on the storage and operation of an existing dam or a DUC for their supply of water and could not function if the dam failed.</i>
Projects on International Waterways OP/BP 7.50	No	The policy is not triggered, since the proposed zones of project intervention do not include international waterways.

Safeguard Policies	Triggered	Relevance of World Bank Safeguards polices to the mining remediation and improvement project and associated sub-projects
Projects in Disputed Areas OP/BP 7.60	No	The policy is not triggered as the proposed zones of project intervention are not in a disputed territory.

4.3 Overview of Relevant Zambian Policies and Plans

Zambia has over the past two decades developed a number of policies, plans and legislation to guide private and public institutions to pursue environmentally and socially sustainable development agenda in various sectors of the economy. Environmental and social issues are crosscutting and this is reflected in the various legislative frameworks, policies and legal structures that are in place. This subsequent section outlines some of the policies, plans and current legislation in place that are relevant to the proposed mining remediation and improvement project that will focus on contaminated sites in Kabwe and Copperbelt Province.

4.3.1 Vision 2030

Zambia's Vision 2030, completed in 2005, is a long-term planning instrument which reflects the collective understanding, aspirations, and determination of Zambia to become a middle income country. The Vision 2030 was developed in response to a 15 year focus on macroeconomic stability and market liberalization which was useful in stabilizing the economy, but did little to address ingrained poverty and socio-economic development. The Vision 2030 signaled a return to development planning and a focus on poverty reduction in Zambia. In the vision 2030 the country envisages that Zambians, by 2030, aspire to live in a strong and dynamic middle-income industrial nation that provides opportunities for improving the well-being of all, embodying values of socio-economic justice, underpinned by the principles of:

- (i) gender responsive sustainable development;
- (ii) democracy;
- (iii) respect for human rights;
- (iv) good traditional and family values;
- (v) positive attitude towards work;
- (vi) peaceful coexistence and;
- (vii) Private-public partnerships.

The vision 2030 principles are relevant to ZMERIP as they show the country's commitment to;

- Respecting human rights, by reducing public health risks for communities near mining sites;
- Private – public partnership in order to foster sustainable economic growth and ensuring mining activities do not pose a danger to the environment and the well-being of communities near mining areas;
- Peaceful coexistence, by ensuring that mining companies are responsive to the needs of communities in which they operate by applying best practices in mining operations and sustainable mine closure plans.
- Mainstreaming of gender into sustainable development by giving opportunities to women on livelihood initiatives.

4.3.2 Revised Sixth National Development Plan (2013-2016)

The Revised Sixth National Development Plan (R-SNDP) 2013-2016 is a medium term plan that is primarily aimed at refocusing Government priorities and policies to be in line with the current Government development paradigm. The R-SNDP is primarily an investment plan which focuses on capital investment areas with a bias to rural development and job creation. This approach, therefore, identifies the main growth areas or sectors as Skills Development, Science and Technology, Agriculture, Livestock and Fisheries, Energy, and infrastructural development particularly transport infrastructure while enhancing human development related

sectors of Water and Sanitation, Education and Health. The other equally important sectors to stimulate rural development and job creation which are mainly driven by private sector such as Tourism, Manufacturing and Mining will be implemented through the normal recurrent annual budget and Medium Term Expenditure Framework (MTEF). In addition, the Government will also put in place appropriate policy environment for the sectors to thrive. Therefore, the strategic focus of this Plan is to primarily focus on job creation, rural development and promote inclusive growth while investing in human development to take care of macro-economic fundamentals (R-SNDP, 2014).

Mining and Diversification

The diversification programme away from mining notwithstanding, the Sector still offers prospects for growth of the economy especially as 40% percent of the country remains geologically unmapped. The 60% area geologically mapped so far has seen new mining developments taking place particularly in North-Western Province. In order to ensure continued investment and maximum economic benefits from the Mining Sector, the thrust over the Plan period is to complete the revision of the 1995 Mining Policy and legislation which includes the following: the Mines and Minerals Development Act of 2008; the Petroleum (Exploration and Production) Act of 2008; and the Explosives Act of 1974. These revisions are aimed at facilitating mineral diversification away from copper and cobalt to others which includes nickel, gold, manganese, iron and uranium. The measures are also aimed at facilitating an increase in exploration activities, ensuring sustainable production and management of mineral resources. Additionally, the measures will help in strengthening mechanisms of monitoring production and export so as to improve tax collections from mining activities. The Government will promote an environment aimed at creating a productive relationship between the mines and mine suppliers to contribute to growth of SMEs and job creation. Furthermore, the Sector will focus on human development to increase efficiency and safety of mining operations and promoting value addition through industrial development. The revised policy framework should enable sector expansion of formal employment levels and increase its overall contribution to GDP(R-SNDP, 2014).

The R-SNDP is relevant to the mining and remediation project as it seeks to strengthen the environmental governance in Mining sector and compliance through a variety of interventions. This will ensure that best practices in the mining industry are adhered to, mining operation benefit communities in which they operate and activities that pose a risk to pose environmental/health risk are minimized or eliminated. Furthermore, livelihood initiatives will create practical examples on how diversification from mining can be enhanced at household and community level.

4.3.3 Mineral Resources Development Policy, 2013

The Mineral Resources Development Policy has been necessitated by the need to reflect the diversity of operations associated with mining such as mineral prospecting, exploration, mining, processing and metal treatment operations. The policy which is a revision of the 1995 mining policy draws heavily on the vision 2030 for Zambia which provides the blueprint for achieving accelerated growth aimed at raising the standards of living of the people of Zambia. The major challenge faced by the Government is to achieve a strategic re-positioning of the mining sector in order to arrive at a balance that will create a competitive, thriving and sustainable mining industry that contributes to sustainable economic development of the country. Therefore, the formulation of the Mineral Resourced Development Policy will contribute to the creation of a sustainable and orderly mining industry contributing to the economic development of the country (Mineral Resources Development Policy, 2013).

The vision of the policy is to have a vibrant, well organized private sector and private-public partnership-led mining sector contributing in excess of 20% towards GDP and sustainable economic development in the country by 2030. In order to realize the vision, the policy objective of the Government for the mining sector are to;

- (i) Attract and encourage both local and foreign private sector participation in the exploration for and commercial exploitation of the Zambia's mineral resources;
- (ii) Facilitate the empowerment of Zambians to become owners/shareholders in the mining industry;
- (iii) Promote the development of a mining sector that integrates in the domestic economy and which promotes local entrepreneurship, increased demand for local goods and services and creates employment for Zambians and also promotes value-addition;
- (iv) Encourage and facilitate orderly and sustainable development of small-scale mining sub-sector in order to enable it contribute to economic development and wealth creation;
- (v) Achieve a socially and internationally acceptable balance between mining and the biophysical environment and to ensure that acceptable standards of health safety and environmental protection are observed by all participants in the mining sector;
- (vi) Promote research and development (R&D) and its application in the mining sector;
- (vii) Encourage mining companies to develop a participatory and collaborative approach to mine planning, development and decommissioning taking into account the needs and concerns of local communities and thereby fulfilling their role as socially responsible corporate citizens; and
- (viii) Ensure transparency and accountability in the management of mineral resources in the country.

4.3.4 National Health Policy, 2012

The National Health Policy for Zambia seeks to respond to these challenges. It has been developed within the context of the Vision 2030 and has taken into consideration other relevant national, regional and global health related policies, protocols and strategic frameworks, including the Sustainable Development Goals (SDGs). The vision of the national health policy is to have a nation of Healthy and Productive People (National Health Policy, 2002).

The overarching objective of the National Health Policy is to reduce the burden of disease, maternal and infant mortality and increase life expectancy through the provision of a continuum of quality effective health care services as close to the family as possible in a competent, clean and caring manner. Specifically the Government undertakes to:

- (i) Create awareness through family health promotion that the responsibility for one's health rests in the individuals as an integral part of the family, community and nation.
- (ii) Promote awareness among Government employees and the community at large that, health problems can only be adequately solved through multi-sectoral collaboration involving such sectors as Education, Agriculture, Water, Private Sector, including not for profit and faith based organisations
- (iii) Ensure that the health services are equitably available and accessible to all the people in the country
- (iv) Train and make available competent and adequate number of human resources to manage health services.
- (v) Ensure the availability of drugs, reagents and medical supplies and infrastructures.

- (vi) Promote and sustain public-private partnership in the delivery of health services and regulate practice.
- (vii) Promote traditional medicine and alternative healing system and regulate the practice.
- (viii) Ensure that the health sector is financed through diverse, sustainable equitable and cost effective financing mechanisms

4.3.5 *The National Decentralisation Policy, 2002*

The objectives of Decentralisation in Zambia stems from the need for the citizenry to exercise control over its local affairs and foster meaningful development which requires that some degree of authority is decentralised to provincial, district and sub-district levels as well as Councils, in the background of centralisation of power, authority, resources and functions, which has in turn subjected institutions at provincial, district and sub-district levels to absolute control by the center. In order to remove the absolute control by the center, it is necessary to transfer the authority, functions and responsibilities, with matching resources to lower levels. The vision of Government to achieve a fully decentralised and democratically elected system of governance characterised by open, predictable and transparent policy making and implementation processes, effective community participation in decision-making, development and administration of their local affairs while maintaining sufficient linkages between the centre and the periphery.

In order to achieve the Government's vision, the following policy objectives will be pursued:

- (i) empower local communities by devolving decision making, function and resources from the Centre to the lowest level with matching resources in order to improve efficiency and effectiveness in the delivery of services;
- (ii) design and implement a mechanism to ensure a "bottom up" flow of integrated development planning and budgeting from the District to the Central Government;
- (iii) enhance local political and administrative authority in order to effectively and efficiently deliver services;
- (iv) promote accountability and transparency in the management and utilisation of resources;
- (v) develop the capacity of Local Authorities and communities in development planning, financing, co-ordinating and managing the delivery of services in their areas;
- (vi) build capacity for development and maintenance of infrastructure at local level;
- (vii) introduce an integrated budget for district development and management; and
- (viii) provide a legal and institutional framework to promote autonomy in decision making at local level.

4.3.6 *National Policy on Environmental Policy (NPE), 2005*

Zambia's National Environmental Policy is aimed at promotion of sustainable social and economic development through sound management of the environment and natural resources. The policy seeks, among other things, to: secure for all persons now and in the future an environment suitable for their health and well-being; promote efficient utilization and management of the country's natural resources and encourage, where appropriate long - term self-sufficiency in food, fuel wood and other energy requirements; facilitate the restoration, maintenance and enhancement of the ecosystems and ecological processes essential for the functioning of the biosphere and prudent use of renewable resources; integrate sustainable environment and natural resources management into the decentralized governance systems and ensure that the institutional framework for the management of the environment and natural resources supports environmental governance in local government authorities; enhance public education and awareness of various environmental issues and public participation in addressing

them; and promote local community, NGO and private sector participation in environment and natural resource management.

The key principles applicable to the ZMERIP are that:

- (i) every person has a right to a clean and healthy environment;
- (ii) every person has a duty to promote sustainable utilization and management of the environment and natural resources, including taking legal action against any person whose activities or omissions have or are likely to have adverse effects on the environment;
- (iii) women should effectively participate in policy, program and project design and implementation to enhance their role in natural resource use and management activities;
- (iv) there is need to use natural resources sustainably to support long-term food security and sustainable economic growth;
- (v) rational and secure tenure over land and resources is a fundamental requirement for sustainable natural resource management; and
- (vi) trade-offs between economic development and environmental degradation can be minimized through use of EIA instruments and environmental monitoring.

For the proposed ZMERIP it is important to recognize the linkage between environment and development. It is also important to realize that the two are not mutually exclusive, but rather complementary. More important for the component on the project whose key objective is integration and provision of sustainable livelihoods, the project should integrate gender, children and other vulnerable groups' concerns in environmental planning at all levels, to ensure sustainable social and economic development.

4.3.7 National Water Policy, 1994

The National Water Policy of 1994 embraces modern principles of water resources management and endeavors to deal with the challenges of poverty reduction, all aspects of water including resource management, development, and service delivery conforming to the current global and regional trends and the requirements as reflected under the new Sustainable Development Goals that replace the Millennium Development Goals (MDGs).

The overall policy goal is sustainable management and utilization of water resources in order to:

- (i) provide water of acceptable quality and of sufficient quantities,
- (ii) ensure availability of efficient and effective water and sanitation services that satisfy the basic requirements of every Zambian and;
- (iii) enhance the country's natural ecosystems.

One of its objectives is to promote public and private sector participation in water resources management, development, supply and conservation. The principles that will guide the management of water resources in and around the remediation and contaminated sites include the following:

- (i) management, protection and conservation of water resources to be undertaken in an integrated manner;
- (ii) all people to have access to potable water and sanitation services to reduce incidences of water related diseases;
- (iii) water resources shall be optimally, equitable and rationally allocated and regulated to ensure sustainable optimal economic returns and social enhancement;

- (iv) water resources management will be based on the concept of decentralisation and will promote local participation with the catchment as the unit of water management;
- (v) promote the empowerment of user communities to own, manage and invest in water resources development;
- (vi) Pollution of water resources shall follow the “Polluter Pays” principle to ensure water user responsibility.

4.3.8 *The National Forest Policy of Zambia, 1998*

This policy aims at promoting sustainable contribution of national forests, woodlands and trees towards improvement of the quality of life in the country by conserving the resources for the benefit of the nation and to the satisfaction of diverse and changing needs of the Zambian population, particularly rural smallholder farmers and entrepreneurs. The policy prevents changes in land-use, which promote deforestation, constrain farm forestry or endanger the protection of forests with cultural or biodiversity or water catchment conservation values, and it also discourages excisions in gazetted forest, except in cases of environment friendly public utility, for which suitable inter-sectoral and local consultations will be established.

The policy further recognizes environmental impact assessment as an important tool for new projects as one way of promoting sustainable management of forest resources. The proposed remediation and rehabilitation of contaminated mining sites will require undertaking site specific environmental and social impact assessment of the project areas to ensure that adverse impacts are avoided, minimized or mitigated.

4.4 Relevant Zambian Legislation

The table below shows an overview of the relevant Zambia legislation, their interpretation and relevance to the ZMERIP Project.

Table 5: Relevant Zambia Legislation and Interpretation

Legislation	Interpretation of Legislation	Relevance to the Project
Anti-Gender-Based Violence Act, 2010.	An Act to provide for the protection of victims of gender-based violence; constitute the Anti-Gender-Based Violence Committee; establish the Anti-Gender-Based Violence Fund; and provide for matters connected with, or incidental to, the foregoing.	The livelihood component on the project will give priority to vulnerable grouping such as women by engaging them in income generation activities for improved financial security and independence
Citizens Economic Empowerment Act, 2006	An Act to establish the Citizens Economic Empowerment Commission and to define its functions and powers; establish the Citizens Economic Empowerment Fund; promote the economic empowerment of targeted citizens, citizen empowered companies, citizen influenced companies and citizen owned companies; promote gender-equality in accessing, owning, managing, controlling and exploiting economic resources; encourage an increase in broad-based and effective ownership and meaningful participation of targeted citizens, citizen empowered companies, citizen influenced companies and citizen owned companies in the economy in order to contribute to sustainable economic growth; remove social customs, statutory provisions or other practices that limit access to any particular gender to skills training that is essential for effective participation in the economic sector; promote the employment of both gender by removing structural and discriminatory constraints that hinder any particular gender from employment opportunities and in so doing ensure equitable income distribution; promote equal opportunity of targeted citizens and citizen empowered companies, citizen influenced companies and citizen owned companies in accessing and being awarded procurement contracts and other services from State institutions; promote Greenfield investment through joint ventures and partnerships between local and foreign investors in order to enhance broad-based economic empowerment; and provide for matters incidental to or connected to the foregoing.	The livelihood component on the project will provide residents in affected mining communities in Chingola Kabwe, Kitwe and Mufulira opportunities to income generation activities. This will further create synergies and improved visibility for CBE's and CBO to access extra funding from the Citizens Economic Empowerment Fund (CEEC) to grow their businesses, enhance productivity and increased access to the market.
Disaster Management Act, 2010	An Act to establish and provide for the maintenance and operation of a system for the anticipation, preparedness, prevention, coordination, mitigation and management of disaster situations and the organization of relief and recovery from disasters; establish the National Disaster Management and Mitigation Unit and provide for its powers and functions; provide for the declaration of disasters; establish the National Disaster Relief Trust Fund; provide for the responsibilities and involvement of the members of the public in disaster management; and provide for matters connected with, or incidental to, the foregoing.	Closed and current mining activities in Kabwe and on the Copperbelt province continue to pose an environmental health risk to communities that are in close proximity to these areas. Unstable, poorly maintained overburden and tailing dams including contaminated sites if left unmanaged can result in disasters that are likely to endanger the lives of communities living in close proximity to these areas. The Disaster Management and Mitigation Unit (DMMU) will help the communities and the project

Legislation	Interpretation of Legislation	Relevance to the Project
		anticipate, prepare and manage disasters should they occur.
Employment Act, 1997	An Act to provide legislation relating to the employment of persons; to make provision for the engagement of persons on contracts of service and to provide for the form of and enforcement of contracts of service; to make provision for the appointment of officers of the Labour Department and for the conferring of powers on such officers and upon medical officers; to make provision for the protection of wages of employees; to provide for the control of employment agencies; and to provide for matters incidental to and consequential upon the foregoing.	During project implementation and associated sub projects, various individuals will be engaged to perform multiple tasks. This will require that all contractors on the project adhere to the provision of the employment act and the national labour laws. This will be achieved by creating a conducive work environment, treating workers in a humane manner and remuneration is favorable.
Environmental Impact Assessment Regulations, 1997	A developer shall not implement a project for which a project brief or an environmental impact statement is required under these Regulations, unless the project brief or an environmental impact assessment has been concluded in accordance with these Regulations and the Council has issued a decision letter.	The various activities to be undertaken on the project are likely to trigger environmental and social impact and this will require that site specific environmental instruments be prepared to eliminate or minimize possible impact. At national level, In Zambia the Environmental Impact Assessment (EIA) regulation of 1997 gives guidance, schedules and categories the various project types and the relevant EIA studies to undertaken. It further gives provision on post EIA approval management of projects and guidelines for developing Environmental Social Management Plans (ESMP's) and Resettlement Action Plans (RAP's).
Environmental Management Act, 2011.	An Act to continue the existence of the Environmental Council and re-name it as the Zambia Environmental Management Agency; provide for integrated environmental management and the protection and conservation of the environment and the sustainable management and use of natural resources; provide for the preparation of the State of the Environment Report, environmental management strategies and other plans for environmental management and sustainable development; provide for the conduct of strategic environmental assessments of proposed policies, plans and programmes likely to have an impact on environmental management; provide for the prevention and control of pollution and environmental degradation; provide for public participation in environmental decision making and access to environmental information; establish the Environment Fund; provide for environmental audit and monitoring; facilitate the implementation of international environmental agreements and conventions to which Zambia is a party; repeal and replace the Environmental Protection and Pollution Control Act, 1990; and provide for matters connected with, or incidental to, the foregoing.	Implementation of the ZMERIP is likely to involve, construction, operation, rehabilitation and remediation activities. This may include; lining of canals, remediation of contaminated sites, and rehabilitation of tailing dams and overburden dumps and construction of an engineered hazardous waste dump site. This will require that a site specific environmental instruments be prepared in accordance with the provisions of the ZEMA EIA regulations. Furthermore, during the operational phase of the project, some activities will be required to be licensed by ZEMA in accordance with the compliance requirements of the Environmental Management Act, 2011.

Legislation	Interpretation of Legislation	Relevance to the Project
Fisheries Act, 2011	An Act to provide for the appointment of the Director of Fisheries and fisheries officers and provide for their powers and functions; promote the sustainable development of fisheries and a precautionary approach in fisheries management, conservation, utilisation and development; establish fisheries management areas and fisheries management committees; provide for the regulation of commercial fishing and aquaculture; establish the Fisheries and Aquaculture Development Fund; repeal and replace the Fisheries Act, 1974; and provide for matters connected with, or incidental to, the foregoing.	The contaminated sites on the ZMERIP on the Copperbelt and Kabwe fall within the Kafue River Basin and its tributaries, including the associated water bodies. Trade effluent from past and current mining activities have continued to affect the water quality affecting both fish and other aquatic life. There are no specific clean-up targets for water bodies; however the proposed remediation activities, improved mining regulations and enhanced environmental enforcement on the project will help reduce possible contamination of rivers and water bodies. This will help protect the various fish and aquatic species from anthropogenic activities that introduce contaminants into the rivers.
Forests Act, 2015	An Act to provide for the establishment and declaration of National Forests, Local Forests, joint forest management areas, botanical reserves, private forests and community forests; provide for the participation of local communities, local authorities, traditional institutions, non-governmental organisations and other stakeholders in sustainable forest management; provide for the conservation and use of forests and trees for the sustainable management of forests ecosystems and biological diversity; establish the Forest Development Fund; provide for the implementation of the United Nations Framework Convention on Climate Change, Convention on International Trade in Endangered Species of Wild Flora and Fauna, the Convention on Wetlands of International Importance, especially as Water Fowl Habitat, the Convention on Biological Diversity, the Convention to Combat Desertification in those Countries experiencing Serious Drought and/or Desertification, particularly in Africa and any other relevant international agreement to which Zambia is a party; repeal and replace the Forests Act, 1999; and provide for matters connected with, or incidental to, the foregoing.	The project is unlikely to involve activities that will involve loss of vegetation but will involve re-vegetation on the livelihood and rehabilitation subprojects. The selection of saplings and tree species to plant in greening and stabilizing contaminated areas will require the guidance of the Forest Department in line with the provision of the newly reenacted forests act.
Gender Equity and Equality Act, 2015	An Act to establish the Gender Equity and Equality Commission and provide for its functions and powers; provide for the taking of measures and making of strategic decisions in all spheres of life in order to ensure gender equity, equality and integration of both sexes in society; promote gender equity and equality as a cross cutting issue in all spheres of life and stimulate productive resources and development opportunities for both sexes; prohibit harassment, victimisation and harmful social, cultural and religious practices; provide for public awareness and training on issues of gender equity and equality; provide for the elimination of all forms of discrimination against women, empower women and achieve	The project will mainstream gender equality into its project activities to help groupings such as women and children that are marginalized and are more susceptible to pollution and the environmental health impacts associated with mining. The livelihood component on the project will foster income activities that will link women to social economic activities to help them improve their quality of life. The proposed inclusion of lead blood testing, the provision of lead treatment intervention and food

Legislation	Interpretation of Legislation	Relevance to the Project
	gender equity and equality by giving effect to the Convention on the Elimination of all Forms of Discrimination against Women, the Protocol to the African Charter on Human and People’s Rights on the Rights of Women in Africa and the SADC Protocol on Gender and Development; and provide for matters connected with, or incidental to, the foregoing.	supplements for affected children will also lessen the burden on mothers who often bare the strain of seeking medical attention for their children.
Human Rights Commission Act, 1996	An Act to provide for the functions and powers of the Human Rights Commission; to provide for its composition and to provide for matters connected with or incidental to the foregoing.	The proposed remediation activities and capping sources of environmental health risks in legacy and current mining areas will help improve the quality of life of residents in the affected areas. These activities will help protect the rights of residents to live in a non-hazardous environment and also create a baseline for future redress should uncontrolled mining activities reoccur.
Lands Act, 1964	An Act to provide for the continuation of leaseholds and leasehold tenure; to provide for the continued vesting of land in the President and alienation of land by the President; to provide for the statutory recognition and continuation of customary tenure; to provide for the conversion of customary tenure into leasehold tenure; to establish a Land Development Fund and a Lands Tribunal; to repeal the Land (Conversion of Titles) Act; to repeal the Zambia (State Lands and Reserves) Orders, 1928 to 1964, the Zambia (Trust Land) Orders, 1947 to 1964, the Zambia (Gwembe District) Orders, 1959 to 1964, and the Western Province (Land and Miscellaneous Provisions) Act, 1970; and to provide for matters connected with or incidental to the foregoing.	During privatization and closure of mines on the Copperbelt Province and Kabwe, some mining areas where acquired by private companies and while some still remain under the jurisdiction of Government. The project will focus on mining sites currently owned by the Zambian Government. The selection of areas to be rehabilitated and remediated will be guided by the provision of the Lands Act with regard to ownership and title boundaries.
Local Government Act, 1995	An Act to provide for an integrated three tier local administration system; to define the functions of local authorities; to repeal the Local Administration Act and certain related laws; and to provide for matters connected with or incidental to the foregoing.	Project implementation and supervision will involve the Municipalities on the Copperbelt Province and kabwe that fall under the Ministry of Local Government and Housing. The function of the municipalities are guided by the provision of the Local Government Act
Mines and Minerals Development Act, 2015	An Act to revise the law relating to the exploration for, mining and processing of, minerals; provide for safety, health and environmental protection in mining operations; provide for the establishment of the Mining Appeals Tribunal; repeal and replace the Mines and Minerals Development Act, 2008; and provide for matters connected with, or incidental to, the foregoing.	Ownership of legacy and current mining areas will be guided by the provisions of the Mines and Mineral Development Act. The mining licensing regime of the ministry will help develop a dashboard that will show Government and privately owned mining sites to eliminate the possibility of trespass and legal implications. The project will focus on remediating and rehabilitation of Government owned contaminated sites, tailing dams and overburden sites. The Act will further guide the project to operationalize the Environmental Protection Fund

Legislation	Interpretation of Legislation	Relevance to the Project
		(EPF) that will require mining companies to contribute to rehabilitation and mining closure in the area of operation
National Health Research Act, 2013	An Act to establish the National Health Research Authority and provide for its functions and powers; establish the National Health Research Ethics Board and provide for its functions and powers; provide a regulatory framework for the development, regulation, financing and coordination of health research and ensure the development of consistent health research standards and guidelines for ethically sound health research; provide for the establishment of health research ethics committees and the regulation and management of research institutions, health researchers and health establishments involved in or undertaking research; provide for the regulation of biological material for health research; provide for ethical approval for the conduct of clinical trials; provide for the use of traditional, complementary and alternative medicines in health research; provide for data management and intellectual property rights in health research; provide for the designation of bio banks; and provide for matters connected with, or incidental to, the foregoing.	The monitoring of lead blood level in the population in the areas of Kabwe will involve the drawing of blood for testing and treatment by administering medication. These medical procedures will require the support of the Ministry of Health and health facilities. Clearance and guidance will be in line with the provision of the National Health Research Act and administered by the National Health Research Ethics Board.
National Heritage Conservation Commission Act, 1989	An Act to repeal and replace the Natural and Historical Monuments and Relics Act; to establish the National Heritage Conservation Commission; to define the functions and powers of the Commission; to provide for the conservation of ancient, cultural and natural heritage, relics and other objects of aesthetic, historical, prehistorical, archaeological or scientific interest; to provide for the regulation of archaeological excavations and export of relics; and to provide for matters connected with or incidental to the foregoing.	The project will develop a chance finds procedure to guide contractors on reporting channels and processes. The National Heritage and Conservation Commission (NHCC) will be notified should a chance find be cited and offer guidance on how such sensitive findings should be handled.
Non-Governmental Organisations Act, 2009	An Act to provide for the co-ordination and registration of non-governmental organisations; establish the Non-Governmental Organisations' Registration Board and the Zambia Congress of Non-Governmental Organisations; constitute the Council of Non-Governmental Organisations; enhance the transparency, accountability and performance of non-governmental organisations; and provide for matters connected with or incidental to the foregoing	Non-Governmental Organizations (NGO's) are some of the major stakeholders on the project, Their involvement on the project will range from; information dissemination, educational activities and livelihood initiatives. This will require that NGO's are registered, regulated and adhere to ethical practices set by the Non-Government Organizations Registration Board and The Zambia Congress of Non-Governmental Organizations.
Occupational Health and Safety Act, 2010	An Act to establish the Occupational Health and Safety Institute and provide for its functions; provide for the establishment of health and safety committees at workplaces and for the health, safety and welfare of persons at work; provide for the duties of manufacturers, importers and suppliers of articles, devices, items and substances for use at work; provide for the protection of persons, other than persons at work, against risks to health or safety arising from, or in connection with, the	During the implementation of project activities, personnel involved in remediation, rehabilitation and the construction of infrastructure and their operation will be required to adhere to best practices with regards to Occupational Health and Safety. Procedures and manuals and regular onsite training will be undertaken to ensure personnel working on site are

Legislation	Interpretation of Legislation	Relevance to the Project
	activities of persons at work; and provide for matters connected with, or incidental to, the foregoing.	conversant with the information contained. The project will ensure that high risk areas are clearly marked with restricted access and the provision of the relevant Personal Protective Equipment (PPE) will be mandatory.
Public Health Act, 1995	An Act to provide for the prevention and suppression of diseases and generally to regulate all matters of public health in Zambia.	The project will involve the capping, remediation and rehabilitation of contaminated sites. These interventions will reduce public health risks from mining activities in both closed and operational mining sites. The lead blood testing and treatment to be undertaken in areas around Kabwe will set best practices and a baseline for future interventions. It will also build capacity for the Municipalities and agencies like MSD, RPA and ZEMA to ensure that such public health risks are minimized or eliminated in future.
Public Procurement Act, 2008	An Act to continue the existence of the Zambia National Tender Board and re-name it as the Zambia Public Procurement Authority; revise the law relating to procurement So as to ensure transparency and accountability in public procurement; regulate and control practices relating to public procurement in order to promote the integrity of, fairness and public confidence in, the procurement process; repeal and replace the Zambia National Tender Board Act, 1982; and provide for matters connected with or incidental to the foregoing	The project will involve the procurement of studies, works, goods and services and this will require that the process follow the Zambia Public Procurement Authority (ZPPA) guidelines to ensure fairness, transparency, integrity, accountability and promote public and stakeholder confidence. The process will be further complimented by World Bank procurement polices
Roads and Road Traffic Act, 1995	An Act to make provision for the care, maintenance and construction of roads in Zambia, for the control of motor traffic, for the licensing of drivers and motor vehicles, for the compulsory third party insurance of motor vehicles, for the licensing and control of public service vehicles and public services, and for other miscellaneous provisions relating to roads and motor traffic.	During implementation of project activities, they is likely to be disruption to roads and traffic in surrounding areas. This will be during construction activities requiring earthworks in close proximity to roads and delivery of materials. Constructors will be required to adhere to set speed limits, undertake works and bulk deliveries away from off pick time and work within the project footprint to minimize intrusion into surrounding areas.
Urban and Regional Planning Act, 2015	An Act to provide for development, planning and administration principles, standards and requirements for urban and regional planning processes and systems; provide for a framework for administering and managing urban and regional planning; provide for a planning framework, guidelines, systems and processes for urban and regional planning; establish a democratic, accountable, transparent, participatory and inclusive	Project implementation is likely to involve rehabilitation, remediation and construction activities. These activities are likely to alter the landscape of the current layout of target areas. The project in collaboration with the Municipalities in which these areas fall will ensure

Legislation	Interpretation of Legislation	Relevance to the Project
	<p>process for urban and regional planning that allows for involvement of communities, private sector, interest groups and other stakeholders in the planning, implementation and operation of human settlement development; ensure functional efficiency and socio-economic integration by providing for integration of activities, uses and facilities; establish procedures for integrated urban and regional planning in a devolved system of governance so as to ensure multi-sector cooperation, coordination and involvement of different levels of ministries, provincial administration, local authorities, traditional leaders and other stakeholders in urban and regional planning; ensure sustainable urban and rural development by promoting environmental, social and economic sustainability in development initiatives and controls at all levels of urban and regional planning; ensure uniformity of law and policy with respect to urban and regional planning; repeal the Town and Country Planning Act, 1962, and the Housing (Statutory and Improvement Areas) Act, 1975; and provide for matters connected with, or incidental to, the foregoing.</p>	<p>the designs and plans adhere with the Urban and Regional Planning of the areas so as to be in harmony with the council's expansion master plan.</p>
Water Act, 1964	<p>An Act to consolidate and amend the law in respect of the ownership, control and use of water; and to provide for matters incidental thereto or connected therewith.</p>	<p>The abstraction or use of water during construction and operational activities will be required to be done in a sustainable manner. This will reduce or eliminate incidences of infringing on the rights of other water users to access the resource.</p>
Water Supply and Sanitation Act, 1997	<p>An Act to establish the National Water Supply and Sanitation Council and define its functions; to provide for the establishment, by local authorities, of water supply and sanitation utilities; to provide for the efficient and sustainable supply of water and sanitation services under the general regulation of the National Water Supply and Sanitation Council; and to provide for matters connected with or incidental to the foregoing.</p>	<p>The National Water Supply and Sanitation Council (NWASCO) regulates water and sanitation provision for water utility companies and municipalities. Proposed revenue collection for waste collection utilizing the existing water billing system will require the involvement of NWASCO.</p>
Water Resources Management Act, 2011	<p>An Act to establish the Water Resources Management Authority and define its functions and powers; provide for the management, development, conservation, protection and preservation of the water resource and its ecosystems; provide for the equitable, reasonable and sustainable utilisation of the water resource; ensure the right to draw or take water for domestic and non-commercial purposes, and that the poor and vulnerable members of the society have an adequate and sustainable source of water free from any charges; create an enabling environment for adaptation to climate change; provide for the constitution, functions and composition of catchment councils, sub-catchment councils and water users associations; provide for international and regional co-operation in, and equitable and sustainable utilisation of, shared water resources; provide for the domestication and implementation of the basic principles and rules of international law relating to the environment and shared water resources as specified in the treaties, conventions</p>	<p>The areas earmarked for intervention on the Copperbelt Province and Kabwe fall within the Kafue Basin Watershed. Remediation, rehabilitation and effective enforcement of mining and environmental regulation will ensure that water resources and ecosystems are protected.</p>

Legislation	Interpretation of Legislation	Relevance to the Project
	and agreements to which Zambia is a State Party; repeal and replace the Water Act, 1949; and provide for matters connected with, or incidental to, the foregoing.	
Zambia Development Agency Act, 2006	An Act to foster economic growth and development by promoting trade and investment in Zambia through an efficient, effective and coordinated private sector led economic development strategy; to establish the Zambia Development Agency as a one stop facility which will ensure, among other matters, client focus, dialogue with the private sector and create confidence in public sector support for business; to provide for the functions and powers of the Agency; to attract and facilitate inward and after care investment; to provide and facilitate support to micro and small business enterprises; to promote exports and globalisation; to streamline bureaucratic procedures and requirements faced by investors; to facilitate industrial infrastructure development and local services; to promote greenfield investments through joint ventures and partnerships between local and foreign investors; to promote and encourage education and skills training so as to increase productivity in business enterprises; to encourage measures to increase Zambia's capacity to trade and enable business to participate in a competitive global environment; to ensure that the private sector takes advantage of and benefits from international and regional trade agreements; and to provide for matters connected with or incidental to the foregoing.	The livelihood component on the project will require support from the Zambia Development Agency (ZDA) that works with various micro and small business enterprises across Zambia. ZDA will help create synergies and connect identified CBO/CBE's to value chains and board market for their products.
Zambia Wildlife Act, 2015	An Act to governing the affairs of the Zambia Wildlife Authority; establish the Department of National Parks and Wildlife in the Ministry responsible for tourism; provide for the establishment, control and management of National Parks, bird and wildlife sanctuaries and for the conservation and enhancement of wildlife ecosystems, biological diversity and objects of aesthetic, pre-historic, historical, geological, archeological and scientific interest in National Parks; provide for the promotion of opportunities for the equitable and sustainable use of the special qualities of public wildlife estates; provide for the establishment, control and co-management of Community Partnership Parks for the conservation and restoration of ecological structures for non-consumptive forms of recreation and environmental education; provide for the sustainable use of wildlife and the effective management of the wildlife habitat in Game Management Areas; enhance the benefits of Game Management Areas to local communities and wildlife; involve local communities in the management of Game Management Areas; provide for the development and implementation of management plans; provide for the regulation of game ranching; provide for the licensing of hunting and control of the processing, sale, import and export of wild animals and trophies; provide for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on Wetlands of International Importance especially as Waterfowl Habitat, the Convention on Biological Diversity, the Lusaka Agreement on	The construction, remediation and rehabilitation activities on the project are likely to affect flora and fauna in the area. Considering most of the contaminated sites, overburden dumps and tailing dams have been dormant for a long time, possible siting of wild animals is very likely. The project will ensure that all personnel on site undergo orientation on how to handle the siting of endangered species.

Legislation	Interpretation of Legislation	Relevance to the Project
	Cooperative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora and other international instruments to which Zambia is party; repeal the Zambia Wildlife Act, 1998; and provide for matters connected with, or incidental to, the foregoing.	

4.4.1 Additional relevant legislation

Additional legislation which may be relevant during the implementation of various components of the project include:

- (i) Agricultural Lands Act , December 23, 1960
- (ii) Decentralization Act, 2013
- (iii) Lands Acquisition Act Chapter 189 of the Laws of Zambia, February 10, 1970
- (iv) Local Government Act Chapter 281 of the Laws of Zambia , September 16, 1991
- (v) National Agricultural Policy, 2004
- (vi) National Gender Policy, 2014
- (vii) Public Roads Act, 2002
- (viii) Town & Country Planning Act Chapter 283 of the laws of Zambia, November 16, 1962

4.5 Complementarity between Zambian Legislation and World Bank Safeguard Policies

A comparison between Zambian legislation and the operational safeguard policies of the World Bank reveals no significant differences or gaps. There are more similarities than there are differences. The two sets of policies and legislation recognize the importance of environmental and social benchmarks in order to mainstream environmental and social issues in development project, and will play a complementary role in the project.

There is a need to streamline and harmonize the various pieces of legislation. Currently, the EMA is probably the closest to overarching legislation for environmental planning and protection. This would require the amendment of the other sectoral acts recognizing the EMA as the main legislation. This is achievable because there is coherence and harmony at the broader national level (Vision 2030 and the Sixth National Development Plan).

Table 6: Complementary roles of World Bank Policies and Zambian Legislation

WB Safeguard Policies		Zambian Legislation
Environmental	4.01 Environmental Assessment (1999)	Disaster Management Act, 2010 Environmental Impact Assessment Regulations, 1997 Environmental Management Act, 2011. Fisheries Act, 2011 Forests Act, 2015 Lands Act, 1964 Mines and Minerals Development Act, 2015 National Health Research Act, 2013 Occupational Health and Safety Act, 2010 Public Health Act, 1995 Roads and Road Traffic Act, 1995 Urban and Regional Planning Act, 2015 Water Act, 1964 Water Supply and Sanitation Act, 1997 Water Resources Management Act, 2011 Zambia Wildlife Act, 2015
Social	4.12 Involuntary Resettlement (2001)	Anti-Gender-Based Violence Act, 2010. Disaster Management Act, 2010 Environmental Impact Assessment Regulations, 1997 Environmental Management Act, 2011. Gender Equity and Equality Act, 2015 Human Rights Commission Act, 1996 Lands Act, 1964 Local Government Act, 1995 National Heritage Conservation Commission Act, 1989 Public Health Act, 1995

LISTING OF POTENTIAL IMPACT AND MITIGATION MEASURES CHAPTER 5
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5.1 Impact Identification, and Mitigation measures

During the implementation of the ZMERIP, different types of sub-projects will be prepared and delivered in Chingola, Kabwe, Kitwe and Mufulira. These sub-projects will have different types of negative environmental and social impacts associated with them. In this chapter the ESMF identifies possible impacts and mitigation measures to support the ESMP during project implementation. Issues related to compensation for temporary impacts on livelihoods due to restriction of access or that may arise as a direct consequence of the sub-projects are dealt with separately in the Resettlement Policy Framework (RPF).

5.2 Environmental Impacts

The proposed sub projects in the 3 broad categories are likely to result into both negative and positive environmental impacts. The table below (Table 7) presents a summary of the social impacts and mitigation or enhancement measures that are relevant to the interventions under the project.

Table 7: Identification of Risks, Impacts and mitigation measures of planned subprojects

Category	Project Activities	Risk/Impacts	Mitigation Measure	Responsibility
Component 1- Infrastructural Upgrade	1. Upgrade and Concrete Lining of Kabwe Canal	<ul style="list-style-type: none"> • Increase in quantities of contaminated soils and hazardous materials removed from canal during dredging process • Generation and poor disposal of construction waste during works • Possible contamination of neighbouring households lands due to poorly disposed contaminated and hazardous soils • Potential increased exposure from generation of dust and noise pollution due to operation of different types of equipment and machinery • Safety and security of community during construction works • Occupational health and safety of workers 	<ul style="list-style-type: none"> • Waste and debris, including sediments and vegetation shall be managed and kept in temporary controlled area and transported in a secure manner for disposal in appropriate disposal facility. Currently the waste is being disposed in unscientific manner which will be stored at secured tailing locations and ultimately disposed at the waste management facility when ready. • Dust suppression measures will be undertaken and construction and use of machinery will be restricted to normal working hours. There will be no excessive idling of construction vehicles at sites. There will be no open burning of construction / waste material at the site • The construction areas will be properly secured with signposting, warning signs, barriers and traffic diversions. Signages should inform the public of potential hazards. Provision of safe passages and crossings for pedestrians, along with active traffic management. Adjustment of working hours to prevent disruption of pedestrian access and local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement Community to be informed about possible temporary restrictions to access • On the job training of workers and provision of appropriate PPE by contractors; Workers to be sensitized on the dangers posed by HIV/AIDS and the means of prevention; If labor camps need to be set up, proper water supply and waste management systems should be provided 	MoM, Kabwe Municipal Council and PMC with Civil works contractor

Category	Project Activities	Risk/Impacts	Mitigation Measure	Responsibility
		<ul style="list-style-type: none"> • Soil and water pollution from operation of machinery • Potential disturbance to plants, animals and bird species within and around the project site • Poor maintenance of rehabilitated canal could result in continued blockage which would cause overflow of contaminated soil and water into neighbouring houses 	<ul style="list-style-type: none"> • The contractor shall monitor monthly the soil and water to comply with emission requirements of ZEMA, as required • Construction workers will be sensitized to the natural physico-chemical and biological environment around the project site • The project will ensure that the budget for canal maintenance and cleaning is included in the municipality's annual plan. Residents living along the canal will be sensitized on the proposed canal project and its associated benefits. 	
	2. Tailing Dams (TD) Stabilization /Closure Overburden (OB) Rock	<ul style="list-style-type: none"> • Possible contamination due to poorly disposed contaminated and hazardous soils • Inadequate disposal of construction waste 	<ul style="list-style-type: none"> • Waste and debris, including sediments and vegetation shall be managed and kept in temporary controlled area and transported in a secure manner for disposal in appropriate disposal facility. Currently the waste is being disposed in unscientific manner which will be stored at secured tailing locations and ultimately disposed at the waste management facility when ready. • Dust suppression measures will be undertaken and construction and use of machinery will be restricted to normal working hours. There will be no excessive idling of construction vehicles at sites. There will be no open burning of construction / waste material at the site • Construction workers will be sensitized or the dangers posed by HIV/AIDS and the means of prevention • The construction areas will be properly secured with signposting, warning signs, barriers and traffic diversions: • Signages should inform the public of potential hazards • Provision of safe passages and crossings for pedestrians, along with active traffic management • Training of workers and provision of appropriate PPE 	MoM, MSD, PMC and ZEMA, with contractor
	Dump Stabilization	<ul style="list-style-type: none"> • Generation of dust and noise pollution due to operation of different types of equipment and machinery • Safety and security of community during construction works • Occupational health and safety of workers • Soil and water pollution from operation of machinery 		MSD

Category	Project Activities	Risk/Impacts	Mitigation Measure	Responsibility
		<ul style="list-style-type: none"> • Disturbance to rare plants, animals and bird species within and around the project site • Loss of Vegetation cover and secondary-growth forests • Loss of habitat for animal and bird species • Increased risks of structural failure from earthworks and movement of materials • Possible encroachment/ conflicts with illegal miners and developers • Reduced structure stability after project completion 	<ul style="list-style-type: none"> • The site-specific design of for rehabilitation of the tailings will include mitigation measures to ensure safety of structure, workers and community during implementation and operations • If labor camps need to be set up, proper water supply and waste management systems should be provided • Adjustment of working hours to prevent disruption of pedestrian access and local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement 	
	Construction Solid Waste Management Site and Hazardous Waste Facility in Kabwe	<ul style="list-style-type: none"> • Possible contamination due to poorly disposed contaminated and hazardous soils or long term impact in case of poorly designed facility • Inadequate disposal of construction waste • Generation of dust and noise pollution due to operation of different types of equipment and machinery • Possibility of fires or uncontrolled movement of leachate during excavation of existing dumpsite • Safety and security of community during construction works • Occupational health and safety of workers • Soil and water pollution from operation of machinery • Loss of Vegetation cover and secondary-growth forests and 	<ul style="list-style-type: none"> • Proper design based on international standards including lining and leachate collection system and ground-water monitoring • Community to be informed about the project and possible temporary disruption of services • Waste and debris, including sediments and vegetation shall be managed and kept in temporary controlled area and transported in a secure manner for disposal in appropriate disposal facility • There will be no open burning of construction / waste material at the site • Dust suppression measures will be undertaken and construction and use of machinery will be restricted to normal working houses. There will be no excessive idling of construction vehicles at sites • Construction workers will be sensitized or the dangers posed by HIV/AIDS and the means of prevention • The construction areas will be properly secured with signposting, warning signs, barriers and traffic diversions: • Signages should inform the public of potential hazards 	Consultant and Kabwe Municipal Council

Category	Project Activities	Risk/Impacts	Mitigation Measure	Responsibility
		<p>disturbance of animal and bird species</p> <ul style="list-style-type: none"> • Increased security risks and in the area and upswing in scavengers • Increased levels of uncollected solid waste in the neighboring communities • Temporary loss of earnings by rag-pickers during time of construction • Disruption of physical cultural property or chance finds 	<ul style="list-style-type: none"> • Provision of safe passages and crossings for pedestrians, along with active traffic management • Training of workers and provision of appropriate PPE • If labor camps need to be set up, proper water supply and waste management systems should be provided • Adjustment of working hours to prevent disruption of pedestrian access and local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement • Procedures for chance finds included in Annex of ESMF 	
Health Interventions	Testing of blood samples to determine levels of Lead	<ul style="list-style-type: none"> • Unsafe practices by healthcare staff by not using PPE or reuse of sharps • Poor practices for mutilation and disposal of sharps • Resistance by community towards getting tested and treated • Lack of cooperation by health workers 	<ul style="list-style-type: none"> • Healthcare staff involved in blood testing to be trained in infection control and healthcare waste management practices. • Existing Healthcare Waste management Plan prepared under the Zambia Health sector project is considered to be relevant for implementation under this subcomponent. This HCWMP will be utilized for training and management of infectious waste • Community outreach and sensitization programs will precede the commencement of the testing program • Set up a GRM to receive and address concerns related to testing and treatment methods. 	Kabwe Municipal Council and Ministry of Health

<p>Income Generating Activities</p>	<p>Community level agro-processing Small scale agricultural support projects</p> <p>Demonstration/nutrition gardens Community tree nurseries</p>	<ul style="list-style-type: none"> ● Change of land use ● Generation of waste ● Risk of selecting sites that may be contaminated ● Varieties not suitable to local conditions and hybrids may increase costs for pest and disease management ● Loss of vegetation cover and indigenous plant species ● Increased use of pesticides and fertilizers ● Increased abstraction of water, for watering nurseries and afforestation activities ● Alteration of top soil and increased levels of dust ● Visual intrusion and changes to the landscape ● Greening of communities and residential areas ● Reduced levels of contaminated dust particulates and improved public health ● Improved Soil Stability <p>Potential for impacts from plantations in contaminated soils (screening process should mitigate this risk)</p>	<ul style="list-style-type: none"> ● Site selection will be in line with the municipalities' development plans ● There is no shortage of clean land in the 4 municipalities. Site selection for livelihood activities will screen out any contaminated land ● Site Selection will focus on areas already owned by the municipalities to eliminate the possibility of land acquisition. The project will ensure active community participation to create employment and livelihood initiatives. ● During operation and project implementation, environmental management plans will incorporate best practices in waste management. ● The project will ensure active community participation ● the footprint will be restricted to reduce on the loss of vegetation ● During site preparation, members of target communities will be engaged in site clearance and land preparation. ● Dust Suppression will be employed by watering dry areas periodically. ● Site Selection will take into consideration current land use to ensure proposed activities do not alter the aesthetics and general landscape. ● Community tree nurseries and afforestation will give priority to community members to ensure they have access to jobs and sustainable livelihoods. ● Greening activities will focus on contaminated areas to reduce dust levels and reduce public health risks ● Planting of saplings will be done mostly in the rainy season to reduce on water use. This will be further enhanced by selecting plant species that require less water to survive. The use of pesticides and fertilizers will be discouraged by selecting plant species that require less industrial chemicals to grow. 	<p>Municipalities on the ZMERIP project and CBE/CBO's along with Forest Department</p>
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			<ul style="list-style-type: none">• Sapling selection will be done in consultation with forest experts to reduce the risks of introducing invasive species.	
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Table 8: Generic Environmental and Social Management Plan for Waste Management related Investment in Kabwe Town

Potential Impacts	Generic Mitigation Measures	Monitoring Indicators	Responsibility
Displaced land uses	Involve community in locating project sites and access routes as well as developing practices & responsibilities for managing project activities and sites	Survey of local population regarding land uses	Kabwe Municipal Council
Disruption or destruction of sites of cultural, religious or historical importance	Involve community in locating appropriate project sites and access routes that avoid such resources	Survey of local population regarding problems with culturally sensitive areas	Kabwe Municipal Council
Human settlements and land uses near landfill and composting sites	Involve community in locating project sites and access routes	Survey of local population regarding siting of facility	Kabwe Municipal Council
Windblown garbage, dust and smoke	Spread and compact incoming refuse, and cover with soil, daily	Complaints from community	Kabwe Municipal Council
Increased traffic to/from the sites	Pave access roads, or use water spraying to reduce dust	Complaints from community	Kabwe Municipal Council
Odors	<ul style="list-style-type: none"> • Provide for safe ventilation of decomposition gases • Spread and compact refuse, and cover with soil daily 	Complaints from community	Kabwe Municipal Council
Containment of water sources	<ul style="list-style-type: none"> • Ensure site layout and management practices, including working training, are adequate • Install adequate surface drainage control measures • Maintain erosion and surface drainage control measures during operations 	<ul style="list-style-type: none"> • Incidences of illness or disease • Decrease in agricultural production 	Kabwe Municipal Council
Creation of stagnant water sources	<ul style="list-style-type: none"> • Ensure site layout is adequate for drainage • Install adequate surface drainage control measures • Maintain erosion and surface drainage control measures during operations 	Periodic check for pooling water due to inadequate drainage	Kabwe Municipal Council

Potential Impacts	Generic Mitigation Measures	Monitoring Indicators	Responsibility
Creation of stagnant water in project sites that breed disease carriers	Assess ecology of disease carriers in project area and employ suitable mitigation measures (e.g. proper drainage)	<ul style="list-style-type: none"> • Increase in disease carriers • Occurrence of illness or disease 	Kabwe Municipal Council
Loss of natural area, important habitats, biodiversity	Avoid infringing on: <ul style="list-style-type: none"> • Protected natural areas and wilderness areas • Critical habitats or areas with significant biodiversity (e.g. wetlands) 	Survey land area and community for environmentally sensitive areas/habitats	Kabwe Municipal Council
Soil erosion	<ul style="list-style-type: none"> • Minimize time of exposure of areas cleared, graded or excavated • Stabilize and revegetate disturbed areas • Install adequate surface drainage control measures • Maintain erosion and surface drainage control measures during operations 	<ul style="list-style-type: none"> • Degree of erosion 	Kabwe Municipal Council
Potential Impacts	Generic Mitigation Measures	Monitoring Indicators	Responsibility
Contamination of surface and groundwater with landfill runoff and leachate	<ul style="list-style-type: none"> • Protect water resources by locating landfills: <ul style="list-style-type: none"> • Where the underlying soils are relatively impermeable, and have a high capability for containing chemical contaminants (e.g. clays) • So that the bottom of the landfill is above the water table • Away and down gradient from surface waters, and groundwater recharge areas sources, whose use could be affected by contamination unless the distance to the receiving water is adequate to dilute and disperse potential contamination • Use a landfill liner (e.g. clay, synthetic) • Collect surface runoff and discharge to safe area • Install test wells at landfill perimeter, and monitor water quality during operations, for early identification and mitigation of emerging adverse effects 	<ul style="list-style-type: none"> • Complaints from community • Lower agricultural productivity • Increased instances of illness or disease 	Kabwe Municipal Council

CLASSIFICATION OF SUB-PROJECTS, SCREENING APPROVAL AND IMPLEMENTATION

CHAPTER 6

6.1 Subproject Preparation and Approval

The identification of sub-projects will be done based on socio-economic, environment and health analysis done under the previous World Bank funded Copperbelt Environment Project. The prioritization of sub-projects under the ZMERIP will be based on further environmental and social analysis, including inputs from public participation to be facilitated during implementation by the PIU's, Municipalities and CBO's/CBE's. Technical guidance and input into preparation of subproject proposals is crucial to ensure that all environmental and social concerns are thoroughly considered from the start of the identification and planning process. The following is an outline of the process that will be undertaken to oversee the subproject identification, preparation, screening, approval and implementation process for infrastructure upgrade, solid waste management, health interventions, nutritional support and agro-projects, natural resources management as well as other sub-projects. The process will be guided by World Bank safeguard policies and the local EMA Act and EIA regulation in order to address environmental and social management considerations under the project.

6.2 Environmental and Social Screening

This section outlines the stages of the environmental and social screening process (the screening process) leading towards the review and environmental approval of any sub-project that will be undertaken on the ZMERIP. To facilitate environmental and social screening, the ESMF has provided a checklist for subproject screening that will assist stakeholders, proponents and project staff with the identification of environmental and social issues relating to the subproject location and the surrounding environment based on available knowledge and field investigations. Once a subproject/subcomponent is specified for a particular location, the proponent with assistance from the PCU, PIU's and Municipalities will complete the environmental and social checklist. In some instances, a field appraisal may be required depending on the information in the environmental and social checklist. (Annex 1)

6.2.1 Environmental Screening:

A desk appraisal of the planned activities plans, including designs, will be carried out by the PIU's, Municipalities and target communities. This initial screening will be carried out through the use of the Environmental and Social Screening Form (see Annex 1). This form will be completed by the PIUs, with assistance from the PCU. Completion of this screening form will facilitate the identification of potential environmental and social impacts, determination of their significance, assignment of the appropriate environmental category, proposal of appropriate environmental mitigation measures, and conduct any further environmental work, if necessary. Suitable qualified officials will conduct the screening process and if none are available, training will be provided to the PIU's, Municipalities and target communities.

6.2.2 Assigning the Environmental Categories and preparing ESMPs:

The assignment of the appropriate environmental category will be based on the World Bank safeguard policy categorization and on the provisions of the local EMA Act EIA Regulation project schedule, depending on type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. Field appraisals will be required for

Category A sub-projects and other projects which are deemed to have moderate to significant impacts.

A generic ESMP that addresses impacts at all the stages of a sub project cycle (design, implementation and operational phases) is annexed within this framework. As adapted, it has to be followed during the design, implementation and post implementation/operational phases of a specific sub-project investment. The plan gives the mitigation measures for each sub-project investment that will eliminate/mitigate adverse or negative environmental impacts. However, these plans need to be made site specific for each of the sub-project after undertaking the necessary assessments. The responsibility of handling mitigation measures for various environmental concerns at various stages of the project will be designated to different agencies according to the type and geographical location of the sub-projects.

Table 9: World Bank Project Categorization

Category	Type of sub-project	Safeguard Instrument
Category A:	The project is using a framework ESMF that includes procedures for undertaking ESIA's. The proposed subproject under the project will be classified as <i>Category A</i> if it is likely to have significant adverse environmental and social impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. Environmental Assessment for a <i>Category A</i> project will examine the project's potential negative and positive environmental and social impacts, compares them with those of feasible alternatives (including the "without project" scenario), and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental and social performance. TORs will be consulted with stakeholders and ESIA disclosed at locations and in a language and manner which will be easily understood by stakeholders.	Applicable to most large Infrastructural upgrades being financed under the project. Normally an EIA including an ESMP
Category B:	A <i>Category B</i> project has potential adverse environmental impacts on human populations or environmentally important areas - including wetlands, forests, grasslands, and other natural habitats - which are less adverse than those of <i>Category A</i> 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 <i>Category A</i> projects. The scope of EA for a <i>Category B</i> project may vary from project to project, but it is narrower than that of <i>Category A</i> assessment. Like <i>Category A</i> , a <i>Category B</i> environmental assessment examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.	Applicable to most Income Generating and health interventions being financed under the project. Environmental Assessment including an ESMP or Environmental checklists/simplified ESMPs depending on the scale and intensity of impacts of subprojects
Category C:	A <i>Category C</i> project is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required.	

6.2.3 Appraisal and Approval of Environmental and Social Work

The Environmental Management Act (2011) of the Laws of Zambia (EMA) read together with Statutory Instrument No. 28 of 1997 provides for Environmental Impact Assessment regulations that classify projects into either the First Schedule or Second Schedule depending on the size, nature and anticipated environmental consequences of a project or sub-project. The Zambia EIA Regulations provide lists of projects or sub-projects proto-types which fall under the two categories, detailed in Annex 7.

The completed screening form along with any additional planning reports (e.g. ESIA/ESMP or RAP) is forwarded together with the overall sub-project application to the review authority – PCU. The first step in the approval process is to determine if all the relevant information has been provided, and is adequate. PCU will also check if the beneficiaries and technical team have thoroughly considered all environmental and social issues with regards to the identification of potential adverse effects arising from the sub-project as well as mitigating measures to adequately address negative impacts. If, based on the desk appraisal and field appraisal, national legislation requires further review, PCU will refer the application to the competent approving authority (ZEMA). ZEMA will make recommendations for approval (conditions and implementation supervision such as erosion control, waste management, and human safety etc.). The Terms of Reference and the ESIA's will be sent to the World Bank for review and disclosure on Infoshop respectively.

6.3 Public Consultation and Disclosure

According to Zambia's EIA regulations (SI No. 28 of 1997) and World Bank Safeguards Policies, public consultations are an integral component of the EIA requirements, and the Guidelines identify the following principal elements:

- Developers are required to conduct public consultations during the preparation of Project Briefs and EIAs.
- The Director General at ZEMA may, on the advice of the Technical Committee on Environment (TCE), conduct his or her own public consultation to verify the works of a developer.
- Formal EIA documents are made available for public review and comments. Documents to which the public has access include Project Briefs, EIA terms of reference, draft and final EIA reports, and decisions of the Director General at ZEMA regarding project approval. The Director General, on the advice of the TCE, will develop practices and procedures for making these documents available to the public.
- Decision Letter approving projects will be published by the developer and displayed for public inspection.
- Public consultations are critical in preparing an effective proposal for the implementation of the project activities. These consultations should identify key issues and determine how the concerns of all parties will be addressed in response to the TORs for the EIA, which might be carried out for construction and rehabilitation proposals.

The Zambia EIA regulations provide details concerning the public consultation methods. Such methods include information notices, brochures/fliers, interviews, questionnaires, community meetings and public hearings. In terms of Zambia's EIA process, public consultation should be undertaken during (i) the preparation of the EIA terms of reference; (ii) the carrying out of an EIA; (iii) Government review of an EIA report; and (iv) the preparation of environmental terms and conditions of approval.

For the ZMERIP, the first step will be to hold public consultations with the local communities and all other interested/affected parties during the screening process. These consultations will be aimed at briefing the communities about the project activities, how the activities will be carried out and what sectors of the environment are likely to be impacted. The public consultations will be done in a participatory manner to encourage the communities to contribute to the screening process.

During preparation of the TORs for an EIA, PIU's (or a consultant) will consult with ZEMA to ensure that the TORs are comprehensive enough to cover all the sectors of the environment and that they conform to the EIA procedures as outlined in the EIA Guidelines. ZEMA will also ensure that the social and health impacts of the project activities will be adequately covered in the EIA report. In the course of preparing the EIA the consultant will conduct extensive public consultations to attract and capture comments from the stakeholders as well as the communities for incorporation in the EIA report. The stakeholders and communities, including institutions will be asked to contribute to the identification of impacts and to proposed mitigation measures for the negative impacts. They will also be asked to comment on how the positive impacts may be enhanced.

When reviewing the EIA report, the Technical Committee on Environment will ensure that the relevant stakeholders, including potentially affected persons, were adequately consulted with regard to the potential impacts of the proposed project activities. Consultation methods applicable to ZMERIP would include workshops, community meetings, public hearings or information notices which would be organized through the district and local authorities. The ESMPs will be subjected to public consultations involving the communities in the proposed project areas and at national level. All safeguards documents (ESMF, ESMP, ESIA, RPF and RAPs, if applicable) prior to beginning of construction works will be made available to the public through the above channels of communication and in the same manner, EIA results would be communicated to the various stakeholders.

SUPERVISION AND MONITORING PLAN

CHAPTER 7

Adherence to World Bank and Zambian environmental and social policies and legislation usually raises challenges during the implementation phase of most projects. Therefore, the importance of monitoring is critical to the successful implementation of projects and sub-projects under ZMERIP.

The objectives of the ESMP for the ZMERIP are to:

- (i) Generate and provide policy makers, decision makers (at national and provincial level), implementers (at district and sub-district and community levels) investors²², financiers and controlling authorities with timely information on the progress being achieved. This monitoring information will enable implementers to make informed decisions regarding appropriate adjustments in the implementation of the sub-projects;
- (ii) Determine whether the goals and objectives of the mitigation measures on ZMERIP have been achieved. This assessment of performance compares the baseline environmental and social conditions with the actual conditions at the time of monitoring of the projects and sub-projects in order to assess the extent to which the original environmental and social conditions have been restored, improved or made worse;
- (iii) Ensure that all activities relating to the operation and maintenance are being carried out in a manner that protects the environmental and social conditions without compromising the health and social well-being of the beneficiaries and target communities; and
- (iv) Ensure, where required, that any changes to ZMERIP ESMPs are made with necessary suggestions for additional training and institutional capacity building in order to improve the performance of the ESMP implementation.

Supervision and monitoring is a key component of the ESMP during project implementation. Monitoring should be undertaken during the ZMERIP implementation phase to authenticate the effectiveness of impact management, including the extent to which mitigation measures are being successfully implemented. An ESMP should have the following components:

- Compliance monitoring;
- Impact monitoring; and
- Cumulative impact monitoring.

The aim of monitoring would be to:

- i.* Improve environmental and social management practices;
- ii.* Check the efficiency and quality of the EA processes;
- iii.* Establish the scientific reliability and credibility of the EA for the project; and
- iv.* Provide the opportunity to report the results on safeguards and impacts and proposed implementation of mitigation measures.

7.1 Compliance Monitoring

This is to authenticate that the required mitigation measures, which are the environmental and social commitments agreed on by the implementing agency, districts and local implementing agencies are being adhered to. A monitoring framework will be developed based on agreed

²² Investors are mainly from the private sector while financiers are bilateral and multilateral donors and MDBs

prototype sub-projects as they are specified in the positive list of projects. The MoM with the support of the PMC will be responsible for undertaking compliance monitoring.

7.2 Impact Monitoring

Monitoring of sub-projects impacts mitigation measures will be the duty of the PCU (MoM/MSD) and the implementing agencies (PIUs). The Environmental and Social Safeguards agreed in the contract specifications will be monitored to ensure that works are proceeding in accordance with the laid down mitigation measures. The MoM and other line ministries and implementing agencies will ensure that the project implementers submit reports on work progress and any challenges in observing the Environmental and Social Safeguards. The monitoring results will form a major part of the reports to be submitted to MoM and ZEMA.

7.3 Cumulative Impacts Monitoring

The impacts of the ZMERIP on the environmental and social resources within the project areas will be monitored with consideration to other developments which might be established or already existing. There will be collaboration between the MoM and proponents of other development projects to compare Environmental and Social Safeguards guiding the individual projects implementation to ensure coordinated and comprehensive management of cumulative impacts.

There are two aspects of monitoring in the ZMERIP include; the first aspect takes into account the monitoring at ward and community level (project site) where the project is being implemented and; secondly, at the larger scale for all sub-projects at district and provincial level.

7.4 Annual Monitoring and Reviews

Environmental monitoring needs will be carried out during the implementation of the Sub-projects. Compliance monitoring of sub-project implementation against the mitigation measures set out in the sub-project's ESIA/ESMP and/or RAP will be carried out jointly by The PIU's and Municipalities with the support of community leaders. Compliance monitoring comprises on-site inspection of activities to verify that measures identified in the ESIA/ESMP and/or RAP are being implemented. One of the monitoring tasks is to ensure that the Contractor is achieving the required standards and quality of work. An appointed environmental consultant will have the responsibility of conducting the environmental inspections. An annual inspection report will be submitted (together with the monitoring report) to WB for review and approval. Annual reviews will be carried out by an independent consultant, NGO or other service provider that is not otherwise involved with ZMERIP. The purpose of the reviews is to assess:

- compliance with ESMF procedures, learn lessons, and improve future ESMF performance, and
- the occurrence of, and potential for, cumulative impacts due to project-funded and other development activities.

The annual reviews will be a principal source of information to the PCU for improving performance. Thus, annual reviews will be undertaken after the annual report on monitoring has been prepared and before Bank supervision of the project.

Supervision requirement and Environmental and Social Monitoring Plan

Environmental supervision needs will be carried out during all phases including construction, operation and maintenance of sub-projects in order to measure the success of the mitigation measures implemented. Sub-project designs will include a monitoring framework, together with indicators. The monitoring requirements of the ESMF that take into consideration the environmental and social mitigations measures are:

- i. Mitigations measures outlined in the ESMP are fully implemented in consultation with all stakeholders involved at national, provincial, district, and ward and community levels;
- ii. Adherence to the policies and legal requirements as outlined in the World Bank, and national legal frameworks;
- iii. The local people's expectations and regulations are taken into account;
- iv. All the stakeholders and institutions involved in implementations of the sub-projects are familiarized with the challenges of identification of impacts and mitigation measures prescribed for each sub-project.

An ESMP is required for sub-projects that have distinct mitigation measures such as physical works or management activities. The ESMP will be included in the sub-project application.

7.5 Monitoring Indicators

The monitoring of sub projects will run according to the following plan: the communities themselves include mitigation mechanisms in the application for a sub project. The mitigation mechanisms are part of the appraisal, and the satisfactory fulfilment of the mitigation mechanisms is routinely monitored. The communities are subsequently trained by the MoM in environmental and social management. The district officers of relevant line ministries from the District Planning Sub-Committee, including Water, Agriculture, Forestry, Fisheries, Environmental Resources, Community Development and the District physical planners have routine contact with the sub-projects and oversee the effectiveness of mitigation mechanisms monthly. The PIU performs quarterly monitoring and a final audit at the end of the project cycle. All the above plan will be supported by the environmental and social officers at the MoM

Monitoring indicators that show the environmental and social performance of the subproject, and in particular demonstrating that mitigation measures are working effectively are an important component of the ESMF. The ESMP will be required to contain information on:

- i. Nature of project being implemented
- ii. Environmental and social impacts associated with the project
- iii. Mitigation or enhancement measures for addressing the identified impacts
- iv. Indicators for assessing progressing and effectiveness of mitigation or enhancement measures
- v. Monitoring schedule outlining the timing and frequency of monitoring the indicators
- vi. Responsible office or organization to undertake the monitoring.

Selected indicators will be measured in units of, for example, time (i.e. duration), frequency (i.e. how often), area or volume (e.g. size of area land used for a specific project), length (e.g. length of canal affected), quantity (e.g. number of persons engaged in environmental health community generated projects).

Monitoring of Environmental and Social Indicators

The goal of monitoring is to measure the success rate of the project, determine whether interventions have resulted in effective mitigation of negative impacts, or whether further interventions are needed or monitoring is to be extended in some areas. Monitoring indicators (as in table 10 below) dependent on specific project contexts. In most subprojects they are expected to be simple, mostly visual confirmation of environmental mitigation and good housekeeping measures.

Table 10: Monitoring Indicators

Monitoring level	Monitoring Issue	Verifiable Indicators	Responsibility
Esmf Level	Adequate dissemination of ESMF and stakeholder capacity building and Training Programmes	Record of meetings and workshops	Line Ministries , Consultants and World Bank
Project Investment Level	Prepare Environmental and Social Impact Assessment Reports	Consultants hired to prepare ESIA and RAP Documents	Line Ministries & Consultants
	Environmental Permits	Environmental Permits for sub projects	ZEMA
	Monitoring & Evaluation	ESMPs	ZEMA
		Monitoring Reports Annual Environmental Reports	ZEMA

The ESMPs will identify the following:

- Monitoring indicators to be measured for evaluating the performance of each mitigation measure
- Monitoring mechanisms and methodologies
- Monitoring frequency
- Monitoring locations
- Monitoring budget

The specific indicators for each sub-projects will be developed depending on the design of the sub-project. The larger infrastructure projects will specify environmental and social monitoring indicators, which will focus on compliance with design (e.g. lining of the Canal in Kabwe, geotechnical stability of tailings dam walls ; landfill siting, design and lining of cells to avoid groundwater contamination etc.). All of these will be verified by the engineer/planners monitoring. It is important to measure the overall success of sub-project in terms of the planned mitigation measures and determining whether the desired environmental and social performance is being achieved.

7.6 Environmental and Social Safeguards Monitoring Responsibility

The MoM will have the overall responsibility for coordinating and monitoring implementation of the ESMF. In addition, this will include conducting sensitization programmes to inform stakeholders about the framework and how it is to be implemented in the context of stakeholder participation.

7.7.1 National level

The PCU, ZEMA and MSD will be responsible for the overall environmental and social monitoring of the sub-projects through various implementing structures. The PCU will have the overall decision making responsibility regarding the monitoring outcomes of the sub-projects, including approval of work plans and budgets relating to activities. The PCU will be charged with the day-to-day national level management of the project, and will be strengthened to be able to do so. Therefore, the PCU will be responsible, coordinate and monitor implementation of the ESMF and the ESMPs.

7.7.2 Provincial, District and Local Levels

The sub-components will be coordinated and under the responsibility of the MoM and the PIUs (MSD, ZEMA, Kabwe and MoM with support from the Municipal Councils of Kitwe, Chingola and Mufulira). These local institutions will equally be expected to report of their monitoring and implementation of the respective sub-projects. In this case, the Municipal Councils and/or Local Area Committees will be encourage to use the community monitoring participation approach to come up with all-inclusive monitoring report. The MoM in consultation with the PIU's will facilitate annual assessment of the sub-projects in both Kabwe, Mufulira, Kitwe and Chingola.

7.7.3 District level

The sub-projects monitoring will be implemented by the relevant stakeholders in different locations. Although the PIU is hosted under the MoM, the ZMERIP recognizes the need for stakeholder participation for monitoring at various levels. These include among others local authorities, Government Agencies, Non-Governmental Organizations, Private Sector Organizations, Civil Societies and Development Partners. Successful implementation of the ESMF, the EMP and the monitoring plan will require input, expertise and resources from all the key stakeholders. It will also require the participation and involvement of the local people and the Local Leaders. Therefore these key stakeholders would need to collaborate in sub-project monitoring at all levels including at national, district and local levels.

INSTITUTIONAL CAPACITY FOR THE ESMF IMPLEMENTATION

CHAPTER 8

8.1 National stakeholders

It is expected that the following institutions will play an active role in various components of the implementation of the ESMF on the ZMERIP:

8.1.1 The Ministry of Mines and Mineral Development

Policy decisions within the MoM are made by the Minister, assisted by the Deputy Minister. The chief executive in the ministry is the Permanent Secretary (PS) who directs four statutory departments - Geological Survey, Mines Development, Mines Safety Department and Headquarters, the latter being devoted to administrative matters. The main PIU on the ZMERIP project and the Project Coordinator and his support team will be housed at the MoM. The ministry will be hosting a World Bank funded project for the first time and does not have a dedicated safeguards unit. Safeguard monitoring and compliance will however be complemented by the Project Management Consultant – **Misenge** Environmental and Technical Services Ltd who have a worth of knowledge and expertise having been involved on the previous World Bank funded project the Copperbelt Environment Project (CEP) (2003 – 2011).

Mine Safety Department (MSD) - The Mines Safety Department is divided into four technical sections - Mining, Explosives, Machinery and Environment. These sections variously enforce the relevant legislative and statutory instruments, formulate new legislation and regulations, and evaluate all aspects of safety in mining operations. The MoM manages the EPF facility under the auspices of the MSD. The Capacity built during the CEP for managing the EPF will need to be strengthened to enable the department to effectively manage the EPF facility and offer technical advice and training, and offer exemptions from the relevant regulations where appropriate

8.1.2 The Ministry of Finance (MoF)

The Ministry is charged with economic, national development planning and budgeting, and financial management responsibilities. The Ministry is headed by a Minister assisted by a Deputy Minister. The Ministry is headed by a Minister assisted by a Deputy Minister. The administrative and technical team is headed by the Secretary to the Treasury assisted by two Permanent Secretaries, namely Permanent Secretary – EMF (Economic Management and Finance) and Permanent Secretary –B (Budget). As the ministry is responsible for coordinating national planning and economic management, mobilizing and managing public resources in a transparent and accountable manner for sustainable national development, it will be a channel through which funds from the WB will be transmitted to the MoM. The previous mining project, the CEP was housed in the MoF and the management of finances on other World Bank funded projects and technical assistance has further enhanced capacity of the Ministry. There is however room to enhance capacity for the ministry to effectively and efficiently carry out its role and support the ZMERIP project.

8.1.3 The Ministry Of Local Government and Housing

The Ministry is charged with the administration of the local government system and will ensure that the people in the project areas are provided with the necessary municipal services. The Ministry of Local Government and Housing, is multi-functional in nature and oversees the

implementation of delegated functions and responsibilities by the local authorities by managing the social, economic and political spheres of governance. According to the Government Gazette no 547 of 2004, the ministry is responsible for Co-ordination of Local Government Administration, Regulation and provision of social amenities, Urban Planning and Regional Planning, Valuation of property, Chiefs Affairs and House of Chiefs, Water Supply and Sanitation, Provision of housing, Provision of municipal infrastructure services and support services, Co-ordination of the implementation of the National Decentralisation Policy, and Provision of feeder, community and urban roads.

In line with decentralization policy that involves the devolution of certain responsibilities from the central to local Government to Municipalities and local authorities. Institutional Capacity in the Municipalities on the ZMERIP project will need to be enhanced to ensure the Objective of the ESMF are being achieved. The four municipalities namely Chingola, Kabwe, Kitwe and Mufulira that will be involved on the project have no previous experience is the hosting of a PIU and implementing a World Bank funded projects. Considering their institutional arrangement has a strong environment health department, this will be a starting point in helping them build capacity for implementing the ESMF.

8.1.4 Zambia Environmental Management Agency:

The mandate of Zambia Environmental Management Agency (ZEMA) formerly called Environmental Council of Zambia (ECZ), is drawn from the Environmental Management Act (EMA) No. 12 of 2011. ZEMA plays a regulatory, advisory, consultative, monitoring, co-ordination and information dissemination role on all environmental issues in Zambia. ZEMA was a beneficial and participant in the World Bank Funded project, the CEP that closed in 2011. This institution however, has regulatory and policy gaps and low staffing levels to adequately support project implementation and provisions of the ESMF. The ZMERIP project will need to help build capacity of the institution to improve effectiveness of monitoring, compliance, enforcement and public disclosure of environmental information.

8.1.5 Radiation Protection Authority (RPA)

The Agency's mandate is drawn from the Ionizing Radiation Protection Act number 16 of 2005 which provides for the protection of the public, workers and the environment from the harmful effects arising from the use of devices or materials that produce ionizing radiation. The institution has no previous experience working on World Bank funded project and continues to have constraints with staffing and equipment. The institution no dedicated staff or unit for safeguards that can support ESMF implementation. The ZMERIP project will seek assist RPA the institution build capacity and also enhance their role in identification and mapping of health risks in critical residential areas where exposure to radioactive waste material may be high.

8.1.6 Civil Society Organisations

To facilitate communication, the involvement of the relevant NGOs in the project is cardinal. These use interpersonal methods of communication, and study the right entry points whereby they gain the trust of the community they seek to benefit. NGOs and training institutions may need assistance to increase their capacity in addressing environmental issues related to the mining sector. NGO will have the advantage of selecting particular places for innovative projects. They would also have a good idea of the feasibility of the projects they take up. Training institutions and NGOs can develop a technical assistance and training capacity and use this to assist both CBOs and the government. Non-Governmental and Civil Society Organisations are active in the areas of the project, and will provide important capacity in the

implementation of the ESMF. Under the coordination of the PCU NGOs will be active partners in the ZMERIP regularly participating in ZMERIP workshops and site visits, and at the district level as facilitators of community initiatives.

8.2 Vulnerable Social Groups

The current Human Development Index on Gender Inequality Index (GII) value for Zambia is 0.752, giving it a rank of 124 out of 138 countries (based on 2008 data). Women are disadvantaged on three dimensions, reproductive health, empowerment, and economic activity. Female participation in the labor market is currently 60% compared to 79% for men. The elderly, both men and women, some men-headed households and the chronically ill are also highly vulnerable. Rural youth are included in this group because they can be particularly disadvantaged in isolated parts of the Copperbelt, where they face high levels of unemployment, and few alternative livelihood options to farming. In general, the prevailing high disparities in economic and social standing between these vulnerable groups and the remaining population make it imperative to design targeted interventions to the benefit of the most vulnerable.

At the earliest stages of community engagement, facilitators will assist communities in identifying vulnerable sections of their society and indicate how such groups will benefit from the proposed sub-project. Typical vulnerable social groups may include women-headed households; widows and elderly (both men and women); rural youths; and people living with HIV-AIDS or caring for HIV-AIDS patients and orphans. These vulnerable social groups will be particularly targeted by the ZMERIP. Given the weak capacity at the sub-district level, NGO partners working with the ZMERIP will be engaged to provide substantial capacity building to these vulnerable stakeholders, including helping them form support groups and assist them in accessing better services and livelihoods.

8.3 Private Sector

The participation and role of private sector partners in the project is important due to the scale of operations, employment opportunities and their significant contribution to the GDP of Zambia. Private sector stakeholders range from large corporate, small and medium enterprises, to farmers. given the right incentives and information, the private sector have the potential to play leading roles in promoting innovative technologies, providing financial services and for market linkages for products. Private sector actors in the project areas will be engaged in supporting environmentally sound practices. Relevant private sector players that exist in the project areas include Mopani Copper Mines plc and Konkola Copper Mines plc. Mopani Copper Mines PLC is a Zambian registered company owned by Carlisa Investments Corporation and ZCCM-IH. Minority shareholders are spread throughout the world, in various locations. Konkola Copper Mines is also a copper mining and smelting company in Zambia.

8.4 Capacity Building Requirements

The main stakeholders for implementation of the ESMF are the line ministries, in particular the district representatives, the Local Councils and District Planning Sub-Committee. Capacity building will be provided based on the needs of the specific actors. Planning, designing and implementing of the ZMERIP programs and sub-projects in the target districts require an understanding of the environmental, social impacts and mitigation measures at community

ward and district levels. Training events focusing on these thematic areas will take the form of courses, workshops and specific seminars at national, provincial and district level. Where necessary awareness campaigns may be used to complement or reinforce the trainings.

Specific workshops on the ESMF/RPF and relevant World Bank safeguard policies triggered by this project will be organized for all key stakeholders. As a similar project (CEP) was implemented on the Copperbelt there is extensive knowledge on environmental and social safeguards, and how to apply standards to sub-projects. As the PCU has established new PIUs, training on application of safeguards to sub-projects will be conducted for new staff. The technical staff in District Planning Sub Committee will be trained in World Bank safeguards requirements and the agreed requirements and procedures in this ESMF, in order to routinely support and monitor sub-projects.

The following additional training topics are proposed:

1. Environmental and social Screening Process and Checklists
2. Zambian EIA Procedural Frameworks
3. Preparation of Terms of Reference for ESIA
4. Preparation of simplified ESMP for sub-projects
5. Environmental and Social Clauses in Contractors' contract and bidding documents

The environmental and social safeguards personnel working with the PIUs will subsequently have sufficient knowledge and understanding of the implementation of relevant World Bank safeguard policies triggered by the project. The awareness creation, capacity building and training workshops will focus on (a) strengthened institutional coordination; (b) improved information for decision makers; and (c) targeted awareness creation. The target group will consist of selected officers directly involved in the implementation of the ZMERIP.

Table 11: Capacity Building Requirements

Entity	Responsibilities under ESMF	Capacity building requirements
MoM	<ul style="list-style-type: none"> screening of sub-projects monitoring of compliance and implementation of mitigation mechanisms 	<ul style="list-style-type: none"> For new PIU: workshops on the ESMF/RPF and relevant World Bank safeguard policies Environmental and social Screening Process and Checklists Zambian EIA Procedural Frameworks Preparation of Terms of Reference for ESIA Preparation of simplified ESMP for sub-projects Environmental and Social Clauses in Contractors' contract and bidding documents
Local Authorities (KCC, KMC, MMC, CMC)	<ul style="list-style-type: none"> desk and field appraisal of the sub-projects monitoring and supporting communities on a monthly basis in the implementation of the projects and implementation of mitigation mechanisms 	<ul style="list-style-type: none"> Workshops on the ESMF/RPF and relevant World Bank safeguard policies Environmental and social Screening Process and Checklists Preparation of simplified ESMP for sub-projects Monitoring of sub-projects
NGO/CBOs	<ul style="list-style-type: none"> facilitate subproject implementation process, including facilitation of applications with environmental and social safeguards assessments and mitigation mechanisms 	<ul style="list-style-type: none"> Participatory Rapid Appraisal methodology and training of trainers Workshop on the ESMF/RPF and relevant World Bank safeguard policies, including SGBV prevention mechanisms
Communities and Wards	<ul style="list-style-type: none"> oversight of implementation of Subprojects, including environmental and social mitigation mechanisms 	<ul style="list-style-type: none"> Participatory Rapid Appraisal process for community decisions on CDD project Basic environmental and social safeguards, training, including monitoring

8.6 Safeguard Compliance in Participatory Project Planning, Implementation and Community Engagement

Community driven projects and community ownership are essential in ensuring compliance to environmental and social safeguards. Based on various levels of interactions and consultations with communities in the target districts and lessons from on-going similar projects, it is notable that public sector institutions service delivery does not adequately meet communities' expectations. In such cases, NGOs, CBOs and to some extent private sector players have attempted to fill the gap left by public sector institutions in providing support services and undertaking capacity building interventions for the communities.

These support and capacity services are critical in empowering communities to take responsibility for their own development through planning and managing their own projects – in this case, projects and sub-projects that promote local integration of affected and targeted communities. When communities get empowered in this way, it follows that they will take greater responsibility for the ensuring compliance to environmental and social safeguards. Specific courses and participation meetings will be arranged between communities and District Officers, NGOs/CBOs and the private sector representatives. The following training topics are proposed:

- Avoiding and Mitigating Environmental and Social Impacts in Community Planning

- Establishing and enforcing Community Rules for Safeguarding
- Community Development Planning and Responsibilities
- Defining Sustainable Development Projects
- Inclusion of Vulnerable Groups in Community Planning and Projects
- Conflict Resolution in Community Decision Making
- Roles and Responsibilities of District Councils and Community in Safeguarding and Conflicts

The stakeholders in the implementation of the ZMERIP have the CEP from which to draw lessons and experience. The aim of the CEP was to address environmental liabilities, associated with the mining sector, following the privatization of the mining assets, and, to improve future compliance of the mining sector with environmental, and social regulations. Through the Environmental Management Facility (EMF) component, environmental and social problems resulting from the Zambia Consolidated Copper Mines Ltd. (ZCCM) operations prior to privatization (including the Government's permanent obligations), were to be addressed in accordance to the country's environmental laws and regulations. A Consolidated Environmental Management Plan (CEMP) was prepared, to identify priority financing, and provide the criteria for funding subprojects.

At the local ward levels, it will be important to provide capacity building support in ESMF implementation to local structures that will be involved in sub-project activities. Local government structures will have a role in monitoring implementation of sub-projects and will need capacity building in ESMF implementation.

8.7 Monitoring Indicators

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

- (i) Specific to avoid ambiguity of items being measured;
- (ii) Measurable to facilitate quantification; and
- (iii) Quantifiable to be easily translated into units of measurement and to facilitate verification.

The table below (table 12) highlights the various monitoring indicators for the proposed subprojects on the ZMERIP project.

Table 12: Monitoring Indicators and Anticipated Sub-Project

Project Type	Anticipated Sub-Projects	Monitoring Indicators
Infrastructure Upgrade	<ul style="list-style-type: none"> Upgrade and Concrete Lining of Kabwe Canal 	<ul style="list-style-type: none"> Eliminate incidences of flooding during the rainy season in surrounding communities Consistent water flow rates in the canal Eliminate eutrophication or vegetation growth in the canal Reduce the levels of siltation in the canal
	<ul style="list-style-type: none"> Tailing Dams (TD) Stabilization/Closure Overburden (OB) Rock Dump Stabilization 	<ul style="list-style-type: none"> Zero reports recorded with regards to structural failure or instability on rehabilitated tailing dams and overburden dumpsites Reduced incidences of public health risks related to contaminated sites
	<ul style="list-style-type: none"> Construction and upgrading of a solid waste management site Establishment of recycling sites 	<ul style="list-style-type: none"> Improved waste management in target communities
Health	<ul style="list-style-type: none"> Lead pollution treatment program 	<ul style="list-style-type: none"> Reduction in Lead Blood levels Increased awareness on the dangers posed by contaminated sites among health practitioners and communities.
Income Generating Activities	<ul style="list-style-type: none"> Community level agro-processing Soya farming (for example) 	<ul style="list-style-type: none"> Increased levels of income in target communities and reduction in poverty Reduced report of malnutrition among vulnerable groups like children and women Creation of sustainable value chains for produce and services
	<ul style="list-style-type: none"> Community tree nurseries Demonstration/nutrition gardens 	<ul style="list-style-type: none"> Greening of communities Enhanced stability of tailing dams and overburden dumps from afforestation activities Increased access to a sustainable cheaper nutritional vegetables from demonstration gardens.

8.8 Budget

The project has earmarked US\$ 1,500,000 for implementation of Environmental and Social Due Diligence actions, mitigation measures, capacity building and monitoring activities defined in the ESMF. It must be noted that the project, as part of the component design, has

also assigned significant amount of funds (US\$ 10million) for baseline data monitoring of environmental, health and compliance and mine safety.

REFERENCES

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- (2) Matthew McCartney, 2005; Technical Note: Hydrology of the Lukanga Swamp, Zambia, <http://publications.iwmi.org/pdf/H040529.pdf> (Accessed, 24th May 2005).
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- (5) Birds Advisor, 2015; Birds of Zambia <http://www.zambia-advisor.com/birds-of-zambia.html> (Accessed, 25th May 2005).
- (6) Champ, 2016; Health Facilities by Province, http://www.champzambia.org/health_facilities (Accessed, 25th May 2005).

ANNEX 1: ENVIRONMENTAL AND SOCIAL SCREENING FORM

PART A: GENERAL INFORMATION

Project Name
Estimated Cost ()
Project Site
Project Objectives
Proposed Main Project Activities:
Name of Evaluator/s
Date of Field Appraisal

PART B: BRIEF DESCRIPTION OF THE PROPOSED ACTIVITIES

- Provide information on the type and scale of the construction/rehabilitation activity (e.g. area, land required and approximate size of structures)
- Provide information on the construction activities including support/ancillary structures and activities required to build them, e.g. need to quarry or excavate borrow materials, water source, access roads etc.
- Describe how the construction/rehabilitation activities will be carried out. Include description of support/activities and resources required for the construction/rehabilitation.

PART C: ENVIRONMENTAL AND SOCIAL BASELINE INFORMATION OF THE SUB PROJECT SITE BRIEF DESCRIPTION

Category of Baseline Information	Brief Description
GEOGRAPHICAL LOCATION * Name of the Area * Proposed location of the project (Include a site map of at least 1:10,000 scale / or coordinates from GPS)	
LAND RESOURCES * Topography and Geology of the area * Soils of the area * Main land uses and economic activities	
WATER RESOURCES * Surface water resources (e.g. rivers, lakes, etc.) quantity and quality	
BIOLOGICAL RESOURCES * Flora (include threatened/endangered/endemic species) * Fauna (include threatened/endangered/endemic species)	

* Sensitive habitats including protected areas e.g. national parks and forest reserves	
CLIMATE * Temperature * Rainfall	
SOCIAL * Number of people potentially impacted * Type and magnitude of impacts (i.e. impact on land, structures, crops, standard of living) * Socio-economic overview of persons impacted	

PART D: SCREENING CRITERIA FOR IMPACTS DURING SUBPROJECT IMPLEMENTATION, AREAS OF IMPACTS AND IMPACTS EVALUATION AND POTENTIAL MITIGATION MEASURES

	Areas of Impacts		Impacts Evaluation						Potential Mitigation Measures
			Extent or coverage (on site, within 3-5km or beyond 5km)			Significance (Low, Medium, High)			
	YES	NO	On Site	Within 3-5 km	Beyond 5 km	Low	Medium	High	
	Is this sub-project site/activity within and/or will it affect the following environmentally sensitive areas?								
1.1	National parks and game Reserve								
1.2	Wet-lands								
1.3	Productive traditional agricultural /grazing lands								
1.4	Areas with rare or endangered flora or fauna								
1.5	Areas with outstanding Scenery/tourist site								
1.6	Within steep slopes/mountains								
1.7	Dry tropical forest								
1,8	Along lakes, along beaches, riverine								
1.9	Near industrial activities								
1.10	Near human settlements								
1.11	Near cultural heritage sites								
1.12	Within prime ground water recharge area - -								

	Areas of Impacts	Impacts Evaluation		Potential Mitigation Measures
1.13	Within prime surface run off			
1.14	Will the sub-project use international water sources?			
2.0	Screening Criteria for Impacts during implementation and Operation			
	Will the implementation and operation of the sub-project within the selected site generate the following externalities/costs/impacts?			
2.1	Deforestation			
2.2	Soil erosion and siltation			
2.3	Siltation of watercourses,			
2.4	Environmental degradation arising from mining of construction materials			
2.5	Damage of wildlife species and habitat			
2.6	Increased exposure to agro-chemical pollutants			
2.7	Hazardous wastes, Asbestos, PCB's, pollution			
2.8	Nuisance - smell or noise			
2.9	Reduced water quality			
2.10	Increase in costs of water treatment			
2.11	Soil contamination			
2.12	Loss of soil fertility			
2.13	Salinization or alkalinisation of soils			
2.14	Reduced flow and availability of water			
2.15	Long term depletion of water resource			
2.16	Incidence of flooding			
2.17	Changes in migration patterns of animals			
2.18	Introduce alien plants and Animals			
2.20	Increased incidence of plant and animal diseases			
	Will the implementation and operation of the sub-project activities within the selected site generate the following socio-economic costs/impacts?			
3.1	Loss of land/land acquisition for human settlement, farming, grazing			
3.2	Loss of assets, property, houses, agricultural produce			
3.3	Loss of livelihood			
3.4	Require a RAP or ARAP			

	Areas of Impacts	Impacts Evaluation		Potential Mitigation Measures
3.5	Loss of cultural sites, graveyards, monuments			
3.6	Disruption of social fabric			
3.7	Interference in marriages for local people by workers			
3.8	Spread of STIs and HIV and AIDS, due to migrant workers			
3.9	Increased incidence of communicable diseases			
3.10	Health hazards to workers and communities			
3.12	Conflicts over use of natural resources e.g. water, land, etc.			
3.13	Conflicts on land ownership			
3.14	Disruption of important pathways, roads			
3.15	Increased population influx			
3.17	Loss of income generating Capacity			

ANNEX 2: GENERIC ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

INTRODUCTION

The project aims at improving environmental management of contaminated soil/areas. The choice of remediation technique will be technology neutral and will be determined based on assessment of environmental health risks associated with each site. Once the site details are analyzed for level of contamination; remediation targets identified and design firmed up, an Environmental Management Plan will be prepared to supplement the designed mitigation measures. The monitoring of environmental quality will be part of the main project design to assess the performance of the intervention and will be integrated into the EMP.

EXECUTIVE SUMMARY

Briefly describe the proposed project, location, investment cost, alternatives considered, major impacts, and environmental management commitments objectives, relevant legislation, technology, project alternatives, main findings and lifespan.

TABLE OF CONTENTS

1.0 INTRODUCTION

- Give a brief project background, objectives.
- Summary description of the project including project rationale
- The developer's physical address and the contact person.
- Particulars of Shareholders and Directors
- Track Record (Previous Experience of Enterprise)
- Brief description of the Location
- Percentage of shareholding by each shareholder
- The developer's physical address and the contact person and details.
- Total Project Cost/Investment
- Proposed Project Implementation Date

2.0 LEGAL AND POLICY FRAMEWORK

2.1 Policy, legal and institutional framework relevant to the project

- Policy, legal and institutional framework relevant to the project
- Specific sections of the cited policy, legal and institutional framework relevant to the proposed project.
- Relevance of cited sections to the proposed development
- Compliance (how the development complies/will comply to the cited sections)

2.2 International agreements and Conventions

- International agreements and conventions relevant to the proposed project.
- Specific sections of the agreements and conventions relevant to the proposed project.
- Relevance of cited sections of the agreement or convention to the proposed development
- Compliance (how the development complies/will comply to the cited sections)

3.0 DESCRIPTION OF THE PROJECT

3.1 Location

- Describe the project location supported by a location map drawn to an appropriate scale with a legend, direction of the True North. The location map must be printed on at least “A3” paper size for it to be clear.
- Provide the spatial extent of the proposed project site(Province, City/Municipality/district, specific site)
- Provide land marks and their distances from the proposed site to help identify proposed project site
- Identify surrounding developments
- Provide coordinates of the proposed site where applicable

3.2 Nature of the Project

- Raw materials (including hazardous materials and their storage on site)
- Process and technology (including flow diagrams)
- Products and by-products
- Production capacity
- Schedule and life time of the project

3.3 Main activities

- Site preparation phase
- Construction phase
- Operation phase

4.0 PROJECT ALTERNATIVES

- i. Identification of alternatives such as but not limited to:
 - a) Project need
 - b) Site
 - c) Design
 - d) Technology
 - e) Process
 - f) Raw materials
 - g) Justification for the selected option(s)
- ii. Analysis of each of the identified alternatives
- iii. List of chosen alternatives in order of preference
- iv. Reasons for choosing the preferred alternatives and rejecting the other alternatives

5.0 DESCRIPTION OF THE BASELINE ENVIRONMENT

5.1 Ecological Resources

a. Fauna

- Terrestrial species (Include common names and respective scientific names)
- Aquatic species (Include common names and respective scientific names)

- Identification of rare or endangered species (Include common names and respective scientific names)
 - Scientific names)
- b. Flora**
- Terrestrial species (Include common names and respective scientific names)
 - Aquatic species (Include common names and respective scientific names)
 - Identification of rare or endangered species (Include common names and respective scientific names)
- c. Birds**
- Field survey of bird species (Include common names and respective scientific names)
 - Identification of rare and endangered bird species

5.2 Geology and Hydrogeology

5.3 Drainage

5.4 Climate

5.5 Landscape and Topography

5.6 Land Use and Soils

5.7 Ground and Surface Water

5.8 Air quality and Noise

5.9 Social, Economic and Cultural Issues

5.10 Built Environment

6.0 ENVIRONMENTAL IMPACTS

Identify and discuss

6.1 Positive Impacts

6.1.1 Socio-economic Environment

6.1.2 Physical Environment

6.1.3 Biological Environment

6.2 Negative Impacts

6.2.1 Socio-economic Environment

6.2.2 Physical Environment

6.2.3 Biological Environment

6.3 Methodology of Impact Evaluation

Evaluation of impacts for significance will combine:

- the frequency of occurrence of the impact
- the duration of the impact
- the severity of impact
- the spatial extent of the impact
- the sensitivity of the element being impacted.

7.0 ENVIRONMENTAL SOCIAL MANAGEMENT PLAN (State the Environmental Management Commitments for mitigating negative Environmental Impacts identified in Section 6.0 and measures for enhancing positive impacts.

7.1 Environmental Monitoring Plan (These will include environmental management cost estimates, responsible personnel and the frequency of monitoring)

Aspect	Impact	Mitigation/ Enhancement measure	Frequency of Monitoring	Time frame	Performance indicator	Responsible person	Cost

7.2 Budget

7.3 Implementation Timeline

8.0 DECLARATION OF AUTHENTICITY OF REPORT CONTENTS

9.0 BIBLIOGRAPHY

10.0 APPENDICES

- Maps and satellite images
- Figures (tables, charts, graphs, models, photographs);
- Certificate of Incorporation
- Investment License
- Title deeds or lease agreements
- Certificates of Incorporation
- Agreements
- Asset valuation reports
- Approval documents
- Any other relevant supporting documents or information that cannot be presented in the main report

ANNEX 3: CHANCE FIND PROCEDURES

Chance Find Procedure is a step by step procedure which outlines what needs to be done when projects come across archeological sites, historical sites, remains and objects, including graveyards and/when individual graves during excavation or construction. This procedure relates to OP/BP 4.11- Physical Cultural Resources – which addresses physical cultural resources which are defined as movable or immovable objects, sites, structures that have archeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below the ground.

If during civil works, sub project discover archeological sites, remains and objects, including those of cultural and religious significance and/or individual graves during excavation or construction, the implementers will carry out the following steps:

1. Stop the construction activities in the area of the chance find;
2. Delineate the discovered site or area;
3. Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged
4. The National Heritage and Conservation Commission (NHCC) will be notified should a chance find be cited and offer guidance on how such sensitive findings should be handled.
5. Responsible authorities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archeologists. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
6. Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities
7. Construction work could resume only after permission is given from the responsible local authorities or department responsible for culture or antiquities concerning safeguard of the heritage.

ANNEX 4: ENVIRONMENTAL AND SOCIAL GUIDELINES FOR CONSTRUCTION CONTRACTOR

The guidelines include provisions for proper management of construction sites, safe storage of construction materials and safe disposal of wastes.

General Considerations

- The contractor shall follow the World Bank Group Environment, Health and Safety Guidelines which should become the basis for preparing the site-specific EHS Plan. For details please refer : www.ifc.org/EHSguidelines
- The contractor in all his activities ensure maximum protection of the environment and the socio-economic wellbeing of the people affected by the project, whether within or outside the physical boundaries of the project area.
- Before any construction works begin, the contractor shall ensure that the relevant environmental and land acquisition certificates of authorization for the works have been obtained from the relevant authorities
- In general, the contractor should become familiar with the environmental and social screening process and the Resettlement Policy Framework (RPF) for this project. The contractor shall work in cooperation and in coordination with the Project Management Team and/or any other authority appointed to perform or to ensure that the social and environmental work is performed according to the provisions of the safeguards documents
- The contractor shall pay close attention to health and safety requirements for workers who must wear protective clothing if required. The artisan should also ensure the health and safety of the community adjoining any construction areas.
- The contractor shall always keep on site and make available to Environmental Inspectors or any authorized persons, copies of the ESMPs, RAPs and ARAPs for the monitoring and evaluation of environmental and social impacts and the level or progress of their mitigation.
- The contractor shall ensure that construction materials such as sand, quarry stone, soils or any other construction materials are acquired from approved suppliers and that the production of these materials by the suppliers or the contractor does not violate the environmental regulations or procedures
- The movement and transportation of construction materials to and within the construction sites shall be done in a manner that generates minimum impacts on the environment and on the community, as required by the ESMP.
- Construction materials shall be stored in a manner to ensure that:
 - There is no obstruction of service roads, passages, driveways and footpaths;
 - Where it is unavoidable to obstruct any of the service paths, the contractor shall provide temporary or alternate by-passes without inconveniencing the flow of traffic or pedestrians;
 - There is no obstruction of drainage channels and natural water courses;
 - There is no contamination of surface water, ground water or the ground;

- There is no access by public or unauthorized persons, to materials and equipment storage areas;
- There is no access by staff, without appropriate protective clothing, to materials and equipment storage areas;
- Access by public or unauthorized persons, to hazardous, corrosive or poisonous substances including asbestos lagging, sludge, chemicals, solvents, oils or their receptacles such as boxes, drums, sacks and bags is prohibited;
- Access by staff, without the appropriate protective clothing, to hazardous, corrosive or poisonous substances including asbestos lagging, sludge, chemicals, solvents, oils or their receptacles such as boxes, drums, sacks and bags is prohibited.
- Construction waste includes but is not limited to combustion products, dust, metals, rubble, timber, water, wastewater and oil. Hence construction waste constitutes solid, liquid and gaseous waste and smoke.
- In performing his activities, the contractor shall use the best practical means for preventing emissions of noxious or offensive substances into the air, land and water. He shall make every effort to render any such emissions (if unavoidable) inoffensive and harmless to people and the environment. The means to be used for making the emissions harmless or for preventing the emissions shall be in accordance to the RAPs, or the ESMPs and with the approval of the relevant Local Authority or ZEMA.
- The contractor shall, in particular, comply with the regulations for disposal of construction/demolition wastes, waste water, combustion products, dust, metals, rubble and timber. Wastewater treatment and discharge will conform to the applicable regulations by the relevant guidelines.
- Asbestos wastes, PCBs and other hazardous wastes shall be treated and disposed of in conformity with the national regulations and World Bank Group standards where applicable, with the supervision of qualified personnel.
- The contractor shall protect the health and safety of workers by providing the necessary and approved protective clothing and by instituting procedures and practices that protect the workers from dangerous operations. The contractor shall be guided by and shall adhere to the relevant national Labor Regulations for the protection of workers. Appropriate information and awareness on HIV/AIDS shall be conducted at each construction site.

ANNEX 5: SAMPLE TORS

SAMPLE TERMS OF REFERENCE FOR ENVIRONMENTAL AND SOCIAL IMPACT STATEMENT (EIS)

GENERAL GUIDANCE ON PREPARATION OF TERMS OF REFERENCE

1. INTRODUCTION

- i. State what the document is all about and for what project the EIS is meant
- ii. State on whose behalf the Terms of Reference (TORs) are being prepared
- iii. State the purpose and objectives of the TORs
- iv. State what the document seeks to identify, what nature, scope and extent of information that will be collected and assessed in conducting the EIA for the project
- v. State study area (project Location).

1.1. PROJECT BACKGROUND

- i. Give a detailed overview of the company providing:
 - a. A corporate profile; and,
 - b. The name of the legal entity that will develop, manage and operate the Project and hold the operating approvals.
- ii. Describe the major components of the proposed project, the implementing agents, and a brief history of the project and its current status.

2. REGULATORY FRAMEWORK AND CORPORATE REQUIREMENTS

Summarise the applicable guidelines, procedural aspects, Acts, rules, regulations and policies to be followed in the preparation of EIA report for the proposed project as follows:

- i. National and International Regulations and Guidelines
- ii. Corporate Standards and Guidelines

3. PROJECT DESCRIPTION

- i. Outline a full description of the project using appropriate maps including a general layout
- ii. State the size of the area that will be covered by the proposed project.
- iii. Outline the key project components such as
 - a. Designs
 - b. Volume and grade of resource
 - c. Production rate
 - d. Infrastructure to be installed
- iv. State all the anticipated wastes from the project cycle

4. EIA SCOPE OF WORK

- i. Outline the spatial extent of the boundaries of the study and any adjacent or remote areas which should be considered with respect to the project.
- ii. Describe how the EIA work will be undertaken and the tasks to be performed.

5. EIA METHODOLOGY

- i. Describe how the baseline data will be gathered and explain how they will be used. The methodologies to be used for data collection should be briefly described. The study goals must be clearly defined

- ii. Wherever possible, propose predictive, quantitative models and standards that will be used to avoid vague and subjective predictions

6. EIA SCHEDULE

Propose a schedule that will be followed accordingly.

7. EIS REPORTING AND OUTPUTS

Outline the EIS structure that will be presented.

8. BASELINE INFORMATION OF THE PROJECT TO INCLUDE:

Propose categories of baseline information to be gathered and specialized studies to be conducted in the study area such as:

- i. Climate
- ii. Air quality
- iii. Soils
- iv. Geology
- v. Hydrology (ground and surface water quality inclusive)
- vi. Topography
- vii. Land use and land tenure
- viii. Noise and vibration
- ix. Built environment
- x. Fauna
- xi. Flora
- xii. Socio-economic environment (*Initial Social Assessment should among other factors identify the population, social services and amenities, vulnerability and direct consultation with people who may be directly affected by the project*).
- xiii. Archeology and Cultural set up

9. STAKEHOLDER CONSULTATION

Identify key issues from the scoping meetings that need to be incorporated in the study and extract and incorporate them into the TORs for the EIA study

10. DETERMINATION OF POTENTIAL IMPACTS OF THE PROPOSED PROJECT

List potential environmental and social impacts that may arise as a result of project implementation. These impacts will be determined based on socio-economic, environment and health aspects of project activities during construction and implementation stages. The choice of remediation techniques and locational aspects of project will be an important criteria in determining the potential impacts of subproject activities.

11. ANALYSIS AND EVALUATION OF IMPACTS

Describe how the impacts will be analyzed and evaluated.

12. IDENTIFICATION OF PROJECT ALTERNATIVES

Outline project alternatives to be considered during EIA such as

- i. Project need
- ii. Site
- iii. Design
- iv. Technology
- v. Process
- vi. Raw materials
- vii. others

13. PROPOSED EIA TEAM

- i. Provide a list of EIA specialists/experts, together with their key qualifications and affiliations
- ii. A description of proposed team staff should be presented including bio-data for all key personnel
- iii. State the role of each EIA team member
- iv. The CVs should reflect the team members' contact details and
- v. The CVs should be signed by respective team members.

14. DECLARATION OF AUTHENTICITY OF REPORT CONTENTS

Make a declaration of the authenticity of report contents

15. OTHER RELEVANT INFORMATION/APPENDICES

Provide a preliminary list of the supporting information that is expected to be used in the preparation of the EIA report. The list should include:

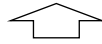
- i. Scoping Report;
- ii. Maps;
- iii. Photographs;
- iv. Tables;
- v. Charts;
- vi. Graphs;
- vii. Signed list of meeting attendees;
- viii. meetings minutes;
- ix. company permits and certificates;
- x. CVs of each member of the EIA team and any questionnaires to be used for preparing the report and
- xi. Any other relevant documents.

ANNEX 6: DRAFT GRIEVANCE REDRESS MECHANISM

The Grievance redress mechanism will be set up at each PIU level (ZEMA, KMC and MSD) who will be responsible to maintain records of all complaints and their responses. A report of GRM performance will be consolidated as part of biannual M&E report, to be submitted to the PCU at MOM for consolidation and onward submission to WB. The GRM will follow that channels highlighted in the illustrations below.

	Focal Point Unit/Organizations	Focal Persons	Role and Responsibilities	
			When a complaint is submitted	Recording complaints
NATIONAL	<p>National Project Implementation Unit (PIU) <i>(Ministry of Mines and Mineral Development)</i></p> <p>Project Management Consultants (PMC) <i>METS –Misenge Environmental and Technical Services Ltd(METS)</i></p>	<ul style="list-style-type: none"> ○ National Project Coordinator <i>(Ministry of Mine and Mineral Development)</i> ○ PMC– Team Leader ○ M&E Officer ○ Independent Auditor 	<p>The PIU with the support of the PMC (or an independent auditor) will try to address it.</p> <ul style="list-style-type: none"> ❖ The PIU will respond to all complaints within 10 business days. ❖ If not resolved, the complaint will be reported to the World Bank. 	<ol style="list-style-type: none"> 1. Record the complaint submitted in the national-level grievance database. 2. Review monthly monitoring submitted by the district/provincial-level, and enter all complaints with the status will be recorded in the national-level grievance database. 3. M&E officer will periodically review the grievance database and follow-up with focal persons to ensure all cases will be addressed. 4. Every 6 months, PIUs to include performance of GRM report as part of M&E report and submit to PCU at MoM and WB
PIU's	<p>Project Implementation Units (PIU's)</p> <ul style="list-style-type: none"> ○ ZEMA ○ RPA ○ MSD ○ Kabwe Municipal Council <i>(Including Ministry of Health)</i> ○ Chingola Municipal Council 	<ul style="list-style-type: none"> ○ Project Coordinator ○ M&E Officer ○ Independent Auditor 	<p>The Project Coordinator and the PIU team will discuss the issue and try to address it at PIU level.</p> <ul style="list-style-type: none"> ❖ The PIU will respond to all complaints within 10 business days. ❖ If not resolved, the complaint will 	<ol style="list-style-type: none"> 1. Record the complaint submitted in the monitoring form. 2. Submit the project's monthly monitoring form including a record on complaints to the national-level PIU.

<ul style="list-style-type: none"> ○ Kitwe City Council ○ Mufulira Municipal Council 		<p>be reported to the National Coordinator at PCU</p>	
--	--	---	--



CONTRACTORS AND CBE's/CBO's

<ul style="list-style-type: none"> ○ Contractors ○ CBE's/CBO's 	<ul style="list-style-type: none"> ○ Project Managers ○ Foreman ○ Project Coordinators ○ Community Leaders 	<p>The focal persons on site will try to address it at site level. If the issue is not addressed it will be forwarded to the respective PIU.</p> <ul style="list-style-type: none"> ❖ The PIU will respond to all complaints within 10 business days. ❖ If not resolved, the complaint will be reported to the respective PIU project Coordinator 	<ol style="list-style-type: none"> 1. Record the complaint submitted in a simple form. 2. Submit the record of complaints to the Project Coordinator
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ANNEX 7: CLASSIFICATION OF PROJECTS UNDER ZAMBIA EIA

The project aims at improving environmental management of contaminated soil/areas. The choice of remediation technique will be technology neutral and will be determined based on assessment of environmental health risks associated with each site. Once the site details are analyzed for level of contamination; remediation targets identified and design firmed up, an Environmental Management Plan will be prepared to supplement the designed mitigation measures. The monitoring of environmental quality will be part of the main project design to assess the performance of the intervention and will be integrated into the EMP.

The Environmental Management Act (2011) of the Laws of Zambia read together with Statutory Instrument No. 28 of 1997 provides for Environmental Impact Assessment regulations that classify projects into either the First Schedule or Second Schedule depending on the size, nature and anticipated environmental consequences of a project or sub-project. The Zambia EIA Regulations provide lists of projects or sub-projects proto-types which fall under the two categories

First Schedule: These are projects or sub-projects with minimal negative impacts on the environment and may require preparation of project briefs to determine the safeguards category. Examples relevant on the ZMERIP will include:

- a) Urban area rehabilitation.
- b) Flood control schemes.
- c) Timber harvesting and processing in forestry.
- d) Land consolidation schemes.
- e) Brick and earthen manufacture.

Others are;

- a) Storage of hydrocarbons.
- b) Projects located in or near environmental sensitive areas such as:-
 - indigenous forests;
 - wetlands;
 - zones of high biological diversity;
 - areas supporting populations of rare and endangered species;
 - zones prone to erosion or desertification;
 - areas of historical and archaeological interest;
 - areas of cultural or religious significance;
 - areas used extensively for recreation and aesthetic reasons;
 - areas prone to flooding and natural hazards;
 - water catchments containing major sources for public, industrial or agricultural uses;
 - and
 - areas of human settlements (particularly those with schools and hospitals).

Second Schedule: These are projects that require an extensive evaluation of activities likely to have significant negative impacts on the environment and require undertaking a detailed Environmental Impact Assessment. Examples on the ZMERIP broadly include:

- a) Urban Development
- b) Dams, Rivers and Water Resources

- c) Forestry Related Activities
- d) Waste Disposal

ANNEX 8: ATTENDANCE LIST FOR STAKEHOLDER WORKSHOPS

Attendance List 1

Workshop on Building Capacity for Monitoring Environmental/Health Risks of Lead Contamination and the Provision of Health Interventions – Hosted by the Kabwe Municipal Council, Ministry of Mines in collaboration with the World Bank

4 – 5th February 2016, Misuku Lodge, Kabwe

No.	Name	Organisation	Position	Phone/Mobile	Email
(1)	Billy Chewe	Ministry of Mines	Chief Mining Engineer	096940809	Billychewe@gmail.com
(2)	Choolwe Chadukwa	Ministry of Mines	Senior Mining Engineer	0977896462	Cchoolwe84@gmail.com
(3)	Joseph Makumba	Misenge Environmental and Technical Services	Chief Executive Officer	0977203489	makumbaj@mets.com.zm
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Attendance List 2

ZMERIP –Design Workshop for Livelihoods and Job Creation Sub-component Kabwe
February 24, 2016 – Walusungu Guesthouse – Kabwe

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(4)	Charity Chibawe	Small Quarry	0979873780
(5)	Charles Bwalya	Small Quarry	0975166012
(6)	Bridget Kabwe	Small Quarry	0979157497
(7)	Victoria Chileshe	Small Quarry	0962411819
(8)	Ruth Mwanza	Chililalila	0979203659
(9)	Boyd Mwape	Chililalila	0964654639
(10)	Ryan Kayeye	Community Development	0975137831
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(14)	George Milongo	Ministry of Mines	0968395347
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(17)	Kapachamoto Clifford	Njanyi Market	0978451709
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(19)	Etambuju Anamela	Agriculture	0955786268
(20)	Miriam Chilundu	Kabwe Municipal Council (KMC)	0966259540
(21)	Grace Wina	KMC	0977631292
(22)	Martha Chamwa?	KMC	0977481141
(23)	Mazuba Moono	KMC	0977503907
(24)	Agnes Mwila	KMC	0953618281
(25)	Joel Mwandila	Youth/Sports	0977460037
(26)	Mwila	Culture	0977205627
(27)	Asansaula Jane	Community Development	0977787120
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(29)	Bethamell Chikote	CCCI	09777764357
(30)	Pamela Zulu	KMC	0965350382
(31)	Victor Kagoli	KMC	
(32)	Kaori Oshima	World Bank	
(33)	Mwansa Lukwesa	World Bank	0978219929
(34)	Svetlana Khvostova	World Bank	
(35)	Mukula Makasa	ZDA	0977549056

Attendance List 3

ZMERIP –Design Workshop for Livelihoods and Job Creation Sub-component Copperbelt Province
February 26, 2016 – Sherbourne Hotel – Kitwe

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(29)	Svetlana Khvostova	World Bank	skhvostova@worldbank.org	