

# NATIONAL GUIDELINE ON MINE SITE DECOMMISSIONING AND REHABILITATION



SWEDISH ENVIRONMENTAL  
PROTECTION AGENCY



## **EXECUTIVE SUMMARY**

The mining sector in Kenya has grown over the years however, the practices have been unsustainable. Mine sites are hardly closed and decommissioned in line with the existing but rather inadequate environmental standards and international best practices. This guideline has been developed to enhance environmental performance and sustainability during mine site decommissioning and rehabilitation. The guideline is divided into three chapters as outlined.

Chapter 1 provides a situational analysis of the sector in Kenya; defines the objectives and scope of the guideline. The sector largely defined by artisanal and small scale miners has been challenged by practices that lead to inappropriate management of tailings, disused open pits and collapsed mine sites.

Chapter 2 provides an in-depth analysis of Policy, Legal and Institutional frameworks that are relevant to the sector. The review of this chapter provides great insights into the existing frameworks that can support sustainable mining practices. The analysis of these frameworks takes cognizance of gaps that have undermined environmentally sound and safe mine sites decommissioning and rehabilitation. The guideline provides a focused approach that addresses the existing uncoordinated requirements and considerations for mine site decommissioning and rehabilitation.

Chapter 3: is divided into three key thematic areas namely; mine site decommissioning and rehabilitation plan, a content guide of the plan and key issues in the mine site decommissioning and rehabilitation plan and finally the review of the plan. This chapter provides the detailed requirements for a typical plan that should be developed by the regulated facility. As part of good practice, the Plan should be submitted as part of the ESIA report and will be subject to review after every five years or as may be advised by the Authority from time to time.

## **FOREWORD**

The National Environment Management Authority (NEMA) in consultation with the relevant stakeholders in pursuant to section 9 (n) of EMCA, 1999 has developed the mine site closure, decommissioning and rehabilitation Guideline.

Planning for mine site closure, decommissioning and rehabilitation is a critical component of environmental management in the mining sector. Globally as evidenced by best practical approaches, planning for mine site closure should be done during the planning and design phase of the particular mining activity and sustained throughout the life time of the mine. This approach will ensure that the costly rehabilitation and remediation works at the end of a mine life is not incurred thus less financial burden to the mine operator, the government and the local community and the relevant stakeholders.

Several best practices have been borrowed from Australia and Sweden in the process of developing these Guideline. The objective of these Guideline is to ensure that, any mine site in Kenya is decommissioned, rehabilitated and closed in a well-planned process that ensures ecological sustainability and protection of the human health.

Therefore, it is envisaged that all the relevant stakeholders in the mining sector (including government agencies, the private sector, the civil society and the general public) will adopt, adhere to and implement these Guideline.

The guideline is further expected to enhance vibrant and sustainable management of mining operations that efficiently and effectively contribute to ecological and environmental stability, social economic development, and cultural benefits and strengthen community resilience towards climate change and to contribute to Kenya's climate change aspirations for the present and future generations.

**Chairperson**

**NEMA Board of Management**

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NEMA Board of Management provided substantive guidance, advice and managerial assistance and support throughout the process. It is my hope that the National Guideline on Mine Site decommissioning and rehabilitation will provide viable and practical bottom up strategy. This will ensure that the process of mine closure is not cumbersome and painful for the mine operators. I urge the policy makers, lead agencies, experts and the mining sector players to make good use of these Guideline on mine Site decommissioning and rehabilitation.

The mine site decommissioning and rehabilitation Guideline is a living document that will undergo review, development and continuous improvement, from time to time with focus on the emerging issues during mines site closure. The Guideline is not meant to replace the various existing regulatory framework in the mining sector and protection of the environment but to enhance them for the better management of the environment.

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## **ACRONYMS**

**ASM – Artisanal and Small-scale Miners**

**BTEX – Benzene, Toluene, Ethylbenzene, Xylene**

**CEC – County Environment Committee**  
**COK - Constitution of Kenya, 2010**  
**CSO - Civil Society Organizations**  
**DOM - Directorate of Mines**  
**DoGS - Directorate of Geological Surveys**  
**DoMP&VA Directorate of Mineral Promotion and Value Addition**  
**DOSHS – Directorate of Occupational Health and Safety Services**  
**EA - Environmental Audit**  
**ELC – Environment and Lands Court**  
**EMCA - Environmental Management and Coordination Act, 1999**  
**ESIA - Environmental and Social Impact Assessment,**  
**ESMPs - Environmental and Social Management Plans**  
**KFS – Kenya Forest Services**  
**KWS – Kenya Wildlife Services**  
**KNCHR – Kenya National Commission on Human Rights**  
**MCDAs – Ministries, Departments, Counties and Agencies**  
**MOH - Ministry of Health**  
**NECC – National Environment Complaints Committee**  
**NEMA - National Environment Management Authority**  
**NET – National Environment Tribunal**  
**NETFUND – National Environment Trust Fund**  
**NLC – National Land Commission**  
**NMC - National Mining Corporation**  
**NORMs – Naturally occurring radioactive material**  
**PAPs - Project Affected Persons**  
**PPP - Polluter-Pays Principle**  
**PPEs - Personal Protective Equipment**  
**PTC - Project Technical Committee**  
**TPH – Total Petroleum Hydrocarbons**  
**TSF - Tailings Storage Facility**  
**WRA – Water Resources Authority**

## **DEFINITION OF TERMS**

**Abandoned mine site -** Non-operational mines where mining tenure no longer exists

and the responsibility for rehabilitation cannot be allocated to any individual, company or organization responsible for the mining activities. Such sites are also called “derelict”, “orphan” or “former” mines.

**Authority** – Means the National Environment Management Authority (NEMA) established under section 7 of Environmental Management and Coordination Act, 1999.

**Beneficiation-** It is any process that improves or benefits the economic value of the ore by removing the gangue (commercially valueless material) minerals which results in a higher grade product or concentrate and a waste stream or tailings.

**“Biological Diversity”** means the variability among living organisms from all sources including, terrestrial ecosystems, aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, among species and of ecosystems.

**Boundary of a landform** - The edge of a landform is taken as being the base of the slope. This may be the battered footprint or the non-battered footprint. The footprint must not exceed the area specified in approval documentation.

**Closure** - A whole-of-mine-life process, which typically culminates in tenement relinquishment. It includes decommissioning and rehabilitation.

**Contaminated, in relation to land, water or a site,** - means having a substance present in or on that land, water or site at above background concentrations that presents, or has the potential to present, a risk of harm to human health, the environment or any environmental value. This definition may apply to the artificial concentration (localized accumulation) of natural substances or minerals which have the potential to present a risk of harm to human health, the environment or any

environmental value through this accumulation, such as mineral processing sites or tailings storage facilities.

**Decommissioning** - A process that begins near, or at, the cessation of mineral production and ends with removal of all unwanted infrastructure and services.

**Key stakeholders** - refers to post-mining land owners/managers and relevant regulators.

**Life of mine** - Expected duration of mining and processing operations.

**Mine Waste and Tailings** – the residue of mining operations that includes gravel, sand, slime or other substances that are discarded in the course of mining operations

**Mineral processing facilities** - Includes all processing facilities for ore treatment including crushing plants, grinding, vat leach, heap leach, dump leach and tailings disposal facilities.

**Mineral Win** - getting or extracting a mineral from the mines.

**Pits** - All open excavations including active mineral rock, gravel, sand, clay, bauxite and salt-pan extraction areas.

**Post-mining land use** - Term used to describe a land use that occurs after the cessation of mining operations.

**Rehabilitation** - The return of disturbed land to a safe, stable, non-polluting/ non-contaminating landform in an ecologically sustainable manner that is productive and/or self-sustaining consistent with the agreed post-mining land use.

**Remediation** - Rehabilitation, clean-up, rehabilitation, post-care, maintenance and compatible after-use activities.

**Safe** - A condition where the risk of adverse effects to people, livestock, other fauna and the environment in general has been reduced to a level acceptable to all stakeholders.

**Stable** - A condition where the rates of change of specified parameters meet agreed criteria.

**Stakeholder** - A person, group or organization with an interest in a particular decision, either as individuals or representing a group, with the potential to influence or be affected by the process of, or outcome of, mine closure.

**Tailings storage facility** - An area used to store and consolidate tailings, and may include one or more tailings storage features.

**Unacceptable liability** - Closure should not lead to regulators, or the community, or landowners or land managers having to take on responsibility for ongoing management, maintenance or monitoring above that which applied before mining, or that which applied to managing land uses comparable to the agreed land uses.

**Waste dumps** - Includes all mullock and waste rock disposal areas (also called Overburden Storage Area, Waste Rock Landform, or Waste Rock Storage/or Area), low grade stockpiles and mineralized waste stockpiles.

## **CHAPTER 1: INTRODUCTION**

### **1.1 Background**

Kenya is endowed with many mineral resources both metallic and non-metallic with their exploitation yet to reach peak level. It is a requirement that the quality of the environment needs to be maintained as an essential sector for the country while

undertaking the mining operations in a safe, clean and healthy environment by the mine owners. This is significant in view of upcoming new developments in the mining sector and considering that the Government of Kenya has recognized it as a key player for Vision 2030 and the Sustainable Development Goals (SDGs).

Failure by mine operators to undertake decommissioning and rehabilitation has negatively affected the sector. It portrays the sector in a negative light to the community due to the abandoned mines which often leave scars on the environment resulting into endangerment of the community health and their property. This has justified the need for development of Guideline for mine site closure, decommissioning and rehabilitation that should help the sector grow in an environmentally sustainable way for wealth creation.

National Environment Management Authority (NEMA) recognizes there is need for environmental rehabilitation at the end of life of a mine with a view to environmental sustainability. As such, mine site decommissioning planning should be part of the mining sector objectives to ensure sustainability during the after-use plan of the mining site. This requires that the environmental issues are well-thought-out throughout the mining life cycle through integration of the various environmental principles, requirements and considerations into the mining activities including the closure aspects. Proper management of the mines ensures that appropriate mitigation measures of potential environmental impacts and human health are integrated in the entire mining cycle.

The enactment of EMCA, 1999 and its subsidiary legislations is informed by several principles including the Polluter-Pays Principle (PPP). The principle provisions that any polluter to the environment must bear full responsibility of its clean up and rehabilitation. This obligates the mine operators to undertake activities such as appropriate decommissioning and rehabilitation to restore the mine site and other

environmental resources within the project area.

## **1.2 Objective of the Guideline**

The overall objective of the Guideline is to assist the mining operators, Ministries, Departments, Counties and Agencies (MCDAs), environmental experts, private sector, Civil Society Organizations (CSOs), communities and mass media in ensuring that the mining sites are decommissioned and rehabilitated after the cessation of the mining operations. This will ensure protection of the environment as well as public health and safety through elimination of adverse environmental effects resulting from the mining activities. It is therefore important to establish conducive conditions that are consistent with the agreed after-use plan and enhancement of the monitoring mechanisms in the decommissioned mine site area.

The objectives of this Guideline are:

- i. To provide guidance on the preparation of mine site decommissioning and rehabilitation plans to meet regulatory requirements and best practices;
- ii. To adopt best practices on mine site decommissioning and rehabilitation; and
- iii. To promote effective engagement and inclusive participation of Project Affected Persons (PAPs) and communities in decision making processes relating to mine site decommissioning, rehabilitation and after use.

## **1.3 The Scope**

These Guideline are applicable to the mining sector in Kenya to inform best practices in mine site decommissioning and rehabilitation. The Guideline shall apply to the mining operators, MCDAs, environmental experts, private sector, CSOs, communities and mass media in ensuring responsible mining decommissioning and rehabilitation. It is further envisaged that the Guideline will contribute to good governance through meaningful engagement among the relevant stakeholders while ensuring environmental and ecosystem sustainability, protection of human health, transparency and human rights considerations in the sector.

The Guideline will also be used during reviews of the relevant Environmental and Social Impact Assessment (ESIA) reports, Environmental and Social Management Plans (ESMPs), during inspections of the mine sites, compliance monitoring and environmental auditing.

## **CHAPTER TWO: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORKS**

### **2.1 Constitution of Kenya, 2010**

Article 42 of the Constitution on environment states that every person has the right to a clean and healthy environment, which includes the right:

- (a) to have the environment protected for the benefit of present and future

generations through legislative and other measures, particularly those contemplated in Article 69; and

(b) to have obligations relating to the environment fulfilled under Article 70.

## 2.2 Relevant National Policy, Legal and Institutional framework

There are other policy, legal and institutional framework that enable the functioning of the Constitution. The matrix below highlights the relevant statutes.

**Table 1: Policy, Legal and Institutional Frameworks Matrix**

| No. | Policy and Legal Frameworks | Key Applicable Provisions                                  | Regulations                                                                                                                                                                                                                               | Institutions                                |
|-----|-----------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| 1.  | Policy                      | National Environment Policy, sessional paper no 10 of 2013 | Chapter 4 which also covers minerals in Kenya which encourages sustainable mining                                                                                                                                                         | Ministry of Environment and Forestry, NEMA, |
|     |                             | Mining and Minerals Policy, sessional paper no 7 of 2016   | Mining Act 2016 and the Mining Regulations                                                                                                                                                                                                | DoM, DoGS, DoMP&VA, NMC                     |
| 3.  | Laws                        | EMCA, 1999                                                 | Section 3, 9, 24, 28, 29, 31, 57A, 58, 68, 108, 117, 125,<br><br>Environmental (Impact Assessment and Audit) Regulations, 2003<br><br>Environmental Management and Coordination (Waste Management) Regulations, 2006<br><br>Environmental | NEMA, NET, NECC, NETFUND, CEC               |

|  |  |                 |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                     |
|--|--|-----------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|  |  |                 |                              | <p>Management and Coordination (Noise &amp; Excessive Vibrations) Regulations, 2009</p> <p>Environmental Management and Coordination (Water Quality) Regulations, 2006</p> <p>Environmental Management and Coordination (Air Quality) Regulations, 2014</p> <p>Environmental Management and Coordination (Conservation of Biological Diversity and resources, access to genetic resources and benefit sharing) resources, 2006</p> |                                                                                                     |
|  |  | Mining Act 2016 | The entire Act is applicable | <p>Mining (Work Programmes and Exploration Reports) Guideline, 2017</p> <p>Mining (Licence and Permit) Regulations, 2017.</p> <p>Mining (Dealings in Minerals) Regulations, 2017.</p>                                                                                                                                                                                                                                              | Ministry of Petroleum & Mining, National Mining Corporation, Minerals and Metals Commodity exchange |

|  |  |           |                                                   |                                                                                                                                                                                                                                                                         |                                                        |
|--|--|-----------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
|  |  |           |                                                   | <p>Mining (Community Development Agreement) Regulations, 2017.</p> <p>Mining (Strategic Minerals) Regulations, 2017.</p> <p>Mining (Mine Support Services) Regulations, 2017.</p> <p>Mining (Award of Mineral Rights by Tender) Regulations, 2017.</p>                  |                                                        |
|  |  | OSHA 2007 | Section 9, 11, 14, 16, 21 44, 49, 50, 52, 64, 101 | <p>Eyes protection rules L.N 44/1978</p> <p>Building operations and works of engineering construction rules L.N 40/1984</p> <p>Electric power special rules L.N 340/1979</p> <p>First aid rules- L.N 160/1979.</p> <p>Health and safety committee rules-L.N 31/2004</p> | Directorate of Occupational Safety and Health Services |

|  |  |                                                |                                                      |                                                                                                                                                                                                 |                                                           |
|--|--|------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
|  |  |                                                |                                                      | <p>Medical examination Rules L.N 24/2005</p> <p>Noise prevention and control Rules L.N 25/2005</p> <p>Fire Risk Reduction Rules L.N. 59/2007</p> <p>Hazardous Substances Rules L.N. 60/2007</p> |                                                           |
|  |  | Explosives Act, Cap 115                        | Section 18, 20, 21, 24, 28                           | Explosives (Blasting and explosives) rules                                                                                                                                                      | Ministry of Petroleum and Mining, Director of Mines       |
|  |  | Work Injury Benefits Act, 2007                 | Section 7, 10, 21, 45,                               |                                                                                                                                                                                                 | DOSHS                                                     |
|  |  | Employment Act, 2007                           | Section 4, 6, 17, 26, 27, 29, 30, 31, 32, 33, 34, 35 | Employment general rules of 2014                                                                                                                                                                | Ministry of Labour, Employment and Labour relations Court |
|  |  | Land Act, 2012                                 | Section 11, 19,                                      |                                                                                                                                                                                                 | NLC                                                       |
|  |  | Environment and Land Court Act, No. 19 of 2011 | Section 4, 13, 14, 16                                |                                                                                                                                                                                                 | ELC                                                       |
|  |  | Community Land Act                             | Section 5, 6, 8, 27, 34, 35, 36                      | Community land Regulations, 2017                                                                                                                                                                | Ministry of Lands, NLC, County Government, ELC            |
|  |  | Water Act, 2016                                | Section 22, 23, 36                                   | Water Resources Management Rules, 2007                                                                                                                                                          | WRA, Water Appeals Tribunal, ELC, Basin Water Resources   |

|  |  |                                                  |                                      |                                                                                                                                   |                                                          |
|--|--|--------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
|  |  |                                                  |                                      |                                                                                                                                   | Committee, Water Resource Users Associations,            |
|  |  | Physical and Land Use Planning Act No. 3 of 2019 | Section 14, 18                       | Physical and Land Use Planning (Development permission and control) (general) Regulations 2021                                    | County physical and land use planning consultative forum |
|  |  | Forest Conservation & Management Act, 2016       | Section 8, 20, 21, 30                | Forest (Participation in Sustainable Forest Management) Rules, 2009                                                               | KFS, County governments                                  |
|  |  | Wildlife Conservation and Management Act, 2013   | Section 26, 45, 46,47                | Wildlife Conservation and Management ( Protection of Endangered and threatened ecosystems, habitat and species) Regulations, 2017 | KWS                                                      |
|  |  |                                                  |                                      | Wildlife Conservation and Management (Joint Management of Protected Water Towers) Regulations, 2017                               |                                                          |
|  |  | National Land Commission Act, 2012               | Section 5, 6                         | National Land Commission (Review of Grants and Dispositions of Public Land) Regulations, 2017                                     | NLC                                                      |
|  |  | County Government Act, 2012                      | Section 102, 103, 104, 105, 109, 110 |                                                                                                                                   | County Government                                        |
|  |  | Public Health Act                                | Section 21, 22, 38,                  |                                                                                                                                   | Ministry of Health                                       |

|  |  |                                                     |                       |  |       |
|--|--|-----------------------------------------------------|-----------------------|--|-------|
|  |  |                                                     | 115                   |  | (MoH) |
|  |  | Kenya National Commission on Human Rights Act, 2011 | Section 8, 28, 29, 33 |  | KNHCR |
|  |  | Climate Change Act, 2016                            | Section 23            |  | ELC   |

### **CHAPTER 3: MINE SITE DECOMMISSIONING AND REHABILITATION PLAN**

Inadequate information at the national scale on the decommissioning and rehabilitation of mines has resulted in several environmental challenges posing risks to public health and the environment.

The development of this Plan will ensure an integrated approach in the

decommissioning, rehabilitation, mine site closure and after-use to guarantee environmental integrity and public safety.

### **3.1 Typical Structure of the Mine Site Decommissioning and Rehabilitation Plan**

The Plan should be structured in the following format to ensure consistency across the mining sector to enable evaluation for adequacy, accuracy and completeness once submitted to NEMA:

#### **1. Cover Page**

The following information must be included on the cover page of the Plan but not limited to:

- (i). Title of project;
- (ii). The mine site location - L.R. Number and GPS Coordinates;
- (iii). Date of submission;
- (iv). ESIA License Number if applicable;
- (v). Environmental Audit reference number;
- (vi). Mining permit/license number;
- (vii). Company name; and
- (viii). Contact details (including the name, address and contact of the proponents and/or operator).

#### **2. Table of Contents**

The Table of Contents for the Plan (among other standard items) must include; an authentication page, list of figures, tables, photos of the project site intended for decommissioning (before and after) and maps as may be appropriate.

#### **3. Scope and Purpose**

This section describes why the Plan is being prepared and details out the scope of the Plan and other relevant introductory information.

#### **4. Project Description**

This section details site description, physical and geological characteristics of the site

and mining operations being undertaken. The following information must be provided in the description but not limited to:

- (i). Land ownership including occupancy, mining tenure, postal and site address, and contact details;
- (ii). Location of the operation, including a list of all relevant tenements and maps showing tenement boundaries, nearby sensitive receptors and the location of the mine in relation to the local and regional setting;
- (iii). An overview of the operations with a description of the major mine components; and a figure showing the mine site layout and identifying all disturbed areas;
- (iv). **Geology:** Briefly describe the topography and general geology indicating rock types available, the chemical constituents of the rocks / minerals including toxic elements if any, at the mine site;
- (v). **Reserves:** Indicate the types of the mineral reserves available in the lease area estimated in the last mining plan / mining scheme approved along with the balance mineral reserves at the proposed mine closure including its quality available (for final mine closure plan only);
- (vi). **Mining Method:** Describe in brief the mining method followed to win the mineral, extent of mechanization, mining machinery deployed, auxiliary equipment, production level, chemicals among others;
- (vii). **Mineral Beneficiation:** Describe in brief the mineral beneficiation practice if any indicating the process description; and
- (viii). Indicate discharge details of any tailings/middling's and their disposal/utilization practice followed and management of overburden.

### **3.2 Key Issues in the Mine Site Decommissioning and Rehabilitation Plan**

Planning for mine closure involves consideration of a number of often complex issues including technical, legal, financial and socio-economic aspects. The focus here is on the technical issues that relate to environmental degradation caused by the mining and its subsequent rehabilitation.

Below is a list of key mine site decommissioning and rehabilitation parameters and monitorable indicators to be addressed but not limited to;

### **3.2.1 Water Quality and Quantity:**

- (i). Reference should be made to the baseline water quality and quantity status prior to the mining operations.
- (ii). Describe in detail the existing surface and ground water bodies available in the mining areas and the measures to be taken for protection of the same. These should include control of erosion, sedimentation, siltation, water treatment, diversion of water courses. Additionally, measures for protection of contaminated ground and surface water in particular considering leach pads, waste facilities with sulfidic mine waste, collection ponds or any material containing chemical products or contaminated water, sediments, soils or waste.
- (iii). Quantity and quality of surface water bodies should also be indicated and corrective measures proposed to meet the water quality standards.
- (iv). Report of hydrological study carried out in the area may also be submitted.
- (v). The water balance chart should be given.
- (vi). If there is potential of acid mine drainage the method of prevention and treatment should be given.
- (vii). Sampling and analysis of the applicable parameters such as heavy metals, PH, total hardness, calcium hardness, magnesium hardness, chlorides, sulfates and total dissolved solids, grease, Total Polyaromatic Hydrocarbons (TPH), Benzene, Toluene, Ethylbenzene, Xylene (BTEX) should be considered among others.

### **3.2.2 Air Quality:**

- (i). Reference should be made to the baseline air quality status prior to the mining operations.
- (ii). Describe the existing air quality status covering the gaseous emissions and particulate matter among others.

- (iii). The corrective measures to be taken for prevention of air pollution should be described.
- (iv). Particular consideration should be given to tailings storage facilities or similar where mine waste can be removed and transported by wind.
- (v). Analysis should be done to establish the presence of Fibrous (including asbestiform) materials and the safety and management measures put in place to address the same.
- (vi). Sampling and analysis of the applicable parameters such as SO<sub>x</sub>, NO<sub>x</sub>, heavy metals, radioactivity, PM<sub>10</sub>, PM<sub>2.5</sub> should be considered among others.

### **3.2.3 Waste Management:**

- (i). Describe the type, quality and quantity of overburden, waste rock, tailings, mine water, mineral rejects available and their disposal practice.
- (ii). If no utilization of waste material is proposed, the manner in which the waste material will be stabilized should be described.
- (iii). The protective measures to be taken for prevention of siltation, erosion and dust generation from these waste materials should also be described.
- (iv). If toxic and hazardous elements are present in the waste material, the protective measures to be taken for prevention of their dispersal in the air environment, leaching in surface and ground water, in soils and sediments should be described.
- (v). Sampling and analysis of the applicable parameters should be considered.

### **3.2.4 Soil Quality:**

- (i). Reference should be made to the baseline soil quality status prior to the mining operations.
- (ii). The top soil, the overburden and the waste rock available at the site and their recovery, storage as well as their utilization should be described.
- (iii). In-situ and ex-situ treatment to remove the contaminants or reduce the associated hazards to acceptable level should be discussed.

- (iv). Radioactivity - Analysis should be done to establish the presence of Naturally Occurring Radioactive Materials (NORMs) and the safety and management measures put in place to address the same.
- (v). Sampling and analysis of the other applicable parameters such as heavy metals, PH, total hardness, calcium hardness, magnesium hardness, chlorides, sulfates and total dissolved solids, grease, TPH, BTEX, should be considered among others.

### **3.2.5 Biodiversity**

Biodiversity is a key component of the ecosystem and must therefore be protected. It is advisable that biodiversity assessment is done during ESIA process and a clear framework for its protection and management to be in place during the decommissioning and rehabilitation planning. The following information should be provided in the Plan but not limited to:

- (i). The biodiversity parameters that should be assessed are; flora & fauna, fresh water & marine, Critical habitats/Fragile ecosystems as is applicable;
- (ii). Reference should be made to the biodiversity assessment studies including ecologically sensitive areas, threatened species which were done prior to the mining operations;
- (iii). **Offset:** Indicate the biodiversity offset as a compensation to the loss of biodiversity;
- (iv). **Opportunity cost:** Discuss lost opportunity that might result from the implementation of the mining activity with the desire to have a win-win scenario between mining activities and conservation; and
- (v). Indicate the status of the ecological recovery at the site.

### **3.2.6 Tailing Storage Facility (TSF) Management**

- (i). The steps taken for protection and stability of tailings dam, periodic desilting, stabilization of tailings material and its utilization
- (ii). Measures to prevent water pollution from tailings arrangement for surplus water overflow along with detail design, structural stability studies, the embankment seepage loss into the receiving environment and ground water contaminant if any

should be given.

- (iii). Post-care and maintenance plan for the TSF to be described
- (iv). Provide details of the mineralogical studies done to characterize tailings and cover material and identify the presence and nature of potentially acid producing sulfides and any other liquids remaining in the TSF and their treatment prior to discharge or evaporation.

### **3.2.7 Disused mine pits**

Develop compatible after-use plans in consultation with the PAPs and other stakeholders for the disused mine pits.

### **3.2.8 Infrastructure**

- (i). The existing infrastructural facilities available such as roads, aerial rope-ways, conveyor belts, railways, power lines, buildings & structures, water treatment plant, transport, water supply sources in the area among others and their future utilization should be evaluated on a case by case basis.
- (ii). If retained, the measures to be taken for their physical stability and maintenance should be described.
- (iii). If decommissioning proposed, dismantling and disposal of building structures, support facilities and other infrastructure like electric transmission line, water line, gas pipeline, water works, sewer line, telephone cables, underground tanks, transportation infrastructure like roads, rails, bridges, culverts, electrical equipment's and infrastructures like electric cables, transformers to be described in connection with restoring land for further use.

### **3.2.9 Disposal of Mining Machinery and Equipment**

- (i). The decommissioning of mining machineries and their possible post mining utilization and disposal options, if any, to be described.
- (ii). The closure plan must consider how rehabilitation works will be carried out if mining machinery is unavailable at the time of rehabilitation and closure.

- (iii). Closure costs should include machine rental costs and costs of manpower on a normal commercial contractor basis.
- (iv). Dismantling, segregation, reuse, recovery, recycling and final disposal to be described.

#### **3.2.10 Safety and Security**

- (i). Explain the safety measures implemented to prevent access to surface openings, excavations and arrangements proposed during the mine decommissioning before the site is subjected to a compatible after-use plan.
- (ii). Occupational safety and health requirements should be observed.

#### **3.2.11 Disaster Management and Risk Assessment**

- (i). This should deal with action plan for high risk accidents like landslides, subsidence flood, inundation in underground mines, fire, seismic activities, tailing dam failure and emergency plan proposed for quick evacuation and ameliorative measures to be taken.
- (ii). The capability of the mine owner and operator to meet such eventualities and the assistance to be required from the National and County Governments should also be described.

#### **3.2.12 Care and maintenance during temporary discontinuance**

- (i). Provide an emergency plan for the situation of temporary discontinuance or incomplete programme due to court order or statutory requirements or any other unforeseen circumstances. This should include a plan indicating measures of care, maintenance and monitoring of status of unplanned discontinued mining operations expected to re-open in near future.
- (ii). This should detail periodic and objective monitoring and maintenance programme.

#### **3.2.13 Visual Amenity**

- (i). Reference should be made to the aesthetic baseline of the site prior to the mining operations.
- (ii). The state of aesthetic recovery in comparison with the surrounding area.
- (iii). Develop compatible after-use plans in consultation with the PAPs and other stakeholders.

#### **3.2.14 Heritage and Cultural Aspects**

- (i). Protection of heritage and cultural site - mineral extractions should not be undertaken within the heritage and cultural sites.
- (ii). Provide information on existing World Heritage and Cultural sites around the mine sites
- (iii). Submit an undertaking on non-interference with the listed heritage and cultural site around the mine site
- (iv). Provide information on the restricted no-go cultural sites and measures taken in liaison with the National Museums of Kenya (NMK) to protect these sites.

#### **3.2.15 Post-Mining Land Use and Closure Objectives**

The mine site decommissioning plan should identify all potential (or pre-existing) environmental legacies (including contaminated sites) which may restrict the post-mining land use. The following land use hierarchy provides a guide to determining post-mining land use(s):

- i. Reinstate “natural” ecosystems to be as similar as possible to the original ecosystem. Biodiversity offsets can also be considered as long as no harm is posed to the environment and the public.
- ii. Develop an alternative land use with higher beneficial uses than the pre-mining land use.
- iii. Reinstate the pre-mining land use.

In the early stages of a mining project, it may be acceptable for provisional or proposed post mining land use(s) to be identified, provided that there has been

adequate engagement with the government, PAPs, local communities and other key stakeholders. A clear process and timelines to further identify or refine the agreed post-mining land use(s), Human Rights-Based Approaches and Grievance Redress Mechanisms (GRM) should be communicated as part of the stakeholders' engagement process.

#### **3.2.16. Identification of Closure Obligations and Commitments**

All legal obligations relevant to rehabilitation and closure at a given mine site must be identified and provided in a suitable format. These include all legally binding conditions and commitments and/or legal obligations applicable under relevant National and County legislations. These include:

- (i). The Mining Act, 2016
- (ii). Environmental Management Coordination Act, 1999
- (iii). Occupational Safety and Health Act , 2007
- (iv). The Water Act, 2016
- (v). The Land Act, 2012
- (vi). The Physical and Land Use Planning Act, 2019
- (vii). Agriculture Fisheries and Food Authority Act, CAP 318
- (viii). Conditions prescribed in the ESIA licence
- (ix). Environmental Rehabilitation Orders and Improvement Orders
- (x). The decommissioning specifications and standards (National and International best practices).

#### **3.2.17. Engagement with the Project Affected Persons, Local Communities and other Stakeholders**

The mine operator shall identify all the stakeholders to be engaged since stakeholder engagement is a key component of mine site decommissioning planning. Early and continuous engagement with stakeholders enables operators to better understand and manage stakeholder expectations and the potential risks associated with closure. Failure to undertake a stakeholder engagement program may compromise the

approval process and mine closure outcomes.

Mine site decommissioning plan reporting requires that a tabulated summary on all engagement between the operator and the relevant parties be provided. It should include:

- (i). Date of engagement;
- (ii). A description of the nature of the engagement;
- (iii). Level of information provided to stakeholders;
- (iv). Who the stakeholders were;
- (v). The comments and issues raised by the stakeholders;
- (vi). How the operator has responded to the concerns raised and report the stakeholder response to the proposed resolution; and
- (vii). Evidence of the stakeholder engagements and process. This should be in form of attendance lists, minutes, pictorials and videography

The operator shall ensure that adequate resources are provided/allocated to ensure effective engagement process.

### **3.2.18. Post closure Audits and Monitoring Responsibilities**

Unless prescribed by the Authority on a case by case basis, the mine operator shall prepare and submit post closure audits annually to the Authority.

The operator shall also monitor environmental elements, parameters and measurable indicators to inform the measurement of environmental changes that have occurred towards achieving the required decommissioning specifications and standards.

In meeting the required decommissioning specifications and standards, the operator shall take into account the following factors:

- (i). The public safety of the site;
- (ii). The stability of the site under a range of seasonal conditions representative of that climate;
- (iii). Ecological system recovery at the site;

- (iv). The state of recovery in comparison to the surrounding area;
- (v). The aesthetic value of the site;
- (vi). Sampling and analysis of applicable parameters;
- (vii). The compatible after-use plan of the site and the potential for improved future land use planning and /or site development;
- (viii). Involvement of the PAPs, the local community and other stakeholders;
- (ix). The timescales to meet the required decommissioning standards;
- (x). The remediation of any contaminated sites;
- (xi). Operation and monitoring information or other information that meets a specific purpose (e.g. maps, photos, area statistics, species lists or modelled environmental impacts); and
- (xii). A history of closure implementation and past developments at the site.

The Authority in consultation with the relevant lead agencies shall undertake periodic environmental monitoring and/or control environmental audits, whenever it is deemed necessary to check compliance with environmental parameters and prescribed standards for the mine site.

### **3.2.19. Financial Provision for Closure**

Current international practice requires that the financial guarantees need to be calculated and secured ahead of mining activities. Ideally, funds for mine closure should be available to close the mines at any stage of the mine life whether the operator is there or not.

The objective of financial provisioning for closure is to ensure that adequate funds are available at the time of closure and that the community is not left with an unacceptable liability. To that end, it is essential that the cost of closure be estimated as early as possible. The financial provisioning process and methodology has to be transparent and verifiable, assumptions and uncertainties have to be clearly documented, and they have to be based on reasonable, site-specific information and data throughout

the life of the project. The closure cost estimates must be regularly reviewed to reflect changing circumstances and levels of risk. This will ensure that the accuracy of closure costs is refined and improved with time, and will assist with management and mitigation of high-risk issues.

The financing of decommissioning, rehabilitation and closure of the mine sites is within the provisions of the Polluter Pays Principle and as specified under section 28 of EMCA, 1999 as well as internationally applicable best practices. This should place the onus of expenditure for site assessment, management, decommissioning, remediation, waste treatment and disposal on those responsible for the pollution.

### **3.3 Review of Mine Decommissioning and Rehabilitation Plan**

The Authority may liaise with the relevant lead agencies to review the mine decommissioning and rehabilitation plan based on set criteria in accordance with section 3.1 of this Guideline and issue a decision on the same. The decision of the Authority, together with the reasons thereof, shall be in writing and communicated to the operator within sixty (60) days from the date of submission of the Plan.

Where the Authority is satisfied with the content of the Plan, the Authority shall issue an approval with terms and conditions, as may be appropriate. If the Authority is not satisfied with the adequacy or reliability of information stated in the Plan, the Authority may request for additional information to enable it make an informed decision.

### **REFERENCES**

National Environment Policy, sessional paper no 10 of 2013

Mining and Minerals Policy, sessional paper no 7 of 2016

Environmental Management Coordination Act, 1999

Mining Act, 2016

Occupational Safety and Health Act, 2007

Explosives Act, Cap 115

Work Injury Benefits Act, 2007

Employment Act, 2007

Land Act, 2012

Environment and Land Court Act, No. 19 of 2011

Community Land Act, 2016

Water Act, 2016

Physical and Land Use Planning Act No. 3 of 2019

Forest Conservation & Management Act, 2016

Wildlife Conservation and Management Act, 2013

National Land Commission Act, 2012

County Government Act, 2012

Public Health Act, Cap 242

Kenya National Commission on Human Rights Act, 2011

Climate Change Act, 2016

Environmental (Impact Assessment and Audit) Regulations, 2003

Environmental Management and Coordination (Waste Management) Regulations, 2006

Environmental Management and Coordination (Noise & Excessive Vibrations) Regulations, 2009

Environmental Management and Coordination (Water Quality) Regulations, 2006

Environmental Management and Coordination (Air Quality) Regulations, 2014

Environmental Management and Coordination (Conservation of Biological Diversity and resources, access to genetic resources and benefit sharing) resources, 2006

Mining (Work Programmes and Exploration Reports) Guideline, 2017

Mining (Licence and Permit) Regulations, 2017.

Mining (Dealings in Minerals) Regulations, 2017.

Mining (Community Development Agreement) Regulations, 2017.

Mining (Strategic Minerals) Regulations, 2017.

Mining (Mine Support Services) Regulations, 2017.

Mining (Award of Mineral Rights by Tender) Regulations, 2017.

Community land Regulations, 2017

Physical and Land Use Planning (Development permission and control) (general) Regulations, 2021

Wildlife Conservation and Management (Protection of Endangered and threatened ecosystems, habitat and species) Regulations, 2017

Wildlife Conservation and Management (Joint Management of Protected Water Towers) Regulations, 2017

National Land Commission (Review of Grants and Dispositions of Public Land) Regulations, 2017