REGULATIONS GOVERNING TAILING STORAGE FACILITIES MANAGEMENT UNDER THE MINERAL, MINING AND ENVIRONMENTAL PROTECTION LAW OF THE REPUBLIC OF LIBERIA 2024-VERSION 1.0

MINISTRY OF MINES & ENERGY
CAPITOL HILL, MONROVIA
LIBERIA
2025

IN EXERCISE of the powers conferred on the Minister by sections 21.1, 21.2, and 21.3 of the Minerals and Mining Law of Liberia 2000, (PART 1, TITLE 23, LIBERIAN CODE OF LAWS REVISED), These Regulations become effective on this 9TH *Day of* OCTOBER *A.D. 2025, at the hour of* 12:00 NOON

Wilmot J. M. Paye
Minister, Ministry of Mines and Energy

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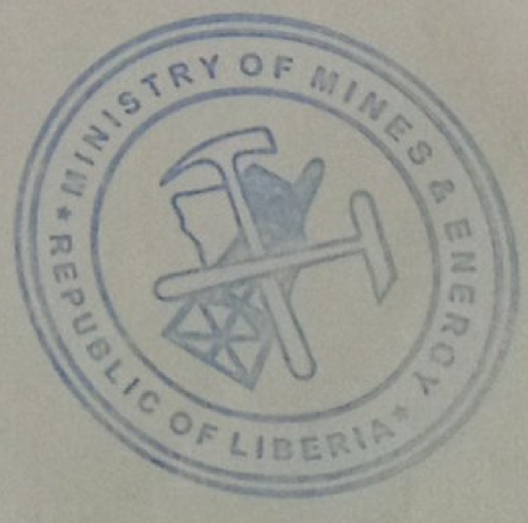

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MINISTRY OF MINES & ENERGY
REPUBLIC OF LIBERIA

PREAMBLE

Regulations govern the standards and procedures for the management of tailing facilities (TSFs) issued under the Liberia mineral and mining Law of 2006 being part 2 of the Title 23 of Liberian code of Law. Including those granted under the authority of Regulation No.002 of the Public Procurement and Concession for regulating public health and safety, environmental protection and sustainable mining practices throughout the lifecycle of mining operations in Liberia. Unless the context otherwise clearly requires, the terms listed below contain the purposes of these regulations, merely set forth below. References to this regulation refer to the complete regulation including all schedules and not merely to section in which the reference embedded.

SECTION 1. GENERAL PROVISIONS

1.1 Title, Commencement

1.1.1 These regulations may be cited as the Tailings Storage Facility (TSF) Management

Regulations of Liberia, 2024.

1.1.2 These regulations shall come into effect on and after the (Effective date) as refer to in section.

1.2 Purpose

This regulation and aim to establish comprehensive guidelines for environment protection and safety that ensure responsible management of TSFs associated with mining activities in Liberia.

1.3 Scope

These regulations are apply to all tailings storage facilities with in Liberia, covering their design, construction, Closure and Post-Closure Phases

1.4 Principles and Interpretation

The principles of the regulation of Tailing Storage Facilities (TSF) are essential for ensuring the safety, environmental protection and operational efficiency in the mining sectors. These principles covered all aspects of Tailing Dam Management including Site Selection, Design, Construction, Operation, Monitoring and inspection, Maintenance, Closure and Rehabilitation.

These Regulatory frameworks contain legal compliance and clear mandates for Risk Management, Environmental protection, Technical Standards, Monitoring and reporting, Stakeholder engagement, Continuous Improvement, Per- Closure, Closure, Post-Closure and Rehabilitation for Long- Term Stewardship.

1.5 Administration and Interpretation

1.5.1 The Regulator refer to Ministry of Mines and Energy as the primary regulatory authority overseeing mining operations and tailing storage facility management in Liberia. Responsible for issuing permits, conduct inspections, and enforcing regulations. **As Specified by Kreft- Burman, K, Saarela, J. & Anderson, R. (2005).**

1.5.2 Implementing partners refer to government agencies that collaborate with the Ministry of Mines and Energy to ensure comprehensive and coordinated oversight of tailing storage facility management, social, economic and public safety deliberations. Such includes:

(I) Environmental Protection Agency (EPA): Responsible for regulating and monitoring environmental impacts, including water and air quality and biodiversity, associated with tailing storage facilities,

(II) Ministry of Public Works (MPW): Provides expertise in civil engineering and Infrastructure development, including the design and construction of tailing storage Facilities and association.

(III) Ministry of Health (MOH): Provides expertise in public health and safety, including assessing and mitigating health risks associated with exposure to contaminants from tailing storage facilities.

(IV) National Bureau of Concessions (NBC): involved in the negotiation and administration of mining concessions and agreements, ensuring compliance with legal and prescribed obligations related to tailing storage facility management

(V) Ministry of Internal Affairs (MIA): Coordinate with local government authority and Communities affected by mining operations, facilitating stakeholder engagement and ensuring community participation in decision- making processes.

(VI) Local Government Authorities: Municipal and county authorities may be involved in land use planning permitting and regulatory enforcement related to tailing storage facilities within their jurisdictions.

(VII) Ministry of Finance and Development Planning (MFDP): Responsible for financial oversight and management, including the establishment and administration of financial assurance mechanisms for tailing storage facilities.

1.6 Definitions and Terminology

1.6.1 ***"Tailings"*** *refer to the residual waste generated after the extraction of valuable mineral from the uneconomic faction and are described as finely ground rock particle that contain toxic water and chemicals that are store in the Tailing Storage Facilities.*

1.6.2 *'Tailing Storage Facility (TSFs)''* *means an engineered structure designed to store tailing after extraction and during the processing of minerals. TSF includes Dams, ponds and impoundments.*

1.6.2 Part of tailing storage facility and association.

(i) 'Beach'' the relatively dry, flat area near the perimeter of tailings impoundment where tailings are deposited. This are help to create a stable surface and can influence the overall stability of the dam.

(ii) 'Embankment'' is the main body of the dam, usually constructed using materials such as earth, rock or mine waste. It provides the structural integrity to contain the tailing.

(iii) 'Perimeter Dike'' An embankment or series of embankments constructed around the perimeter of the tailings impoundment to contain the tailing and water.

(iv) 'Reclaim Pond'' A pond located within the TSF where water is collected and recycled back in to the processing plant. Additionally, it aids in managing the water balance and reducing and environmental impact.

(v) ''Starter Dam'' the initial, often smaller dam constructed to begin tailing storage. It serve as the base for subsequent raises as the tailing volume increases.

(vi) 'Spillway'' A structure designed to safely convey excess water away from the dam to prevent overtopping and potential failure.

(vii) 'Seepage Collection system'' is a system designed to collect and manage any seepage through the dam.

(viii) ''Tailing Basin/ impoundment '' the area behind the embankment where the tailing are stored. It can be a valley a flat area or artificially created depression.

(ix) 'Tailing Dam Failure'' means the collapse or breach of a dam signed to contain tailings, resulting in the release of stored materials into the environment.

(x) 'Tailing Pipeline'' is used to transport the tailings slurry from the processing plant to the TSF

(xi) 'Upstream" involves constructing successive embankments on top of and upstream of the previous ones, utilizing the dried tailings as part the foundation. **(xii) 'Downstream"** involve constructing new embankments downstream of the initial embankment, using borrow materials from other sources.

(xiv) 'Design Capacity" The maximum volume or capacity of tailing storage facilities determined during the design phase, based on factors such as estimated production rates and lifespan of mine.

(xii) 'Centerline" combines features of both Upstream and Downstream methods, with new raises built directly on top of the previous one aligned with the original crest.

(xv) 'Structural stability" The ability of tailing storage facility to maintain its physical integrity and resist collapse or failure, ensuring the safety of personnel and nearby communities.

(xvi) 'Seepage Control Measures" implemented to prevent or minimize the migration of water or contaminants through the walls, flood, or foundation of a tailing storage facility, reducing the risk of environmental contamination.

(a) 'Best Available Techniques (BAT)" Mean the most effective and advanced state in the stage of the development of activities and their methods of operation.

(b) 'Best Practices" refer to the most effective and efficient methods recognized globally for managing TSFs to ensure safety and environmental sustainability.

(c) 'Contamination" refer the presence of harmful substances in the environment resulting from the release of tailings, which can affect soil, water and ecosystems.

(d) 'Drill" a planned exercise or practice session designed to prepare the TSF personnel for emergency situations and help to prepare the staff and management for potential emergency issues such as dam breaches, tailing spills or other incidents that pose risks to safety and the environment.

(f) 'Emergency Preparedness" plan refer to a strategy developed to respond effectivity to emergencies, such as tailings dam failures to minimize environmental and human impact.

(g) 'Emergency Response Plan (ERP)" Plans and procedures developed to address potential emergencies or incidents at tailing storage facilities such as dam breaches, spills, or slope failure , including evacuation plans, emergency contact information, and response protocols.**(h) 'Environmental Impact Assessment (EIA)"** refer to a process used to evaluate the environmental effects of a proposed project or development.

(i) 'Environmental Monitoring" The systematic collection and analysis of data to assess the environmental impacts of tailing storage facilities, including water quality monitoring, air quality monitoring, and ecological monitoring.**(j) 'Effective date"** the accurate, reliable and time information that is crucial for ensuring the safe and efficient operation of the facility was recorded.

(k) **'Environmental Protection"** the process of minimizing the environmental impact of tailings storage by proactive management and remediation efforts.**(l) 'Erosion Protection"** Techniques employed to prevent erosion of the surface of a tailing storage facility, such as revegetation, erosion control mats, or slope stabilization measures.

(m) 'Financial Assurance ' Financial mechanisms such as surety bonds, trust funds or insurance, provided by mining operations to cover the costs of closure, post closure monitoring and remediation of tailing storage facilities in event of bankruptcy or default.

(n) 'TSF License" is a regulatory authorization required for the construction, operation and maintenance of tailing dam in Liberia.

(o) 'Licensee" is the entity (typically a mining company or operator) that holds the tailing storage facility management license.

(p) 'Mineral and Mining Law of Liberia" refer to the regulation governing the exploration, extraction, and management of minerals resources in Liberia, including regulation of TSFs.

(q) 'Monitoring and Compliance" refer to the ongoing process of checking and ensuing that TSFs adhere to regulatory requirement and environment standards.

(r) Monitoring Equipment: includes instruments such as piezometers, inclinometers, and settlement gauges to monitor the structural health and stability of the dam.

(s) Rehabilitation and closure: The process of decommissioning and restoring a tailing storage facility to its pre-mining land use, including activities such as reclamation, revegetation, and long term monitoring

(t)Rehabilitation and closure structures: Facilities and measures designed for the long-term closure and rehabilitation of tailing dam including covers, vegetation and water treatment systems to ensure site is safe and environmentally stable post-closure.

(t) 'Reclamation" The process of restoring land disturbed by mining activities including TSFs, to its natural or economically usable state

(u) 'Regulatory framework" mean the set of laws. Regulation and guidelines, and standards that govern the construction, operation and decommissioning of TSFs.

(v) 'Risk Assessment" refer to the process of identifying, Analyzing and evaluating the risks associated with TSFs to minimize potential environmental and safety Hazards.

(w) 'Stakeholder Engagement" refer to the involvement of all parties affected by TSFs including local communities, NGOs, government agency, and mining companies in decision-making processes.

SECTION 2. REGULATORY CONTEXT AND AUTHORISATION

2.1 Legal Framework

All TSF Operators in Liberia must comply with all National Laws and Regulations in Alignment with International Best Practices and guidelines for tailing dam management in Liberia. These include but not limited to The Tailings Storage Facility (TSF) Management Regulations of Liberia, ITP 308, 2024, the Mineral and Mining Law of Liberia, the Environmental Protection Agency Acts, the Public Health Law and the Exploration Regulation of Liberia. And the International Commission on Large Dams (ICOLD) and International Council on Mining and Metals.

2.2 Compliance Requirement

The Obligation of operator is to demonstrate compliance through regular reporting, audits and inspections.

(a) Compliance with these regulations is mandatory for all entities operating TSFs in Liberia.

(b) Penalties for noncompliance, including fines, Suspension of Operation and revocation of permits will be issued base on the severity of the violation. As indicated in the Mineral and mining Laws of Liberia, the exploration Regulations, the Environmental Protection Agency Acts, and section of this TSF Regulation.

(c) Ministry of Mines and Energy must create and issue guidelines to the licensees for TSF design, construction, operation, closure and post closure. **As outline in**

2.3 Roles and Responsibilities

(a) Ministry of Mines and Energy (MME) is the primary regulatory body for TSFs Management in Liberia. **As outline in Section 1.5.1**

(b) Environmental Protection Agency (EPA) and other implementing partners must collaborate with MME to implement the management of TSFs in Liberia. **As framed in Section 1.5.2**

SECTION 3. APPROVAL AND PERMITTING

3.1. Approval Requirement

Preliminary permit should be granted to applicants to conduct baseline studies for the period of three month as required **in schedule 1.1.2 (a)**

(a)Prior to the approval of preliminary permit, operators must submit the project proposal including design, construction plans and Environmental Social Impact Assessment (ESIA), to the Minister of Mines and Energy (MME)**. As outline in Schedule 1.1.3 (i)**

3.2 Permitting Process

Construction, Operational, and Closure permits should be granted to licensees by the Minister of MME base on the submission of

- Environmental social Impact Assessment (ESIA).
- TSF Construction plans including: Designed, Construction, Operational, Closure and Post-closure plans.

Ministry of Mines and Energy (MME) must conduct a though review of the submitted documents and should involve third-party experts to ensure compliance with safety and environmental standards. As prescribed **by Canadian Dam Association's (CDA) Guidelines and Provincial Regulation.**

SECTION 4. DESIGN AND CONSTRUCTION

4.1 Site Section and environmental impact assessment

Operators must ensure minimal impact on local ecosystems and communities by conducting thorough site evaluations including geological, hydrological and environmental impact.

(a) All mining companies in Liberia involving with or interesting in mineral processing must build a TSF's Dam base on these standards Quantified in **Schedule 1.1.1 (i)**

(b) In searching for a suitable site, Operators shall take advantage of elevated areas like hills or high lands, as well as valleys basins or elevation **See Schedule 1.1.1 (ii).**

(c) Operator must conduct baseline studies prior to dam construction to evaluate the site environmental condition. **As outlines in schedule.1.1.2 (a)**

4.2 Design Standard

TSF Designs must comply with engineering standards for Geo-hazard and hydrological risk assessments to ensure structural integrity and stability.

(a) Tailing storage facilities must incorporate risk management strategies to withstand local environmental conditions including potential hazards, extreme weather and to prevent leaks and failures. **As indicated in Schedule**

(c) The design shall incorporate measures to prevent seepage and groundwater contamination.

(d) Construction must follow appropriate designs and include robust Quality Assurance and quality control (QA/QC) procedures.

(e) Mandatory, Qualified and Technical TSF Expert must oversee construction activities.

Moreover, prepared a detail progress report for submission at the Ministry of Mines and Energy (MME). As specified **by WITT, K.J. & Wudtke, R,-B, (2004)**

4.3 Material and Construction Quality

(a) Use appropriate materials for dam construction and liner systems to ensure stability and impermeability.

(b) Implement strict quality control measures during construction, including inspections and testing.

4.4 Water Management Design

(a) Design effective water management systems to handle precipitation, surface runoff and water process water.

SECTION 5. MANAGEMENT AND OPERATION

5.1 Operational processes

(a) A Tailings Management plan (TMP) must be develop and approve by Ministry of Mines and Energy (MME). As prescribed **by Engels, J, (2004).**

(b) The Tailings Management plan (TMP) shall detail operational procedures, emergency preparedness, Maintenance schedules and Environmental protection measures.

(c) The Best Available Techniques (BAT) must be employed for tailings deposition and water management. As recommended **by Engels, J, (2004).**

SECTION 6. MONITORING, INSPECTING AND PROTOCOLS

6.1 Monitoring and requirement

(a) Continuous monitoring of TSF stability, seepage, water quality, and environmental impact is mandatory. (b) Automated and manual monitoring systems should be used. (c) Monitoring data of facility's performance must be regularly reported to MME to ensure compliance with legal requirement. In reference to **Niederleithinger, E, Kruschwitz, S. & Martin, T (2005).**

6.2. Inspection Protocols

(a) Routine inspections by qualified engineers are required.

(b) Mandatory, Independent third – party must conduct inspections yearly.

(c) Inspection reports must be submitted to Ministry Mines and Energy (MME), in accordance to **Kreft- Burman, K., Saarela, J. & Anderson, R. (2005).**

(d) The inspection reports shall document findings, identify deficiencies, and recommend corrective actions.

63 Reporting and requirement

(a) Operators must submit regular reports on TSF operations including environmental monitoring and inspection data to MME. **(b)** Any incidents or noncompliance issues must be reported immediately. **(c)** Reports shall be made available to the public to ensure transparency and accountability **(a)** Comprehensive risk assessments must be conducted during design and operation phases.

(b)Risk assessment should identify potential failure modes and outline mitigation strategies. In reference to **Witt, K.J. & Schonhardt, M. (2004).**

SECTION 7 RISK MANAGEMENT

7.1. Risk assessment and mitigation

Comprehensive risk assessments must be conducted during design and operational phases.

(a) The risk assessments should identify potential failure modes and outline mitigation strategies.

(b) These strategies should assist in detecting structural weakness, water seepage or contamination early to mitigate risk and prevent failures.

7.2. Emergency planning and preparedness

(a) Each TSF must have a site-specific Emergency Response Plan (ERP) to address potential incidents such as dam breaches or leaks.

(b) Obligatory, The Emergency Response Plan (ERP) must be reviewed and updated annually, as stipulated **by Engels, J, (2004).**

(c) Compulsory, regular emergency drill should be part of the comprehensive disaster risk reduction strategy as indicated **by the UN Disaster Preparedness and Risk Reduction Guidelines.**

7.3 Training and drills

(a) All personnel involved in TSFs management must undergo regular training and be certificated to conduct drills and ensure readiness for emergency, as recommended by ICMM Critical Control Management.

(i) The purpose of this training exercise is to ensure personnel are familiar with emergency response plans and capable of identifying areas for improvement.

(ii) During this exercise, Operators should develop a clear communication channels and include response actions to evaluate containment that coordinate with emergency services.

(iii) Conduct a debriefing session after the drill to review performance, discuss what, how, when and where to identify areas for improvement.

(b) Take in account of regular emergency drill assessment quarterly to ensure comprehensive preparedness.

(c)All relevant personnel, including TSF operator, safety and emergency response teams, potentially local community representatives and authorities should participate in the drills. In reference to **Engels, J, (2004).**

SECTION 10. CLOSURE, POST- CLOSURE AND REHABILATATION

Section 10.1. Closure planning

(a) TSF Operators must developed closure plans at the initial stage of the TSF design, and This plan should captures the procedures for TSF decommissioning, and rehabilitation that should be integrated base on the standards set forth by International council of Mining and Metals (ICCM).

(b) Rehabilitation plans must restore the land to its' natural or economically usable state. This mean, the site needs to be restored to its stable and safe condition

(c) Post-closure monitoring is required to ensure long-term stability and environmental protection or rehabilitation goals.

(d) Financial assurances for closure and rehabilitation must be secured.

As mentioned **by Xenidis, A. (2004)**

SECTION 8 STAKEHOLDER ENGAGEMENT

8.1 Public Participation

(a) TSF Operators and regulators are obligated to involve stakeholders, including local communities in the decision-making process.

As recommended by Kreft- Burman, K, Saarela, J. & Anderson, R. (2005)

(b) This process should be transparent and the information must be accessible to ensure clear communication channels and to maintain the bond among stakeholders.

(c) Operators must create protocols to address stakeholder concerns and incidents as well as getting them Involved with environment and safety monitoring programs.

(d) Provide education and training program for stakeholder.

8.2 Conflict Prevention and Resolution

MME must engage with stakeholders to gather diverse perspectives and ensure the regulations address the needs and concerns of all affected parties.

(a) Reduces the risk of conflicts and opposition by involving stakeholders in decision-making process and addressing their concerns.

(b) TSF performance and stakeholder engagement activities should be share to the public.

(c) Operative mandate involved, investing in community development and provide tangible benefits to local or affected communities. Especially the direct affected communities.

(d) Maintain ongoing dialogue regularly with stakeholder to address concerns proactively and prevent conflict from escalating.

(e) Share impact assessed from TSF's operation with stakeholders and any mitigation measures implemented.

(f) Cultivate regular review of concerned and issues raised by the community dwellers to improve conflict resolution process base on feedback and learned.

SECTION 9. REVIEW AND IMPROVEMENT

9.1 Continuous improvement

(a) Mining operators must regularly review and update their TSF management practice to incorporate new technologies, industry best practices, based on the lesson learned from the experiences.

(b) This process should include internal audits and assessments to identify opportunities for improvement.

9.2 Regulatory Review and update

(a) Ministry of Mines and Energy along with relevant stakeholders must review these regulations and update every five years.

11.(b) In this review, consider feedback from the stakeholders, technological advancements and change in international standards, as mentioned by Kreft- Burman, K, Saarela, J. & Anderson, R. (2005).

(c) Ministry of Mines and Energy (MME) must publish any amendment or updates to these regulations in the official newspaper.

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SCHEDULES

SCHEDULES 1. TSF Lifecycle Guidelines

i. Planning and Design Phase, **Duration must be 6 months maximum.**

This phase involve initial feasibility studies such as site selection and Environmental Impact assessment and approval of permits

Site selection for tailings dam construction: Time frame: Two (2) months maximum.

Selecting tailings dam site is a complex process that involves multidisplinary approaches that ensure safety, environmental protection, regulatory compliance and economic feasibility. With that said, Operator must consider the below factors in order to determine site suitability, stability, and safety.

ii. Geological and Geotechnical conditions

All mining companies in Liberia involving with or interesting in mineral processing must build their TSF 's Dam base on these standards for selecting a site**, conduct drilling**, **soil sampling**, **rock chips testing** and **groundwater analysis** to evaluate the strength and stability of the soil and rock before construction of TSF's Dam.

(a) Deduce the site must have a low or zero risk of tectonic activities such faults, landslide, seismic activities etc.
(b) Note, if the entire area has high risk of tectonic activities, operators are required to create a design that can withstand those activities.
(c) The site must have low level of permeable soil to reduce seepage and potential contamination of groundwater.

iii. Topographical investigation: High and low elevation, such as hills, Valleys, basins or depressions cloud be preferable site for selecting site for TSF Dam construction. In that, the higher the area the lesser the seepage becomes. On the other hand, the valley or depression can served as containment if they have impermeable layer, which helps reduce seepage, and improve the overall stability and safety of the TSF. Additionally, they maximize the storage capacity for tailing, without the need for extensive embankment construction and helps to reduce erosion and the risk of dam failure. Nevertheless, depressions are not free from surface and groundwater contamination.

iv. Hydrological investigations: All operators must analyze the historical and potential flood events in the area and investigate how well the area collects and stores water. Considering the flood risk assessment, As well as avoiding proximity to water sources such as rivers, lakes, and aquifers to prevent contamination.

1.1.2 Environmental Impact Assessment (EIA) Period: Three (3) Months maximum.

(a) At this stage, operators shall evaluate the potential environmental impact and develop mitigation strategies. This assessment should include, baseline studies, public consultations, and draft EIA report.

1.1.3 Permits and approvals Requirements Length: one (1) Month maximum.

(i) Upon approval of the Environmental Social Impact Assessment (ESIA) prior to TSF Dam Construction and operation, operators must submit the Environmental Impact Assessment (EIA) report and Public consultation documents to the Ministry of Mines and Energy (MME) in order to obtain a Construction Permit.

1.1.3 Tailing Storage Facility Design and Construction

(a) Detailed engineering design and specification

Operator must hire a qualify TSF technocrat and an engineer to prepare a complete design and construction plan that outline all aspects of construction and operation of tailing storage facility (TSF). These plans must align with national laws, international best practices and standards.

(b) These construction plan must include site's map and location, including boundaries and access road as well as nearby infrastructure if there is any.

(i) **Draw detailed diagram** of the physical structures including dams, embankments and containment walls as well as its angles and sections.
(ii) **Construction material** should be suitable soil, rock, concrete and geo-membranes.
(iii) **Construction methods includes,** excavation, compaction and layering techniques
(iv) **Consider the flood risk assessment**, the soil and rock stability, its bearing capacity and potential for settlement or slippage, measure to prevent soil erosion and management sediment during and after construction.

(v) For safety measures, construct drainage systems to manage seepage and prevent contamination of groundwater.

(vi) Calculate the stability of the slope properly to ensure embankment and slope stability under various conditions.

(vii) Construct emergency spillway channels to manage excess water during extreme weather events and prevent overflow of the tailings.

(viii) **1.3** Detailed procedures for the development of Pre- Closure, Closure, Post-Closure Rehabilitation and Decommission of TSFs.

1.3.1 Per-Closure periods (12 – 24 Months or 1-2 years)

Before TSFs Closure, Operator must prepare a per-closure plan specifying detailed engineering designs and times for closure.

(i) Stipulate methods for safe closure and rehabilitation.

(ii) The maximum and minimum timeframe shall be 1-6 months.

(iii) Assess potential risks and environmental impacts such as surface and ground water quality, soil degradation, etc.

(iv) Meet with regulatory bodies, local communities and other stakeholders to ensure demonstration with compliance.

(a) **Permits and Approvals Period (7- 12 Months)**

Licensees must apply for closure permits and Approvals from the 7-12 month base on the submission of the final draft of the of the Closure plain to Ministry of Mines and Energy to secure legal permits and ensure finding for closure and post-closure activities.

(b) 13 -18 Months are allotted for financial resources allocation, personnel settlement and equipment discard methods such as decontamination, recycling, Reuse and repurposing, selling safe disposal, dismantling and demolition, documentation and compliance, professional Services and Community Involvement.

(c) Assign specific personnel and equipment to various closure activities.

1.3.2. Closure (0-2 Years): From the **6 and 7 Months,** all mineral processing activities must cease. This mean the tailing depositional process should slowly reduce or stop. At this point, the implementation measures to prevent erosions and dust generation must take effects.

(a) Within the " **7- 12 months** any remaining water with in the facilities and the dam ponds must be treated and controlled through the design channel s or ponds before discharging into the environment.
(b) Beginning from the **13-18 months**, reinforce embankment and Dams for long-term stability.
(c) Use revegetation, Geo-textiles or other methods for erosion control.
(d) By the **"19-24 months"** Licensees must apply cover system. The method that should be use to cover the tailing's surface includes material such as clay, geo- membranes and soil.
(e) These Selected materials should be effective and durable for the covering.
(f) Plant vegetable or native species to covered tailings surface for sustainable vegetation.

1.3.3. Post- closure (60 months or 5 years)

(a) In the first 1- 12 Months, Licensees must conduct regular inspection on the TSF and surrounding areas to identify any early issues. The parameters for inspection and monitoring are below

(i) Licensees must regularly monitor the water quality, soil stability, and vegetation growth.

(ii) Ensure that water management systems are functioning properly and repair any immediate damage.
(iii) Additionally, Licensees must engage and submit the first set of progress report to the minister of Minister of MME and relevant stakeholders (**see section**) for valediction.
(iv) In the reporting document, the reporters must highlight all details of post-closure activities and any issues encountered.

(b) In the second 13 to 24 Months or year 2 the inspection and monitoring activities should continue.

(i) Licensees must adhere to regulatory requirements and evaluate the effectiveness of initial rehabilitation measures.

(ii) Address any issues identified during the first year, including system maintenance and erosion control.

(iii) Submit updated progress reports and document to MME

(C) The 25-36 Months or Year 3, licenses shall conduct intensive monitoring activities based on previous findings, and ensure adjustments to rehabilitation efforts based on environmental monitoring results.

(i) Perform additional maintenance as required, addressing new issues or reinforcing previous measures.

(ii) Maintain communication with stakeholders, providing updates and addressing any concerns

1 **The 37-48 Months or year 4,** licensees must conduct comprehensive inspections to ensure all systems are functioning optimally.

(i) There must be a rigorous, persistence environmental monitoring, documentation, and effectiveness of implemented measures.

(ii) Retain details documentation of all activities, finding, and adjustments made.

2 **Months 49-60 or year 5,** Licensees must conduct final review of all closure and post-closure activities per formed in the past five years.

(i) The closure plan shall be revise base on new data, findings, and technological advancements.

(ii) In the final monitoring and maintenance events, ensure all systems are stable and functional, addressing any outstanding issues.

(iii) Prepare and submit the final report summarizing all monitoring results and adjustment made.

SCHEDULES 3. Application form

3.1 Preliminary Approval Application form

3.2 Construction permit Application form

3.3 Operational License Application form

SCHEDULE 4. MONITORING AND INSPECTION CHECKLISTS

4.1 Daily, weekly and Monthly Inspection Checklists

4.2 Annual Inspection Checklists

Schedule 5. Risk assessment template

5.1 Risk assessment template for design phase

5.2 Risk assessment template for operational phase

5.3 Emergency Response Plan Template

5.4 Emergency including contact list

(a) Migration routes

(b) Response procedures

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Schedule 7. Reporting Formats

7.1 The organized reporting formats for monitoring data and inspection