ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FULL STUDY REPORT FOR THE PROPOSED EMAKPET UNIVERSAL LIMITED, SODIUM CYANIDE, NITRIC ACID, SULPHURIC ACID AND CAUSTIC SODA STORAGE, HANDLING AND UTILIZATION IN GOLD LEACHING AND ELUTION PLANT IN MIGORI COUNTY ON LR NUMBER SUNA EAST/WASWETA 1/9032

Latitude -1.087550 and Longitude 34.460323

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August 2023

PROJECT STUDY REPORT AUTHENTICATION

PROJECT CONSULTANT

Certification by the EIA/EA Expert

I hereby certify that this full study report for the proposed Emakpet Universal Limited proposed sodium cyanide, nitric acid, sulphuric acid and caustic soda storage, handling and utilization in gold leaching and elution plant in Migori county on LR Number Suna East/Wasweta 1/9032 has been done by a team of experts lead by me as a licensed expert and that the study criteria, methodology and content reporting conforms to the requirements of the amended Environmental Management and Coordination Act 2015, section 147 with regard to full study reports.

Signature: _____ **Date: 30th August 2023**

EIA/EA Lead Expert: Evans Nangulu

NEMA Reg. No. 1951

Certification by Proponent

I hereby confirm that the contents of this report are true and shall guide the implementation of the proposed mitigation measures and also wish to undertake to implement further instructions from NEMA in relation to these study findings as well as feedback from onsite inspections.

Signature: _____ **Date: 30th August 2023**

Mr. Amaheno Jumbah Gaylord

General Manager

This report immensely benefited with the contributions on the following experts who played a vital role in its development.

NAME	TECHNICAL ASSIGNMENT
I. Dr. Jane Kabugi	Sociologist and Gender Expert
II. Humphrey Mmbasu	Health and safety expert
III. Dulow L. Khayenja	Geologist /Hydrogeologist
IV. Michael Mwaura	Biologist (botany and zoology expert), NEMA EIA Associate
V. Peter Ohon	Sociologist (Population Expert)

EXECUTIVE SUMMARY

Emakpet Universal Limited is a registered company in Kenya and would wish to establish a Gold leaching and processing plant in Migori County. In fulfillment for the requirements of the Environmental Management and Coordination Act, EMCA 2015, the proponent successfully submitted the project terms of reference which were approved and hereby submit the full study report to the national environment management authority for review and subsequent advertisement to both print and audio media for a wider stakeholder's engagement.

This full study report has been prepared in accordance with the legal requirements of the Environmental Management and Coordination Act, EMCA 2015 amendment and Environmental (Impact Assessment and Audit) 2006 and Amendment Regulations of 2019 requiring projects listed in schedule II to undergoes environmental impact assessment prior to implementation. The proposed project will be implemented, installed or housed in an existing go down facility formally used for fish processing along Migori -Isebania road approximately 5 km from Migori town at cost of Ksh. 12,000,000

Based on the consultants site visit, interview with the project proponent , collected views from key informants within Migori County and results from a stakeholders consultation meeting held on 17th of August 2023 in Migori, it was established that the proposed project is of high risk and require vital mitigation measures to be put in place and the proponent has to constantly put in place and implement mitigation measure proposed in the environmental and social management plan developed for contentious improvement and sustainability From the site visits findings and interaction with stakeholders, immediate positive impacts which will be realized with the implementation of the proposed project include.

I. Creation of employment opportunities – the proposed project will provide employment for the locals who will be responsible the minerals exploration, mining process, loading, transportation. processing and final Gold product finishing and provision of other auxiliary services within the facility i.e. security and administration services

II. Creation of income to Gold miners with a ripple effect into the community at large

III. Enhanced economic growth – the proposed facility will enhance the economic growth of Migori County through revenue generation through various applicable forms of county taxation.

IV. Contribution to the development of the local infrastructure through, increased power connectivity and enhanced water supply
V. Increased land and resource value addition through Gold mining and processing in the region
VI. The project will contribute to creating a globally competitive and prosperous Kenya with high quality of life that aims to transform Kenya into a newly industrializing middle-income country contributing to the global precious Mineral (Gold) trade

Negative impacts anticipated with the implementation of the proposed project include

I. Soil erosion from the disturbed/compacted lands during the raw materials mining processes
II. Pressure to the existing infrastructure and resources i.e. water which will be required for dust suppression during mining and processing
III. Increased noise and vibration mostly during the facility operation
IV. Air pollution (dust particles emanating from samples delivery by vehicles and from the sample preparation activity (crushing to fine dust)
V. Exhausts gases pollution from the Gold leaching and elution plant, raw materials delivery and personnel vehicles and onsite generator that will be installed
VI. Occupational health and safety concerns related to poor workmanship and poor chemicals handling, poor health standards may occur and chances of accidents to workers if health and safety concerns will not be enforced
VII. Occupational health and safety concerns related to communicable diseases i.e. COVID 19, Common flue/colds and HIV Aids may occur due to increase of human contact
VIII. Solid Waste Generation from used final muddy soil and domestic waste generated by personnel on site
IX. Exacerbation of social crimes within the facility site due to increased activities.

Based on the expert's analysis, the contribution of the positive impacts associated with the proposed project and given that Gold mining and processing is among of the government agenda and priorities to spur economic growth of the country while maximally exploiting the country minerals resources base and value addition for national development outweighs the negative impacts which in nature and not adverse and irreversible. These negative impacts have been mitigated in the environmental and social management plan during the full study process. Therefore, it is our recommendation that the proposed be approved after a further subjection to public participation through the print and audio media.

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CHAPTER ONE

1.0 INTRODUCTION

Emakpet Universal Limited proposed project will entail renovation of an existing go down in Migori County formally utilized by a fish processing. The facility to be utilized will undergo renovation and consists of two good downs all partitioned into various sections that will house offices, a quality control laboratory, storage areas for sensitive chemicals (sodium cyanide, nitric acid, sulphuric acid caustic soda and black carbon) and a state of the art gold leaching /elution processing facility with the collection of tailings. The existing go downs to be utilized are on a 0.20-ha plot of land situated within a sparsely populated area of SUNA EAST/WASWETA 1/9032 Migori County.

1.1 Gold mining in Kenya

In Kenya the gold mining, leaching and processing sector is largely operated illegally, the artisanal gold and small-scale mining (AGSM) workforce in Kenya is estimated to be 10 times that of large-scale gold mining operations in the country and supports the livelihoods of up to 800,000 people. This sub-sector also makes significant contributions to Kenya's economy as listed below

I. The Ministry of Mining and Petroleum estimates that Kenya's entire mining sector produces more than 34 tons of gold per year
II. A report from the Alliance for Responsible Mining estimates that artisanal and small-scale gold mining contributes about US$224 million to the country's economy, representing over half the entire mining sector's contribution to the GDP.
III. Artisanal and small-scale mining accounts for 2 percent of Kenya's total export earnings

Despite the contributions of gold mining to the economy and increasing importance, the sub-sector remains largely informal. This results in miners and their families bearing immense risk in trying to eke out a living. The widespread use of mercury and dangerous, unhealthy working conditions, as well as the presence of illegal child labor, and environmental risks continues to attract the attention and action from key stakeholders including the Kenyan government, which is making strides and investments in the sub-sector since the enactment of the Mining Act, 2016.

Today, the government of Kenya envisions that the entire mining sector's contribution to the GDP will grow to represent 10 percent by 2030 through value addition and the implementation of new policies. To this end, the Mining Act, 2016 aims to streamline the country's mining sector, contribute

to environmental conservation and sustainable development. In the year 2021, the Artisanal gold miners finally got government support in which various programs on safety training, sustainable mining practices were launched.

Emakpet Universal Limited would wish to establish a modern medium scale gold leaching facility in Migori County. The proposed facility will use stabilized sodium cyanide, nitric acid, sulphuric acid and caustic soda as the main raw material for gold extraction and treatment.

1.2 Principal of Environmental and Social Impact Assessment (ESIA) full study consideration.

The core principle of the ESIA is that every person has the right to a clean and safe environment and has a duty to improve and protect the environment. With this obvious logic and specific reasons, this proposed project report is compiled for submission to NEMA for the required phase of documentation and to make choices. In addition to the above-mentioned main concept, other ESIA principles considered are

I. Accounting for all environmental issues in the proposed project cycle activities proposed.
II. Performance evaluation of the proposed project activities and meeting or exceeding all relevant requirements and regulations
III. Measuring and assessing environmental performance during the entire project cycle by performing daily internal audits.
IV. Conducting meaningful public engagement and participation to collect the necessary information on the proposed project activities from the interested and affected stakeholders.
V. Recognition of historically used social and cultural values in the management of the climate and natural resources
VI. Emphasizing on Emergency preparedness and response planning based on the chemicals to be handled and establishing a robust quantitative risk for the project Considerations
VII. A precautionary principle which stipulates that action must be taken to avoid serious and irreversible damage.

1.4 Proposed project objectives.

The proponent aims to establish a modern medium scale gold leaching facility in Migori County. The facility will use stabilized sodium cyanide, nitric acid, sulphuric acid and caustic soda as the main raw material for gold extraction and treatment.

. This project will ensure;

I. Boosting the local economy by offering job opportunities renovation and operations
II. To make a more socio-economic use of the plot as it is currently vacant
III. Enhance revenue collection hence contribution to that local and national government economic growth
IV. Promote sustainable mining and minerals processing in line with the national's aspiration of upscaling mining activities.

1.5 Objective of the ESIA.

I. To comply with the legal requirements as outlined in section 58 of the EMCA 2015 and EIA/EA regulation of 1019
II. Perform an environmental assessment of the project area with a view to avoiding environmental deterioration and ensuring the proper functioning of ecological systems.
III. Identify the major environmental impacts of the proposed project and analyzing them in line with available best alternatives
IV. Formulation and implementation of the Environmental Protection and Monitoring Plan for the entire project life cycle

1.6 Proposed Project Scope

For any new projects, initiatives or activities at their planning stages, the Environment Management and Coordination Act, 2015 mandates that an EISA be carried out to ensure that major environmental effects are considered during the project design eventual operation and decommissioning. The following scope has been considered for guiding the implementation of the proposed project

I. Environmental screening in accordance with the proposed project
II. Environmental scoping based on the site visits
III. Identification of anticipated environmental impacts of the proposed project and scale of the impacts
IV. Identification and analyses of alternative methods or technologies form implementation the proposed project
V. In-depth stakeholder consultation and public consultation for interested and affected parties.
VI. Examination of applicable international and national laws regulating patterns.

VII. Compensatory steps to take account of the negative consequences if any

VIII. Identification and discussion of the possible positive and negative effects on the physical, social, economic and cultural environments of the proposed project.

IX. Preparation of an Environmental Management Plan (EMP) to direct the project's implementation.

X. Preparation of full study Environmental and Social Impacts Assessment report for the proposed project and submission to NEMA for decision making.

1.7 Project Terms of Reference

The terms of reference agreed between the expert and the project proponent(s) were as follows: -

I. To provide a description of the proposed project activities with a potential focus on potential adverse impacts in the proposed project design operation and abandonment (decommissioning) phases caused by the inputs, waste generated and disposal and social economic aspects.

II. To establish the legal and regulatory aspects, administrative frame of reference, to identify governing standards, legislation and guidelines, and to determine permits and authorizations which will be required from different sectors agencies and institutions involved.

III. To describe the area of influence, and select methods of measuring the environmental aspects of concern including physical (water, air, soil and noise), biotic environment (vegetation, flora and fauna), chemical, socioeconomic (socio and economic structure, demographic, and socioeconomic background), cultural (aspects of cultural, archaeological, or anthropological interest) and landscape

IV. To establish scales to be used for required maps and characteristics of baseline and other data required and the reliability or deficiency level stipulated for such data.

V. To establish the methods to be used in identifying and quantifying environmental impacts, methodologies for predicting those impacts and how those impacts will be described in terms of; character (negative or positive), condition (reversible or irreversible), period (short, medium, or long-term), scope (cumulative, synergistic, direct, indirect) and establishing what standards will be used for the ESIA.

VI. To establish at what stages of the project the mitigating, corrective, compensatory and other measures will be used to eliminate, minimizing or mitigating adverse/significant impacts and how these measures will be selected.

VII. To define a schedule of activities, reaction with regard to risk prevention and accident control, objectives, specific tasks and budget through an Environmental and Social Management Plan (ESMP)

VIII. To provide a monitoring program of relevant environmental issues, specific variables to be included in the environmental follow-ups, detection limits and standards to be used and contents of the follow-up program.

IX. To establish the stakeholders to be involved in the community/public participation process, methods of reporting the project to the public, procedures to be used for community participation and aspects to be considered in the community participation plan during the development and review of the study.

X. To establish the criteria to be used in defining the composition of the working team of experts and the special requirements and information needed to form the team and characterize the same respectively.

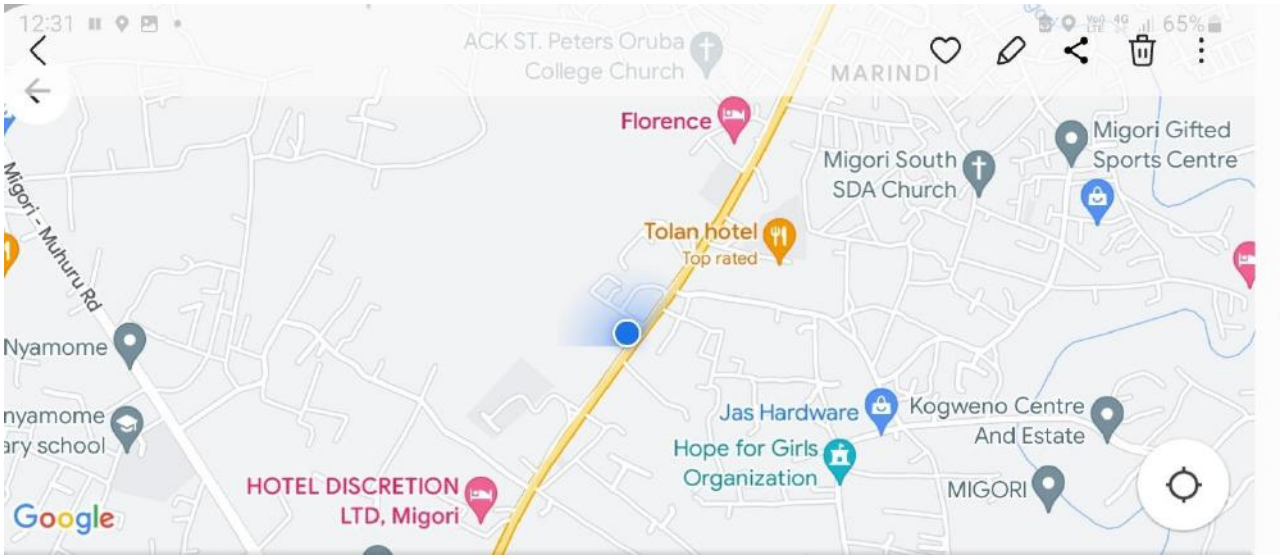
XI. To produce a systematic study report in accordance to the Environmental Impact Assessment and Audit Regulations of 2019

CHAPTER TWO

2.0 PROJECT DESCRIPTION AND PHYSICAL ENVIRONMENT

2.1 Proposed Site Location

The proposed project site is accessible from along Migori -Isebania road at coordinates Latitude -1.087550 and Longitude 34.460323 at an elevation of 1402 Meters Above Sea Level on LR No. Suna East/Wasweta 1/9032 Migori County.



The project proposed location is a gold-rich gold belt and is expected to contain several milli on tons of gold. This has contributed to gold discovery and mining by individuals and corporations since the colonial period. However, the mining and processing techniques used (artisanal) are mostly primitive and thus leave most of the gold intact in the gangue. It is due to this reason that Emakpet Universal Limited would wish to establish a modern medium scale gold leaching / elution facility in Migori County, Suna East. The facility will use stabilized sodium cyanide, nitric acid, sulphuric acid and caustic soda as the main raw material for gold extraction and treatment.

2.2 The Cyanide Process

Cyanide Process is the most common process used for the extraction of gold. Various methods, such as concentration of gravity, flotation, panning, hydrometallurgy, cyanidation, etc., are required for extraction of gold metal from its ores. Cyanidation is the most common method used in these processes. This method includes the dissolution of gold bearing ores in diluted cyanide solution in the presence of lime and oxygen.

Sodium Cyanide (a combination of Carbon and Nitrogen) is one of the main substances used for gold extraction in a process called “Cyanide Leaching” (cyanidation). Cyanide in a form of diluted sodium cyanide solution is used to dissolve and extract gold from ore. The process has been introduced by large-scale commercial mining, having the additional benefit that it was safer than mercury amalgamation, which has been predominant method prior to cyanide use. In Migori it is also used by Artisanal and Small-Scale Gold Miners, although they are still in the transition process from mercury usage.

2.3 Gold cyanidation

Gold cyanidation (also known as the cyanide process or the MacArthur-Forrest process) is a hydrometallurgical technique for extracting gold from low-grade ore by converting the gold to a water-soluble coordination complex. It is the most commonly used leaching process for gold extraction. Cyanidation is also widely used in the extraction of silver, usually after froth flotation.

Emakpet universal will adopt the following process **Mining (ore extraction) – Ore characterization – Ore preparation – Cyanide Leaching – Recovery of gold** – Gold is smelted into dore (***not to be done on site***).

2.4 Gold Extraction Process description

Emakpet universal will adopt a simple type of gold recovery by cyanide leaching, called Vat Leaching Technology (VLT). It does not require any mechanical agitators and merely relies on the action of a percolating Cyanide solution to dissolve any particles of gold that come into contact with it. The process will begin with the preparation of reagents, which will dissolve cyanide into a barren tank for a solution of 450-500 ppm Cyanide. Then on the raw material pad, the materials will be combined with lime, which will serve as a pH-raising agent maintained above 11 in the leaching method. After preparation, the ore is deposited in the vat/leach tanks by means of conveyors or loaders or by hand shovels. A barren solution of 450-500 ppm Cyanide solution from the solution feeder tanks will then be discharged to the ore (each tank individually fed) by a hollow pipe system. The solution is fed from the top of the leach tanks through the top of the pile to allow the solution to percolate through the pile. Cyanide has been left to leach gold for up to 72 hours. The gold-plated pregnant solution will flow from the bottom of the pile to the pregnant solution tank. The solution will be read for carbon loading prior to subsequent and electro-winning processes. During the leaching phase, the solution is checked for PH. balance, which should be maintained at a minimum of 010.5 using lime.

The fully used leached tailing would then be washed with fresh water to wash away any trace of cyanide left in it until it is removed from the leaching tank. Water from the flashing/washing process will be discharged into the carbon chamber into the same discharged channels in order to undergo the same process as the gold-plated pregnant solution. It is assumed that after the leaching process and the flashing/washing of fresh water tailings before removal from the leaching tanks, there will be no trace of cyanide in the treated tailings and if any, it will have a low concentration and an insignificant environmental effect as it is easily and rapidly destroyed by sunlight.

2.5 Adsorption of carbon

Carbonaceous ores that allow cyanide to dissolve gold but quickly return gold to the active carbon in the ore. Treatment methods include chlorination for carbon deactivation, carbon-burning roasting and carbon-in-leaching, which adds competing high-level carbon to preferably adsorb gold that can be easily isolated from the leaching slurry. This region would have a variety of chambers containing carbon, cylindrical in form and conical at the bottom of the carbon. The pregnant solution collected in the gold pregnant solution is clarified and the holding tank is then passed through the carbon chamber for the extraction of gold through a method known as carbon adsorption. The solution is moved into the first column referred to as the head; the tail, which overflows from the bottom of the column, will be the head of the next column, and so on until all the gold is extracted. Once the carbon is saturated with gold (it will be determined through the examination of the contents by the laboratory process), the carbon will be extracted from the chambers and replaced by the new ones. The filled will then be washed with fresh water and stored while awaiting transport for the desorption of the gold process. Water used to wash the filled carbon will be returned to the mixing tank for recycling and re-use in the leaching ponds. The process of the leaching will be completed.

2.6 Barren Solution recycling

The sterile solution of the carbon chamber is drained into the mixing/barren tank (continuous process). The bare solution in the tank will be checked for consistency and appropriate adjustment by adding the required quantity of cyanide, water and lime and then pumping it back into the overhead tanks to supply the leaching tanks. In order to ensure that the solution in the mixing tank and the solution pumped to the feeder tanks is of the appropriate quality, the mixing tank will be recharged from the nearby underground freshwater reserve tank. This is a closed process loop, so the solution is filtered throughout and no subsequent water is released into the atmosphere.

2.7 Processed Tailing.

Emakpet Universal intends to make good use of the tailings by extracting any remaining gold with a recovery of 95%. Before the fully used/leached tailings are removed from the leaching tanks, they will be washed/flashed with fresh water to wash away any trace of cyanide left in it and also open to the sky to enable the tailings to obtain enough sunlight to decompose any traces of cyanide left over. The tailings would be deposited on an impermeable layer of bottom liner and in a position that ensures that the storm water does not flow downstream. A drainage canal will be dug around the processing area and the tailings storage yard to ensure that the storm water from the section is collected in a controlled manner and drained into the pond to be built on site. The tailings will be used to cover abandoned mine holes and quarries in the project area or used economically to produce building bricks or used to restore deteriorated farms for agriculture because the operation will not have polluted the tailing. The following figure provides a schematic cyanidation flow diagram

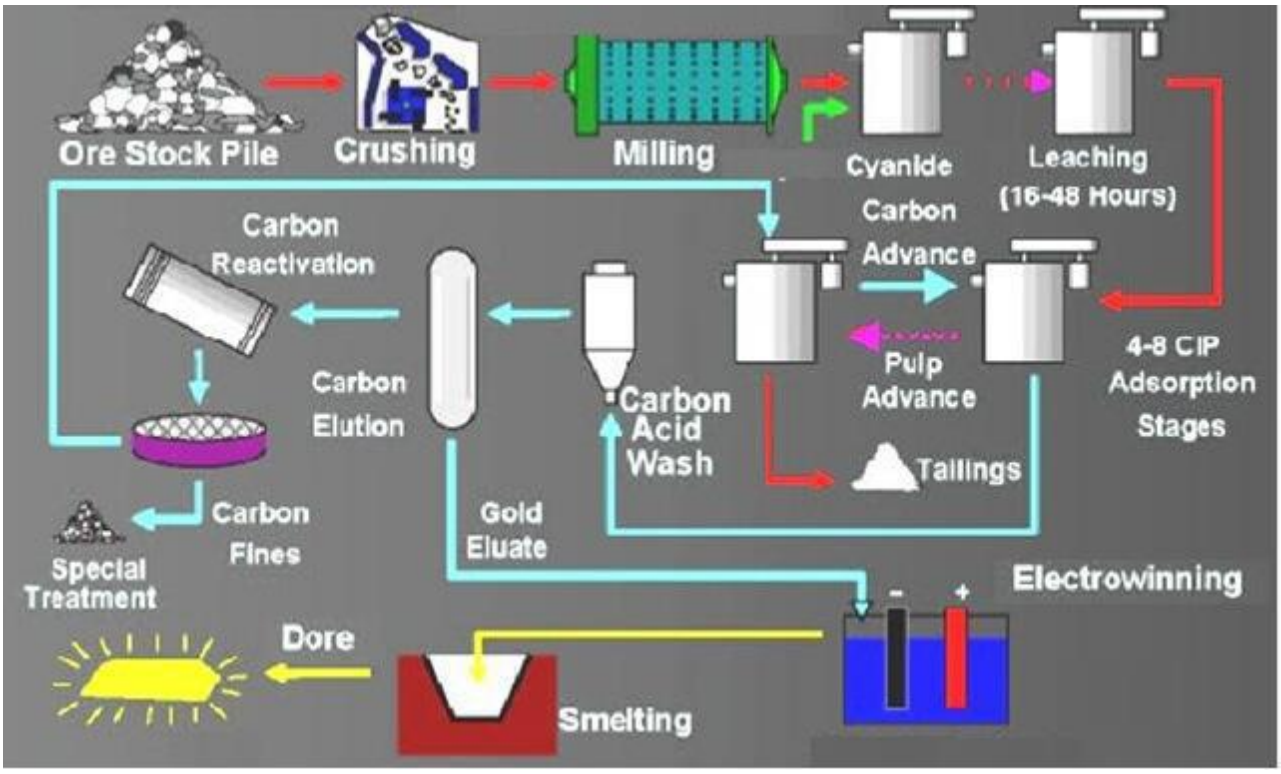


Figure 2.1 Generic scheme of cyanidation

2.8 The advantages of cyanide over Mercury for gold elution

I. Cyanide does not cause cancer,

II. Cyanide does not accumulate or “biomagnify” in the food chain.

III. Cyanide does not persist in the environment and is quickly broken down into ammonia and carbon dioxide by sunlight and air (oxygen)

IV. Cyanide tailing is easily treated by safe chemical processes

2.9 How Emakpet universal shall manage cyanide in order to keep workers, environment, and wildlife safe

The best practices in cyanide usage are regulated by "The International Cyanide Management Code". The mining industry has voluntarily created the "Cyanide Code". Which we shall subscribe to. The goal being to protect the environment and ensure people and wildlife safety. There are nine principles of the "Cyanide Code" which we shall fellow.

2.10 Raw material Sourcing, Transport, Handling and Storage, Operations, Waste Disposal, Mine Decommissioning.

For the mine to comply with the Cyanide Code, it must comply with regulations and laws of the applicable international and national legal frameworks. The principles are:

2.10.1 Cyanide production

Emakpet Universal shall encourage responsible cyanide production by sourcing materials from manufacturers who operate safely, socially, and environmentally responsible.

2.10.2 Transport

Emakpet Universal shall protect communities and the environment during its transport by hiring certified and trained transportation companies.

2.10.3 Handling and storage

Emakpet Universal shall protect workers and the environment during cyanide handling and storage

2.10.4 Operations

Emakpet Universal shall manage responsible cyanide process solutions and waste streams to protect human health and the environment.

2.10. 5 Mine decommissioning

Emakpet Universal shall protect the communities and the environment from cyanide by developing and implementing decommissioning plans for cyanide facilities.

2.10.6 Worker safety

Emakpet Universal shall protect workers' health and safety from exposure to cyanide.

2.10.7 Training

Emakpet Universal shall train workers and emergency response personnel to manage cyanide in a safe and environmentally protective manner.

2.10.8 Dialogue

Emakpet Universal shall protect communities and the environment through the development of emergency response strategies and capabilities

CHAPTER THREE

3.0 PROPOSED PROJECT SITE LOCATION BASELINE CONDITIONS

The proposed project site is accessible from along Migori -Isebania road at coordinates latitude -1.087550 and longitude 34.460323 at an elevation of 1402 Meters Above Sea Level on LR No. Suna East/Wasweta 1/9032 Migori County

3.1 Baseline Information of Migori County

Migori County is situated in the southwest of Kenya at an altitude of 1322-1550 meters above sea level. Migori County neighboring counties are: Homa Bay County to the north, Kisii County, Narok County to the east, and the Republic of Tanzania to the south. Migori City is part of the business center of the Greater Nyanza Area due to its strategic location and accessibility. It is located 60 km from the town of Kisii and is crossed by 104.6 km (A1) which links Kenya to Tanzania via Isibania.

Migori County is now expanding rapidly as a result of the Central Government's devolution policy for County Governance and the development of road infrastructure and the expansion of water supply capability in the county. This has drawn investors and it is now developing the previously undeveloped plots. The climate and physical conditions of the site where the proposed project is located are favorable. A combination of one or more of these factors affects urban growth directly, and are preconditions for study and planning of the site.

3.2 Climatic conditions

3.2.1 Rainfall

Migori County has an equatorial climate with temperatures changed by Lake Victoria. Temperatures and rainfall are lower than the emblematic equatorial conditions and thus the region is rated as sub-humid with annual rainfall of between 700 mm and 1800 mm. Long rains are between March and May, while short rains are between September and November. The dry seasons stretch from December to February to June and September. The rainfall is controlled by the movement of ITCZ (Inter Tropical Convergence Zone). There are considerable spatial variations in the area, mainly due to the location of the highlands and nearness to Lake Victoria.

3.2.2 Temperature

The temperature ranges from 19.30c to 21.70c in the highlands, but in the lower parts of Migori, the temperature may rise to or exceed 280c with high humidity and a possible evaporation of 1800 to 2000 mm per year.

3.2.3 Hydrology:

Migori County is situated on the southern and neighboring shores of Lake Victoria and has two main rivers, the Migori River and the Kuja River.

Figure 3.1: River Migori across Migori town. This is the nearest river at approx. 5km from the project proposed site

3.2.4 Geology and soil

The geology of Migori is characterized by a metamorphic rock. These rocks are rich in gemstones such as ruby, topaz, aquamarine, grenades, and others. The Migori area is situated in the southern part of the Nyanza rift, with the Nyanza system (2.8-3.1Ga).

3.3 Biodiversity

3.3.1 The floral

It is important to remember that the proposed site is located in Migori township. Has been modified due to development and mainly consists of grass and shrubs. There are also no major plants that will be threatened or destroyed by the project.

Figure 3.2: Paved compound without vegetation at the proposed site

3.3.2 Fauna

The fauna of the region includes many types of domesticated animals such as cattle, sheep, goats, birds, cats and dogs, among others. Wild fauna comprises insects, birds, snakes and rodents. However, it should be noted in Migori County that the number and diversity of animals are restricted, obviously as a result of changes in land use. There is no major fauna within the project site that will be impacted as a result of the implementation of the project. 3.7.3 Vulnerable Habitats or Place of Cultural Significance. the proposed project site does not have important ecological units or places of cultural importance in the immediate area likely to be affected.

3.4 Economic activities

Migori County is considered to be engaged in mining activities. the county is gold rich with beltline that stretches to the neighboring counties and Tanzania, respectively. Other economic activities include farming

Figure 3.3: Another go down in the neighborhood to the proposed project site

3.5 Cultural Significance Sites

The project area has little cultural significance for the community, and so the project is unlikely to compete with any position of cultural interest for the residents.

3.6 Infrastructural facilities and services;

3.6.1 Supply of water

The site is served by Migori water and sewerage company. Also, the site has private water supply

3.6.2 Road and Accessibility

The site is connected to various road network thus accessibility to the project site is simple.

Figure 3.4 A petrol station opposite the proposed project site across Migori -Isebania Road

3.6.3 Communication to the network

Communication equipment, landline and mobile telephone networks are available in the area.

3.6.4 Power

The proposed project site is already connected with KPLC power. The proponent will also install a backup generator.

CHAPTER FOUR

4,0 POLICY, LEGAL AND ADMINISTARTIVE FRAMEWORK

4.1 General Overview

Kenya has a policy, legal and administrative framework for environmental management. Under the framework, the National Environment Management Authority (NEMA) is responsible for ensuring that environmental impact assessments (EIAs) are carried out for new projects and environmental audits on existing facilities as per the Environmental Management and Coordination Act 2015 EIA studies are carried out in order to identify potential positive and negative impacts associated with the proposed project with a view to taking advantage of the positive impacts whilst providing effective mitigation measures for the negative effects. The requirements on EIA are contained in sections 58 to 67 of the Act. According to section 68 of the environmental management and coordination Act (EMCA) 2015, the Authority shall be responsible for carrying out environmental audits on all activities that are likely to have a significant effect on the environment.

The government has established regulations to facilitate the process on ESIAs and environmental audits. The regulations are contained in the Kenya Gazette Supplement No. 56, legislative supplement No. 31, and legal notice No. 101 of 13th June 2003. In the past, the government has established a number of National policies and legal statutes to enhance environmental conservation and sustainable development.

4.2 Policies

4.2.1 The Constitution of Kenya, 2010

The Constitution of Kenya is the supreme law of the Republic of Kenya and binds all persons and all State organs at all levels of government. It provides the broad framework regulating all existence and development aspects of interest to the people of Kenya, and along which all national and sectorial legislative documents are drawn. In relation to environment, Article 42 of Chapter 4, the Bill of Rights, confers to every person the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative measures, particularly those contemplated in Article 69, and to have obligations relating to the environment fulfilled under Article 70.

Chapter 5 of the new constitution provides the main pillars on which the 77 environmental statutes are hinged and covers "Land and Environment" and includes the aforementioned articles 69 and 70. Part 1 of the Chapter dwells on land, outlining the principles informing land policy, land classification as well as land use and property. Part 2 of the Chapter directs focus on the environment and natural resources. It provides for a clear outline of the state's obligation with respect to the environment. The Chapter seeks to eliminate processes & activities likely to endanger the environment. There are further provisions on enforcement of environmental rights as well as establishment of legislation relating to the environment in accordance to the guidelines provided in this Chapter. In conformity with the Constitution of Kenya 2010, every activity or project undertaken within the Republic of Kenya must be in tandem with the state's vision for the national environment as well as adherence to the right of every individual to a clean and healthy environment.

4.2.2 Vision 2030

This is the sole government development blue print up to the year 2030. The overall goal of the Vision 2030 is to transform Kenya into a middle-income country providing a high quality of life to all its citizens by the year 2030. The Vision is anchored on three pillars, namely: the Economic Pillar which targets sustained economic growth of 10% per annum; the Social Pillar which seeks to create a just and cohesive society enjoying equitable social development in a clean and secure environment; and the Political Pillar whose aspiration is for Kenya to enjoy issue-based, people centered, results oriented and accountable democratic political system. The three pillars are underpinned by the Foundations for Socio-economic Transformation, which seek to provide the necessary support for Kenya's social, economic and political development. The Vision spells out the following strategies which are associated with the role of the Judiciary:

- Aligning the national policy and legal framework with the needs of a market-driven economy, human rights and gender equality commitments.
- Increasing access and quality of services available to the public and reducing barriers to service availability and access to justice.
- Streamlining functional capability (including professionalization) of legal and judicial institutions to enhance inter-agency cooperation.
- Inculcating a culture of compliance with laws, cultivating civility and decent human behavior between Kenyans and outsiders.

The Vision outlines judicial and legal reforms as a flagship project that relates to reforms in the rule of law and enhancement of the Bill of Rights. The Vision further outlines reforms in Government institutions, especially those involving public participation in governance, and those connected to transparency and accountability within the public sector.

4.2.3 National Environmental Action Plan (NEAP) 48

According to the Kenya National Environment Action Plan (NEAP, 1994) the Government recognized the negative impacts on ecosystems emanating from industrial, economic and social development programmes that 3disregarded environmental sustainability. Following this, establishment of appropriate policies and legal guidelines as well as harmonization of existing policies have either been accomplished and/or are in the process of development. Under the NEAP process Environmental Impact Assessments were introduced targeting the industrialists, business community and local authorities.

4.2.4 National Policy on Water Resources Management and Development

While the National Policy on Water Resources Management and Development (1999) enhances a systematic development of water facilities in all sectors for promotion of the country's socio-economic progress, it also recognizes the by-products of this process as wastewater. It, therefore, calls for development of appropriate sanitation systems to protect people's health and water resources from institutional pollution. Industrial, business and large scale agricultural development activities, therefore, should be accompanied by corresponding waste management systems to handle the wastewater and other waste emanating there from. The same policy requires that such projects should also undergo comprehensive EIAs that will provide suitable measures to be taken to ensure environmental resources and people's health in the immediate neighborhood and further downstream are not negatively impacted by the discharges.

As a follow-up to this, EMCA 2015 requires annual environmental audits to be conducted in order to ensure that mitigation measures and other improvements identified during Elias are implemented. In addition, the policy provides for charging levies on wastewater on the basis of quantity and quality. The "polluter-pays-principle" applies in which case parties contaminating water are required to meet the appropriate cost of remediation. The policy provides for establishment of standards to protect water bodies receiving wastewater, a process that is ongoing.

4.2.5 Sessional Paper on Environment and Development (No. 6 of 1999)

The key objectives of the Policy include: **i.** To ensure that from the onset, all development policies, programmes and projects take environmental considerations into account, **ii.** To ensure that an independent environmental impact assessment (EIA) report is prepared for any industrial venture or other development before implementation, iii. To come up with effluent treatment standards that will conform to acceptable health guidelines. 49 Under this paper, broad categories of development issues have been covered that require a "sustainable development" approach. These issues relate to waste management and human settlement. The policy recommends the need for enhanced re-use/recycling of residues including wastewater, use of low or non-waste technologies, increased public awareness raising and appreciation of a clean environment. It also encourages participation of stakeholders in the management of wastes within their localities. Regarding human settlement, the paper encourages better planning in both rural and urban areas and provision of basic needs such as water, drainage and waste disposal facilities among others.

4.2.6 International Obligations- Multilateral Environmental Agreements

The evolving system of international conventions, agreements and treaties has provided important framework for waste management policies across the globe. The current global environmental governance is to a large extend a result of the Rio Earth Summit of 1992 and Agenda 21 which amongst others advocates for four major waste related programmes:

i) Minimizing wastes
ii) Maximizing environmentally sound waste disposal and treatment
iii) Promoting environmentally sound waste disposal and treatment
iv) Extending waste service coverage

4.3 Legal Aspects

The key national laws that govern the management of environmental resources in the country have been briefly discussed in the following paragraphs. Note that wherever any of the laws contradict each other, the Environmental Management and Coordination Act 2015 amendments supersedes.

4.3.1 The Environment Management and Coordination Act, 2015 amendment

The Environmental Management & Coordination Act, 2015 amendment generally provides for enjoyment by every person in Kenya to a clean and healthy environment while also placing responsibility to safeguard and enhance the environment. According to the Act an Environmental impact assessment study needs to be carried out on projects specified in the second schedule of the Act that are likely to have a significant impact on the environment. This proposed project has been rightly classified among those that must be subjected to an ESIA study under the second schedule of the Act. It further stipulates that operators of projects should carry out annual environmental audits in order to determine level of compliance with statements made during the EIA. The audit report should be submitted to NEMA. The Act prohibits discharging or applying poisonous, toxic, noxious or obstructing matter, radioactive or any other pollutants into aquatic environment. It further places responsibility on operators of project which discharges effluent or other pollutants to submit to NEMA accurate information about the quantity and quality of the effluent and to seek effluent discharge licenses.

4.3.2 Environmental Management and Co-ordination (Water Quality) Regulations, 2006 - Legal Notice No. 120

These regulations are established under the Environmental Management and Coordination Act. These regulations apply to drinking water, water used for industrial, agricultural and recreational purposes, including water used for fisheries and wildlife, among others. These regulations prohibits discharge or application of any poison, toxic, noxious or obstructing matter, radioactive wastes, or other pollutants into water meant for fisheries, wildlife, recreational purposes or any other purposes. The regulations provide for the creation of a buffer zone for irrigation schemes of at least fifty (50) metres in width between the irrigation scheme and the natural water body.

4.3.3 The Environmental (Impact Assessment and Audit) Regulations, 2019

The EMCA makes it mandatory for any person being a proponent of a project to submit a project report to NEMA in a prescribed format. Of immediate relevance regarding conducting EIA are Part VIII, Section 58 (1&2) and the Second Schedule of the EMCA. Section 58 (1) states that: “Notwithstanding any approval, permit of license granted under this Act or any other law in force in Kenya, any person, being a proponent of the project, shall before financing,

commencing, proceeding with, carrying out, executing or conducting or causing to be financed, commenced, proceeding with, carried out, executed or conducted by another person any undertaking specified in the Second Schedule to this Act, submit a project report to the Authority in the prescribed form, giving the prescribed information and which shall be accompanied by the prescribed fees". Section 58(2) states that the proponent of a project shall undertake or cause to be undertaken at his own expense an environmental impact assessment study and prepare a report thereof. In accordance to the Section 147 of the above Act, Environmental and (Impact Assessment and Audit) Regulations, 2019 have now been formulated and gazetted in Kenya. Gazette Supplement No. 56. Part IV, Section 18 (1) states that a proponent shall submit to the Authority, an environmental impact assessment study report incorporating but not limited to the following information:

i) The proposed location of the project;
ii) A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project;
iii) The objectives of the project;
iv) The technology, procedures and processes to be used, in the implementation of the project;
v) The materials to be used in the construction and implementation of the project;
vi) The products, by-products and waste generated by the project;
vii) A description of the potentially affected environment;
viii) The environment effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated;
ix) Alternative technologies and processes available and reasons for preferring the chosen technology and processes;
x) Analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design and technologies.
xi) An environmental management plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment; including the cost, time frame and responsibility to implement the measures;
xii) Provision of an action plan for the prevention and management of foreseeable accidents and hazardous activities in the cause of carrying out activities or major industrial and other development activities;

xiii) The measures to prevent health hazards and to ensure security in the working environment for the employees and for the management of emergencies;

xiv) An identification of gaps in knowledge and uncertainties which were encountered in compiling the information;

xv) An economic and social analysis of the project;

xvi) An indication of whether the environment of any other state is likely to be affected and the available alternatives and mitigating measures; and

xvii) Such other matters as the Authority may require

4.3.4 The Water Act, 2002

This Act has placed overall responsibility for water management with the Ministry of Water Resources and Irrigation. This Act has provided for the formation of a Water Resources Authority (WRA) responsible for the management of lakes, aquifers and rivers, among other functions. The Act empowers the minister in charge to promote the conservation and proper use of water resources and the conservation of water catchments, water sources and courses. It further prohibits the draining or interfering with wetlands for any purpose without proper authority.

4.3.5 The Water Resources Management Rules, 2007- Legal Notice No. 171

These rules are made pursuant to the Water Act. The rules requires permission by way of obtaining an abstraction permit from the prescribed authority (WRMA) by any person or institution seeking to abstract water from defined watercourses after payment of prescribed fees. It further requires permit holders for abstraction of water for irrigation purpose to renew after every 5 years. It prescribes that permit fees are based on the surface area to be irrigated. The rules restrict the permit holder only to use the flood flow for irrigation and will construct a reservoir to store enough water to irrigate the area specified in the permit for 90 days. The Act has also provided for the formation of Water Resources Users Associations (WRUA) in order to ensure sustainable use of water management schemes.

The rules requires the permit holder storing or arresting the flow of water by means of a dam or weir located on a body of water or watercourse to provide at a depth measured from the top of the dam or weir, an outlet, controlled by a valve, sluice gate or other device, which is capable of being operated at all stages of the flow of such body of water or watercourse so that the normal flow, or other flow as required by the Authority, of such body of water or watercourse

can be passed through or around such dam or weir at all stages to enable for compensation of flow. The rules also states that authorized water users to be appurtenant to land which should be proved by way of an authentic title deed, lease agreement, easement, way leaves or a letter from the land owner or community endorsed by the provincial administration. The rules also requires permit holder to pay to the designated Authority water use charges on the basis of the water abstracted, diverted, obstructed or used including energy derived from a water resource.

4.3.6 The Public Health Act (Cap. 242)

This Act prohibits any person or institution from causing nuisance or conditions liable to be injurious or dangerous to human health. It further forbids discharge of any noxious matter or wastewater flowing or discharged from any premises into a public street or into the gutter or side channel or watercourse, irrigation channel or bed not approved for discharge.

4.3.7 The Penal Code, Cap 63

The Penal Code prohibits any person or institution from voluntarily corrupting or foiling water for public springs or reservoirs, rendering it less fit for its ordinary use. In addition, the same act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons/institution in dwellings or business premises in the neighborhood or those passing along public way commit an offence.

4.3.8 Legal Notice 40 (Building, Operation & Work of Engineering) Rules 1984

These rules require the contractor to ensure health, safety and welfare of employees and states. It further requires the main contractor to notify the chief inspector within 7 days of commencing or undertaking building operation or works of engineering. The rules require that walls of excavations deeper than 1.2m be reinforced with timber of suitable quality or with other suitable material to prevent so far as is reasonable practicable the danger or injury resulting from a fall or dislodgement of earthwork. The rules further require that a scaffold of good construction and suitable strength shall be made available for any construction site where working at height is to be undertaken. A first aid box shall also be provided and be distinctively marked ‘FIRST AID’ and placed under the charge of a responsible person whose name shall be plainly indicated in a prominent place or near the box.

4.3.9 Penal Code Act (Cap.63)

Section 191 of the penal code states that if any person or institution that voluntarily corrupts or foils water for public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offence. Section 192 of the same Act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons /institution, dwelling or business premises in the neighborhood or those passing along public way, commit an offence.

4.3.10 The Cap 306 Mining Act, 1940 (Review in 1987) and the 2014 Mining Bill

This is an ACT of the Parliament which gives effect to the provisions of Articles 60, 62(1)(f) 66(2), 69 and 71 of the Constitution in so far as they relate to minerals; provides for the prospecting, mining, processing, processing, refining and transport of minerals and related purposes, and any dealings therein. The Mining Act Cap currently governs all prospecting and mining operations in Kenya. 306 of the Kenya Rules, which is currently under review. When signed into law, the Mining Bill would replace the Mining Act of 1940, the Unwrought Precious Metal Trade Act and the Diamond Industry Safety Act. The Bill was presented on 17 March 2014 at the National Assembly of Kenya.

4.4Climate Change considerations

Global warming as a result of anthropogenic activities is today a global concern. The rising levels of greenhouse gases have continually raised global temperature. Currently, concentration levels of CO_2 in the environment is rated at 411 ppm over 61 ppm higher from the safe limit of 350 ppm. These levels are projected to attain 445 ppm by the year 2030 at growth rate of 0, 47%. As a result, the current rate of global temperature increase is 1.22^0C and is projected to raise to 5.8 ^{0}C by 2030.

Kenya's total GHG emissions in 2013-2023 were 60.2 million metric tons of carbon dioxide equivalent (MtCO2e), totaling 0.13% of global GHG emissions. The agriculture sector emitted 62.8% of total emissions, followed by the energy sector (31.2%), industrial processes sector (4.6%), and waste sector (1.4%).

Kenya's Intended Nationally Determined Contribution (INDC) commits to reducing GHG emissions by 30% (143 MtCO2e) relative to business as usual levels by 2030, contingent on receiving international finance, investment, technology development and transfer, and capacity-building support. To achieve this commitment, Kenya has developed various policy

documents aimed at guiding sectorial developments to a attain a low carbon industrial development economy. Some of this policy documents and guidelines are;

i) The Climate Change Act 2016
ii) National Climate Change Response Strategy
iii) National Climate Change Action Plan (NCCAP) 2018- 2022

4.4.1 The Climate Change Act 2016

This is an Act of Parliament whose objective is to provide a regulatory framework for an enhanced response to climate change and to provide mechanisms and measures to improve resilience to climate change and promote low carbon development. The Climate Change Act adopts a mainstreaming approach, provides a legal basis for climate change activities through the National Climate Change Action Plan, and establishes the National Climate Change Council and the Climate Fund.

The main object of the Climate Change Act is to be applied in the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya.

4.4.2 Provisions of The Climate Change Act 2016

4.4.2.1 Public Participation

Public participation is an important aspect in dealing with climate change issues. It allows for individual views on measures to be taken that are effective and efficient in combating climate change and ensuring low carbon development in the country. Furthermore, it is a tenet provided for under the Constitution of Kenya 2010.

The Climate Change Act provides for public participation whereby it states that public entities at each government level must at all times when preparing strategies, laws and policies regarding climate change, undertake public awareness drives and conduct public consultations. Additionally, the Act calls for the public consultations to be held in such a manner that the publics views make an impact in decision making.

4.4.2.2 Integration, Reporting and Enforcement of the Climate Change act 2016

National Environment Management Authority (NEMA) is empowered, pursuant to Section 17, to regulate, enforce and monitor compliance on levels of GHG emissions on behalf of the National Climate Change Council. Failure to comply may incur a fine of up to 1 million Kenyan shillings and five years' imprisonment for officers of an entity.

The Climate Change Act also provides for incentives to those who encourage and put in place measures for the elimination of climate change, including the reduction of GHG emissions and the use of renewable energy.

The Climate Change Act 2016 mandates the National Climate Change Council to set targets for the regulation of GHG emissions (Section 6). Section 13 of the Act further requires the National Climate Change Action Plan (NCCAP) to prescribe measures and mechanisms to review levels and trends of GHG emissions. Section 15 further imposes an obligation on all state departments and national government public entities to report on sectoral GHG emissions for the national inventory.

The NCCAP 2018–2022 provides detailed guidelines for GHG emissions. According to the NCCAP, actions in the six mitigation sectors set out in the UNFCCC – agriculture, energy, forestry, industry, transport and waste – are expected to lead to lower emissions than in the projected baseline and help to meet Kenya's mitigation NDC to abate GHG emissions by 30 per cent by 2030 relative to the business-as-usual scenario.

4.4.2.3 Incentivizing through climate financing

As part of the priority enabling actions, the NCCAP required the National Treasury and Planning Department, among other lead agencies, to identify policy and fiscal incentives (such as tax incentives, reduced energy tariffs, low interest loans and public-private partnerships) that promote the uptake of climate-friendly technology by 30 December 2020. Although the 30 December 2020 deadline contemplated in the NCCAP was not met, the National Treasury is continuing the process of developing a National Policy Framework on Green Fiscal Incentives.

Under the Act, The National Treasury is responsible for developing climate finance strategy and regulations, and the National Climate Change Fund is also vested in the department. In its

Strategic Plan 2018/19 – 2022/23, the National Treasury recognises climate finance action through sectoral policy development as one of its key result areas.

The NCCAP expects the public sector to play a role in the planning, implementation and monitoring of climate change interventions, with an emphasis on enhancing adaptive capacity and improving the ability to withstand climate shocks. The private sector is also expected to take measures towards reducing GHG emissions from business operations.

4.4.2 Mainstreaming the Climate Change Act 2016 into industrial development

To mainstream the Climate Change Act into national induration development, A number of regulations and policies are currently being developed pursuant to the Climate Change Act. These include.

4.4.2.1 The Draft Climate Change (Public Participation and Access to Information) Regulations 2021

These regulations are being introduced pursuant to Section 24(3) of the Climate Change Act. These Regulations seek to give effect to the constitutional requirement for public involvement in decision-making by providing for the substantive and procedural mechanisms for public participation. The Regulations will also provide details on access to information on climate change in line with the Access to Information Act No. 31 2016

4.4.2.2 The Draft Climate Change (Duties and Incentives) Regulations 2021

These regulations seek to impose climate change duties on public entities in the national and county governments. Under the Draft Regulations, public entities under both levels of government have the duty to enhance the nation's adaptation ambition by mainstreaming and integrating any adaptation duties outlined in the NCCAP, the NDC and the National Adaptation Plan into their laws, policies, programmes, projects, plans and any additional relevant activities. Part III of the Regulations seeks to impose a number of climate change obligations on private parties, including individuals, with fiscal incentives to be prescribed by the cabinet secretary responsible for finance for eligible climate change initiatives. These Regulations will certainly require robust participation and feedback from key stakeholders from both the public and private sectors before enactment

4.4.2.3 The Draft Climate Change (Monitoring, Reporting and Verification) Regulations 2021

The main aim of these regulations is to provide a framework for monitoring, reporting and verifying greenhouse gas (GHG) emissions; mitigation and adaptation actions; and climate change enablers such as climate finance, technology development, and transfer and capacity building. The schedules provide a list of proposed reportable GHG emissions activities for various industrial sectors

4.4.2.4 The Draft National Climate Change Learning Strategy 2021–2031,

These regulations sets the framework for promoting public awareness to enhance knowledge and participation of the general public in climate change actions.

CHAPTER FIVE

5.0 ENVIRONMENTAL IMPACTS IDENTIFICATION AND APPRAISAL

5.1Identification Analysis and Appraisal of Impacts

In order to accurately identify the proposed project impacts, the following issues were considered pertinent and important for the coverage.

5.2 Physical Environment (Biophysical Impacts)

i) Water quality aspects for both surface water sources like piped water, storm water, and other related aspects
ii) Soil conditions, soil contamination and landscape alterations/degradation (based on aesthetic aspects) associated with the proposed project.
iii) Drainage patterns especially in relation to wastewater effluents, chemicals, oil spillages, discharges channeled into the drainage ditches.
iv) Air quality aspects especially atmospheric emissions from the proposed project operations
v) Noise and vibration (sonic factors) where applicable

5.2.1 Natural Environment

i) Natural flora and fauna from the adjacent ecosystem (i.e. effects to natural plants and animals where applicable).
ii) Adjacent water bodies, tributaries and streams-pollution indicators, impacts on water flow patterns and quality aspects, user interference and contamination.

5.2.2 Social welfare, Economic and Cultural Environment

i) Determination of implications to the human society distribution, demographic details, settlement patterns, changes to the cultural lifestyle and indigenous knowledge of the local society/public where applicable.
ii) Notable changes in land use systems and the general land utilization types where applicable.
iii) Aesthetic, landscape alterations and changes to infrastructural facilities, among others.
iv) Effects associated with the renovation of the existing facility and operation activities and related handling and disposal of wastes generated during the operations.

v) Effects associated with income generation opportunities created by the project due to the upcoming operations.
vi) Introduction of nuisances, such as pests and related multiplication breeding sites

5.3Environmental and Social Impacts identification, methodology and appraisal

5.3.1 Physical Impacts

A. Air Quality

NO_X and SO_X can cause adverse health effects, through both acute and chronic exposure. Chronic exposure may result in increased incidences of respiratory illnesses in the exposed population.

a. Project Site Preparation and Construction/renovation Phases

It is expected that during these phases of development, there may be some changes in the air quality. Storage of raw materials and spoilage, and renovation works are expected to liberate dust and other forms of particulate matter, which currently is within the set limits for particulate matter (PM). While most of the dust generated is likely to settle a short distance from these sources, smaller particles may be transported across a wider area. The magnitude of dispersion will be influenced by the local meteorological conditions. The dust generated from the site preparation and construction/renovation activities is likely to have relatively negative environmental impact. Movement of heavy construction vehicles and the increase in traffic may cause an increase of local greenhouse gas emissions including NO_2 and SO_2. Short and long term exposure to NO_2 and SO_2 may result in the development of both acute and chronic respiratory illness. Chronic exposure may result in increased incidences of respiratory illnesses in the exposed population. The impacts although negative, may be short term, and not significant.

b. Operation Phase

The operation of the proposed chemicals storage facilities and Gold elution plant will mean an increase in in Carbon Monoxide and the Oxides of Sulphur and Nitrogen in the area emissions to the atmosphere due to the nature of raw materials and chemical additives to be used in the gold elusion process. Air emissions from gold elution plants include the gaseous products of

sulfur dioxide (SO_2), nitrogen oxide (NO_X), carbon dioxide (CO_2), and Particulate Matter (PM).

B. Water Quality

a. Site Preparation and Construction/Renovation Phases

The activities involved in these phases of the project development may cause a major negative long-term impact on the surface (terrestrial) and ground water quality within the development area. This will be as a result of many of the activities which are slated to take place in these phases which includes the storage of hazardous substances on the site such as diesel and motor oil for the operation of machinery and stand-by generators, and the storage of raw material for the renovation works.

b. Operation Phase

This phase of the development may have the most negative, long term impact on the surface water (aquatic and terrestrial) quality if not properly monitored and managed and is potentially irreversible in an event the chemicals to be stored and used will find their way to water channels

C. Water Quantity

a. Site Preparation and Construction/Renovation Phases

The water consumption in these phases of the development will be minimal when compared to the rate of consumption in the operation phase. Water will be used for the renovation works, as well as for domestic use among labourers employed to the site.

b. Operation Phase

The Operation of the facility will mean an added pressure to the existing water supply since Gold leaching and washing is a water intensive process

D. Soils and Geology

a. Site Preparation and Construction/Renovation Phases

The activities involved in the site preparation and renovation phase of the development may significant negative and moderate impact on soil and geology of the project site. Heavy machinery will be traversing the site due to the renovation activities this may lead to soil compaction and erosion of the soil. Hazardous substances such as diesel used for the operation

of machinery and stand-by generators, may be stored on the property. This may have a significant negative long-term impact on soil quality in the area.

b. Operation Phase

The gold leaching process and associated waste streams may affect soil quality, by changing the soil's chemistry through changes in pH. This environmental impact may be long-term, major, irreversible and negative.

C. Hydrogeology

a. Site Preparation and Construction/Renovation Phases

These phases of the development may have a moderate and negative impact on the hydrology of the area. Heavy equipment used in these phases of the development can cause soil compaction and therefore result in increased surface runoff, which changes the natural internal drainage capacity.

b. Operation Phase

The Operation Phase of the proposed project is likely to have a major negative, long-term impact on the hydrology of the area if not well managed. i.e. stored chemicals finding their way into the drainage and poor disposal of the tailings.

D. Noise & Vibration

a. Site Preparation and Construction Phases

The site preparation and construction/renovation phases of the development may likely have the most negative impact to the ambient noise and vibration in the area. A number of measures may be undertaken by the developer/s to reduce the impact of noise on the existing and potential residents as well as the workers involved in the project. This is temporary, however, and the aim at this point is to make the increase in noise as minimal as possible until this phase is complete. The cumulative impact of the renovation activities occurring simultaneously with the operation of other companies already in existence in the area may increase the noise and vibration levels significantly.

b. Operation Phase

The Operation Phase of the project is not expected to cause a major negative impact. Although the property will be operated as an industrial facility it is likely that the noise limits will not be a problem to the public.

5.3.2 Biological Impacts

A. Terrestrial Environment (Flora)

a. Site Preparation and Construction/Renovation Phases

the site is already developed and paved. Therefore, there are no sensitive vibration other than flowers used for landscaping the renovation phase will not result in the removal of vegetation in the area. No rare or threatened species has been observed at the proposed project site. This shows that from an ecological stand-point the area is not one of very high ecological importance.

b. Operation Phase

the proponent will likely revegetate the site for aesthetic value. The activities involved in the maintenance of the ornamental plants and flowers may have a High negative long-term irreversible impact if chemical fertilizers will be used for growth i.e. use of herbicides for turf maintenance and indirect impacts (alteration of soil chemistry and water quality).

B. Social Structure (Demography)

a. Site Preparation and Construction/Renovation Phases

The inflow of workers who choose to reside in the community during these phases of the development may not have any impact on the demography of the area. The numbers of workers anticipated to be employed in these phases is estimated at approximately 50 workers who will be directly employed from the local communities.

b. Operation Phase

The change in the demography of the area is not likely to increase due to the operation of this phase.

C. Infrastructure (Road Network)

a. Site Preparation and Construction/Renovation Phases

These phases of the development will have no impact. The proposed site is along an already existing road in good conditions.

b. Operation Phase

The operation phase of the project will have no negative impact on the road network in the area as the volume of traffic associated with the project will easily be sustained with the existing Migori -Isebania road.

D. Utilities (Electricity)

a. Site Preparation and Construction/Renovation Phases

These phases of the development will not have an impact on the electricity supplying the area. The site is supplied with electricity by KPLC.

b. Operation Phase

This phase of the development will not have any impact on the electricity consumption in the area. The proposed project is a light industry.

E. Utilities (Water Availability)

a. Site Preparation and Construction/Renovation Phases

These phases of the development will place a strain on the current supply through the renovation of buildings and other infrastructural works proposed for the development. The impact on water availability will therefore be negative, compatible and short-term. The proponents will consider alternative sources for water supply e.g. use of bowsers for water transportation.

b. Operation Phase

Based on the evaluation of water availability in the area the available supply will be able to supply the volume of water required for the operation of the plant and the auxiliary activities.

F. Utilities (Telecommunications)

a. Site Preparation and Construction/Renovation Phases

These phases of the development will not have an impact on the telecommunication services in the area. The area is well covered with all mobile providers.

b. Operation Phase

The project will have no any negative impact on the telecommunications services available in the area. The project may see an addition of other services such fast internet to the area.

G. Waste (Solid Waste)

a. Site Preparation and Construction/Renovation Phases

A significant amount of solid waste will be generated in this phase through site preparation and for construction and modification of the existing go down. This will therefore have a major negative short-term impact on solid waste collection in the area. The proponent should take the initiative of removal of the solid waste which is expected to be generated during this phase of the development.

b. Operation Phase

The operation phase of the development will have a major long-term negative impact on the solid collection in the area. Solid waste (muddy soil from the leaching tanks). Chemical containers and bags will also be significantly generated. It is advisable that the proponent contracts a NEMA licensed hazardous waste handler.

H. Waste (Sewage and Industrial Effluent)

a. Site Preparation and Construction/renovation Phases

Currently this site is connected to the county sewerage line this waste water will be sufficiently managed.

b. Operation Phase

Sewage will be generated by employees, customers and its auxiliary activities as well as visitors to the site. This will be managed through the sewer line.

I. Social Services (Health Services)

a. Site Preparation and Construction/Renovation Phases

There may be an influx of workers for these phases of the project. It is however anticipated that most of these workers will be recruited from within the project area and therefore these phases of the project will have a no impact on the Health Services in the area.

b. Operation Phase

The operation phase of the project will have no impact on the health services in the area. The area is well served by both public and private hospitals

J. Emergency Services (Fire Services)

a. Site Preparation and Construction/ Renovation Phases

The site preparation and renovation phases may have a minor negative impact on the fire services in the area. The storage of diesel and other flammable substance for the use in machinery used in this phase of the development poses the possibility of fires. However, Migori county has sufficient fire engines which is near the site for incase of any eventualities. The proponent will also install various types of fire extinguishers.

b. Operation Phase

The operation phase of the project may have a minor negative long-term impact on the Fire Services in the area. Copious amounts of chemicals will be stored which have a higher affinity for fire. These substances are mostly flammable and increase the susceptibility of the area to fires. Mitigation measures must be identified for fire.

K. Emergency Services (Police Services and Security)

a. Site Preparation and Construction/Renovation Phases

Crime might increase to influx of youth seeking employment in the proposed project site Therefore these phases of the development have a minor negative, short term effect on the levels of crime and violence in the area and therefore have an impact on the police services in the area. To curb on crime due to an influx of youth seeking employment, the proponent must provide security by using security guards and surveillance equipment.

b. Operation Phase

The facility will be a major income earner and it is therefore expected that large sums of money will be handled at the site daily for payment of suppliers, wages etc. This may attract criminal elements to the site and also increase the level of crime and violence in the surrounding communities. This possible surge in crime and violence may place a strain on the police services that are responsible for the area. In order to ensure the safety of the workers, it is recommended that the proposed mitigation measures be implemented.

5.3.3 Occupational Health and Safety

A. Technological Hazards

Fire and explosions may be described as Technological Hazards, which can cause serious injury or result in loss of life and damage to vegetation.

a. Site Preparation and Construction Phases

Flammable substances including diesel and motor oil may be stored or used on the project site for heavy-duty equipment. These substances are precursors for fires and explosions, which may range from small incipient to larger fires of great intensity, which generates heat causing damage to property, injuries or loss of human life.

b. Operation Phase

In this phase of the development, large volumes of the proposed chemical substances will be stored on the property, most of which are highly flammable or support fire. In addition, the operation of a possible kitchen or restaurant for workers on site will mean the storage of LPG on site which is also highly flammable, which may increase the vulnerability of the operation to a fire or an explosion

B. Accidents/General Human Health

Due to the nature of proposed project, accidents may be possible. These may occur during the all stages of the development. These accidents often happen unexpectedly and un-intentionally and can result in the loss of life and injuries, as well as damage to property. In addition, it is very important that the developer considers the health and safety of its workers and customers.

CHAPTER SIX

6.0 CLIMATE CHANGE RISKS AND VULNERABILITY ASSESSMENT FOR THE PROPOSED PROJECT

6.1 Introduction

Climate risk assessments identify the likelihood of future climate hazards and their potential impacts to communities due to on the proposed project implementation. This is fundamental for informing the prioritization of climate action and investment in mitigation and adaptation. For the proponent to effectively mitigate the foreseen and unforeseen impacts, the following components for the climate risk should be considered

i) The proposed site demographic, socio-economic and environmental context, to understand potential impacts and priorities for the proposed project
ii) Past climatic events in the area and region
iii) Climate change trends and future scenarios, and research into the likelihood, consequence, frequency and impacts of each hazard type on people, animals and crops
iv) A map of climate risks and vulnerabilities, identifying how and where climate hazards will affect the community, sectors and assets
v) Identification of priority risks, based on exposure, sensitivity, interdependencies and vulnerability.

6.2 Climate Change Risks Evaluation Methods

The 6-step Climate Risk Assessment (CRA) methodology developed by the Global Programme on Risk Assessment and Management for Adaptation to Climate Change provides practitioners and decision-makers with a guidance on how to assess climate risks and how to translate the assessment into measures. Climate Risk Assessment CRA aims to identify risk, assess the magnitude of impacts on people, assets and ecosystems, and ascertain the possible options for action.

Main characteristics of the methodology include the participation of all stakeholders, the assessment of hazards along the entire spectrum from slow onset processes to extreme weather events, the consideration of non-economic losses and damages as well as the focus on risk tolerance levels. It aims at identifying a smart mix of climate risk management measures, combining proven instruments from climate change adaptation and disaster risk management

with innovative measures to address residual risks which cannot be averted. As such, CRA can support evidence-based and risk-informed decision making and planning in the context of climate change.

These steps are namely

Step 1: Analysis of status quo – information needs and objectives

Step 2: Hotspot and capacity analysis of system of interest

Step 3: Development of a context-specific methodological approach

Step 4: Qualitative and quantitative risk assessment

Step 5: Evaluation of risk tolerance

Step 6: Identification of feasible options to avert, minimize, and address (potential) losses and damages

Table 6.1 elaborates the 6 steps in Climate Risk Assessment (CRA) methodology

Table 6.1 : Details of the 6-step Climate Risk Assessment (CRA) methodology

STEP	GUIDING QUESTIONS	EXPECTED OUTCOMES	TOOLS, METHODS, SOURCES
1. Analysis of status quo information needs and objectives	**What is the current state of knowledge?** I. Which are the relevant institutions to collect necessary data and have the mandate to lead the CRA as part of CRM? II. Which studies and data already exist? III. Which policy frameworks and operating procedures already exist with regard to CRA and CRM? IV. What are possible regions and sectors of interest in the area? V. How can duplication of efforts be avoided?	I. Context profiling: overview of climate (change) risks, other disaster risks, socio-economic data, and institutional set-up II. Mapping of relevant stakeholders to be included in the assessment III. Analysis of existing policy frameworks, rules, and regulations regarding climate risks and risk management IV. Identification of potential systems of interest which may include sectors, specific regions, or population groups	I. Literature and policy review II. Stakeholder identification and consultation

STEP	GUIDING QUESTIONS	EXPECTED OUTCOMES	TOOLS, METHODS, SOURCES
2. Hotspot and capacity analysis of system of interest	**What region and sector are we looking at?** I. Which sectors and livelihood strategies are crucial for the achievement of development objectives in the area of concern? II. Which communities / regions and sectors have already been identified as highly vulnerable to the impacts of climate change (including considerations of especially vulnerable groups such as youth, women, elderly, and minorities)?	**Selection of a clearly defined sector /region based on criteria such as:** I. Potential climate (and disaster) risks; II. Socio-economic and ecological factors; III. Institutional factors; IV. Availability of data.	I. Compilation of climate change-related hazards and their potential impacts; II. Collection of spatial and historical data, such as socio-economic, exposure, weather, and climate data; III. Use of geographic information systems (GIS) where applicable

STEP	GUIDING QUESTIONS	EXPECTED OUTCOMES	TOOLS, METHODS, SOURCES
	III. For which development objectives is information about impacts from projected climate change lacking? IV. For which sectors and livelihood strategies are adaptation and risk management options still lacking?		IV. Stakeholder consultation; V. Local, national, international VI. Secondary sources.
3. Development of a context-specific methodological approach	**How can the magnitude of potential climate-related impacts be assessed in the system?** I. Which existing quantitative and qualitative approaches for assessing risks and	**Detailed overview of the context-specific methodology that comprises elements such as:** I. The description of the methodology, combining quantitative and qualitative approaches;	I. Stakeholder consultation (interviews)

STEP	GUIDING QUESTIONS	EXPECTED OUTCOMES	TOOLS, METHODS, SOURCES
	impacts can be used and adjusted? II. What data and information are available for the specific approach? III. What data has to be collected additionally, with which methods, and at which costs? Which proxies could be used for unavailable data?	II. An overview of main stake-holders and information sources; III. An implementation plan including timeframe; and IV. Specific aspects that may include non-economic losses and damages and effects on informal economic activities in relation to losses and damages.	
4. Qualitative and quantitative risk assessment	**What is at risk? Where and from what? To which extent?** I. What are the current and projected climate change impacts? II. How would socio-economic trends in the	I. A thorough risk assessment that includes qualitative and quantitative analyses; II. Presentation of combination of suitable CRM measures including	I. Assessment according to chosen method, e. g. risk modelling, indicator/scenario analysis,

STEP	GUIDING QUESTIONS	EXPECTED OUTCOMES	TOOLS, METHODS, SOURCES
	system be influenced by implemented or planned measures? III. Which indicators need to be selected to evaluate risk components (hazards, vulnerability and exposure)?	III. Information on costs, benefits, and **IV.** Framework conditions.	market price and economic valuation, or compilation of impact chains; II. Qualitative assessments and consultation of stakeholders may be considered as information source in the case of lack of data; III. Inclusion of local socio-economic trends such as

STEP	GUIDING QUESTIONS	EXPECTED OUTCOMES	TOOLS, METHODS, SOURCES
			demographic change.
5. Evaluation of risk tolerance	**What level of risk tolerance does the affected population exhibit?** I. What are risk levels for communities, sectors, or livelihood strategies (including considerations of especially vulnerable groups)? II. Is the identified risk acceptable (no further actions necessary), tolerable (further incremental actions required to manage risk) or intolerable	I. Assessment of risk tolerance that compares different interconnected climate-related risks with non-climate- related risks, such as general health or accidents II. Quantitative assessment of the extent of associated risks III. Evaluation of response mechanisms reaching from incremental to transformational adaptation.	I. Field surveys and/or focus groups on risk perception II. Expert judgement on levels of risk tolerance (acceptable, tolerable, intolerable).

STEP	GUIDING QUESTIONS	EXPECTED OUTCOMES	TOOLS, METHODS, SOURCES
	(transformational actions to avoid risks are necessary)?		
6. Identification of feasible options to avert, minimize, and address (potential) losses and damages	**How can we respond using the identified CRM measures from step 4 and 5?** I. Which measures can effectively prevent/reduce potential losses and damages? II. At what cost? To what extent? III. Which constraints (financial, institutional, and technical) need to be considered? **How will we respond?**	I. Detailed overview of possible CRM interventions including risk levels, relevance/importance, and feasibility; II. Provision of policy-relevant information to support decision-makers in forward-looking planning and implementation of measures.	I. Stakeholder-based Elicitation of options; II. Cost-benefit analysis; III. Cost-effectiveness analysis; IV. Robust decision-making approaches; V. Multi-criteria analysis; VI. Adaptation pathways

STEP	GUIDING QUESTIONS	EXPECTED OUTCOMES	TOOLS, METHODS, SOURCES
	I. Which options are prioritised in consultation with stakeholders and do they cover all risk tolerance levels? II. What do respondents and decision-makers consider feasible and relevant?		

CHAPTER SEVEN

7.0 PUBLIC CONSULTATION AND TARTICIPATION

7.1 Legal basis

Stakeholder Consultation and Public Participation (CPP) component of the proposed Environmental and Social Impact Assessment (ESIA) study was conducted pursuant to the sustainability principles that emphasize application of participatory approaches to development, and stipulated in Part III, Section 17 of the Kenyan Environmental Impact Assessment and Audit Regulations, (2019) of the EMCA, (2015). This legislative framework stipulates that the views and opinions of the local populace and relevant stakeholders in the proposed project be duly solicited, analyzed and accordingly integrated in the decision making about actions on the proposed project. In this context, the CPP process sought to map out most of diverse views across community representation scales.

7.2 Data Collection Methods

7.2.1 Dimensions of views and opinions required

This ESIA study sought out the views and opinions for purposes of determining fundamental environmental and social impacts that need to be mitigated in the entire life cycle of the proposed project. The focus was on how the construction/renovation and operation process and outcome, from the perspective of sustainable development thinking, is likely to induce changes in the existing natural and entire social and economic ecosystem elements.

This assignment involved enlisting the public concerns (in their own self-expressions) in relation to how the planned project might conform to, and/or part ways with, the quality of their bio-spherical, socio-economic and cultural quality of lives. On the basis of analysis of these aspects, preferred impact mitigation measures for the proposed project were be identified and proposed.

With this understanding, the CPP exercise in the ESIA study was to avail extensive and inclusive views and opinions of the public and relevant stakeholders for decision making and subsequent actions on the proposed project.

Thus conceived, the CPP exercise was organized around three mutually related perspectives:

I. Unravelling the indicative social and environmental issues for the proposed project

II. Highlighting public concerns which may not be directly related to the proposed project but present significant bearings on its set up and subsequent operations in the absence of responsive mitigation measures; and
III. Analyzing and singling out core social and environmental concerns for consideration in formulating the environmental management plan (EMP) for the proposed project.

7.2.2 Target participants

The CPP process will reach out to a wide range of participants in the interest of bringing in diverse views, knowledge and experiences to the shaping of social and environmental impact mitigation measures for the proposed project. To this end, target sources of data and information for the proposed ESIA study will be:

I. Resident local community members through Public Barazas and media advertisement
II. Local opinion leaders (including religious leaders & political wings).
III. Heads of neighboring related auxiliary institutions and/or amenities/facilities. Special interest groups (CSOs/NGOs) and environmental movement actor organizations.
IV. Expert opinions of professionals and state/county government and environmental sustainability promotion agencies based in the surrounding proposed site for the project.

7.2.3 The CPP methods and supportive tools

The CPP task was accomplished through a series of data collection methods and tools in the social science research traditions, namely:

I. Focus Group Discussions (FGDs)/meetings with local community members, aided by an FGD Schedule (Public Barraza)
II. Key Informant Interviews (KIIs) with representatives of specialized state agencies and non-state actors in environmental sustainability management aided with an Interview Schedule
III. Semi-structured questionnaire aided in-depth interviews (face-to-face guided interrogations with local opinion leaders).

7.3 Consultation and public participation outcome.

To attain a meaningful and comprehensive public participation, the consultant sought the views of key informants at Count Government of Migori in relevant ministries and departments in

the month of June 2023. The local administration led by the county commissioner down to the assistant chief were also consulted. Other institutions consulted were the community based organizations within the location. List of key informants consulted is attached to this report. The following section summarizes the collective views from these stakeholders as echoed through structured questionnaires.

7.4 Key informants consulted

The following key informants were reached for their comments. However not all provided their views individually. Some County Executive Members delegated to their directors and assistants.

I. Migori County Commissioner
II. Migori County CEC Environment, Natural Resources and Disaster Management
III. Migori County CEC Health Services
IV. Migori County CEC Agriculture, Livestock, Fisheries and Water Development
V. Migori County CEC Land, Housing & Urban Development
VI. Migori County CEC Water & Energy
VII. Migori County CEC Road, Transport & Public Works
VIII. Migori County CEC Trade, Marketing, Tourism & Industrialization
IX. Migori County Director, Water Services
X. Migori County Director, Health Administration and Planning
XI. Migori County Director, Public Works
XII. Migori County Director, Roads and Transport
XIII. Migori County Director Mining
XIV. Migori County Director for Environment
XV. Migori County Director for Trade and Industry
XVI. Migori County Director for Health Services
XVII. Migori County Director for Water and Natural Resources
XVIII. Migori County Director for Fisheries
XIX. Chair, Migori County Executive Committee on Environment
XX. OCPD, Migori Police Station
XXI. Regional Director, Water Resource Authority, Migori county
XXII. Director, Migori Water and Sewage Company

XXIII. Director Water Resources Authority Migori county

XXIV. Director Public Health Migori County

XXV. NEMA-Director of Environment Migori County

XXVI. Kenya National Chamber of Commerce & Industry Director Migori county

XXVII. Community Action Support Organization (CASO)-CBO

XXVIII. Catholic Medical Mission Board's (CMMB) Migori office -CBO

XXIX. Development and Community Empowerment Organization (Dace) Migori -CBO

XXX. Local Administration Office -Area chief- Wasweta Location

7.5 Summary of views collected

1 (a). What environmental impacts do you anticipate from the proposed Chemicals Storage and Gold mining, leaching / elution project? **Delve into likely effects on flora (tree/vegetation cover) and Fauna (animals) through to water, air and soil quality.**

- *Environmental pollution i.e. water, air, soil and noise pollution*
- *Issues of waste management e.g. used chemicals containers*
- *Use of cyanide might cause health effects of humans and livestock*

(b) Suggest preferred measures towards mitigating the said effects- **Based on the experiences concerning Gold Mining, Leaching and Elution effects to the environment?**

- *Ensure that no seepage occurs within the facility and beyond. all waste water pits must be lined by a plastic cover to control seepage*
- *Properly secure the leaching plant*
- *Dispose off leaching and elution waste sustainably*
- *Ensure no waste water ends into existing water bodies*
- *Ensure regular residual monitoring*
- *Have a controlled pollution prevention system*
- *Provide proper protective equipment's to workers and visitors*
- *Ensure that there is no smoke at the facility*
- *Use low impact mining technologies*
- *Ensure that chemicals and handled and managed professionally*

(c). are there any health effects that could emerge due to the operation of the proposed project? **(Delve into the human health issue that could emerge i.e. diseases and any physical body harm)**

- *Poor chemicals handling and disposal practices may lead to both human and animals' health effects*
- *Handling of acid and sodium hydroxide may cause skin and eye irritation*
- *Cancer associated risks may occur when chemicals are not properly handled*
- *Respiratory diseases may occur when poor practices occur*

(d). Are there any forms of social conflicts that are likely to result from the proposed project? **(Delve into facility leasing, Material extraction, integration with other businesses, historical sites, farming practices, roads network, recreational amenities, etc.).**

- *Since the facility is leased their might be no issue but due diligence must me considered to ensure that the facility leased and documentation follow legal process*
- *Conflict may occur is the processes to be implemented will affect land fertility in the area*
- *The project may alter the current security in the area.*

How can the issues raised in **1 (a), (b) (c)** and **(d)** above be mitigated?

- *Do more community sensitization during the project development*
- *Ensure compliance with NEMA and other relevant authorities*
- *Embrace fair employment by considering the locals*
- *Have some Corporate Social Responsibility (CSR) projects with the community*
- *Have a conflict resolution mechanism during operation*

2 (a). In your view, how is the proposed Project likely to affect the lives of the people of this community? Focus on potential effects on: **health, schooling, employment opportunity, trade patterns, transport networks, religious activities, relations with other institutions/facilities (Highlight both possible satisfactory and undesirable outcomes of this project).**

- *Creation of employment opportunities – the proposed project will provide employment for the locals who will be responsible the minerals exploration, mining process,*

loading, transportation. processing and final Gold product finishing and provision of other auxiliary services within the facility i.e. security and administration services

- *Creation of income to Gold miners with a ripple effect into the community at large*
- *Enhanced economic growth – the proposed facility will enhance the economic growth of Migori County through revenue generation through various applicable forms of county taxation.*
- *Contribution to the development of the local infrastructure through, increased power connectivity and enhanced water supply*
- *Increased land and resource value addition through Gold mining and processing in the region*
- *The project will contribute to creating a globally competitive and prosperous Kenya with high quality of life that aims to transform Kenya into a newly industrializing middle-income country contributing to the global precious Mineral (Gold) trade*
- *Negative impacts anticipated with the implementation of the proposed project include*
- *Soil erosion from the disturbed/compacted lands during the raw materials mining processes*
- *Pressure to the existing infrastructure and resources i.e. water which will be required for dust suppression during mining and processing*
- *Increased noise and vibration mostly during the facility operation*
- *Air pollution (dust particles emanating from samples delivery by vehicles and from the sample preparation activity (crushing to fine dust)*
- *Exhausts gases pollution from the Gold leaching and elution plant, raw materials delivery and personnel vehicles and onsite generator that will be installed*
- *Occupational health and safety concerns related to poor workmanship and poor chemicals handling, poor health standards may occur and chances of accidents to workers if health and safety concerns will not be enforced*
- *Occupational health and safety concerns related to communicable diseases i.e. COVID 19, Common flue/colds and HIV Aids may occur due to increase of human contact*
- *Solid Waste Generation from used final muddy soil and domestic waste generated by personnel on site*
- *Exacerbation of social crimes within the facility site due to increased activities*

2 (b). Elaborate on any specific **areas of fear/vulnerability and directions of action for improvement/risk mitigation** for the proposed project.

- *Diseases outbreak may occur*
- *Increased school dropout among the youths*
- *Increased communicable diseases*
- *Environmental pollution may occur*
- *Child labour*
- *Increased insecurity*
- *The project may lead to increased gender based violence*

3(a). What measure would you want to see the **Emakpet Universal Limited**. Management to put in place during the entire project cycle and, in the end, functioning of the proposed facility mitigate against the adverse impacts anticipated?

- *Adhere to and comply with all relevant regulations and laws*
- *Ensure proper facility management*
- *Comply to the environment management plan*
- *Adequately engage the community at all times*

(b) How would you want the **Emakpet Universal Limited**? Management to involve you in implementing the measures?

- *Ensure a constant public consultation through local leadership*
- *Increased sensitization*
- *Residue monitoring*

(c) Which **Legal and Institutional Frame Work** and policies do you think should be taken into consideration to streamline the facility operations select appropriate? **Example**

- *Environmental Impact Assessment and Audit Regulations*
- *Waste management regulations*
- *Water and waste water management regulations*
- *Noise and excessive vibration regulations*
- *Air quality regulations*
- *County Government laws and bylaws*
- *Occupational health and safety rules*

7.5 Public Consultation Barraza

To gain more views from the general public, the consultant in collaboration with the proponent notified the NEMA office in Migori County for an Upcoming public Barraza on the 3rd of August 2023 (a copy of this letter is attached to this report). This followed the provision of EMCA 2015 and the constitution of Kenya 2010. This was followed by notification of the public through posters for a meeting that was slated for 17th August 2023 at the Hotel Discretion in Migori County. This meeting attracted 46 persons. The meeting was chaired by the Deputy County Commissioner (DCC) and observed by the office of the County Director of Environment Migori County. Present also during the Assistant County Commissioner (ACC) Suna East area Chief and the Assistant Chief. **Minutes for the meeting are attached to this report**. The following photo plates shows the details of the advertisement posters strategically placed in different areas inviting the public for the Baraza.

Photo 7.1: an advertisement poster at the main gate of the proposed site location

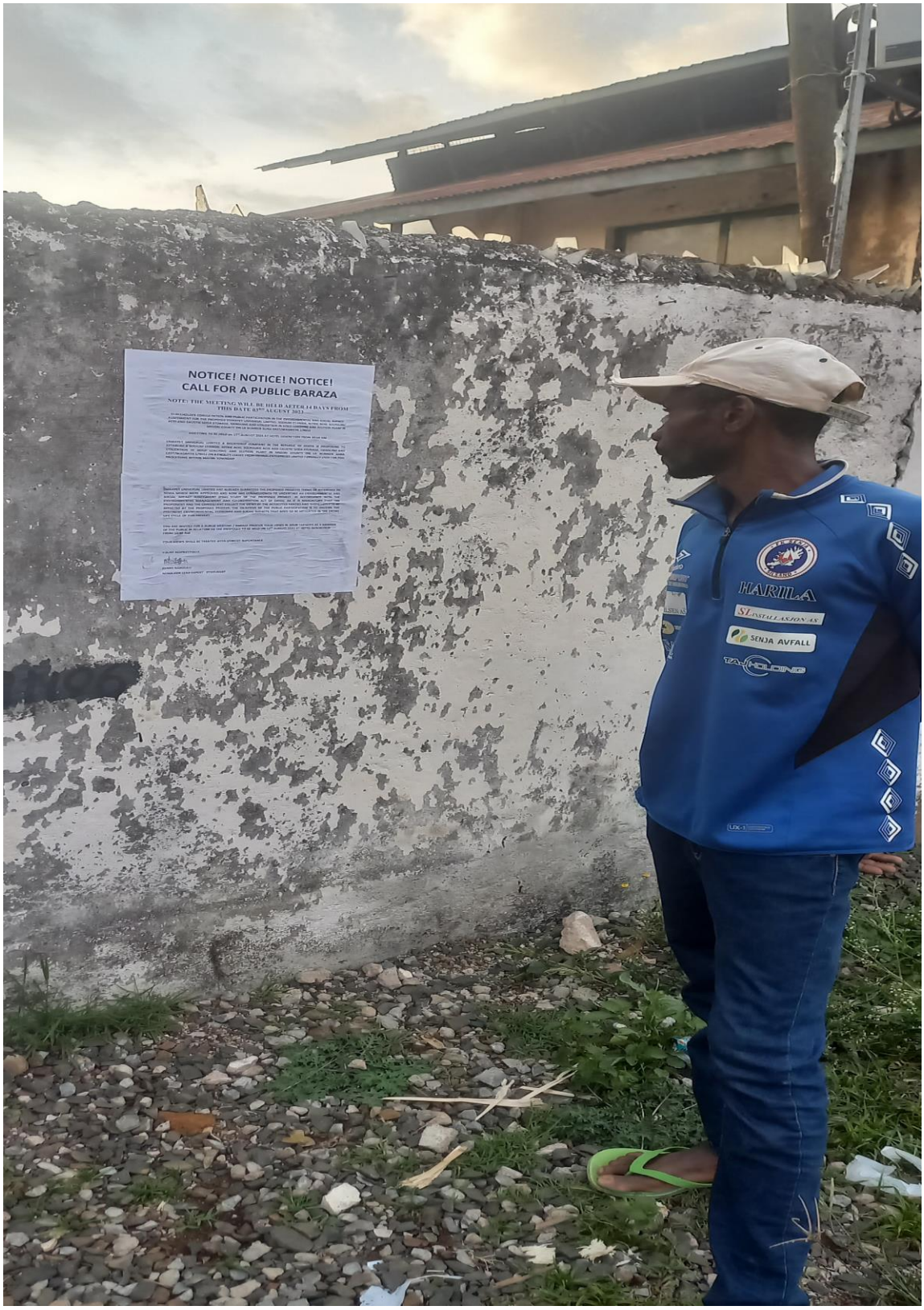


Photo 7.2 A member of the public keenly going through the advisement poster

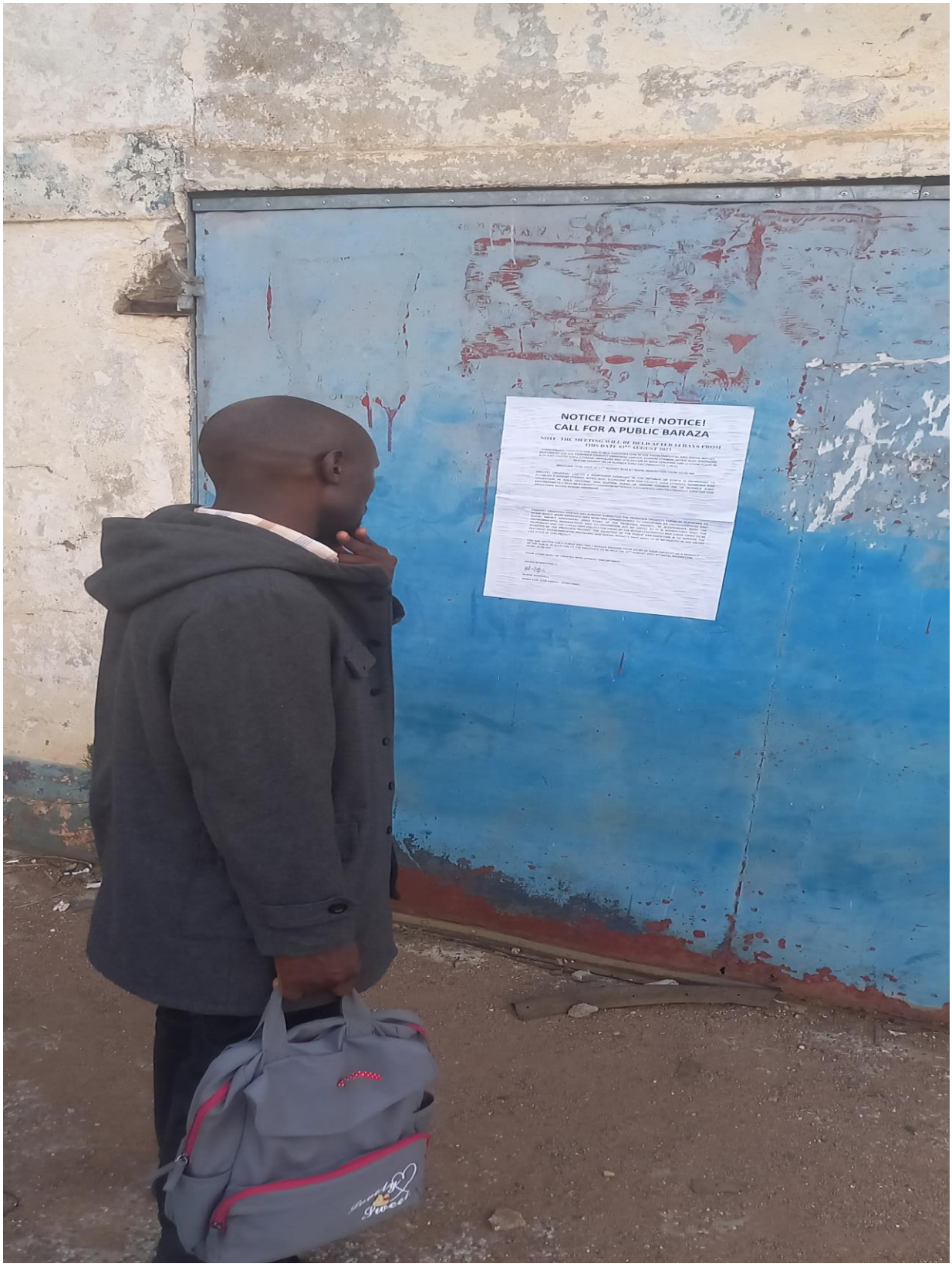
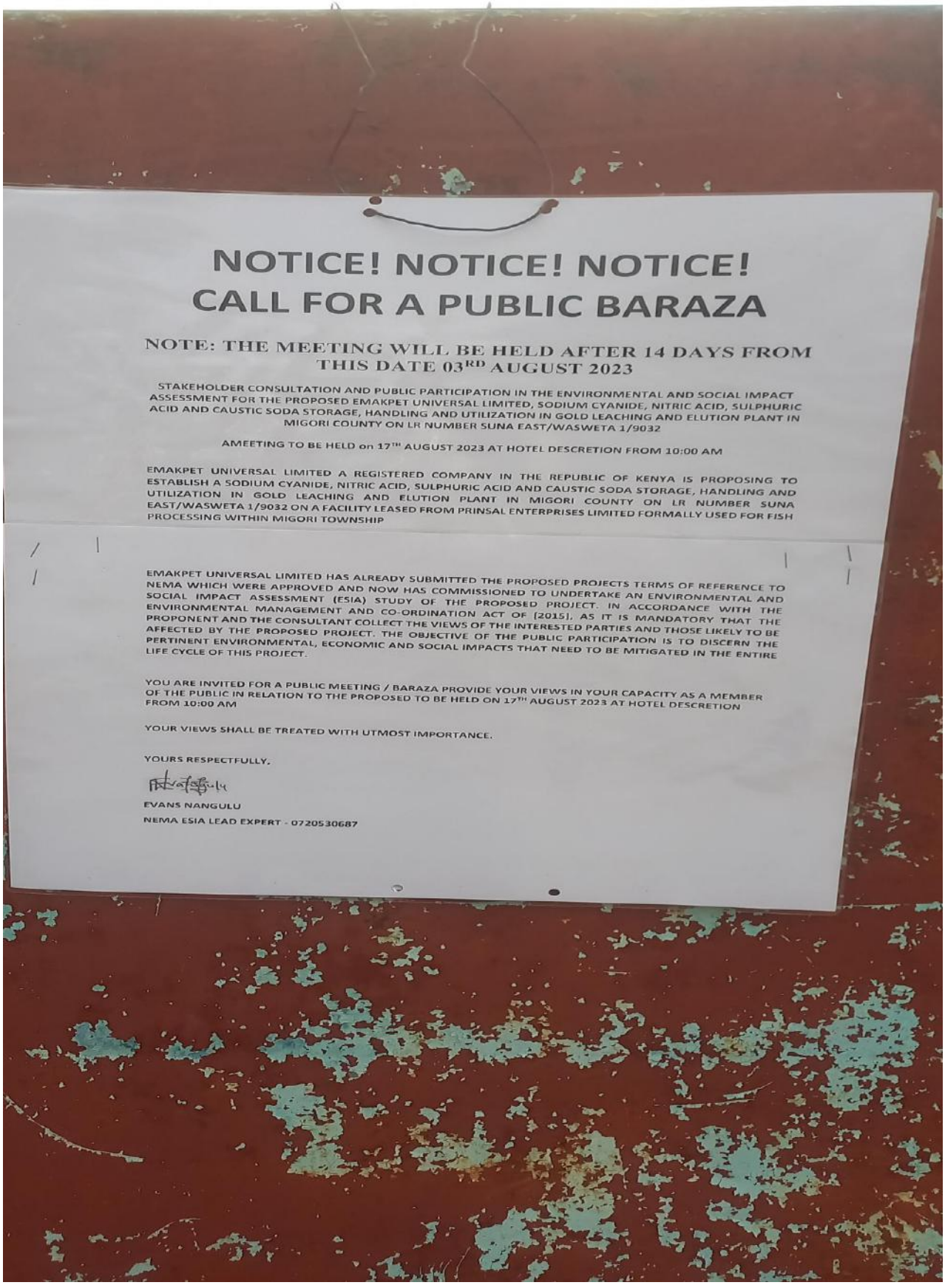


Photo 7.3 A member of the public going through the advertisement poster



NOTICE! NOTICE! NOTICE!
CALL FOR A PUBLIC BARAZA

NOTE: THE MEETING WILL BE HELD AFTER 14 DAYS FROM THIS DATE 03RD AUGUST 2023

STAKEHOLDER CONSULTATION AND PUBLIC PARTICIPATION IN THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED EMAKPET UNIVERSAL LIMITED, SODIUM CYANIDE, NITRIC ACID, SULPHURIC ACID AND CAUSTIC SODA STORAGE, HANDLING AND UTILIZATION IN GOLD LEACHING AND ELUTION PLANT IN MIGORI COUNTY ON LR NUMBER SUNA EAST/WASWETA 1/9032

AMEETING TO BE HELD on 17TH AUGUST 2023 AT HOTEL DESCRETION FROM 10:00 AM

EMAKPET UNIVERSAL LIMITED A REGISTERED COMPANY IN THE REPUBLIC OF KENYA IS PROPOSING TO ESTABLISH A SODIUM CYANIDE, NITRIC ACID, SULPHURIC ACID AND CAUSTIC SODA STORAGE, HANDLING AND UTILIZATION IN GOLD LEACHING AND ELUTION PLANT IN MIGORI COUNTY ON LR NUMBER SUNA EAST/WASWETA 1/9032 ON A FACILITY LEASED FROM PRINSAL ENTERPRISES LIMITED FORMALLY USED FOR FISH PROCESSING WITHIN MIGORI TOWNSHIP

EMAKPET UNIVERSAL LIMITED HAS ALREADY SUBMITTED THE PROPOSED PROJECTS TERMS OF REFERENCE TO NEMA WHICH WERE APPROVED AND NOW HAS COMMISSIONED TO UNDERTAKE AN ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY OF THE PROPOSED PROJECT. IN ACCORDANCE WITH THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT OF (2015), AS IT IS MANDATORY THAT THE PROPONENT AND THE CONSULTANT COLLECT THE VIEWS OF THE INTERESTED PARTIES AND THOSE LIKELY TO BE AFFECTED BY THE PROPOSED PROJECT. THE OBJECTIVE OF THE PUBLIC PARTICIPATION IS TO DISCERN THE PERTINENT ENVIRONMENTAL, ECONOMIC AND SOCIAL IMPACTS THAT NEED TO BE MITIGATED IN THE ENTIRE LIFE CYCLE OF THIS PROJECT.

YOU ARE INVITED FOR A PUBLIC MEETING / BARAZA PROVIDE YOUR VIEWS IN YOUR CAPACITY AS A MEMBER OF THE PUBLIC IN RELATION TO THE PROPOSED TO BE HELD ON 17TH AUGUST 2023 AT HOTEL DESCRETION FROM 10:00 AM

YOUR VIEWS SHALL BE TREATED WITH UTMOST IMPORTANCE.

YOURS RESPECTFULLY.

EVANS NANGULU

NEMA ESIA LEAD EXPERT - 0720530687

Photo 7.4 Details of the public meeting poster

Photo 7.5: The Assistant County Commissioner giving his opening Remarks

Photo 7.6 The Area Chief giving his opening remarks

Photo 7.7 The Deputy County Commissioner officially opening the public meeting

Photo 7.8 A section of the meeting participants

Photo 7.9 A section of the meeting participants

Photo 7.10 : The general manager Emakpet introducing the project

Photo 7.11 Plenary discussion during the lead expert presentation

Photo 7.12 Plenary discussion during the lead expert presentation

Photo 7.13 Plenary discussion during the lead expert presentation

Photo 7.14 Plenary discussion during the lead expert presentation

Photo 7.15 Plenary discussion during the lead expert presentation

Photo7.16 NEMA officer giving his remarks and closing the meeting

CHAPTER SEVEN

7.0 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

7.1 Significance of EMP

The EMP for the proposed facility development provides the impacts findings of the assessment and mitigation measures, time schedules, costs, responsibilities and commitments. It contains recommendations proposed to minimize environmental impacts of the proposed activities

7.2 Objectives of the EMP

The objectives of the EMP include the following:

I. To bring the proposed facility operations into compliance with national and international policies, laws and protocols.
II. To outline mitigating/enhancing, monitoring, consultative and institutional measures
III. To ease decision making by Emakpet Universal Limited
IV. To assist the authorities, monitor implementation of ESIA recommendations.

7.3 Responsibilities

To ensure effective implementation of the EMP and efficient operations of the facility, it is necessary to identify and define the responsibilities and authority of the various persons and organizations that are involved. The following were identified for implementation of the EMP.

V. Emakpet Universal Limited
VI. Migori County Government
VII. Facility staff
VIII. Consultants

Table 7.1 Environmental Management Plan (EMP)

ANTICIPATED IMPACTS	POSSIBLIE MITIGATION MEASURES	RESPONSIBILITY	APPROXIMATE COST
IMPACT ON PHYSICAL CLIMATE			
SITE PREPERATION AND CONSTRUCTION/ RENOVATION PHASE	• Maintain all mature trees where possible • Remove only vegetation that is absolutely necessary; • Ensure that buffer areas and green belts are incorporated in the project design; • All raw materials must be sourced as close as possible to the construction site ; • Ensure that all vehicles are properly maintained and serviced; and Machines must not be left idling to save fuel and reduce emissions.	• Emakpet Universal Limited management • Contractor	• KES 100,000
OPERATION PHASE	• Implement a traffic system that involves appropriate signals and signs. • Ensure that buffer areas and green belts that are incorporated in the project design are delineated by containment measures • Re-vegetate open areas with fast growing trees.	• Emakpet Universal Limited management	• KES 50,000
IMPACT ON AIR QUALITY			
SITE PREPERATION AND CONSTRUCTION/RENOVATION PHASE	• The clearing of vegetation must be carried out on a phased basis • All material (sand and aggregate) stockpiled on the site should be regularly	• Emakpet Universal Limited management • Contractor	• KES 200,000

	sprayed using water to minimize dust generation • All trucks carrying aggregate and sand should be covered during delivery to the site. • Spill control measures should be in place to prevent spread. • Ensure sprinkling of water to reduce dust in periods when wind speed is greatest and the rainfall amounts are lowest. • All staff employed at the construction site must be provided with dust masks and be trained to use them. • All waste must be transported off-site to designated area approved by NEMA. • Perform repair and construction at times that persons are at work		
OPERATION PHASE	• Install sufficient exhaust (Scrubbers) from the facility to manage emission of toxic gasses • Use 'environmentally friendly chemicals	• Emakpet Universal Limited management	• KES 2,000,000
IMPACT ON WATER QUALITY			
SITE PREPERATION/RENOVATION AND CONSTRUCTION PHASE	• All diesel and motor oil should be stored in a designated area that is properly contained. • Store all raw materials away from the water drains	• Emakpet Universal Limited management • Contractor	• KES. 100,000

	• Install siltation traps within the drainage design to collect silt and sediment. • Conduct periodical water quality monitoring to ensure that standards are maintained.		
OPERATION PHASE	• Ensure that all areas of the project site lined with geotextile material to prevent the contamination of ground water in the area; • Maintain a vegetation buffer around natural environments to reduce the nutrient loading to these waterways. • Ensure that all chemicals are properly stored and properly labeled. The area where chemicals will be stored and handled must be constructed with an impermeable surface. • Ensure that there is proper storage and disposal of waste generated (chemical bags, containers, resultant tailing and muddy soil) • Conduct regular water quality monitoring of the waste water treatment facilities, water courses to ensure that these are in keeping with the prescribed water quality standards	• Emakpet Universal Limited management	• KES 200,000

	• Purchase and store only the amount of chemicals needed for the immediate future. • Develop and follow a first in first out principle for chemicals stored and used		
IMPACT ON SOIL AND GEOLOGY			
SITE PREPERATION AND CONSTRUCTION/RENOVATION PHASE	• Install appropriate drainage systems to direct water away from slopes; • Avoid as far as possible the traversing of bare soil by vehicles to reduce soil compaction; • Designate a main access route for heavy machinery;	• Emakpet Universal Limited management • Contractor	• KES 150,000
OPERATION PHASE	• Apply practices and use products that reduce the potential for contamination of soils including the physical removal of weeds, use of slow-release products and choosing the most 'environmentally friendly products available • Ensure that chemicals used and tailing do not spill to the soils and open drains • Prevent the contamination of soils by the designation of a maintenance area for the maintenance of vehicles and other equipment to be used for the upkeep of the turf. This area should be lined with an impervious material and all run-offs from	• Emakpet Universal Limited management	• KES 230,000

	this area channeled and collected in a catchment area.		
IMPACT ON HYDROLOGY			
SITE PREPERATION AND CONSTRUCTION PHASE	• Ensure that the drainage plan proposed is implemented as stipulated on the plan. • Additional drainage may be put in place to convey the flood discharge and the retention areas used primarily to retain water for irrigation and smaller flood discharges. • The provision of a system of culverts should be considered.	• Emakpet Universal Limited management • Contractor	• KES 180,000
OPERATION PHASE	• Ensure that all drains and culverts collecting water within the site are regularly cleaned and maintained.	• Emakpet Universal Limited management	Nill
IMPACT ON NOISE AND VIBRATION			
SITE PREPARATION AND CONSTRUCTION/RENOVATION PHASE	• Silenced machinery and instruments should be employed to reduce the impact of noise on the existing residents and workers. • Machinery, vehicles and instruments that emit high levels of noise should be used on a phased basis to reduce the overall impact. • These pieces of equipment such as drills, graders and cement mixers should also be used when the least number of residents can be expected to be affected, for	• Emakpet Universal Limited management • Contractor	• KES 50,000

	example during periods where most residents are at work or school. • Workers, especially those working with machinery, vehicles and instruments that emit high levels of noise should be supplied with ear plugs and ear muffs to reduce the risk of hearing impairment. Temporary barriers such as earth berms, zinc fencing and sound dampening fencing such as acoustic screens should be employed to reduce the impact of noise to the existing residents; • Ensure that construction activities for the development and the other developments proposed for the area are staggered to decrease the levels of noise and vibration in the area; • Construction hours should be limited to the hours of 8:00 a.m. and 6:00 p.m. daily except Sundays. • The delivery of raw materials must be limited to 8:00 a.m. and 6:00 p.m.		
OPERATION PHASE	• Ensure that there is proper traffic signage and signals where necessary or appropriate to effect the free and safe movement of traffic and there reduce the noise caused by traffic build-up.	• Emakpet Universal Limited management	• Nill

	• Ensure that deliveries to the facility are made between 8:00 a.m. and 5:00 p.m. daily. • Ensure that maintenance works occurs between the hours of 8:00 a.m. and 5:00 p.m. daily.		
IMPACT ON LAND SCARPING AND AESTHETIC			
SITE PREPARATION AND CONSTRUCTION / RENOVATION PHASE	• Conduct vegetation clearance on a phased basis • Re-vegetate cleared areas as soon as possible. • Retain vegetation screens to reduce the visual effect of this stage of the development. • Ensure that local building materials and muted colours are used to reduce the visual impacts of the development and the landscaping to blend with the local environment.	• Emakpet Universal Limited management • Contractor	• To be determined
OPERATION PHASE	• Ensure that land scarping is incorporated within its designs are regularly maintained.	• Emakpet Universal Limited management	• KES 20,000
IMPACT ON BIOLOGICAL IMPACTS (FLORA AND FAUNA)			
SITE PREPARATION AND CONSTRUCTION/RENOVATION PHASE	• Determine access roads which are to be used by machinery used in the construction/renovations and site preparation phase of the development to	• Emakpet Universal Limited management • Contractor	• KES 20,000

	avoid the unnecessary trampling of vegetation that will be maintained within the development • Reduce edge effect and habitat loss by physically delimit the remaining vegetation by some means of fencing which will reduce the impact of secondary opportunistic clearance in the area as a result of increased accessibility created by the development; • Incorporate as much local plants found within the area • The proponent should incorporate trees that are used by bird species for foraging to attract bird species to the area.		
OPERATION PHASE	• Reduce Clearance in the area as a result of increased accessibility created by the development; • Develop and implement a comprehensive Nutrient Management Programme for the maintenance of the lawns.	• Emakpet Universal Limited management	• NILL
IMPACT ON SOCIO-ECONOMIC MITIGATION MEASURES			
Community Cohesion			
OPERATION PHASE	• The developer should develop a Corporate Social Responsibility Programme which could provide assistance to the community e.g. free medical camps and water supply	• Emakpet Universal Limited management	• KES 1,000,000 annually

	• The Local Planning Authority must play an important role in ensuring that the development and its operations is monitored and implemented in an orderly and sustainable manner.		
SITE PREPARATION AND CONSTRUCTION / RENOVATION PHASES	• This should avoid any feelings of resentment and will ensure that the community derives the most benefits from the development. As far as possible purchase supplies to be used in the construction / renovation should be sourced from nearby suppliers. • Identify a specific area on the project site for vending type activities ensuring that there are garbage receptacles throughout the project site.	• Emakpet Universal Limited management • Contractor	NIL
IMPAT ON INFRASTRUCTURAL AND ROADNETWORK			
SITE PREPARATION AND CONSTRUCTION/RENOVATION PHASES	• The developer must improve the road network which provides access to the project area. This should be accompanied by an upgrade in the drainage along this road network. Ideally the road improvement works should take place prior to the infrastructural works at the development site. These road improvements must be scheduled between 9:00 a.m. and 4:00 p.m. daily, so as not to disrupt traffic in the area and to	• Emakpet Universal Limited management • Contractor	• KES 500, 000 Annually

	abate the increase in ambient noise levels in the community.		
OPERATION PHASE	• Ensure that roads connection to the site are regularly maintained and do not cause traffic	• Emakpet Universal Limited management	• To be determined
IMPACT ON UTILITIES AND ELECTRICITY			
OPERATION PHASE	• Install energy saving utilities • Ensure that a back-up generator is installed for use in periods of power outages. • Ensure that the facility is designed in such a manner that there is reduction in the energy use associated with the operation of air conditioning units; and • Train employees in the benefits of energy conservation.	• Emakpet Universal Limited management	• To be determined
IMPACT ON WATER AVAILABILITY			
SITE PREPARATION AND CONSTRUCTION/RENOVATION PHASES	• Ensure that there is adequate water available to supply the increase in demand that the construction/ renovation activities will pose.	• Emakpet Universal Limited management • Contractor	• KES 300,000
OPERATION PHASE	• Ensure that there is an upgrade to the water supply in the area prior to the operation of the facility. Water consumption during this phase can be reduced with the installation of water conservation fixtures and maximizing of	• Emakpet Universal Limited management	• KES 150,000 annually

	recycled water in the Gold processing activities		
IMPACT ON SOLID WASTE			
SITE PREPARATION AND CONSTRUCTION / RENOVATION PHASES	• The developer should seek to hire a private licensed solid waste collection company. All the refuse generated should be properly transported and disposed of at the nearest licensed solid waste facility. • Chemicals bags and containers should incinerate • Ensure that vending during these phases of the development is localized. • Provide garbage receptacles around the project site.	• Emakpet Universal Limited management • Contractor • Service providers	• KES 200,000
OPERATION PHASE	• The developer should install a mechanism to manage solid waste generated. • Chemicals bags and containers should incinerate by a licensed operator	• Emakpet Universal Limited management • Service providers	• KES 200,000 annually
IMPACT ON SEWAGE EFFLUENT			
SITE PREPARATION AND CONSTRUCTION /RENOVATION PHASES	• Ensure that toilets are provided for use by employees during these phases of the development. A reasonable ratio would be one (1) toilet per eight (8) workers.	• Emakpet Universal Limited management • Contractor	• To be determined
OPERATION PHASE	• The developer should ensure that all sewage treatment lines or septic tanks are	• Emakpet Universal Limited management	• KES 150,000

	maintained regularly and that, all effluent released is within or below the standards for effluent as stipulated by the NEMA, Water Quality Regulations, 2006.		
IMPACT ON SOCIAL SERVICES			
SITE PREPARATION AND CONSTRUCTION/RENOVATION PHASES	• Provide a First Aid Kit on site for any minor injuries that may occur on site • Inform and make arrangements with the nearest Health Clinic to accommodate any major injuries that may occur in these phases of the project	• Emakpet Universal Limited management • Contractor	• KES 50,000
IMPACT ON EMERGENCY SERVICES			
SITE PREPARATION AND CONSTRUCTION/RENOVATION PHASES	• Burning should not be employed on the site preparation activities. Bund areas where flammable substances will be stored. These bunds must be designed to hold approximately 1 ½ times the amount of the substances that will be stored • Place warning signs in areas where flammable substances will be stored	• Emakpet Universal Limited management • Contractor	• KES 15,000
IMPACT ON SECURITY			
SITE PREPARATION AND CONSTRUCTION/RENOVATION PHASES	• It is recommended that persons from the nearby communities be employed to work on the construction site. This will avoid any feelings of resentment that may be felt from locals and may reduce	• Emakpet Universal Limited management • Contractor	To be determined

	the level of crime and violence during these phases of the development.		
OPERATION PHASE	• Ensure that buildings are properly secured; and Ensure that there is adequate security on site at all times	• Emakpet Universal Limited management • Service providers	• KES 30,000 Monthly
OCCUPATIONAL HEALTH AND SAFETY MITIGATION MEASURES			
SITE PREPERATION, CONSTRUCTION/RENOVATION AND OPERATION PHASE	• Provide all employees with safety and protective gear • Including hard hats, safety goggles, dust masks, gloves and safety shoes. Employees will be required to wear these at all times on the project site. • Designate the roles and responsibilities of employees, which will enable a clear chain of command during a fire or explosion and allows persons to be aware of their responsibilities in the event of such occurrences. • Ensure that all machinery used on the site is properly maintained and inspected before use. • Install several suitable, approved fire extinguishers at accessible, conspicuous and unobstructed points throughout the development area. • Place a fully equipped first aid kit on the project site.	•	•

	• Place conspicuous warning signs where hazardous or flammable substances will be stored. • Place information signs around the project site which list the numbers of the person responsible for handling emergencies on the site, i.e. Migori Fire Department, keep an emergency log to document any occurrences of fires and explosions as well as to record any damage to the property and human injuries. This log must also contain emergency contact information for all employees.		
ACCIDENTS AND GENERAL HUMA HELATH			
SITE PREPARATION, CONSTRUCTION/RENOVATION PHASE	• Provide all employees with safety and protective gear including hard hats, safety goggles, dust masks, gloves and safety shoes. Employees will be required to wear these at all times on the project site. Designate the roles and responsibilities of employees, which will enable a clear chain of command in the event of an accident and allows persons to be aware of their responsibilities in the event of such occurrences. • Place a fully equipped first aid kit on the project site.	• Emakpet Universal Limited management • Contractor • Consultants	• KES 600,000

	• Ensure that a crew member is trained in basic first aid practices. • Place information/warning signs around the project site, which indicates where hazardous and flammable material will be stored. • Signs must also be placed around the renovation site displaying the numbers of the person responsible for handling emergencies on the site, • Keep an emergency log to document any occurrences of any accidents that may occur on the site. • Ensure that all machinery operating at the project is regularly serviced and maintained. • Ensure that persons operating equipment's are trained		
OPERATION PHASE	• Ensure that only the required amounts of chemicals to be used in the short-term will be stored at the maintenance facility; • Ensure that chemicals are stored in a safe and secure environment, and that only authorized persons will be allowed in these storage areas. These areas should be properly signed to indicate that hazardous chemicals are stored in this area;	• Emakpet Universal Limited management • Service providers	• KES 200,000 annually

	• Develop and implement a Health and Safety Training Manual for the employees. • Ensure to have a sufficient work procedure and accessible to all		

CHAPTER EIGHT

8.0 MONITORING PLAN AND ALTERNATIVES TO DEVELOPMENT

8.1 Monitoring plan

Regular monitoring of important and crucial environmental parameters is of immense importance to assess the status of environment in any industrial process. With the knowledge of baseline conditions, the monitoring programme will serve as an indicator for any deterioration in environmental conditions due to operation of the proposed chemicals storage and gold elution facility to enable taking up suitable mitigation steps in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring. The following routine monitoring programme would therefore be implemented in the entire project cycle.

8.1.1 Training Programmes

Trainings and re training will be very important for Emakpet universal limited workers particularly those who will be in direct operations. They shall be trained in the following areas:

I. Occupational health and Safety training
II. Firefighting training
III. Hazardous and non-hazardous waste management training
IV. Energy efficiency
V. Regular refresher training on relevant process technologies
VI. Environmental management training like internal environmental audit training

8.1.2 Emergency preparedness

Emergency preparedness will be put in place during the entire project cycle. In the event of accidents or any other emergency, it will be possible to manage any situation. Firefighting infrastructure will be installed and continually upgraded. Regular medical extermination will be carried out for workers

8.1.3 Air and water quality

The proponent will continually monitor the air and water quality at the site by regularly sampling for analysis in licensed laboratories.

8.2 Project Alternative for Development

This section examines alternatives to the proposed project in terms of the site, Raw material availability, project design technology and social aspects. Also, impacts of each alternative are identified, discussed and compared with those of this development proposal. With such information, reviewers and the proponent have basis for decision making.

8.2.1 No Project Alternative

This option can be imposed by the National and County Government of Migori to the Proponent. This option implies that the existing situation prevail i.e. no development activity to take place. This option is mostly applicable in situations where the proposed project area is in ecologically sensitive areas. The land in which the chemicals storage and Gold leaching plant is to be developed is in a stable industrial type environment (formally used for fish processing) therefore will not be affected by this development as within the area, there are other production facilities. From a socio-economic perspective the "no action" alternative may not be the best alternative as there numerous benefits to be gained from the development locally, nationally and internationally The 'No Project Option' is the least preferred from the socio-economic and partly environmental perspective since if the project is not done;

I. The economic benefits especially during development i.e. provision of jobs for skilled and non-skilled workers will not be realized.
II. There will be no generation of income by the developer and the Government.
III. The social-economic status of Kenyans and local people would remain unchanged.
IV. The local skills would remain under utilized
V. No employment opportunities will be created for Kenyans who will work in the project area and after development.
VI. Discouragement for local investment

From the analysis above, it becomes apparent that the 'No Project Alternative' is not the appropriate alternative to the local people, Kenyans, and the Government. This alternative describes a situation where the proposed development fails to be implemented. In case this happens, positive impacts associated with the proposed development will not accrue to the stakeholders including the locals to be the development consultants, contractors and suppliers of materials.

However, from an environmental conservation perspective, this alternative will be beneficial in the sense that any potential negative impacts associated with the project will be avoided. The "No Action Alternative" should not be adopted, as we need to encourage development so long as it is undertaken on a sustainable manner.

8.2.2 Relocation Option

Relocation option to a different site is an option available for the project implementation. However, at present the investor does not have an alternative site (the facility has already been leased). Under this alternative, it means that he has to look for other premises. Looking for other premises to accommodate the scale and size of the facility and completing official transaction on it may take more than three years although there is no guarantee that such facilities would be available. Whatever has been done and paid to date will be counted as a loss to the developer. This would also lead to a situation like No Project Alternative option. The other consequence of this is that it would be a discouragement for private/local investors. In consideration of the above concerns and assessment of the current site, relocation of the proposed project is not a viable option.

8.2.3 The Proposed Project Alternative

Even though there exist other sites and set-ups suitable for the establishment of the proposed project, land availability, and proximity to favorable infrastructures (raw materials, roads, water, reliable, energy) formed the basis of selection of the proposed site. Moreover, the proposed site was considered the most feasible because of the following advantages.

Advantages of this alternative

I. The project will not require a new building thus no construction activities.

II. The county in which the project is to be established (Migori county) is rich in Gold prospects and hence raw material will be readily available for processing
III. The site is easily accessed.
IV. The site is easily accessible to water supply and electricity
V. The proposed project conforms to land uses in the area therefore will not be in conflict with other land uses.
VI. The project potential negative environmental and social impacts due to the proposed project will be insignificant.
VII. Locating the project on the proposed site will be beneficial to the local community in the area.

The selection of the site for the proposed project however has the following disadvantages;

I. The proposed project will increase industrial development footprint and its attendant effects on the bio-physical environment of the immediate area.
II. The local resources and public utilities in the location of the site will be strained due to additional development.

Under the project alternative, the proponent will be issued with an ESIA License. In issuing the license, NEMA will approve the proponent's proposed project provided that all environmental measures are complied with at all phases. This alternative consists of the applicant's final proposal with the inclusion of the NEMA regulations and procedures as stipulated in the environmental management and coordination (Act 2015). **This is the most viable option in respect to the facility.**

8.2.4 Wastewater Management Alternatives

8.2.4.1 Alternative One-Use of septic tanks

This involves the construction of underground concrete-made tanks to store the sludge with soak pits. This alternative is viable for management of the factory wash water to be generated in minimal quantities.

8.2.4.2 Alternative two - Connection to the existing sewer system

This alternative works best in areas served by a sewer line. Connection to an available large main sewer line solves wastewater management issue at a very minimal cost and in an environmental efficient manner. This is thus the best option for efficient wastewater management during the operation phase of the project since the site is connected to the sewer line

8.3 Solid Waste Management Alternatives

Significant amounts of wastes will be generated from the facility. Notwithstanding, an integrated solid waste management system is recommendable. First, the proponent will give priority to reduction at source of the materials. This option will, secondly demand a solid waste management awareness programme for both the management and the personnel. Recycling, Reuse and compositing of the waste will be the second alternative in priority. This will call for a source separation programme to be put in place. The recyclables will be sold to authorized waste buyers which hazardous waste will be incinerated at recommended facilities by NEMA. This will be the best alternative considering the nature of operation of the facility

CHAPERT NINE

9.0 PROJECT DECOMISSIONING

9.1 Description of the Project's Decommissioning Activities

Decommissioning is an important phase in the project cycle and comes last to wind up the operational activities of a particular project in an event it ceases to operate and exist. It refers to the final disposal of the project and associated materials at the expiry of the project lifespan. If such a stage is reached, the proponent needs to remove all materials resulting from the demolition/ decommissioning from the site. The following should be undertaken to restore the environment.

I. Fence and signpost unsafe areas until natural stabilization occurs e.g. leaching pits
II. Remove all project structures from the site
III. All structures should be removed from the site
IV. Ensure that all remaining chemicals and chemical containers are disposed off by a licensed hazardous waste handler
V. Backfill all surface openings
VI. Ensure all the workers are adequately prepared for lay off and facilitate possible redeployment
VII. Ensure fair compensation to workers
VIII. Notify NEMA and develop a decommissioning report for submission

9.2 Site Restoration

Once all the waste resulting from dismantling works is removed from the site, the site will be restored through replenishment of the topsoil and re-vegetation using indigenous plant species. Since the facility is just leased, no demolition works will take place. The property owner will decide the next life of the facility

CHAPTER TEN

10.0 CONCLUSION

This Project Study Report provides a developmental and operational review of Emakpet Universal limited proposed chemicals storage, leaching and elution plant and its interactions with the surrounding environment, the assessment analysed potential impacts due to the its operations, with the objective of determining the scale and intensity of impacts.

The proposed project in question is of high risk in nature with potentially high negative impacts if the project proponent will not implement the recommendation developed in the Environmental management plan and views of the stakeholders echoed.

This report findings i.e. EMP will be advertised to both the print and audio media for a further public participation prior to the final decision by the authority. Once more view are collected during the advertisement window, the consultant will incorporate the views from the public into the report to make it final and resubmit to NEMA for final decision making. To this end and based on the field findings and stakeholder engagements, the proposed project stands a chance for greenlight and the proponent is advised to take keen consideration of recommendations and conditions to be set by the authority.

CHAPTER ELEVEN

11.0 REFERENCES

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CHAPTER TWELVE

12. 0 APPENDICES