

Environmental Scoping Study for:

The Proposed Underground Exploration and Mining Activities through Asis West (AW) and Asis Far West (AFW) shafts at the Kombat Mine in the Otjozondjupa Region, Namibia



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EXECUTIVE SUMMARY

Trigon Mining (Namibia) (Pty) Ltd (hereinafter referred to as Trigon Mining or the Proponent) intends to carry out underground exploration and mining activities on their Mining Licenses (MLs) No. 73B, 16 & 9, collectively referred to as the Mining License (the old Kombat Mine, hereinafter referred to as the Mine). The Mine is located close to the Kombat Settlement on the southern margin of the Otavi Mountain Range in the Otjozondjupa Region. Located about 41km east of Otavi on the B8 Road to Grootfontein, the Mine is a past-producing copper, lead and silver Mine that was intermittently in operation from the early 1900s to 2007, and has been on care and maintenance since early 2008.

The Mine intends to expand its operations by undertaking underground exploration and mining works. It should however be noted that exploration and mining activities are listed in the EIA Regulation as activities that may not be undertaken without an Environmental Clearance Certificate (ECC). This is stipulated under the Environmental Management Act (EMA) (2007) and its 2012 Environmental Impact Assessment (EIA) Regulations. The listed activities as per EIA regulations as relevant to the proposed activity are listed below:

"3. MINING AND QUARRYING ACTIVITIES

- *3.1 The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
- *3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.*
- *3.3 Resource extraction, manipulation, conservation, and related activities."*

Associated activities include

"8. WATER RESOURCE DEVELOPMENTS

- *8.1 The abstraction of ground or surface water for industrial or commercial purposes,*
- *8.2 The abstraction of groundwater at a volume exceeding the threshold authorised in terms of a law relating to water resources."*

To fulfil the EMA requirements, Trigon Mining appointed Excel Dynamic Solutions (Pty) Ltd, independent Environmental Consultants. EDS' tasks are to conduct the required EIA process and submit the ECC application to the Environmental Commissioner at the Department of Environmental Affairs and Forestry (DEAF) at the Ministry of Environment, Forestry & Tourism (MEFT) for evaluation and consideration of the ECC.

Brief Project Description

Planned Activities: Proposed underground exploration and mining and associated ore processing

The project description is provided herein under Chapter 2 and the main activities are as follows:

- Underground exploration works: mapping, rock sampling, underground trenching and drilling,
- Underground mining activities, and
- Copper ore processing.

The comments provided and received during the consultation period were noted and used to form a basis for the impact assessment in the EIA Report and to develop the Draft EMP.

The following impacts have been identified and their description as well as assessment are provided in the EIA Report.

The identified positive impacts:

- Socio-economic development: temporary and long-term employment opportunities.
- Investment opportunities/infrastructure-related development benefits.
- Boosting of the local economic (through corporate social responsibility/Investment (CSR/CSI), regional and national economic development through taxes.
- Increased support for local businesses through the procurement of locally available goods and services.

The identified negative impacts:

- Water resources (over-abstraction of water) and pollution.
- Occupational health and safety risks associated with underground exploration and mining (handling of machinery and equipment).
- Impact on the groundwater table through dewatering associated with the activities.

- Land subsidence and slope deformation (particularly during mining).
- Noise and vibrations associated with underground blasting and drilling activities.
- Waste generation (management).
- Vehicle traffic safety.
- Social Nuisance - Job seeking leading to the influx of outsiders in Kombat

Conclusions

The potential impacts identified during the Scoping phase are assessed in the EIA Report and recommended management and mitigation measures are provide in the EMP.

Disclaimer

EDS warrants that the findings and conclusion contained herein were accomplished in accordance with the methodologies set forth in the Scope of Work and EMA of 2007 with its 2012 EIA Regulations. These methodologies are described as representing good customary practice for conducting an EIA for the purpose of identifying recognized environmental conditions. There is a possibility that even with the proper application of these methodologies there may exist on the subject Project Site conditions that could not be identified within the scope of the assessment, or which were not reasonably identifiable from the available information. The EDS Consultants believe that the information obtained from the record review and during the public consultation processes concerning the proposed project activities is reliable. However, the Consultants cannot and do not warrant or guarantee that the information provided by the other sources is accurate or complete. The conclusions and findings set forth in this Report are strictly limited in time and scope to the date of the evaluations. No other warranties are implied or expressed.

Some of the information provided in this Report is based upon personal interviews, public / stakeholders' engagement and research of available documents, records, and maps held by the appropriate government and private agencies. This Report is therefore subject to the limitations of historical documentation, availability, and accuracy of pertinent records and the personal recollections of the persons contacted or consulted.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
AW	Asis West
AFW	Asis Far West
CV	Curriculum Vitae
DEAF	Department of Environmental Affairs and Forestry
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EDS	Excel Dynamic Solutions

Abbreviation	Meaning
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPFIs	Equator Principle Financial Institutions
GG & GN	Government Gazette & Government Notice
I&APs	Interested and Affected Parties
IFC	International Finance Corporation
LOM	Life of Mine
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
ML	Mining License
MME	Ministry of Mines and Energy
PPE	Personal Protective Equipment
Reg / S	Regulation / Section
TOR	Terms of Reference
UNCCD	The United Nations Convention to Combat Desertification

KEY TERMS

Terms	Definition
Alternative	A possible course of action, in place of another that would meet the same purpose and need of the proposal.
Baseline	Work done to collect and interpret information on the condition/trends of the existing environment.
Biophysical	That part of the environment that does not originate with human activities (e.g., biological, physical and chemical processes).
Cumulative Impacts/Effects Assessment	In relation to an activity, means the impact of an activity that may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Terms	Definition
Decision-maker	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal.
Ecological Processes	Processes which play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of evolution).
Environment	As defined in Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water, and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.
Environmental Management Plan	As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environments effects are to be mitigated, controlled, and monitored.
Interested and Affected Party (I&AP)	In relation to the assessment of a listed activity includes - (a) any person, group of persons or organization interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity.
Fauna and Flora	All the animals and plants found in an area.
Mining Licence	This License gives the holder the exclusive mining right in the licence area for a period of 25 years or the life of the mine, with renewals valid for 15-year periods (for Trigon Mining, the ML is valid for 10 years). The holder is required to demonstrate the financial and technical ability to develop and operate a mine.
Mitigation	The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of a proposed action on the affected environment.
Monitoring	Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).
Proponent	Organization (private or public sector) or individual intending to implement a development proposal, but also as defined in the Environmental Management Act, a person who proposes to undertake a listed activity.
Public Consultation/Involvement	A range of techniques that can be used to inform, consult or interact with stakeholders affected by the proposed activities.
Protected Area	Refers to a protected area that is proclaimed in the Government Gazette according to the Nature Conservation Ordinance number 4 of 1975, as amended.

Terms	Definition
Scoping level	An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. Can also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of site and surroundings, and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into full EIA.
Significant impact	Means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment
Terms of Reference (ToR)	Written requirements governing full EIA input and implementation, consultations to be held, data to be produced and form/contents of the EIA Report. Often produced as an output from scoping.

1 INTRODUCTION

1.1 Project Background and Locality

Trigon Mining (Namibia) (Pty) Ltd¹ (hereinafter referred to as *Trigon Mining* or the *Proponent*) intends to carry out underground exploration and mining activities on their Mining Licenses (MLs) No. 73B, 16 & 9, collectively referred to as the Mining License (the old Kombat Mine, hereinafter referred to as *the Mine*). The Mine is located close to the Kombat Settlement on the southern margin of the Otavi Mountain Range in the Otjozondjupa Region – as shown in Figure 1-1. Located about 41km east of Otavi on the B8 Road to Grootfontein, the Mine is a past-producing copper, lead and silver Mine that was intermittently in operation from the early 1900s to 2007, and has been on care and maintenance since early 2008.

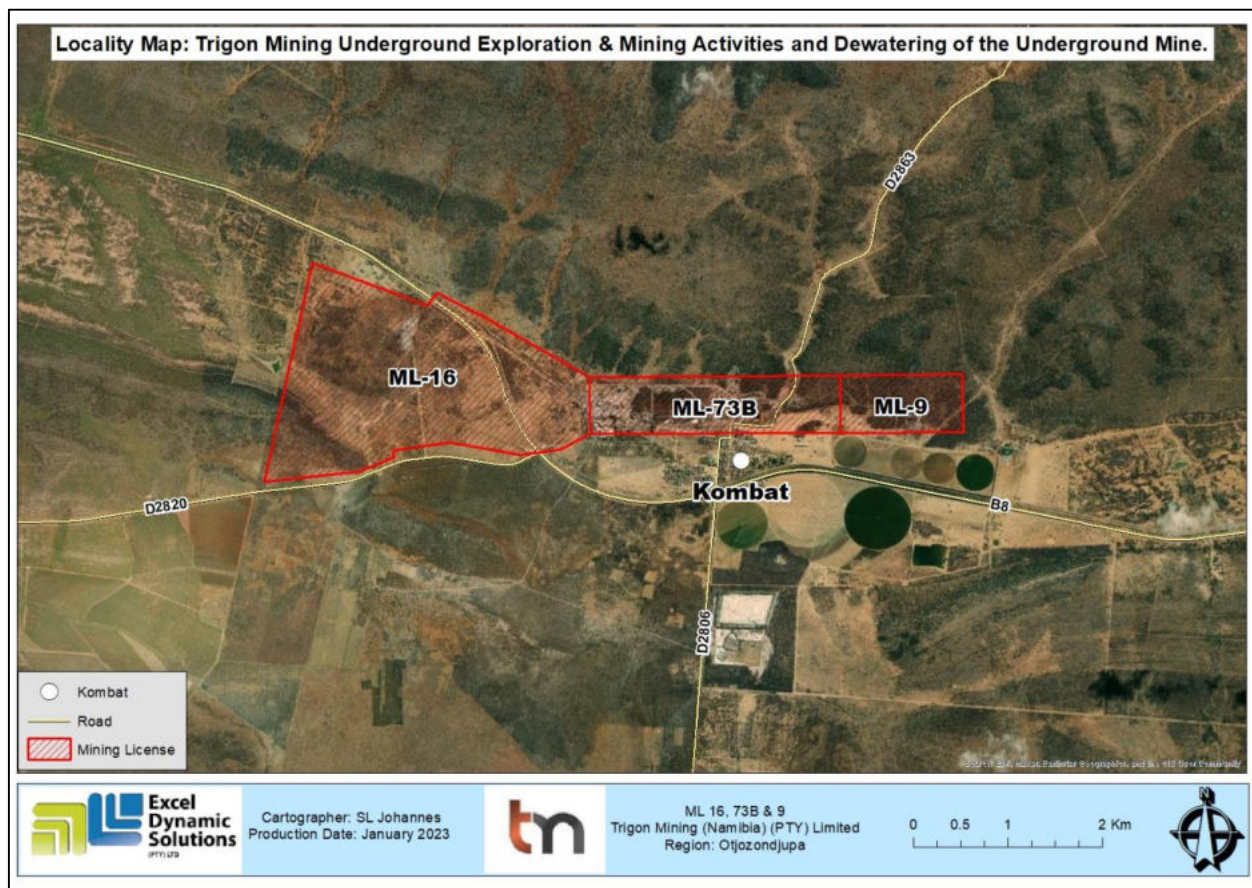


Figure 1-1: The locality map of the Kombat Mine in the Otjozondjupa Region

¹ The Kombat Mine is owned by Namibian company, Trigon Mining (Namibia), which is owned by: 80% - Trigon Metals Inc (Canadian company, listed on the TSX Venture Exchange), 10% - Texel Mining and Exploration (local partner), and 10% - Epangelo Mining Company (Namibian state owned mining company). The Trigon group is focused on copper and silver exploration, development and mining in attractive jurisdictions in Africa

The three MLs were granted to the Proponent on the 4th of June 2021 and expire on the 3rd of June 2031, and are therefore active as indicated on the mining portal in Figure 1-2.

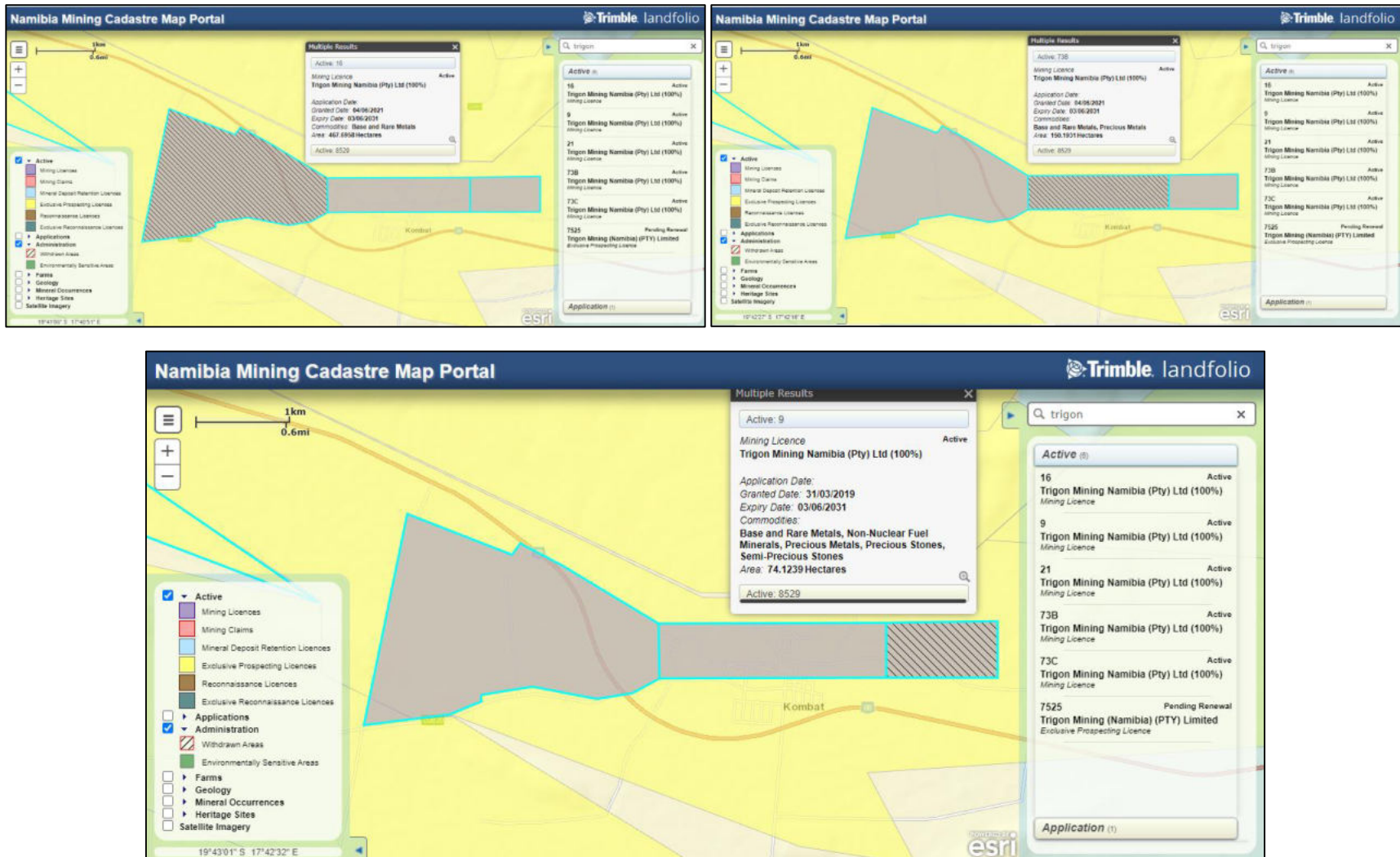


Figure 1-2: ML-73B, 16 and 9 on the Namibia Mining Cadastre Map Portal (source: <https://portals.landfolio.com/namibia/>)

1.2 The size of the Mining Licenses and Type of Commodities

The three MLs cover a combined area of 692.0128 hectares (Ha). The individual areas of the MLs and commodity types on each ML are presented in Table 1-1 below.

Table 1-1: The sizes of the three mining licenses (MLs) and their commodities

ML No.	Size (Ha)	Commodities
73B	150.1931Ha	Base & Rare Metals and Precious Metals
16	467.6958Ha	Base & Rare Metals
9	74.1239Ha	Base & Rare Metals, Non-Nuclear Fuel Minerals, Precious Metals, Precious Stones and Semi-Precious Stones

1.3 The Need for the Environmental Assessment

To resume the mining activities at the Kombat Mine, an ECC has been granted for surface mining activities, initially in July 2018 and renewed in June 2021. The Mine intends to expand its operations by undertaking underground exploration and mining works. Thus, an ECC for underground works needs to be applied for and obtained from the Environmental Commissioner upon completion and approval of the Scoping/EIA Study.

It should however be noted that exploration and mining activities are listed in the EIA Regulation as activities that may not be undertaken without an Environmental Clearance Certificate (ECC). This is stipulated under the Environmental Management Act (EMA) (2007) and its 2012 Environmental Impact Assessment (EIA) Regulations. The listed activities as per EIA regulations as relevant to the proposed activity are listed below:

"3. MINING AND QUARRYING ACTIVITIES

- *3.1 The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
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Associated activities include

8. WATER RESOURCE DEVELOPMENTS

- 8.1 *The abstraction of ground or surface water for industrial or commercial purposes,*
- 8.2 *The abstraction of groundwater at a volume exceeding the threshold authorised in terms of a law relating to water resources.”*

To fulfil the EMA requirements, Trigon Mining appointed Excel Dynamic Solutions (Pty) Ltd (EDS), independent Environmental Consultants. EDS' tasks are to conduct the required Scoping/EIA process and submit the ECC application to the Environmental Commissioner at the Department of Environmental Affairs and Forestry (DEAF) at the Ministry of Environment, Forestry & Tourism (MEFT) for evaluation and consideration of the ECC.

1.4 Terms of Reference and Scope of Works

There are no specific Terms of Reference (ToR) provided by the Proponent for the Scoping Study. Therefore, the EDS Consultants undertook the Study according to the requirements of the EMA and its 2012 EIA Regulations (Government Notice. No. 30 of 2012) and apply for the ECC.

The application for the ECC was compiled and submitted to the Environmental Custodian, the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF). The Background Information Document (BID) was also uploaded on the online ECC Portal for project registration purposes. Upon submission of an EIA Report and Draft Environmental Management Plan (EMP), an ECC for the proposed project activities will be considered by the Environmental Commissioner at MEFT.

The findings of the environmental assessment process are incorporated into this Report and the Draft EMP (Appendix A). These documents will be submitted as part of the ECC application to the Environmental Commissioner for consideration of the ECC.

1.5 Appointed Environmental Assessment Practitioner

To satisfy the requirements of the EMA and its 2012 EIA Regulations, the Proponent appointed a team of independent environmental consultants EDS, to conduct the required EIA process.

The Scoping and EIA Study is headed by Mr. Nerson Tjelos, a qualified and experienced Geoscientist and experienced Environmental Assessment Practitioner (EAP) with over 8 years of

experience in Natural Resources Consulting and Business Development. This Scoping Study and subsequent EIA Consultation process and reporting were done by Ms. Fredrika Shagama, an experienced EAP and qualified Geohydrologist and experienced and registered EAP with over 7 years of experience in the Environmental and Groundwater Management Consulting sector. Ms. Shagama's CV is presented under Appendix B.

1.6 The Need for the Proposed Project Activities

Mining contributes about 12.5% towards Namibia's Gross Domestic Product (GDP). The mining industry is one of the largest contributors to the Namibian economy; therefore, it contributes to the improvement of livelihoods. The minerals sector yields foreign exchange and accounts for a significant portion of gross domestic product (GDP). The mining sector forms the vital part of some of Namibia's development plans, namely: Vision 2030, National Development Plan 5 (NDP5) and Harambee Prosperity Plans (HPPs) I and II. Thus, mining is essential to the development goals of Namibia in contributing to meeting the ever-increasing global demand for minerals, and for national prosperity, i.e., contributing towards achieving the goals of the national development plans.

The description of the proposed activities is provided under Chapter 2 (next chapter).

2 PROJECT DESCRIPTION: PROPOSED EXPLORATION WORKS

The proposed activities will entail underground exploration (to delineate the mineral deposits) and subsequent mining activities on the three MLs at the Kombat Mine. Exploration is aimed at determining whether the deposit for the targeted commodity (copper) is economically feasible (to advance to the resources development and mining phase). Underground exploration is done to acquire the necessary data required for further decision-making and investment options.

The proposed two-component activities are presented under the following subheadings.

2.1 Underground Exploration Activities

Similarly to surface exploration activities, the underground exploration on the three MLs will be undertaken into three stages and these are listed below.

- Desktop Study (Geological mapping) - This mainly entails a desktop review of geological area maps and underground observations. This includes the review of geological maps of the area and observations and an update where relevant, of the information obtained during previous geological studies of the mine area.
- Lithology geochemical surveys: rock samples will be collected underground and taken for trace element analysis to be conducted by analytical chemistry laboratories to determine if enough commodities are presented for mining within the MLs. The sampling would consist of small pits ($\pm 20\text{cm} \times 20\text{cm} \times 30\text{cm}$) being dug where 1kg samples can be extracted and sieved to collect the required volume of material. The dimensions and volumes of rock samples will be determined by the Proponent and underground conditions during exploration.
- Detailed Exploration (Underground trenching and drilling): Should analyses by an analytical laboratory be positive, holes are drilled, and drill samples will be collected for further analysis. This will determine the depth of the potential mineralization. The typical underground technique that may be adopted would be horizontal directional drilling (including diamond-drilling). However, other drilling techniques may also be considered for this exploration, for better geological control and to perform processing trials.



Figure 2-1: The mineral exploration cycle (after, Savannah Resources, 2019)

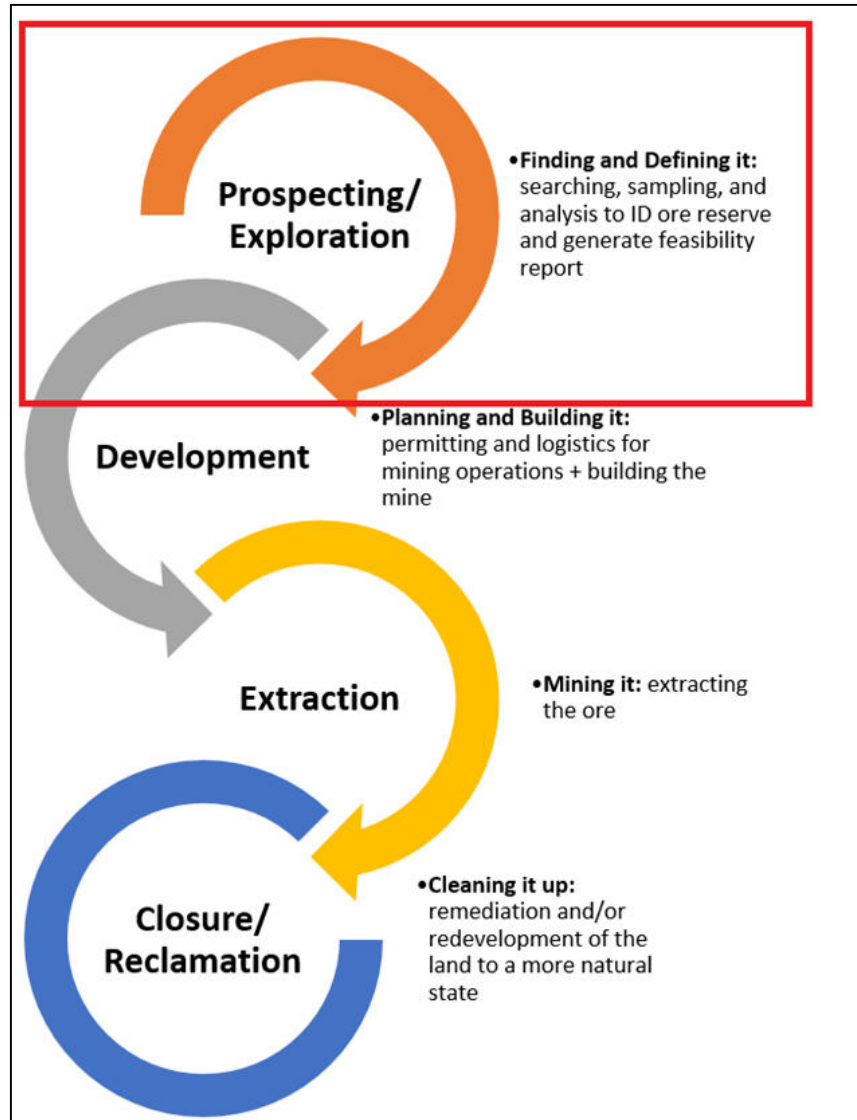


Figure 2-2: Diagram of the Life Cycle of a Mine (after Superfund Research Project, 2019)

Once exploration works are completed, the feasible parts of the Mine will be developed for mining as per the following subheading.

2.2 Underground Mining Activities

2.2.1 Background on the Existing Mining Activities

The Kombat Mine has a strong track record of production having operated for 45 years from 1962 to 2008 during which time it produced 12.46 million tons @ 2.62% copper, 1.55% lead and 18g/t

silver. The project has significant existing infrastructure which means that production can be restarted at an attractive capital cost/returns ratio.

Trigon restarted with open pit mining at the end of 2021, but paused operations from August 2022, due to a significant decrease in the copper price and various operational challenges which resulted in higher operating costs. Therefore, Trigon will now focus on the second phase of its strategy to re-open the underground mines, starting with Asis West (AW), and thereafter Asis Far West (AFW).

The restart of Kombat Mine is planned to take place in 2 phases, initially processing 30ktpm from the open pit and thereafter doubling capacity to 60ktpm and then up to 90ktpm with the restart of the underground operations.

Table 2-1: The information on the ongoing and planned underground mining for the Kombat mine

	Phase 1	Phase 2a	Phase 2b
Mining	Open Pit	Underground (Asis West)	Underground (Asis Far West)
Timing for restart	End of 2021 (paused from August 2022)	2024	2024/2025
Life of mine	2 years (stop when UG commences)	10 years	10 years +
Plant processing capacity (total)	30ktpm	60ktpm	90ktpm
Average grade	1.2%	2.6%	3.0%
Copper concentrate (per annum)	13ktpa	35ktpa	70ktpa
Copper in concentrate	22%	28.5%	28.5%
Capital cost	USD12 million	USD16 million + USD5 million for plant expansion	USD25 million + USD5 million for plant expansion

2.2.2 The Planned Underground Mining Activities

During the extraction of copper ore, the boring machinery is used to drill holes into the hard rock, and explosives are inserted into the drill holes to blast and break the rock. The resulting boulders are then ready for hauling; specialized haul trucks, conveyors, trains, and shuttle cars can all be used to haul the ore from the blasting site to the loading area for transportation to the Mine's Processing Plant on the surface.

In terms of the mining process flow, a typical example of an underground mine layout is shown in Figure 2-3. The layout has a shaft and ramp like Asis West (AW) shaft at the Kombat Mine, with a ventilation and backfill raises and filled stopes for the cut and fill method.

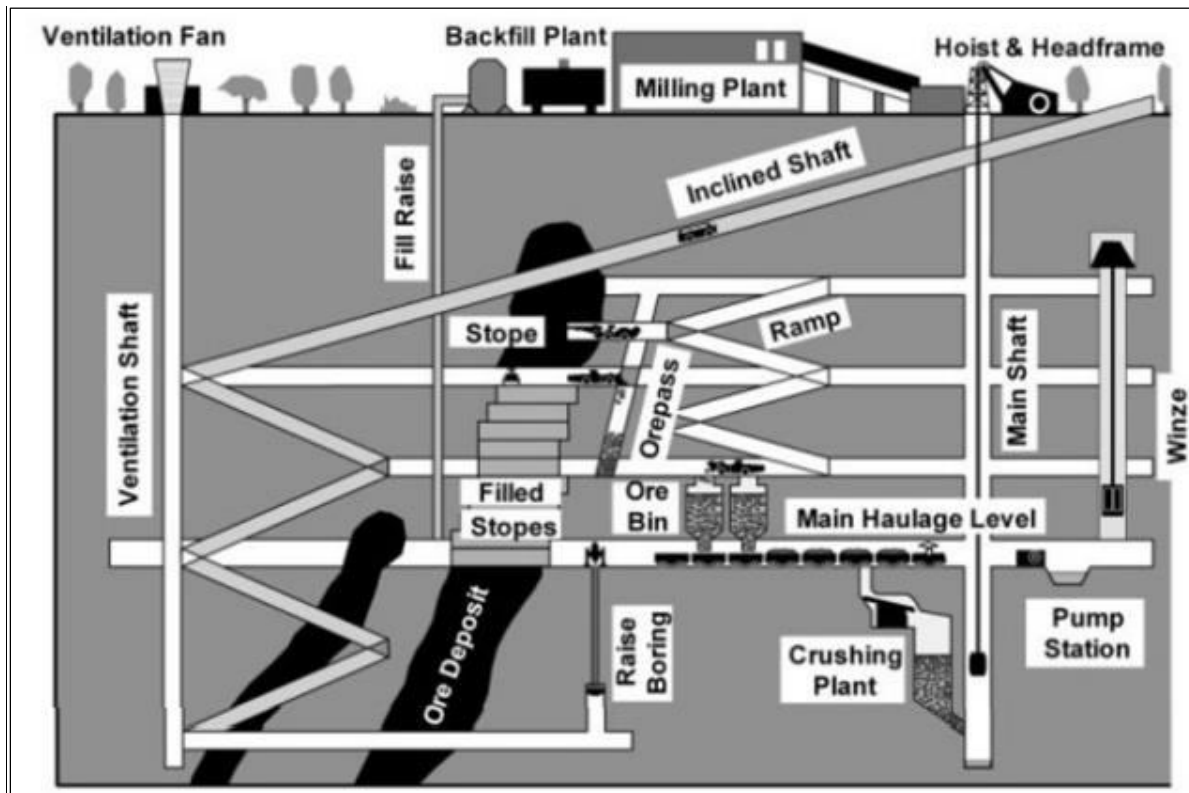


Figure 2-3: An example layout of an underground mine (Okubo and Yamatomi, undated)

The brief description of the planned activities on the Asis West (AW) and Asis Far West (AFW) shafts is provided in Table 2-2.

Table 2-2: The underground mining information at AW and AFW

Asis West (AW)	Asis Far West (AFW)
<ul style="list-style-type: none"> -1 shaft bottom at 450m below surface -1B shaft bottom at 681m below surface -Development up to 20/1 Level at 727.5m below surface -Water level at 54m below surface -Cut and fill mining method was used. Backfilling being done with cemented tailings and/or crushed waste -AW is well developed with a ramp structure from surface to 20 level 	<ul style="list-style-type: none"> -Shaft Bottom at 802m below surface -Development on 19 level at 724m below surface -Water level at approximately 60m below surface -Only development has been done with ore pockets mined as they developed -Very little development has been done on only 1 level (19 level and exploration drives on 19/1) -Small pump station, workshop and substation has been developed

Asis West (AW)	Asis Far West (AFW)
<p>-Additional development at AW includes workshops, pump stations, sub stations, ore passes, up casts, ventilation doors etc.</p> <p>-AW has well established exploration drives on 10, 12 and 13 level</p> <p>-Known ore reserves at 11 level and 12 level</p> <p>-AW requires ramp between 13 and 12 level to reduce tramming distance.</p>	<p>-Detailed development plans are available for expansion</p> <p>-AFW requires immediate upgrade to the pump station location and size. Require exploration drives.</p>

The mining concept of Trigon Mining and the initial target mining areas are shown in Figure 2-4 and Figure 2-5, respectively. The Figure below also indicates the exploration gaps (area) that will need to be explored further to obtain more data for informed decision-making.

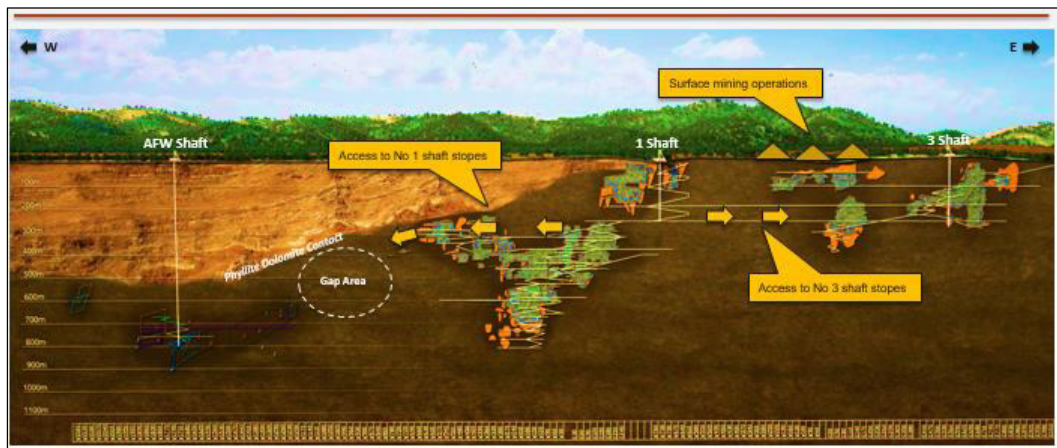


Figure 2-4: The mining concept of the Kombat Mine (Trigon Mining Namibia, 2023)

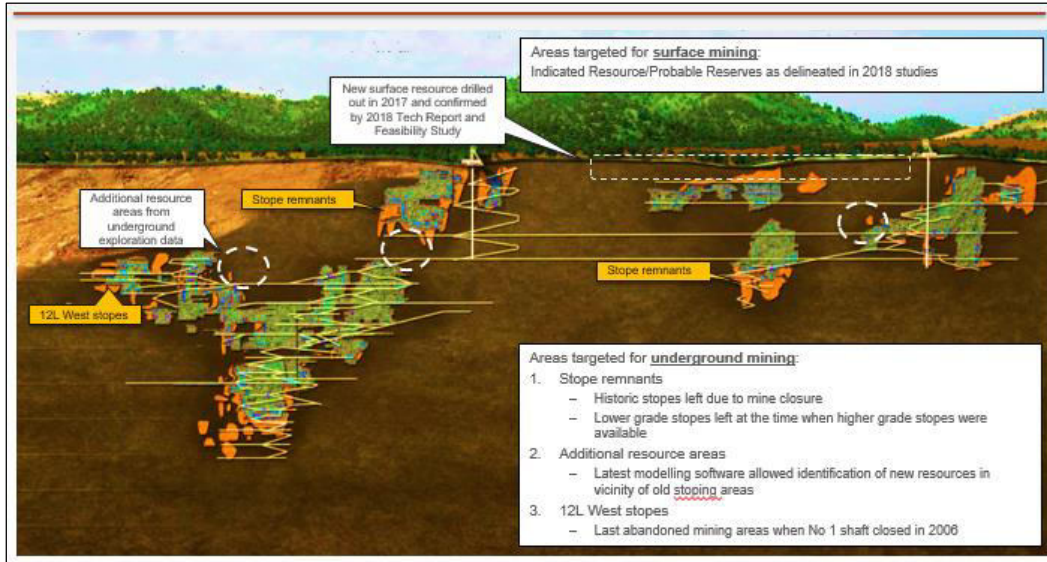


Figure 2-5: The initial target mining areas Kombat Mine (from surface to underground mine), (Trigon Mining Namibia, 2023)

2.3 Copper Ore Processing

The mined ore will be sent via a three-stage crushing, rod and ball milling and flotation Plant to produce a copper concentrate. The anticipated process flow for the processing of the copper ore at the Plant is shown in Figure 2-6.

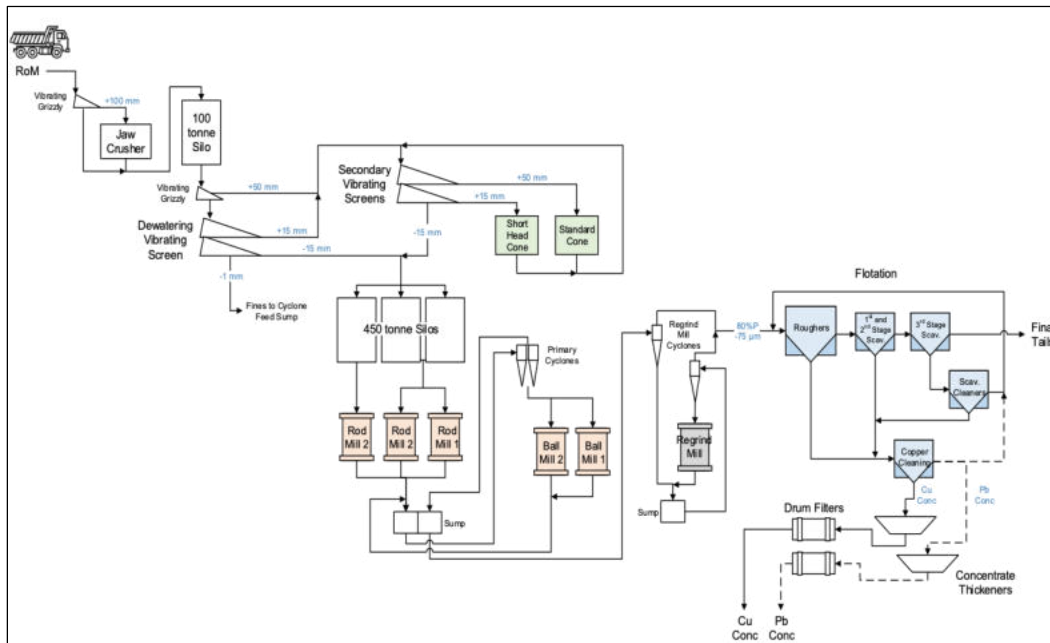


Figure 2-6: The layout of the processing flow at the Plant (Trigon Mining Namibia, 2023)

The site specific stages of the copper ore processing onsite will entail three-stage; crushing and screening rod, ball milling, flotation, concentrate thickening and filtering as shown by the simplified diagram in Figure 2-7.

The Plant will be able to produce separate copper and lead concentrates. The current capacity of 1,100 kilotons per day (ktpd) (± 30 kt per month) will be increased to total of up to 90ktpm for AW and AFW production.

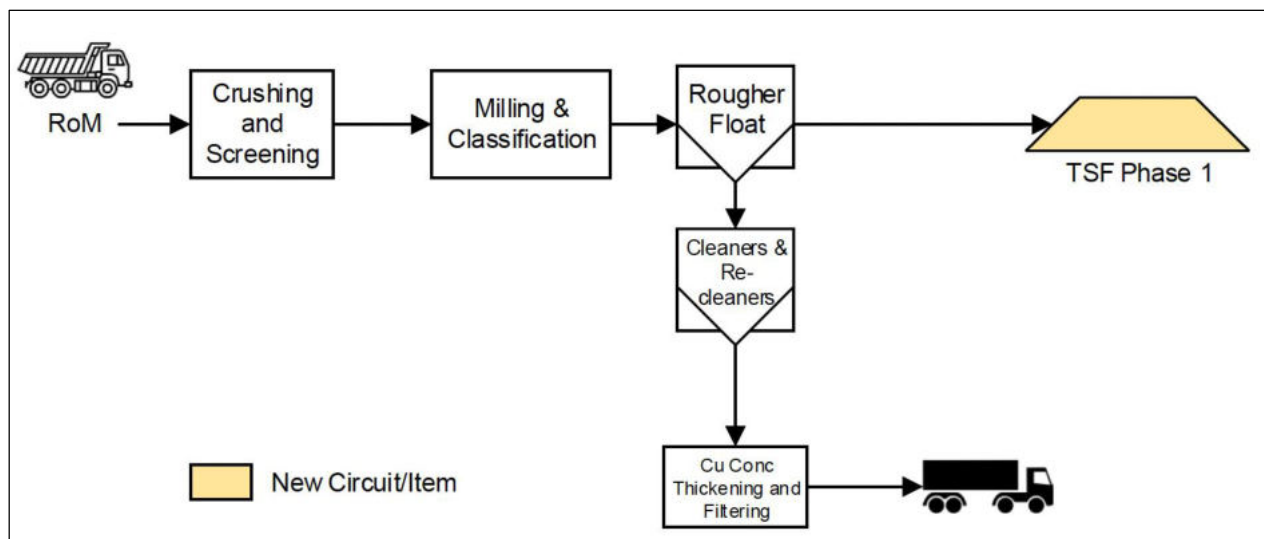


Figure 2-7: The processing flow at the Kombat Mine Plant (Trigon Mining Namibia, 2023)

The waste produced from the processing will be disposed of at the Mine's tailings storage facility (TSF) that is still under construction. Phase 1 of mining will produce about 382,132m³ (approximately 1,069,969 tons) volume of waste at the TSF and this is expected to double during Phase 2.

2.4 Project Supporting Resources, Services, and Infrastructure

The resources (in terms of human, vehicles, machinery, and equipment), services and infrastructure required for the proposed activities are presented in Table 2-3 below.

Table 2-3: The list of resources, services and infrastructure

Resource/Service	Brief description	Other related description
Human resources	Around thirty (30) people will be employed during the exploration phase and a further one hundred (100) will be hired for mining.	The workers will be accommodated in the Kombat Settlement and or other surrounding areas such as Otavi and Grootfontein (for specialised skilled personnel living in the two nearby towns). Therefore, Trigon will provide daily transport for the out-of-Kombat personnel hence, no onsite accommodation.
Water supply	Water will be required for the exploration and mining activities, including processing. About 120m ³ per month will be required for processing from the second month of operations.	The required water will be supplied from the Mine's existing water supplies.
Electrical (power) supply	Currently the demand has been lowered from 3MW to 250KW Phase 1 of dewatering will require 3MW (800kW per pump including site demand) Phase 2 of dewatering will require an additional 2MW. Mining at AW will require 7MW including the Processing Plant Asis West and AFW will require between 8 and 9MW	Available capacity on site is 10MW
Project Equipment, Material, Machinery, and Vehicles	Specialized haul trucks, conveyors, trains, and shuttle cars will be used underground.	Since underground activities will be linked to the surface in terms of supply, the anticipated vehicles will include will comprise of fifteen (15) pickup trucks,

Resource/Service	Brief description	Other related description
		drilling supporting trucks & loaders, water and fuel storage containers, air compressors, drilling fluids stored in manufacturers approved containers, backup generators for power, etc.
Fuel Supply (machinery and equipment)	Diesel will be used for machinery and equipment and power generation.	Vehicles will be refuelled at dedicated fuel bays with the necessary spillage prevention measures and emergency clean up kits in place.
Accessibility (roads):	The Mine is accessible from the B8 via the access road passing through the Kombat Settlement. The specific Mine areas and to the underground workings will be accessed through the existing site roads.	The underground access roads will be used to access the exploration and mining areas in the Mine.
Waste management:	<p>Sewage, solid waste, and hazardous waste produced during exploration and mining activities will be sorted accordingly, and stored at designated sites underground.</p> <p>Once capacity is reached underground, the waste will be carefully handled for transportation to the ground surface within the Mine premises where it will be prepared for disposal at appropriate waste management facilities.</p>	<p><u>Sewage:</u> Mobile chemical ablution facilities will be provided underground. Once capacity is reached, the waste will be transported offsite for treatment by a designated / appointed external sewage management contractor.</p> <p><u>Hazardous waste:</u> Vehicles, machinery and equipment will be provided with drip trays to capture potential fuel spills and waste oils. The waste fuel/oils will be carefully stored in a standardized container until such</p>

Resource/Service	Brief description	Other related description
	<u>General and domestic waste:</u> sufficient waste bins will be provided at both working sites	a time that it can be disposed of at the nearest approved hazardous waste management facility by an external hazardous handling contractor.
Occupational Health and Safety	Adequate and appropriate Personal Protective Equipment (PPE) will be provided to project personnel. The underground working sites will be equipped with at least two fully furnished first aid kits.	The PPE will be replaced as often as possible. At least two underground workers/personnel at each working area will be trained to administer first aid to attend to potential minor injuries. Major injured will be transported to the Kombat Health Centre (Clinic) and if necessary to the hospitals in Otavi or Grootfontein.
Potential Accidental Fire Outbreaks	Fire extinguishers will be readily available in vehicles and at various operational sites such as offices, workshops, and Plant.	All working areas underground will be equipped with at least two fire extinguishers. The underground personnel team will comprise of at least 2 trained and experienced firefighters.
Site Security	Security and access control at the Mine site is well established and includes security offices, parking and a house dedicated to security services.	The security measures and associated facilities will be upgraded, certain areas fenced off and access controlled to all areas prior to the commencement of underground
Storm water management	Storm water management: managing the clean (non-contact) water that is arriving at the site from upstream, and managing the dirty (contact) water that is generated onsite	The processing Plant infrastructure is divided into different sections and therefore the stormwater management plan will include different sections and methods for the

Resource/Service	Brief description	Other related description
	from coming into contact with equipment, disturbed ground and other possible pollution sources. This will be more applicable especially at the underground mine entrance.	most effective collection of contact water, and diversion of non-contact water around infrastructure.

The alternatives considered for the proposed Project in terms of “No-Go”, location, methods and supporting services and infrastructures are presented under the next chapter.

3 PROJECT ALTERNATIVES

Alternatives are defined as the “*different means of meeting the general purpose and requirements of the activity*” (EMA, 2007). This section will highlight the different ways in which the project can be undertaken and to identify the alternative that will be the most practical, but least damaging to the environment is identified.

Once the alternatives have been established, these are examined by asking the following three questions:

- What alternatives are technically and economically feasible?
- What are the environmental effects associated with the feasible alternatives?
- What is the rationale for selecting the preferred alternative?

The alternatives considered for the proposed development are discussed in the following subsections.

3.1 Types of Alternatives Considered

3.1.1 The "No-go" Alternative

The “no action” alternative implies that the status quo remains, and nothing happens. Should the proposed activities be discontinued, none of the potential impacts (positive and negative) identified would occur.

This option was considered and a comparative assessment of the environmental and socio-economic impacts of the “no action” alternative was undertaken to establish what benefits might be lost if the project is not implemented. The key benefits that may never be realized if the proposed project does not go ahead include:

- Over 200 job opportunities and corporate social responsibilities (community benefits) linked especially to mining will not be realized.
- No realization of local businesses empowerment through the procurement of goods and services, and
- Loss of income to the government through license lease fees and various tax structures.

Considering the above losses, the “no-action/go” alternative was not considered a viable option for this project.

3.1.2 Project Location

The MLs selected for exploration and mining activities are dependent on the geological setting, economic geology, and mining history of the site and Proponents’ preference of an area. This also because the Proponent has been issued the MLs already, therefore, finding an alternative location for the activities is not possible. The mineralization of the commodities within the MLs is area-specific as determined by the geology (host rocks) and ore-forming mechanism.

3.1.3 Exploration and Mining Methods

The exploration activities as presented above are expected to take place. If any other alternative viable exploration methods are found to achieve the purpose more effectively and/or efficiently without aggravating any environmental measures put in place, it will be implemented.

Due to the depth and nature of the orebody in the Asis West and Asis Far West area, exploration needs to be done from underground, requiring the underground water to first be abstracted from the existing shafts. Surface drilling proves to be inaccurate, expensive, time consuming and difficult to follow the orebody at depth.

3.1.4 Supporting Services, and Infrastructures

Certain alternatives were considered for the different supporting infrastructures envisaged to ensure that the most feasible options were selected. These were weighed in terms of technological, economic, and environmental limitations in selecting the most feasible option(s). The alternative considered in this regard are presented in Table 3-1 below.

Table 3-1: Service infrastructure and structures (technical resources) alternatives considered

Category of Infrastructure	Alternatives Considered	Justification for selected option(s)
Ablution facilities	-Install fixed facility with septic tank -Portable facilities with septic tank	-To avoid complex rehabilitation costs and reduce structure dismantling / removal time, portable toilets with septic tanks will be used for areas not connected to the sewage plant system.

Category of Infrastructure	Alternatives Considered	Justification for selected option(s)
Accommodation	-Accommodation in Kombat and nearby settlements -Accommodation onsite	-The accommodation in Kombat is justifiable to ensure that there is no external pressure exerted on the Mine's services to accommodate over 200 people onsite.
Water supply	-Abstracting water from the local boreholes -Carting water from elsewhere	-The site already has sufficient groundwater and therefore, abstracting water from site will be feasible.
Diesel storage	-Trailer mounted diesel tank -Fixed diesel tank onsite	-A trailer mounted diesel tank for fuel storage has great mobility requirements for underground workings.
Power supply	-Diesel generator set -Electricity	-From economic and convenience point of view, the electricity and generator power sources will be combined.

The above provided project description, associated activities and considered alternatives thereto are governed by specific legal framework, from a local, regional, national to international perspective. The presentation of these legal requirements is provided under Chapter 4.

4 LEGAL FRAMEWORK: LEGISLATION, POLICIES AND GUIDELINES

A review of applicable and relevant national (Namibian) and international legislation, policies, and guidelines to the proposed activities is given in this section. This review serves to inform the project Proponent, Interested and Affected Parties, and the decision-makers at the DEAF of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled to establish the proposed project activities.

4.1 Local and National Legal Requirements (Legislation, Acts, Policies, Ordinances)

The legal obligations that are relevant to the proposed activities on the MLs and related activities are presented in Table 4-1.

Table 4-1: Applicable local, national and international standards, policies and guidelines governing the proposed exploration and mining activities on the MLs

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
<p>The Constitution of the Republic of Namibia, 1990 as amended:</p> <p>Government of the Republic of Namibia</p>	<p>The Constitution of the Republic of Namibia (1990 as amended) addresses matters relating to environmental protection and sustainable development. Article 91(c) defines the functions of the Ombudsman to include:</p> <p>“...the duty to investigate complaints concerning the over-utilisation of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia...”</p> <p>Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at the:</p> <p>“...Natural resources situated in the soil and on the subsoil, the internal waters, in the sea, in the continental shelf, and in the exclusive economic zone are property of the State.”</p>	<p>By implementing the environmental management plan, the establishment will be in conformance with the constitution in terms of environmental management and sustainability.</p> <p>Ecological sustainability will be main priority for the proposed development.</p>

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
<p>Environmental Management Act (No. 7 of 2007) and its 2012 Environmental Impact Assessment (EIA) Regulations (Government Gazette (GG) No. 4878 Government Notice (GN) No. 30): Ministry of Environment, Forestry and Tourism (MEFT)</p>	<p>The EMA has stipulated requirements to complete the required documentation to obtain an Environmental Clearance Certificate (ECC) for permission to undertake certain listed activities. These activities are listed under the following Regulations:</p> <p><i>-3.1 The construction of facilities for any process or activities which requires a license, right of other forms of authorization, and the renewal of a license, right or other form of authorization, in terms of the Minerals (Prospecting and Mining Act, 1992).</i></p> <p><i>-3.2 other forms of mining or extraction of any natural resources whether regulated by law or not.</i></p> <p><i>-3.3 Resource extraction, manipulation, conservation and related activities.</i></p> <p>The (EIA) Regulations detail requirements for public consultation within a given environmental assessment process (GN 30 Section (S) 21). The EIA regulations also outline the required details of a Scoping / EIA Report (GN 30 S8) and an Assessment Report (GN 30 S15).</p>	<p>The EIA Study has been conducted in accordance with the EMA and its Regulation. This is presented under Chapter 6 of this Report.</p> <p>An ECC application has been launched with the MEFT. This EIA Report and Draft EMP will be submitted to the Environmental Commissioner at DEAF for evaluation and consideration of the ECC.</p>
<p>Minerals (Prospecting and Mining) Act (No. 33 of 1992): Ministry of Mines and Energy (MME)</p>	<p>Section 52 requires mineral license holders to enter into a written agreement with affected landowners before exercising rights conferred upon the license holder.</p> <p>Section 52(1) mineral licence holder may not exercise his/her rights in any town or village, on or in a proclaimed road, land utilised for cultivation, within 100m of any water resource (borehole, dam, spring, drinking trough etc.) and boreholes, or no operations in municipal areas, etc.), which should individually be checked to ensure compliance.</p>	<p>The Proponent should include as part of their MLs, measures by which they will rehabilitate the areas where they intend to carry out the underground exploration and mining activities and associated surface activities.</p>

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
	<p>Section 54 requires written notice to be submitted to the Mining Commissioner if the holder of a mineral license intends to abandon the mineral license area.</p> <p>Section 91 requires that rehabilitation measures should be included in an application for a mineral license.</p>	
<p>Mine Health & Safety Regulations, 10th Draft: Ministry of Health and Social Services (MHSS)</p>	<p>Makes provision for the health and safety of persons employed or otherwise present in mineral licenses area. These deal with among other matters; clothing and devices; design, use, operation, supervision and control of machinery; fencing and guards; and safety measures during repairs and maintenance.</p>	<p>The Proponent should comply with all these regulations with respect to their employees.</p>
<p>Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001): Ministry of Mines and Energy (MME)</p>	<p>Regulation 3(2)(b) states that “No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area”</p>	<p>A consumer installation license/certificate to store fuel (in excess of 600 litres) onsite is required. Trigon already has this in place (Consumer Installation Certificate No. CI/2806/2021).</p>
<p>The Regional Councils Act (No. 22 of 1992): Ministry of Urban and Rural Development (MURD)</p>	<p>This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region.</p> <p>From a land use and project planning perspective, their duties include, as described in section 28 “to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment.</p>	<p>The relevant Regional Councils are I&APs and must be consulted during the EIA process. The project site (Kombat) falls under the Otjozondjupa Regional Council (and Otavi Constituency Office); therefore, they should be consulted.</p>

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
<p>Water Act 54 of 1956: Ministry of Agriculture, Water and Land Reform (MAWLR)</p>	<p>The Water Resources Management Act 11 of 2013 is presently without regulations; therefore, the Water Act No. 54 of 1956 is still in force:</p> <p>Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duty of care to prevent pollution (S3 (k)).</p> <p>Provides for control and protection of groundwater (S66 (1), (d (ii)).</p> <p>Liability of clean-up costs after closure/abandonment of an activity (S3 (l)).</p>	<p>The protection (both quality and quantity/abstraction) of water resources should be a priority.</p> <p>The permits and license required thereto should be obtained from MAWLR's relevant Departments (these permits include Borehole Drilling Permits, Groundwater Abstraction & Use Permits, and when required, the Wastewater / Effluent Discharge Permits).</p>
<p>Water Resources Management Act (No 11 of 2013): Ministry of Agriculture, Water and Land Reform (MAWLR)</p>	<p>The Act provides for the management, protection, development, use and conservation of water resources; and provides for the regulation and monitoring of water services and to provide for incidental matters. The objects of this Act are to:</p> <p>Ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (S68).</p>	
<p>National Heritage Act No. 27 of 2004: Ministry of Education, Arts and Culture (MEAC)</p>	<p>To provide for the protection and conservation of places and objects of heritage significance and the registration of such places and objects; to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.</p>	<p>The Proponent should ensure compliance with this Acts' requirements. The necessary management measures and related permitting requirements must be taken. This done by consulting with the National Heritage Council (NHC) of Namibia. The management measures should be incorporated into the Draft EMP.</p>
<p>The National Monuments Act (No. 28 of 1969): Ministry of Education, Arts and Culture (MEAC)</p>	<p>The Act enables the proclamation of national monuments and protects archaeological sites.</p>	

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Soil Conservation Act (No 76 of 1969): Ministry of Agriculture, Water and Land Reform (MAWLR)	The Act makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources and resources, through directives declared by the Minister.	For surface linked activities, duty of care must be applied to soil conservation and management measures must be included in the EMP.
Public Health Act (No. 36 of 1919): Ministry of Health and Social Services (MHSS)	Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”	The Proponent and all its employees should ensure compliance with the provisions of these legal instruments.
Health and Safety Regulations GN 156/1997 (GG 1617): Ministry of Health and Social Services (MHSS)	Details various requirements regarding health and safety of labourers.	
Public and Environmental Health Act No. 1 of 2015: Ministry of Health and Social Services (MHSS)	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	The Proponent should ensure that the project infrastructure, vehicles, equipment, and machinery are designed and operated in a way that is safe, or not injurious or dangerous to public health and that the noise and dust emissions which could be considered a nuisance remain at acceptable levels. The public and environmental health should be preserved and remain uncompromised.
Hazardous Substance Ordinance, No. 14 of 1974: Ministry of Health and Social Services (MHSS)	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.	The Proponent should handle and manage the storage and use of hazardous substances on site so that they do not harm or compromise the site environment

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Labour Act (No. 6 of 1992): Ministry of Labour, Industrial Relations and Employment Creation (MLIREC)	Ministry of Labour, Industrial Relations and Employment Creation is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety and enhanced labour market services for the benefit of all Namibians. This ministry insures effective implementation of the Labour Act No. 6 of 1992.	The Proponent should ensure that the project activities do not compromise the safety and welfare of workers.

4.2 International Policies, Principles, Standards, Treaties and Conventions

The international policies, principles, standards, treaties, and conventions that are deemed applicable to the proposed Project and its related activities are listed in Table 4-2 below.

Table 4-2: International Policies, Principles, Standards, Treaties and Convention applicable to the Project

Statute	Provisions	Project Implications
Equator Principles	<p>A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects (August 2013). The Equator Principles have been developed in conjunction with the International Finance Corporation (IFC), to establish an International Standard with which companies must comply with to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The Principles apply to all new project financings globally across all sectors.</p> <p>Principle 1: Review and Categorization</p> <p>Principle 2: Environmental and Social Assessment</p> <p>Principle 3: Applicable Environmental and Social Standards</p> <p>Principle 4: Environmental and Social Management System and Equator Principles Action Plan</p>	<p>These principles are an attempt to: ‘...encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.’</p>

Statute	Provisions	Project Implications
	<p>Principle 5: Stakeholder Engagement and</p> <p>Principle 6: Grievance Mechanism</p> <p>Principle 7: Independent Review</p> <p>Principle 8: Covenants</p> <p>Principle 9: Independent Monitoring and Reporting and Principle 10: Reporting and Transparency</p>	
<p>The International Finance Corporation (IFC) Performance Standards</p>	<p>The International Finance Corporation's (IFC) Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability. As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires a project Proponents to meet throughout the life of an investment. These standard requirements are briefly described below.</p> <p>Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts</p> <p>Performance Standard 2: Labour and Working Conditions</p> <p>Performance Standard 3: Resource Efficient and Pollution Prevention and Management</p> <p>Performance Standard 4: Community Health and Safety</p>	<p>The Performance Standards are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the Client (Borrower) in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives.</p>

Statute	Provisions	Project Implications
	<p>Performance Standard 5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement</p> <p>Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p> <p>Performance Standard 7: Indigenous Peoples/Sub-Saharan African Historically Undeserved Traditional Local Communities</p> <p>Performance Standard 8: Cultural Heritage</p> <p>Performance Standard 9: Financial Intermediaries (FIs)</p> <p>Performance Standard 10: Stakeholder Engagement and Information</p> <p>A full description of the IFC Standards can be obtained from</p> <p>http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-social-standards?cq_ck=1522164538151#ess1</p>	
<p>The United Nations Convention to Combat Desertification (UNCCD) 1992</p>	<p>Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change.</p> <p>The objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability.</p>	<p>The Project activities should not be such that they contribute to desertification.</p>
<p>Convention on Biological Diversity 1992</p>	<p>Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use.</p>	<p>Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible, minimised.</p>

Statute	Provisions	Project Implications
	Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings	
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: “a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.

Other relevant international Treaties and Protocols ratified by the Namibian Government are:

- Convention on International Trade and Endangered Species of Wild Fauna and Flora (CITES), 1973.
- Convention on Biological Diversity, 1992.

The Project activities presented under Chapter 2, their alternatives and legal framework above will be undertaken in a specific environment, i.e., physical, biological and social environmental features as presented under the next chapter.

5 ENVIRONMENTAL: BIOPHYSICAL AND SOCIAL BASELINE

The proposed activities works will be undertaken in specific environmental and social conditions. Understanding the pre-project conditions of the environment will aid in predicting the projections of environmental conditions during and after the project implementation. This knowledge also helps in identifying the sensitive environmental features that may need to be protected through the recommendations and effective implementation of mitigation measures. The summary of selected physical, biological and social baseline information about the site area is given below.

The baseline information presented below is sourced from a variety of sources including reports of studies conducted for the Mine, in the Kombat area, and Otjozondjupa Region at large. Further information was obtained by the Environmental Consultant during observation on site on the 15th of November 2022 and 24th of January 2023.

The climatic conditions of the Kombat area are described using the available data obtained from Mendelsohn *et al* (2002), World Weather Online, and Meteoblue websites (2023).

5.1 Climate

The climatic conditions of the Kombat area are presented below.

5.1.1 Temperatures

According to Mendelsohn *et al* (2002), the annual temperatures of Kombat and surroundings range between 20 and 22°C, while maximum temperatures range between 32 and 34°C, and minimum temperatures range between 4 and 6°C.

According to the temperature information on World Weather Online (2023), the area experiences maximum temperature of 35°C in October/November and minimum of 6°C in June/July (Figure 5-1).

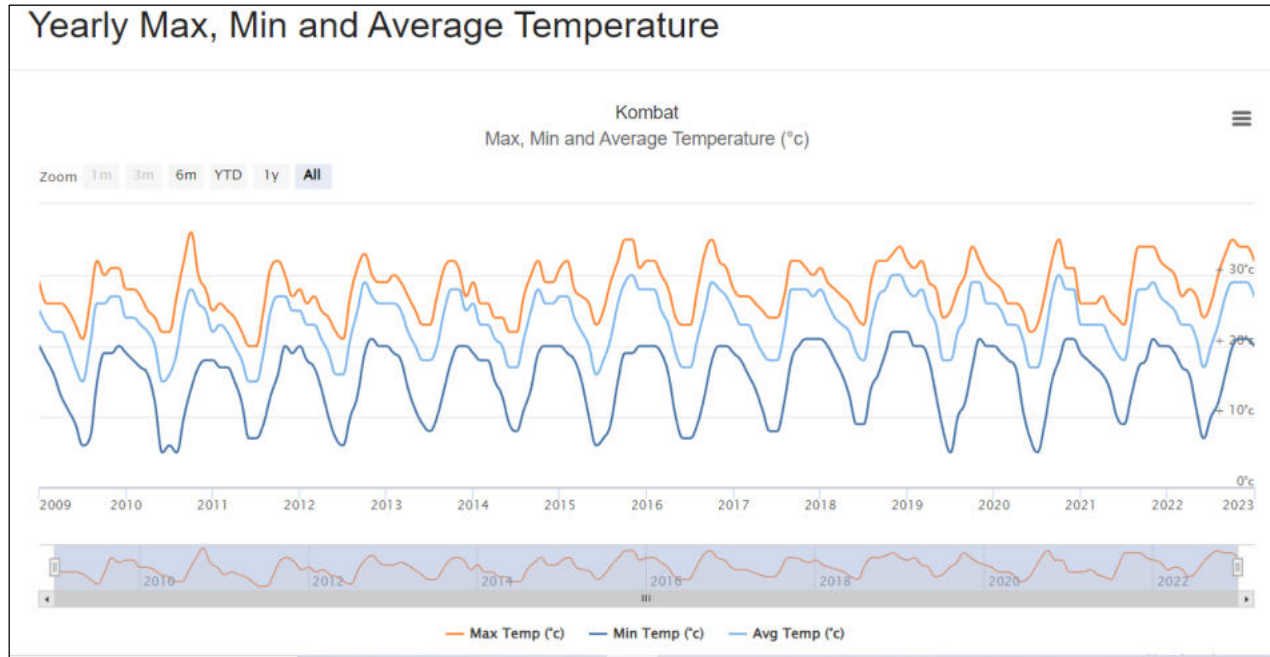


Figure 5-1: The annual maximum, minimum, and average temperatures (World Weather Online, 2023)

The average low temperature for the area is 7°C in July and high temperature is 33°C in October as shown in Figure 5-2.

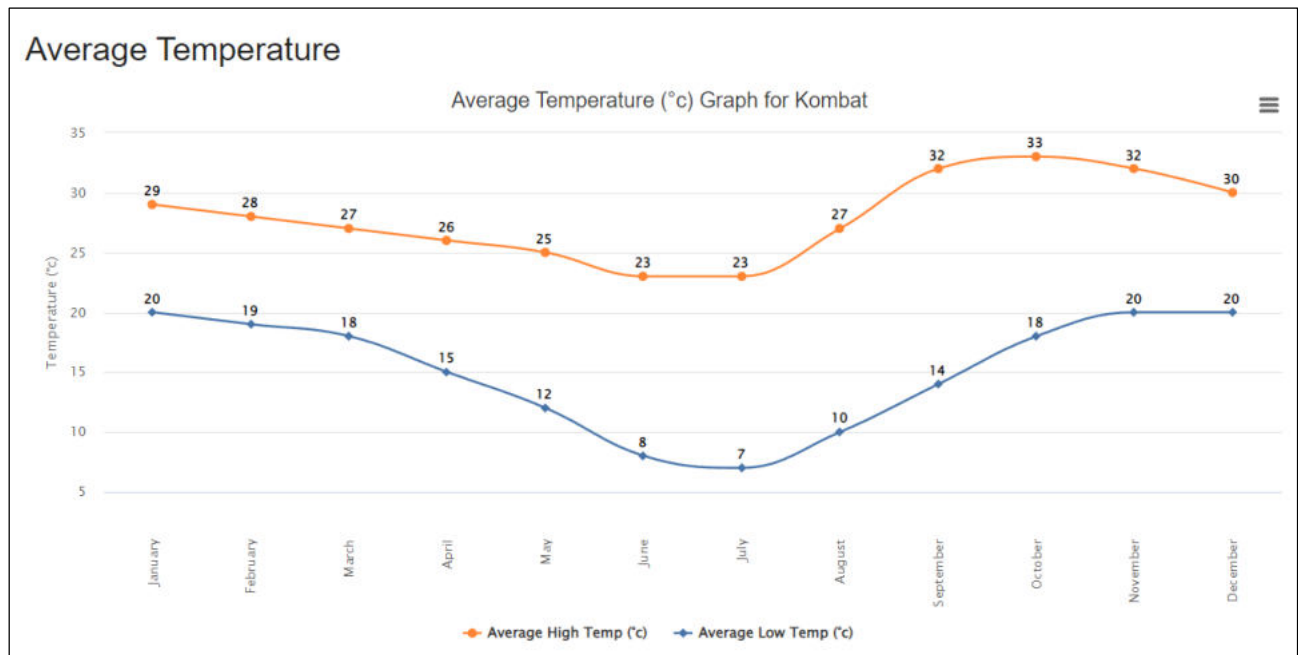


Figure 5-2: The average temperatures for Kombat area (World Weather Online, 2023)

5.1.2 Rainfall and Evaporation

The average rainfall for Kombat area over a complete period of thirteen (13) years, i.e., from 2009 to 2022 is shown in Figure 5-3 below. The area and surrounding areas experience good rains of 550 to 600mm of rainfall per year (Mendelsohn *et al.*, 2002) between the months of December and March.

The highest rainfall recorded over the past 13 years was 708mm in January 2021 when it rained for 15 days, followed by 699mm in December 2011 (rained for 25 days) and 690mm in January 2011 when it rained for 20 days (World Weather Online, 2023) - Figure 5-3.

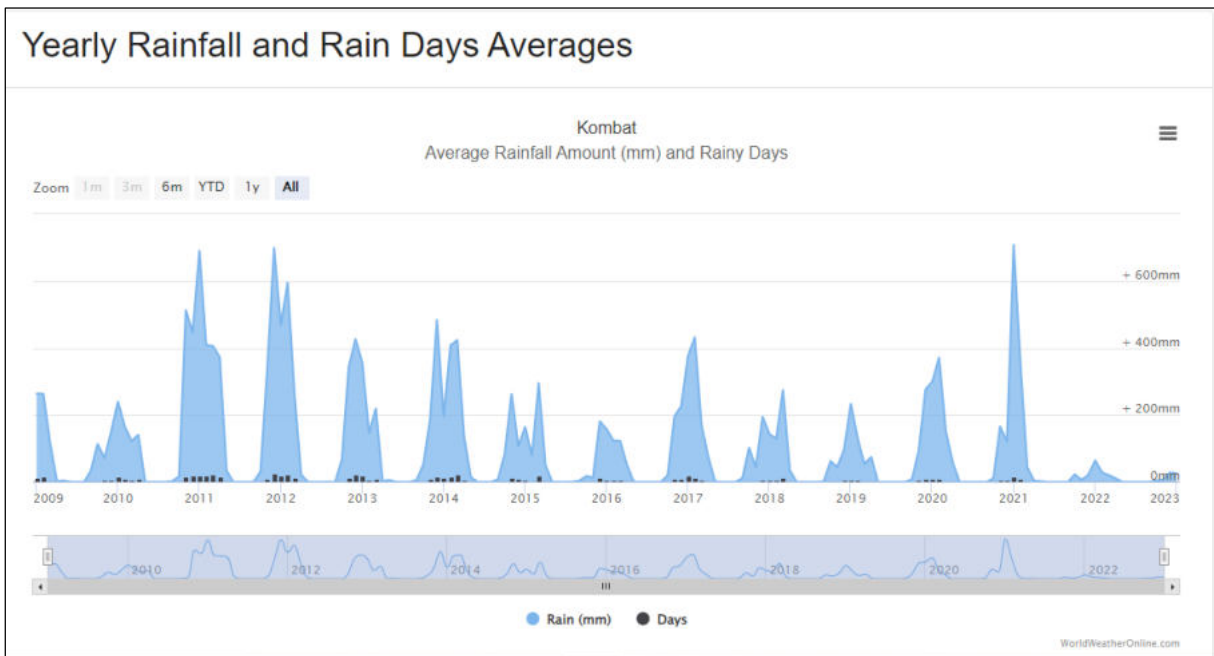


Figure 5-3: The rainfall & rainy days for Kombat area (World Weather Online, 2023)

The highest average rainfall is 290mm in January where it rained for 12 days, followed by February with an average of 260mm when it rained for 11 days (Figure 5-4).

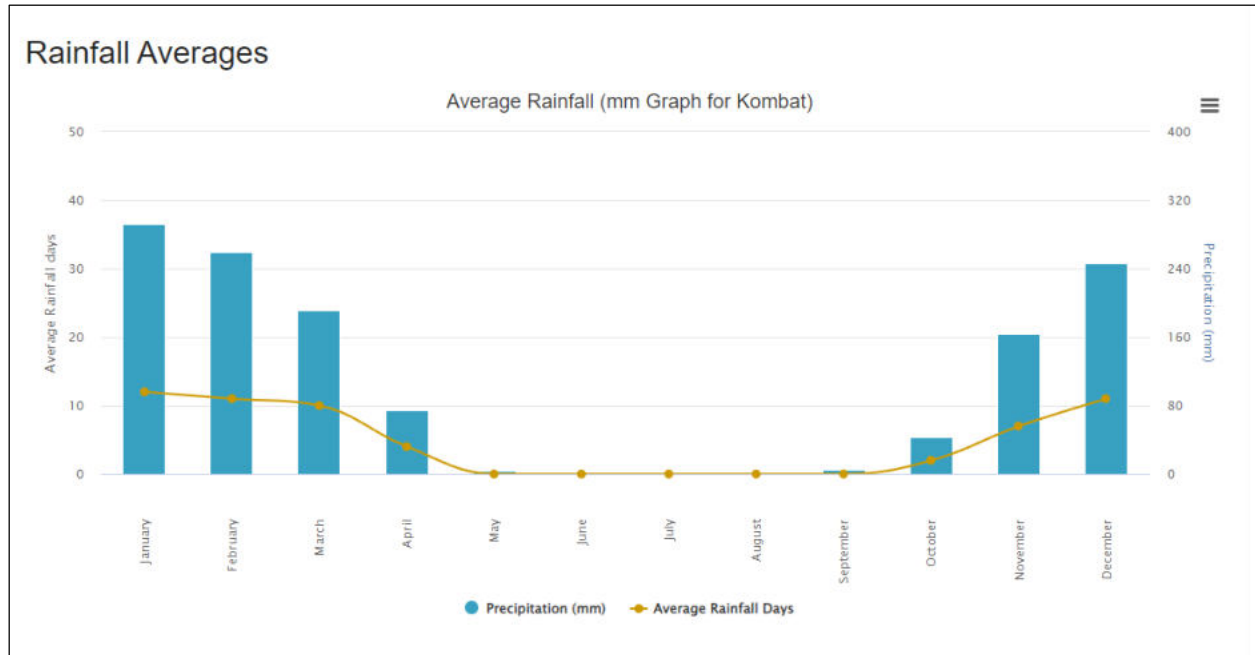


Figure 5-4: The average rainfall for Kombat area (World Weather Online, 2023)

The evaporation rate for the area ranges between 2000 and 2400 mm/year (Mendelsohn et al. 2002).

5.1.3 Air and Wind

Air: the current known sources of air pollution in the area are dust emissions from unpaved district and access roads within the area, and emissions from heavy vehicles on the local roads particularly in dry and windy months.

Wind: the wind speed chart for Kombat from the Meteoblue modelled climate is shown in Figure 5-5. High wind speeds (between 12 and 19km/h and more) are experienced throughout the year but mainly from July to October for more than 10 days as indicated in the chart - Figure 5-5.

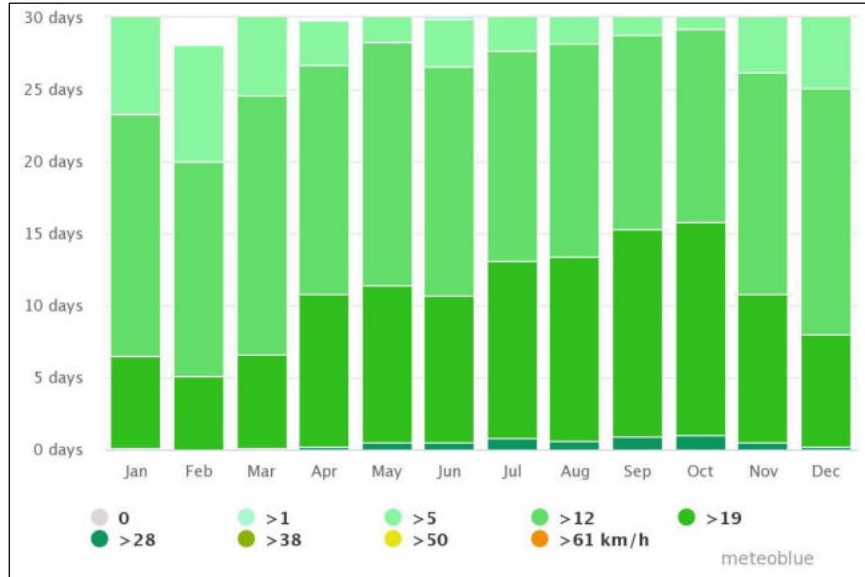


Figure 5-5: The wind speed chart for Kombat (Meteoblue, 2022)

The wind rose is shown in Figure 5-6 and indicates that the wind is dominantly blowing from southwest (SW) to northeast (NE) with the speed of 12km/h and 19km/h.

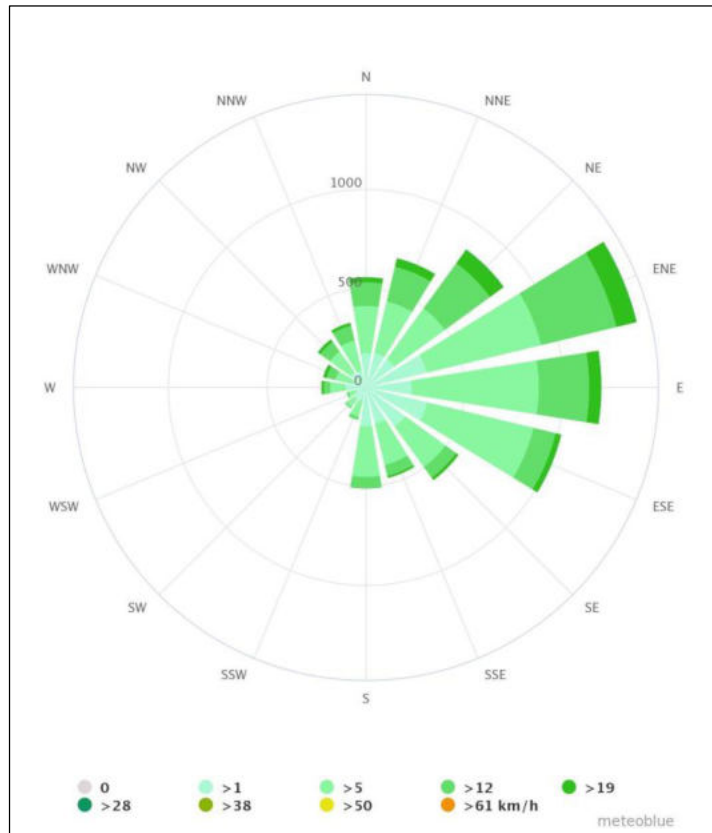


Figure 5-6: The wind rose for Kombat area (Meteoblue, 2022)

5.2 Landscape and Topography

The Kombat area is characterized by the Karstveld landscape as shown in Figure 5-7. Mendelsohn *et al* (2002), most of this landscape extends as a narrow, raised margin that encircles the lower-lying Owambo Basin in central northern Namibia. The rocks are dominated by limestone that easily dissolves water, forming large underground caverns, lakes (such as Lake Otjikoto and Lake Guinas) and aquifers of underground water. There is little surface water run-off from the Karstveld landscape, and no major rivers drain it. Typically, areas with greater elevations around Grootfontein, Otavi and Tsumeb receive higher rainfall than the surrounding lowlands. White calcrete rocks litter the surface in most lower-lying areas.

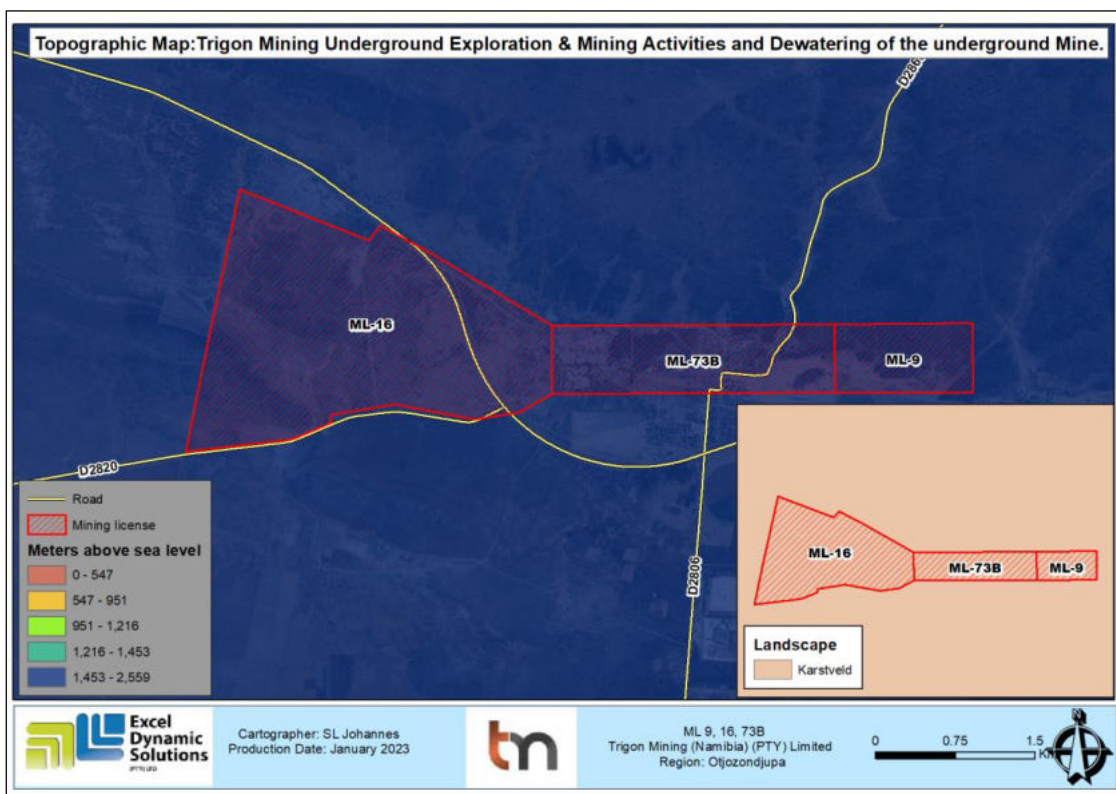


Figure 5-7: The landscape and topographic within the MLs and surroundings

In the terms of topography, the Kombat Mine (MLs) is situated in a flat and in some areas, hilly with elevations ranging between 1,453 and 2,559 meters above sea level as shown on topographic map above (Figure 5-7).

Photos of the topography view for the area around the Kombat Mine are shown in Figure 5-8.



Figure 5-8: The Topographic view of the Kombat area (overlying the MLs)

5.3 Geology and Soils

According to Mendelsohn et al (2002), the Kombat area is characterized by the Otavi Group (Limestone). ML-16 is mainly covered by the rock units of quartzites, schists and phyllite to its north, the dolomites, shales and limestone in the central and small portion of diamictite units to the south-western side. ML-73B and M-9 are both characterized by the units of dolomites, shales and limestone as shown on the geological map in Figure 5-9. The geological settings of the area make them the ideal host for the ores of the sought-after mineral commodities that triggered the need to explore and mine on the MLs.

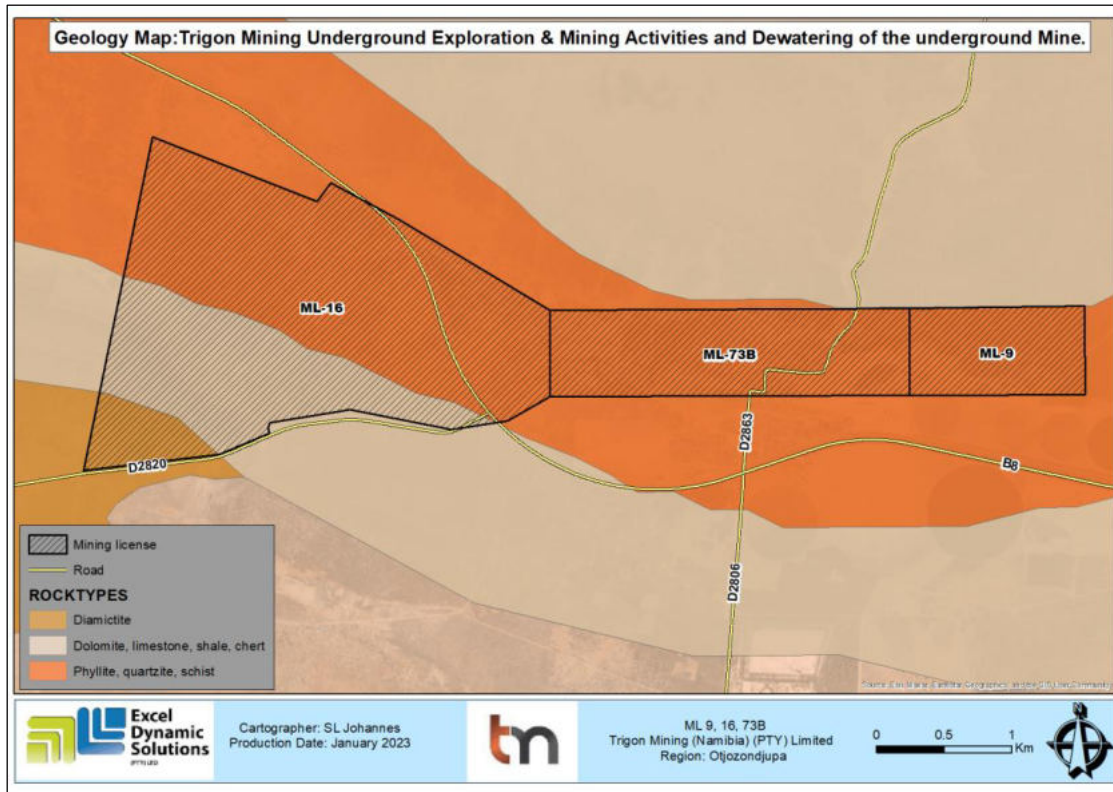


Figure 5-9: The geology of the MLs and surrounding areas

In terms of soils, the MLs are overlain by three different soil types, namely the chromic luvisols, eutric regosols and rock outcrops as shown on the soil map in Figure 5-10. These different soil types are briefly described as follows (according to Mendelsohn *et al*, 2002):

- **Chromic luvisols:** soils with bright colours with soil units belonging to the luvisols are confined to two small areas west of Grootfontein. They are suitable for a range of agricultural uses because of their good-water holding capacity and well-drained, porous, and aerated structure. This soil is covering the north-western side of ML-16 as shown in the map.
- **Eutric regosols:** These fertile soils with high base saturation, medium fine or fine-textured soils of actively eroding landscapes, thin layers lying directly above the rock surfaces from which they are formed. These soils cover most parts of ML-16 and 73B and a very small part of ML-9.
- **Rock outcrops:** these are not really soils but rocks only, with very thin or no soil covers at all. The rock type cover the south-western part of ML-16, a small part of ML-73B and most of ML-19.

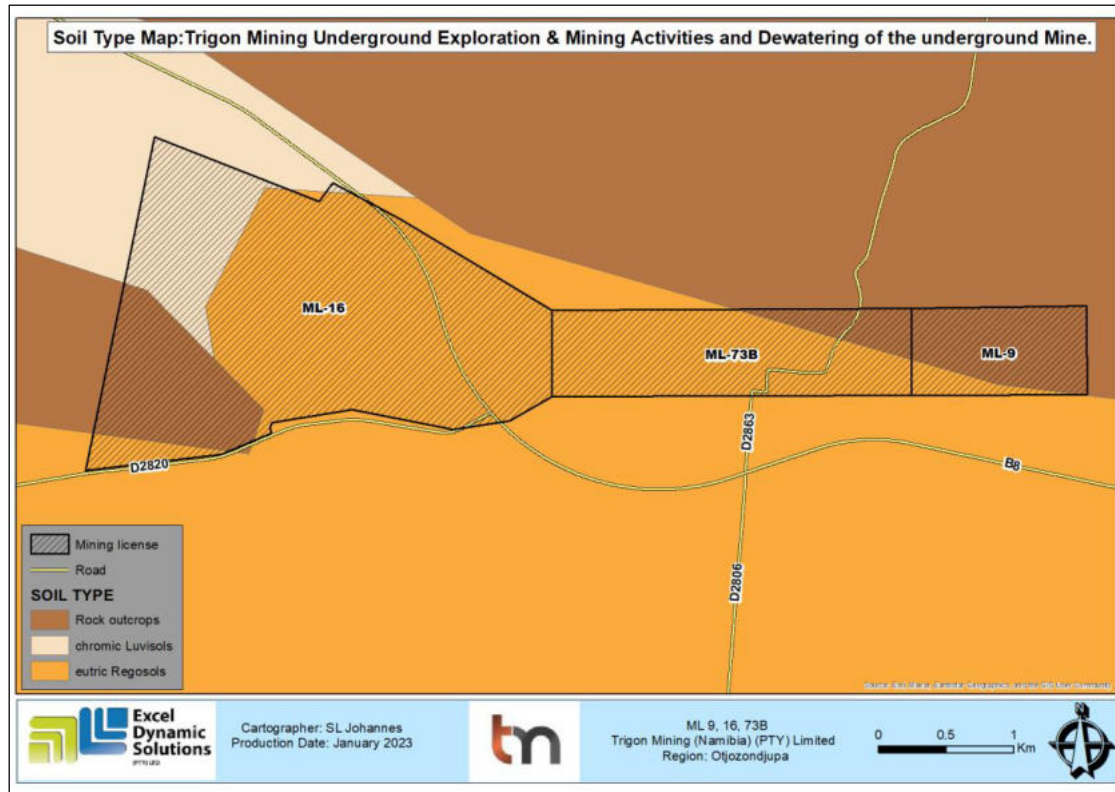


Figure 5-10: The dominant soil types covering the MLs

5.4 Water Resources

5.4.1 Groundwater (Hydrogeology)

The project site area falls under the Otavi Mountainland groundwater basin. Located in the Central Northern Namibia, the Otavi Mountainland comprises a series of dolomite units that have been subjected to an erosion process of carbonate dissolution to form karstified landforms. The Mountainland region is a major groundwater resource known as the “Karst Area” or “Karstland” which comprises the mountainous landscapes of Otavi, Tsumeb and Grootfontein.

Groundwater Recharge: As indicated under the climate section above, the Kombat area receives an average annual rainfall of between 550 to 600mm and given the high infiltration rates typical in this Karst area, groundwater recharge is therefore high (Lohe *et al.*, 2021).

Groundwater Flow: The local groundwater flow pattern follows the regional northerly flow direction from the Otavi Mountain Land (OML) in the south towards the north. Groundwater flow is reported to occur primarily within the upper 150m below surface although flow is reported to occur as deep as 900m below ground level (mbgl) (Van Rooyen and Nel, 2013).

The Kombat area is found in a region with a productive fractured to moderately productive aquifer types as on the national aquifer type and productivity map in Figure 5-11, that groundwater in the area is hosted in rock bodies with little groundwater potential.

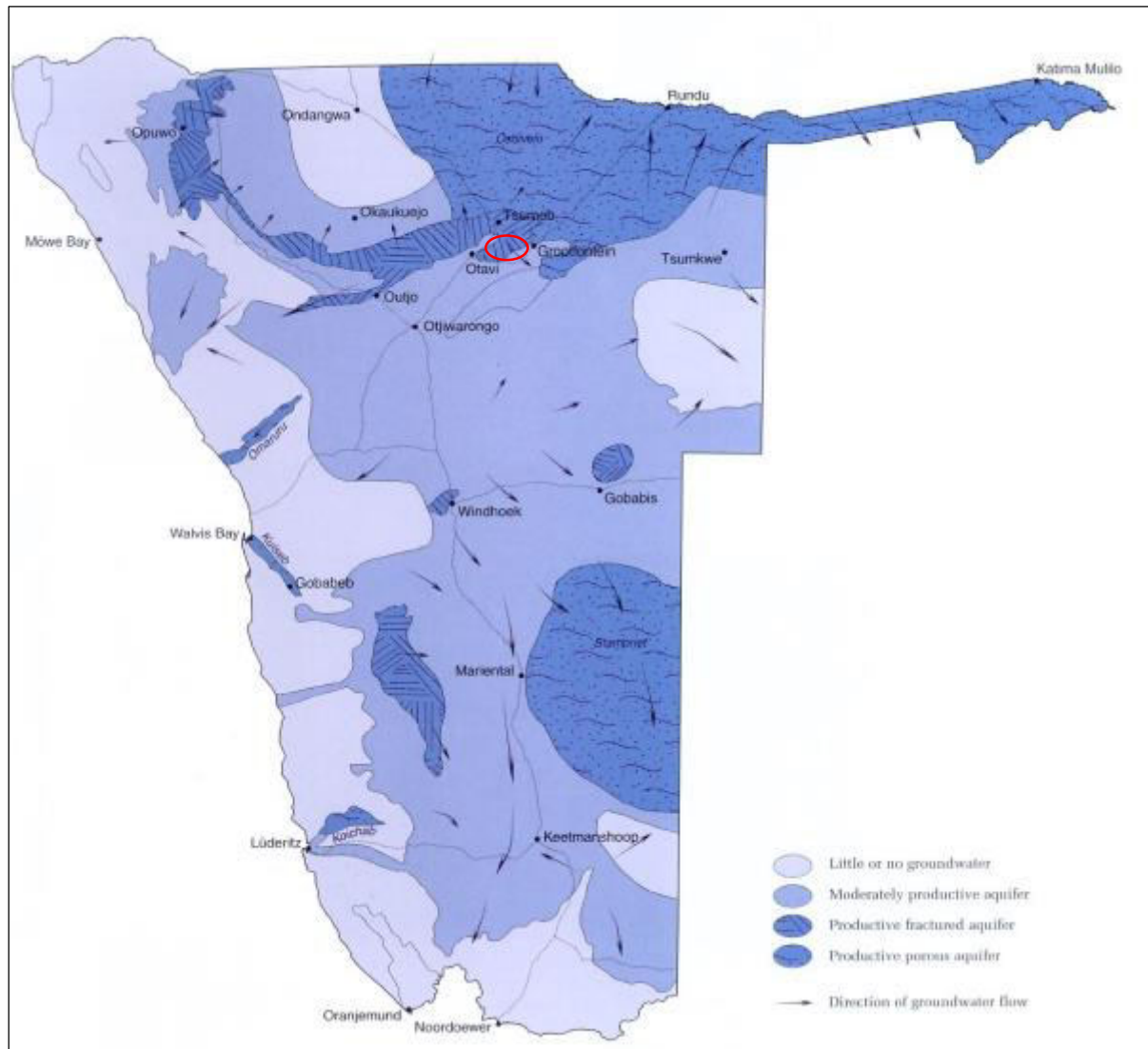


Figure 5-11: The national aquifer type and productivity conditions (Kombat area enclosed in red) (Mendelsohn *et al*, 2002)

In terms of local groundwater conditions, the Kombat Mine is within an area fractured, fissured or karstified aquifers, and aquifers characterized by rocks within little groundwater potential (as depicted on the map in Figure 5-12. The ML-73B and ML-9 both fall under the latter type of aquifers, whereas ML-16 falls under both local aquifer types (fractured, fissured or karstified aquifers and little groundwater potential).

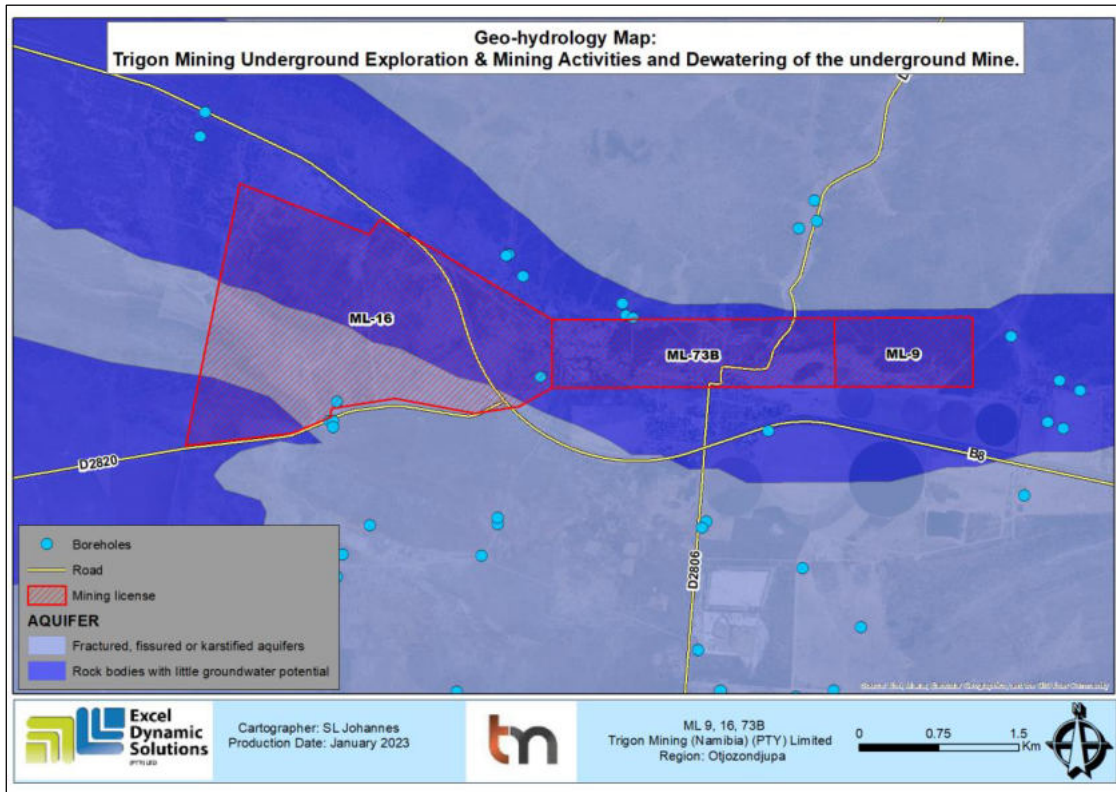


Figure 5-12: The hydrogeological (groundwater) conditions of the MLs and surroundings

5.4.1.1 Vulnerability to Over-abstraction

The over-abstraction of groundwater in any aquifer does not only affect the surrounding human populations, but the general environment too that depends on the same water resource. The lowering of the water table would mean a decrease in borehole water levels for downstream water users. A decrease in water level in the surrounding (downstream) users' boreholes increases pumping costs because advanced pumping equipment will be required to reach the new borehole water levels.

Furthermore, over-pumping of groundwater in areas with poor recharge will also increase salt concentrations in the aquifer, leading to poor water quality.

With regards to the project area (Kombat), the water potential of the project area is moderate to high. Therefore, continued abstraction of water from the site borehole(s) at a sustainable yield would probably not negatively impact the aquifers (due to over-abstraction). Thus, the vulnerability of the aquifers to over-abstraction will be low (insignificant).

5.4.1.2 Vulnerability to Pollution

In areas where extensive agricultural, industrial and mining activities are practised with poor prior planning and waste management, the aspects of water pollution and water protection have increasingly become an issue in most parts of the world. However, poor water quality does not only come from direct pollution from the ground surface, but from over-abstraction of water from aquifers that are poorly recharged. This would be the case with some aquifers in the southern parts of Namibia, where if abstraction exceeds effective recharge, the salt concentrations increase leading to poor quality water. In other words, the lowering of water levels from intensive abstraction in areas with poor rainfall may lead to the salinization of groundwater.

Typically, the vulnerability risk to pollution is assessed based on the vulnerability of groundwater resources to pollution as per parameters on the vulnerability map is shown in Figure 5-13, with the project area enclosed in the navy blue circle.

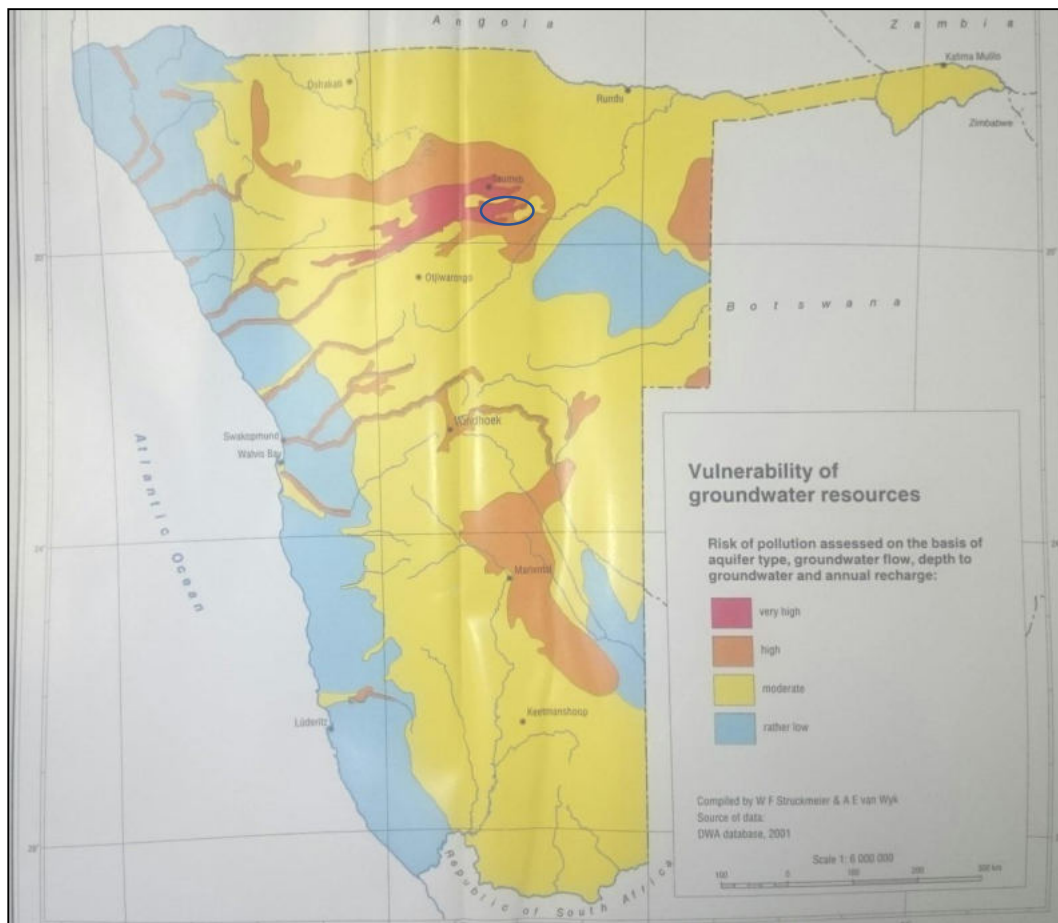


Figure 5-13: Vulnerability of groundwater resources to Pollution (source: Van Wyk et al, 2001)

Based on the Groundwater Resources Vulnerability Map of Namibia above, the vulnerability of groundwater to pollution in the project area is very high around Kombat (Figure 5-14). The geology and secondary nature of the bedrocks “encourage/trigger” the transport of pollutants in the groundwater. In other words, the fractured and karstified nature of the rock units in the area would provide ready passage for pollutants into groundwater. Therefore, the vulnerability of groundwater to pollution at Kombat would be promoted by the fractured/karstified rock units is very high.

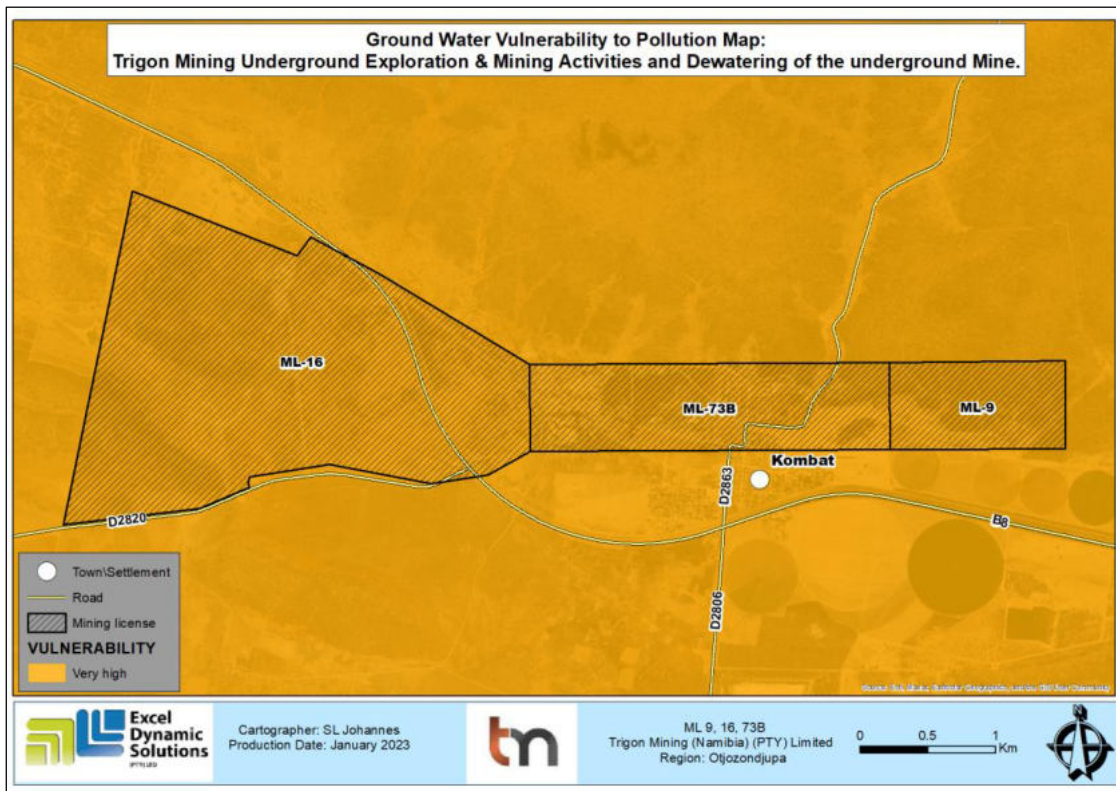


Figure 5-14: The groundwater vulnerability of the MLs and surroundings

5.4.2 Surface Water (Hydrology)

In terms of surface water, there is not much water on the surface in Namibia. This is because the little rain that falls, especially on the coastal area of the country either evaporates, seeps into the ground or is rapidly drained by ephemeral rivers that dominate natural surface water systems inside the country. Water is only held for longer periods in perennial rivers on Namibia’s borders with other neighbouring countries. These rivers that can hold surface water are extremely varied, ranging from great rivers to a host of smaller rivers and channels that flow at varying frequencies (Mendelsohn *et al.*, 2002).

5.5 Biodiversity

The Kombat area falls under the Karstveld / Acacia tree and shrub Savanna type of biome and vegetation. The Acacia tree and shrub Savanna is characterized by large, open expanses of grasslands dotted with Acacia trees. The trees are tallest in areas of deeper sands in the east, with plant growth becoming progressively shrubby further west where soils are shallower and the landscape is more hilly and rocky (Mendelsohn *et al.*, 2002).

The study area is part of the Savanna Biome of Irish (1994) as cited by Mannheimer (2017), where phanerophytes (woody perennials) and hemicryptophytes (perennials that die back in winter, such as grasses) are regarded as the dominant life forms, although in good rainy seasons therophytes (annuals) are also briefly abundant. This largely corresponds with the Tree-and-shrub Savanna Biome of Mendelsohn *et al* (2002), who describe the vegetation type as mixed woodlands – as shown in the vegetation (flora) map in Figure 5-15, with broadleaved woodland towards the north-east and Acacia woodland towards the south-east.

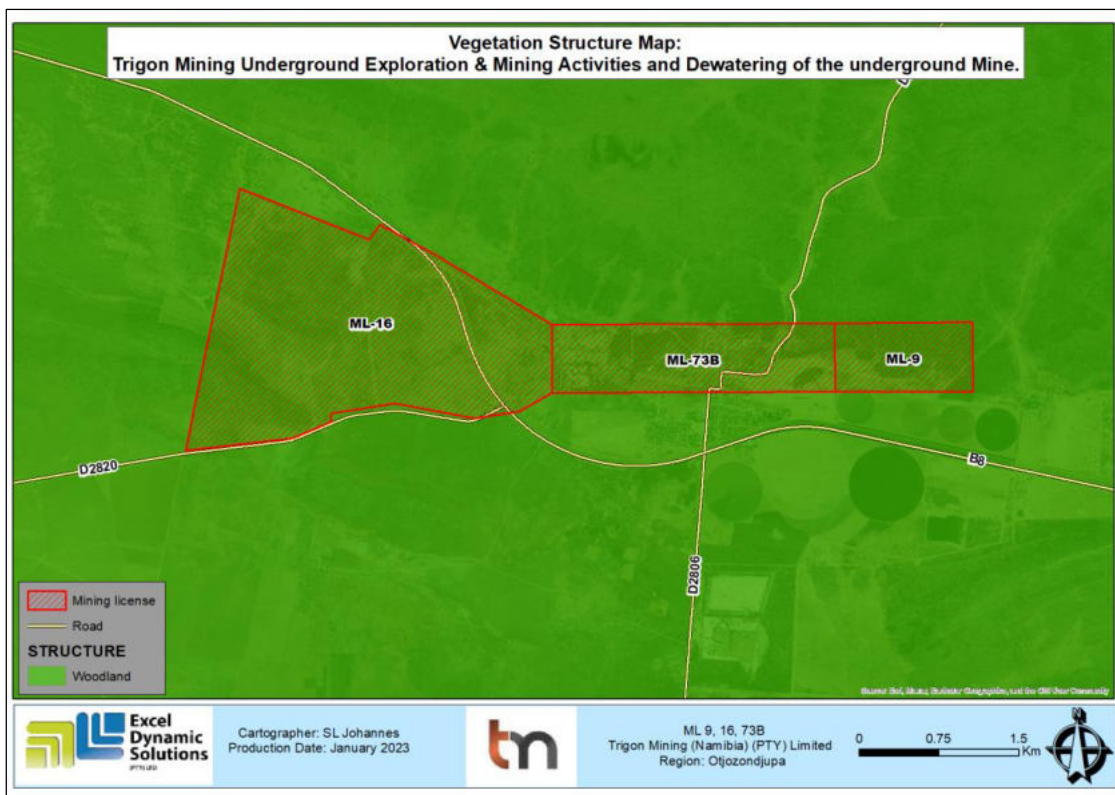


Figure 5-15: The dominant vegetation type within the area

Mannheimer (2017) further stated that plant species diversity in the general area is regarded as very high, at over 500 taxa (Mendelsohn *et al.*, 2002). This may be ascribed in part to topographic/niche diversity and high rainfall. Endemicity is also high, which is consistent with the presence of the dolomite mountains and hills of the Otavi Highlands, which has long been recognised as a centre of diversity and endemism within Namibia, and includes a number of narrow endemic species mountains are noted for their high diversity and endemism, which may be ascribed to a number of factors, inter alia niche diversity and the effect of altitude, which often results in zones of higher moisture availability and lower temperatures, as well as the presence of relict species from earlier geological times (palaeoendemics) and/or speciation (neoendemics) The project area lies in the Mountain Savanna and Karstveld vegetation zone of Giess (1998), essentially equivalent to the Karstveld of Mendelsohn et al which, particularly on the mountain slopes, is characterised by a high density and diversity of broadleaved trees and shrubs (i.e.: broadleaved woodland), including important species such as *Combretum imberbe*, *Ficus spp.*, *Sclerocarya birrea*, *Searsia lancea*, *Kirkia acuminata*, *Berchemia discolor* and *Spirostachys Africana*. The valleys and sandveld patches in between carry a slightly lower diversity of broadleaved trees and shrubs with thornveld components such as *Dichrostachys cinerea* and *Acacia spp.* more prevalent, often forming dense areas of encroachment (i.e.: mixed woodland). Numerous endemic and/or protected geophyte species have been recorded in this zone (Mannheimer, 2017).

5.6 Social Conditions

5.6.1 Demography

According to the 2011 National Population and Housing Census data, the Otjozondjupa Region had a total population 143,903, of which 70,001 were females and 73,902 males (Namibia Statistics Agency, 2014).

Kombat Settlement falls under the Otavi constituency and the Constituency's population was 12,488 (5,754 females and 6,734 males). However, it is not known how much of that population made up the Kombat figure. According to SLR Namibia (2018), the population in Kombat has increased over the past few years with many people searching for opportunities and hoping on the prospects of the reopening of the mine. Therefore, a number of people moved into the town subsequent to the mine being placed on care and maintenance.

From a local perspective, the Kombat Housing and Population survey report, 2016 there are an estimated 246 people in Kombat town and 66 households. The town consists of brick and pre-fabric houses rented out on a monthly basis to the residents of Kombat. This includes nurses, police officers, school teachers and the people that remained in the town upon closure of the mine in 2008.

5.6.2 Employment Status

Namibia suffers from high unemployment levels of around 28% although university graduates have unemployment rates of less than 5%. Youth unemployment was 39% in 2014 and more than 60% of all people unemployed have been unemployed for more than two years.

With regards to Kombat, about 70.1% of its population (as indicated in Table 5-1) belongs to the economically active group, which forms the labour force, while 35% is outside the labour force. The labour force is made up of the employed (39.6%) and the unemployed (60.4%). In the economically inactive population group, students make up 21.1%, while too old constitute 2.4%. More females are unemployed (73.2%) than males.

Table 5-1: Population by activity status and sex, Kombat (SLR Namibia, 2018)

Activity status	Male		Female		Total	
	Number	%	Number	%	Number	%
Employed	40		19		59	
Unemployed	38		52		90	
Economically Active (Labour Force)	78	66.1	71	68.1	149	70.1
Unemployment rate		48.7		73.2		60.4
Students	17	14.4	35	27.3	52	21.1
Too young	15	12.7	13	10.2	28	11.4
Too old	3	2.5	3	2.3	6	2.4
Economically Inactive (Outside Labour Force)	35	29.7	51	39.8	86	35.0
Not stated	5	4.2	6	4.7	11	4.5
Total	118	100.0	128	100.0	246	100.0

5.6.3 Income

About 62% of the employed population have a monthly income of between N\$0-500, while only 4.5% have a monthly income between N\$2,001-3,000. More females, 22.7% belong to the monthly income group earning between N\$1,001-2,000 (SLR Namibia, 2018).

5.7 Education and Economic Activities

According to the Namibia Statistics Agency (2014), at the time of the Census, the population of Otavi Constituency at the age of 15 years above, about 18 % never attended school, 26% was still at school and 52% had left school.

The main source of income in households in the Otavi Constituency is farming (7%), wages and salaries (72%), cash remittance (3%), business and non-farming (6%) and pension (7%) (Namibia Statistics Agency, 2014),

5.8 Land Uses

Kombat is in the heart of the Otjozondjupa cattle farming area with the majority of the surrounding land representing the dominant land-use in the immediate vicinity of the mine, with other land uses comprising of de-bushing on farms, brick making and charcoal making activities. There are also agricultural fields (central pivot irrigation) to the east and southeast of the mine.

Closest to the mine, is the Kombat Town with houses and community infrastructure which is administered under a local private ownership. About 50 houses were refurbished to serve as campus facilities for the Welwitschia University. An informal settlement is located on a Government farm ±5km south of the mine and is characterized by a largely unemployed population residing in shacks and huts, enclosed by small portions of maize meal fields (SLR Namibia, 2018).

In terms of surrounding land uses, the land uses around the Mine are commercial farms on either sides, with the Kombat Settlement to the immediate south of the Mine premises. The map showing the land uses around the Kombat Mine is shown in Figure 5-16 below. The typical activities undertaken on the farms are irrigation and livestock farming.

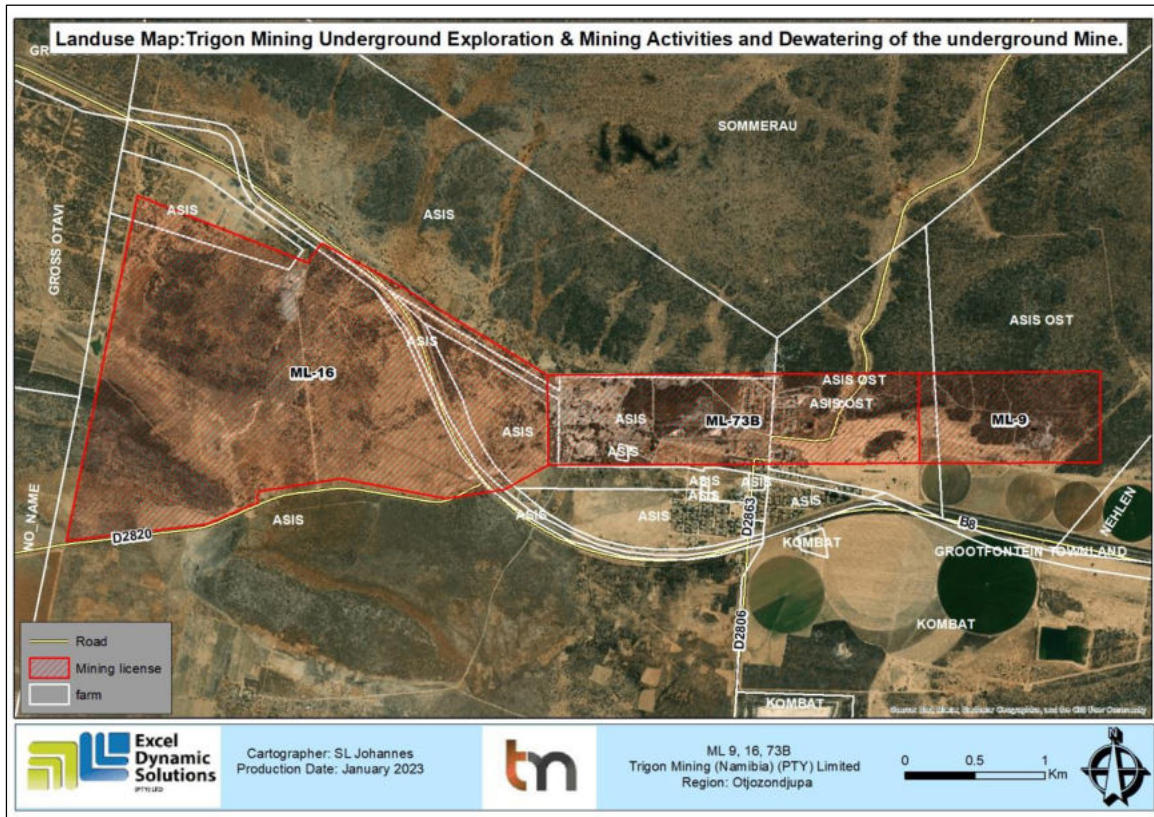


Figure 5-16: The surrounding land uses

5.9 Archaeology, Cultural and Heritage Aspects

According to SLR Namibia (2018), there were no visible archaeological artefacts or heritage sites noted in the vicinity of the proposed project areas by SLR during the site visits (this was also confirmed by EDS Consultants on two site visits conducted in November 2022 and January 2023). No neighbouring I&APs raised any archaeological concerns during the public participating (consultation) process. The project site area is not a Greenfield, given the long history of on and off mining activities in Kombat. Therefore, although there might have been local archaeological resources, they would have been erased or lost in the past. However, these have not been documented onsite.

The old German Shaft (i.e. "Otavi Minen und Eisenbahn Gesellschaft") does have heritage value and is located near the Kombat Mine Office. The old Post Office at the vehicle parking at the Kombat Mine Head Office was the first building for the town and the office was the first shop and building owned by the owner in 1911 till 1925 when the mine flooded for the first time in history. A Fig Tree was planted in that days adjacent to the one wall and it invaded and took over and

grew totally through and over the portion of one wall of the building which was left. The small house and building on the left hand entrance of the Main Security Gate was the Railway Station of Kombat. This was the only 'Eisenbahn' (small track railway line) to the North. (PP – J. Lusse, January 2018) (SLR Namibia, 2018).

With that said, there is no anticipated impact of the proposed project activities and their associated infrastructure on archaeology and heritage.

The key potential impacts associated with the proposed project activities are listed, described and assessed under the next chapter. Under the same chapter, the impact assessment methodology is also provided. The measures to maximize the potential positive impacts (benefits) and mitigate the negative impacts are provided in the Draft EMP.

6 IDENTIFICATION OF IMPACTS

6.1 Identification of Key Impacts

The proposed activities are usually associated with different potential positive and/or negative impacts. Therefore, the impacts should be assessed, and mitigation measures provided thereto. This is done to ensure that these impacts are addressed by providing adequate mitigation measures such that an impact's significance is brought under control, while maximizing the positive impacts (benefits). The potential positive and negative impacts that have been identified from the proposed activities are listed as follow:

Positive impacts:

- Socio-economic development: temporary and long-term employment opportunities.
- Investment opportunities/infrastructure-related development benefits.
- Boosting of the local economic (through corporate social responsibility/Investment (CSR/CSI), regional and national economic development through taxes.
- Increased support for local businesses through the procurement of locally available goods and services.

Negative impacts:

- Water resources (over-abstraction of water) and pollution.
- Occupational health and safety risks associated with underground exploration and mining (handling of machinery and equipment).
- Impact on the groundwater table through dewatering associated with exploration and mining underground.
- Land subsidence and slope deformation (particularly during mining).
- Noise and vibrations associated with underground blasting and drilling activities.
- Waste generation (poor waste management).
- Vehicular traffic safety and road pressure.
- Social Nuisance - Job seeking leading to the influx of outsiders in Kombat.

6.2 Feedback from I&APs and Public Comments Period

Issues raised and comments submitted by I&APs during the first consultation period were recorded and attached as received (presented in the EIA Report under Appendix C3) and addressed under the Comments & Responses Trail in the EIA Report (Appendix C4). The issues and comments have been incorporated into the EIA Report and EMP. The summary of these key issues is presented in Table 6-1 below.

Table 6-1: Summary of main comments (and or issues) received during the consultation period

Aspect	Summary of the Comments, Concern / Issue
Influx of people (job seekers) into Kombat	-The uncontrolled influx of jobseekers that will not be employed by Kombat – but will remain in the area without finding employment
The existing dumpsite at Kombat	-The situation with the dump pit of household refuse at Kombat.
Tailings water/waste water site	-The wastewater should be disposed of in accordance with best mining principles to avoid history of past mining
Downstream water pollution from mining activities.	-Mining activities should be done in accordance with best mining principles to minimize environmental damage.
Underground blasting.	-Historically, there have been sand and dirt influxes into the surrounding water pumps on the farms (surface mining)
Water quality and monitoring	-Care must be taken so that the chemicals/substances used during mining and processing do not pollute the environment. This should be monitored and reported to the surrounding communities.
Mining rehabilitation	-Mines have a terrible footprint on the environment. This can be seen with the old tailings dam that was never rehabilitated. It is critically important that the Mine must be responsible for rehabilitation when it closes down
Environmental Management Plans	-All I&APs should be included in the EMPs and updated.
Environmental Audits	-All affected parties and communities must be included and updated regularly.
Monitoring by responsible authorities (MEFT, MAWLR and MME)	-Monitoring and controlling of Mine operations to ensure that the environment is not adversely affected. All affected parties should be informed of all decisions and processes by the relevant authorities.
Long-term impact of mining	-Analysis of mining vs farming the Kombat area
Human capital plan	-Trigon should invest in training Kombat residents to take up employment than bringing in people from outside

Aspect	Summary of the Comments, Concern / Issue
Community project investment	-Trigon should consider supplying water to the community projects in and around Kombat.
Wastewater	-Trigon should properly manage wastewater to ensure that it does not get into the environment to pollute water resources
Damaged houses and Relocation of some residents	-Some houses in Kavango location were damaged by flying rocks during blasting. -The query on whether and when residents would be relocated -Some community members compensated an amount less than N\$ 20,000.00 only and houses demolished for mine development.

7 CONCLUSIONS

The comments and concerns made and raised on the proposed project activities, respectively were noted, incorporated and addressed in the EIA Report and mitigation measures provided in the Draft EMP.

The positive impacts identified during the scoping stage are as follows:

- Socio-economic development: temporary and long-term employment opportunities.
- Investment opportunities/infrastructure-related development benefits.
- Boosting of the local economic (through corporate social responsibility/Investment (CSR/CSI), regional and national economic development through taxes.
- Increased support for local businesses through the procurement of locally available goods and services.

The negative impacts identified during the Scoping phase are as follows:

- Water resources (over-abstraction of water) and pollution.
- Occupational health and safety risks associated with underground exploration and mining (handling of machinery and equipment).
- Impact on the groundwater table through dewatering associated with exploration and mining underground.
- Land subsidence and slope deformation (particularly during mining).
- Noise and vibrations associated with underground blasting and drilling activities.
- Waste generation (management).
- Vehicle traffic safety.
- Social Nuisance - Job seeking leading to the influx of outsiders in Kombat.

The potential impacts identified during the Scoping phase are assessed in the EIA Report and recommended management and mitigation measures are provide in the EMP.

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