Namibia Nuclear Corporation (Pty) Ltd

Updated Final Environmental Management Plan (EMP) Report to Support the Application for the Renewal of the Environmental Clearance Certificate (ECC) for Ongoing and Proposed Mining and Exploration Activities in the Mining License (ML) No. 121, Swakopmund District,
Erongo Region, West Central Namibia

May 2023

P. O. Box 4418, Windhoek
107 Olf Palme Street, Eros Park,
Windhoek, Namibia

PROPONENT, LISTED ACTIVITIES AND RELATED INFORMATION SUMMARY

TYPE OF AUTHORISATIONS

Environmental Clearance Certificate (ECC) for
Ongoing and Proposed Mining and Exploration Activities in the
Mining License (ML) No. 121

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM (MEFT)

ECC APPLICATION REFERENCE No.

APP-001506

NAME AND ADDRESS OF THE PROPONENT

Namibia Nuclear Corporation (Pty) Ltd
P. O. Box 4418, Windhoek
107 Olf Palme Street, Eros Park,
Windhoek, Namibia

COMPETENT AUTHORITY

Ministry of Mines and Energy (MME)

PROPOSED PROJECT

ECC for Mining License (ML) No. 121
Ongoing and Proposed Mining and Exploration Activities,
Swakopmund District, Erongo Region, Namibia

PROJECT LOCATION

Swakopmund District, Erongo Region, West Central Namibia
Latitude: -22.546812, Longitude: 14.977745

PERMITTING DE-RISKING ADVISORS AND ENVIRONMENTAL CONSULTANTS

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EXECUTIVE SUMMARY

1. Introduction

Namibia Nuclear Corporation (Pty) Ltd (the **Proponent**) holds minerals rights under the Mining License (ML) No. 121 situated in Swakopmund District in the Erongo Region, west central Namibia. The ML No. 121 is situated about 50 km to the east of Swakopmund, 9 km to the southwest of the town of Arandis, 10 km to the west of the Rössing Uranium Mine and 13 km to the northwest of the Husab Uranium Mine. The ML 121 area falls within the ǂGaingu Communal Conservancy. The north-western and western portions of the ML area border the Dorob National Park and the south and south-eastern areas borders the Namib-Naukluft Park (NNP), with ML boundary running along the Khan Ephemeral River Channel. Access to the ML area is through the B2 Road from Windhoek to Swakopmund and the ML area accessed along the private tarred road to the Husab Uranium Mine. Rail service, via a 1.067 m gauge line, is located 12.0 km away at the Rössing Uranium Mine siding.

2. Regulatory and Permitting Framework

This Updated Environmental Management Plan (EMP) Report has been prepared to support the application for the renewal and amendment of the current ECC in order to align it with the current minerals rights ownership of the ML 121 and the prevailing regulatory requirements as provided for the Minerals (Prospecting and Mining) Act, 1992, (Act No. 33 of 1992) and the Environmental Management Act (EMA), 2007, (Act No. 7 of 2007) as well, as the associated Regulations as administered by MEFT and MME, respectively. The current ECC granted on the 20th June 2015 to the previous Proponent, Stone Africa (Pty) Ltd, with a condition of validity linked to the duration of the proposed mining operations need to be renewed, and amended to reflect only the ML No. 121 and Namibia Nuclear Corporation (Pty) Ltd (Pty) as the Proponent.

3. The EMP Provisions

The Environmental Management Plan (EMP), described in this report, is based on the findings and recommendations as detailed in the EIA. Namibia Nuclear Corporation (Pty) Ltd shall incorporate the EMP provisions in the Environmental Management System (EMS) of the company in line with the Environmental Policy of the company.

This EMP report incorporates the provisions of the national legislations, regulations and guidelines inclusive of the Minerals (Prospecting and mining) Act (No. 33 of 1992), Environmental Impact Assessment Regulations (2012) and the Environmental Management Act, 2007, (Act No. 7 of 2007) as well as all the key applicable legislative provisions as outlined in the EIA Report.

This Updated EMP Report covers the impact assessment for ongoing and proposed mining and exploration activities with respect to the following standard mining project developmental stages:

(i) Preconstruction and site clearing for quarry and supporting infrastructure area such as storage / yard area/ supporting containerised area/ access and all related services points for water and energy supplies as may be required.

(ii) Construction of the proposed quarry and supporting infrastructure.

(iii) Operation, ongoing monitoring and rehabilitation, and.

(iv) Decommissioning, closure and aftercare.

This EMP excludes all the activities associated with the processing of the mined granites once it arrives at the processing plant as well as the export of the raw or finished products through the Port of Walvis Bay. All the mitigation measures for proposed project activities with significant impacts on the receiving environment as detailed in the EIA Report are presented in this EMP Report.

4. Summary of the EMP

This EMP provides for mining of dimension stones only and if there is a need for new modifications that may require regulatory approvals such as mining of new commodity as granted in the ML 121 other than dimension stones, an increase in the size or additional new land to the ML area, the Proponent will be required to apply for a new / amended ECC before such modifications may be implemented.

Based on the assessment of potential material impacts undertaken for the proposed mining operations and ongoing exploration activities as well as all the supporting infrastructures such as roads, administrative areas, yard / storage areas and water supply within the ML No. 121, a number of positive and negative impacts have been identified.

Mitigation measures for minimising the influence of the negative impacts have been proposed and management strategies are provided in this EMP covering the following proposed mining operations and ongoing exploration activities lifecycle developmental stages:

(i) Preconstruction.

(ii) Construction.

(iii) Operation, ongoing exploration activities, monitoring and rehabilitation, and.

(iv) Decommissioning, closure and aftercare.

Overall, it is hereby recommended that the proposed mining operations and ongoing exploration activities in the ML No. 121 with all the supporting infrastructure be issued with an Environmental Clearance Certificate (ECC) with the following key conditions:

(i) The Proponent will undertake to implement the conditions of the land lease agreements to be concluded with the owners of the commercial / communal farmland portions of Farms Odien and Fairview falling within the ǂGaingu Communal Conservancy as may be required to support the proposed mining operations and ongoing exploration activities.

(ii) The proponent shall implement and adhere to all the provisions of this EMP report.

(iii) Mitigation measures shall be implemented as detailed in this EMP report.

(iv) The Proponent shall adhere to all the applicable national regulations and standards as well as Good International Industry Practice (GIIP) that defines leading industry best practices, and.

(v) The Proponent shall adopt the precautionary approach / principles in instances where baseline information, national or international guidelines or mitigation measures have not been provided or do not sufficiently address the site-specific project impact.

5. Proponent Roles and Responsibilities

The following are the recommended actions (roles and responsibility) to be implemented by the Proponent as a part of the management of the impacts through implementations of this EMP Report:

(i) Appoint an Environmental Control Officer to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and sub-contractors in the field during the whole duration of the proposed project.

(ii) Provide with other support, human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned mine project life cycle.

(iii) Develop a simplified environmental induction and awareness programme for all the workforce, contractors and sub-contractors.

(iv) Where contracted service providers are likely to cause environmental impacts, these will need to identified and contract agreements need to be developed with costing provisions for environmental liabilities.

(v) Implement internal and external monitoring of the actions and management strategies developed during the project duration and a final Environmental Monitoring report to be prepared by the Environmental Control Officer and to be submitted to the regulators and to end the proposed mine project, and.

(vi) Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA related to the expansion of the current delineated resources or development of completely new mine site within the ML No. 121 isa.

All the responsibilities to ensure that the recommendations and provisions of this EMP Report are executed accordingly, rest with the **Namibia Nuclear Corporation (Pty) Ltd**. The Proponent shall provide all appropriate resource requirements for the implementation of this EMP as well as an independently managed (not directly controlled by the mining company) funding instrument for mine closure and aftercare environmental liabilities. The funding instrument to be created either in form of cash deposit, bond or insurance shall be approved by the MME and MEFT before its implementation.

It is the responsibility of the Proponent to make sure that all members of the workforce including contractors and subcontractors are aware of the provisions of this EMP and its objectives. It is hereby recommended that the Proponent take all the necessary steps to implement all the recommendations of this EMP for the successful execution of the preconstruction, construction, operational, decommissioning, closure and aftercare activities of the proposed mining operations and ongoing exploration activities in the ML No. 121.

1. PROJECT BACKGROUND

1.1 Introduction

Namibia Nuclear Corporation (Pty) Ltd (the **Proponent**) holds minerals rights under the Mining License (ML) No. 121. The 3534.5885 Ha ML No. 121 area was granted on 04/06/2017 and will expire on the 04/06/2027. The ML No. 121 was first granted to Stone Africa (Pty) and was later transferred to Namibia Nuclear Corporation (Pty) Ltd as the current Proponent.

The 3534.5885 Ha ML No. 121 area was granted on 04/06/2017 and will expire on the 04/06/2027. The ML No. 121 is granted for base and rare metals, dimension stone, industrial minerals, nuclear fuels minerals and precious metals. Current operations in the ML area are focused on dimension stone with detailed exploration and feasibility evaluation for other commodity groups been undertaken.

1.2 Environment Clearance Requirements (ECC)

The ongoing and proposed mining, minerals processing and ongoing exploration activities in the ML No. 121 are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA) Regulation, 2012 as among the activities with the potential to cause significance negative impact on the receiving physical, biological and socioeconomic environments. All listed activities cannot be undertaken without an Environmental Clearance Certificate (ECC).

In order to obtain an ECC, the Proponent is required to have undertaken Environmental Assessment (EA) comprising Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the proposed listed activities. The Environmental Assessment process shall be undertaken in accordance with the provisions of the Environmental Impact Assessment Regulations, 2012 and the Environmental Management Act, 2007, (Act No. 7 of 2007).

Following the completion of the Environmental Assessment process that was undertaken in 2015 and in line with the provisions of the Environmental Management Act (EMA), 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA), 2012 Regulations, an ECC was granted to then Proponent (Stone Africa (Pty) Ltd) by the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT) on the 20th June 2015 with a condition of validity linked to the duration of the proposed mining operations (Fig. 1.1).

1.3 Updated Environmental Management Plan (EMP) Report

This Updated Environmental Management Plan (EMP) Report has been prepared to support the application for the renewal and amendment of the current ECC as shown in Fig. 1.1, in order to align it to the current minerals rights ownership of the ML 121 and the prevailing regulatory requirements as provided for the Minerals (Prospecting and Mining) Act, 1992, (Act No. 33 of 1992) and the Environmental Management Act (EMA), 2007, (Act No. 7 of 2007) as well, as the associated Regulations as administered by MEFT and MME, respectively.

The current ECC as shown in Fig. 1.1 need to be renewed, and amended to reflect only the ML No. 121 and Namibia Nuclear Corporation (Pty) Ltd (Pty) as the Proponent. This EMP provides for mining of Dimension Stones only and if there is a need for new modifications that may require regulatory approvals such as mining of new commodity as granted other than dimension stones, an increase in the size or additional new land to the ML area, the Proponent will be required to apply for a new / amended ECC before such modifications may be implemented.

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

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Cnr of Dr. Kenneth David Kaunda Street
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Private Bag 13306
Windhoek
04 June 2015

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

Managing Director
Stone Africa (Pty) Ltd
P. O Box 1204
Walvis Bay
Namibia

Dear Sir

SUBJECT: ENVIRONMENTAL CLEARANCE FOR THE PROPOSED INTERNAL BOUNDARY ADJUSTMENTS FOR THE MINING LICENSES (MLS) NOS. 120, 121 AND 123 FOR POSSIBLE MINING OF SULPHITES AND ASSOCIATED MINERALS

The Environmental Impact Assessment made a satisfactory analysis of environmental issues. The Environmental Management Plan contains adequate provisions for control and monitoring, especially on flora and fauna destruction.

This letter serves as an environmental clearance for the proposed adjustment of internal boundary and proposed mining operations. However, this clearance letter does not hold the Ministry of Environment and Tourism accountable for any misleading information provided, nor any adverse effects that may arise from these activities. Instead, full accountability rests with Stone Africa (Pty) Ltd and their Consultants.

This environmental clearance is valid for the proposed mining period, unless withdrawn by this office.

Yours sincerely,

MINISTRY OF ENVIRONMENT AND TOURISM
P/Bag 13306
Windhoek, Namibia
2015 -06- 26
Office of the
Environmental Commissioner

Teofilus Nghitila
ENVIRONMENTAL COMMISSIONER

All official correspondence must be addressed to the Permanent Secretary

Figure 1.1: Copy of the ECC that was granted to then the Proponent (Stone Africa (Pty) Ltd) with respect to the MLs Nos. 120, 121 and 123 and the ECC has a validity period for the duration of the proposed mining period. ML No. 121 covered in this report, were first granted to Stone Africa (Pty) and were transferred to

Starting Right 265 (Pty) Ltd, now renamed Namibia Nuclear Corporation (Pty) Ltd as the current Proponent. This ECC need to be renewed, and amended to reflect only the ML No. 121 and Namibia Nuclear Corporation (Pty) Ltd (Pty) as the Proponent.

1.4 Location, Site Description, Land Use and Infrastructure

1.4.1 Location and Land Use

The ML No. 121 area totalling 3534.5885 Ha falls within the Swakopmund District, Erongo Region, west central Namibia (Fig. 1.1-1.4). The ML No. 121 is situated about 50 km to the east of Swakopmund, 9 km to the southwest of the town of Arandis, 10 km to the west of the Rössing Uranium Mine and 13 km to the northwest of the Husab Uranium Mine.

The ML 121 area falls within the state land of the ǂGaingu Communal Conservancy. The north-western and western portions of the ML area border the Dorob National Park and the south and south-eastern areas borders the Namib-Naukluft Park (NNP) with ML boundary running along the Khan Ephemeral River Channel (Fig. 1.5).

The main key land uses around the ML area is dominated by large-scale commercial uranium and dimension stone mining operations. The ML area falls within the southern portions of the ǂGaingu Communal Conservancy. This southern portion of the conservancy does not have conservancy tourism activities or agriculture comprising cattle and small stock commercial / subsistence communal farming activities that dominate the central and northern portions of this conservancy (Fig. 1.5).

The key business operations of the ǂGaingu Communal Conservancy area are centred around Spitskoppe. In addition to the campsite at Spitskoppe, a number of lodges are found in the general surrounding areas but not within or near the ML No. 121 boundaries.

A number of quarry areas have been identified within the ML area but not all of them are active (Plates 1.1 and 1.2). A number of quarry areas have been opened in the ML No. 121 but not all of them are active.

1.4.2 Supporting Infrastructure and Services

The ML 121 area falls within the state land with western portion of the ML No. 120 bordering the Dorob National Park (Fig. 1.5). Access to the ML area is through the B2 Road from Windhoek to Swakopmund and the ML area accessed along the private tarred road to the Husab Uranium Mine (Fig. 1.2-1.5). Rail service, via a 1.067 m gauge line, is located 12.0 km away at the Rössing Uranium Mine siding.

The following supporting infrastructures and services will be required:

(i) External and internal roads network: The Proponent is utilising the already existing external and internal road networks and created additional new access road linking the quarries (mine) sites to the main access.

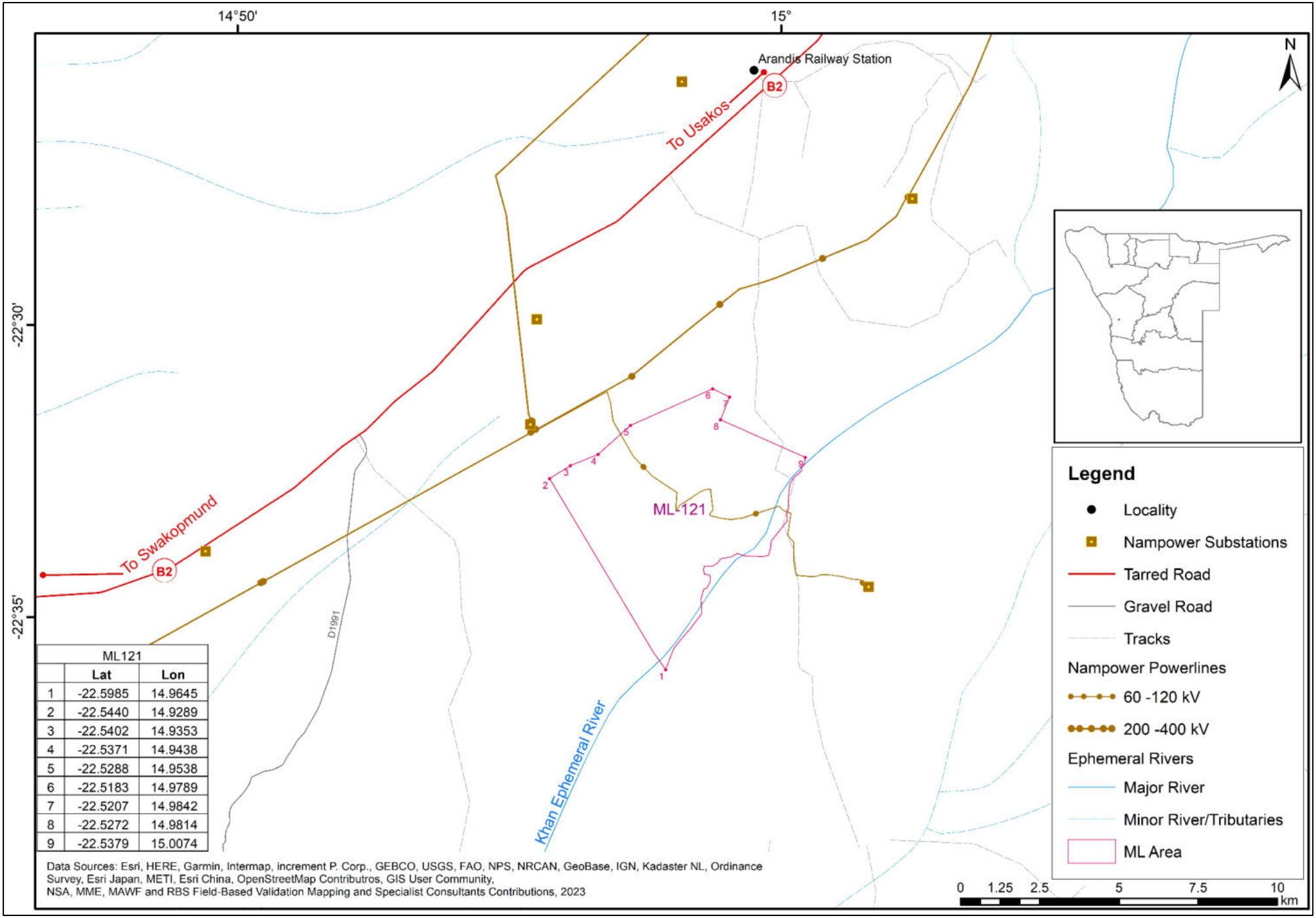
(ii) Water supply: Raw water continue to be sourced from local Arandis greywater facilities as well as local groundwater resources. The Proponent will utilise the existing boreholes and will also drill additional boreholes as may be required.

(iii) Energy Sources: Ongoing and proposed mining operations in ML No. 121 uses electricity supply from the national grid, diesels and solar energy sources.

(iv) Onsite administrations and offices (supporting infrastructure): Central facilities including workshop and other operational areas have been created in the ML area, and.

(v) Staff transport arrangements from Arandis and Swakopmund to the mine sites are provided by the Proponent as required.

Figure 1.2: Regional location of the ML No. 121.



ML121		
	Lat	Lon
1	-22.5985	14.9645
2	-22.5440	14.9289
3	-22.5402	14.9353
4	-22.5371	14.9438
5	-22.5288	14.9538
6	-22.5183	14.9789
7	-22.5207	14.9842
8	-22.5272	14.9814
9	-22.5379	15.0074

Figure 1.3: Detailed regional location of the ML No. 121 with comer coordinates and existing infrastructure.

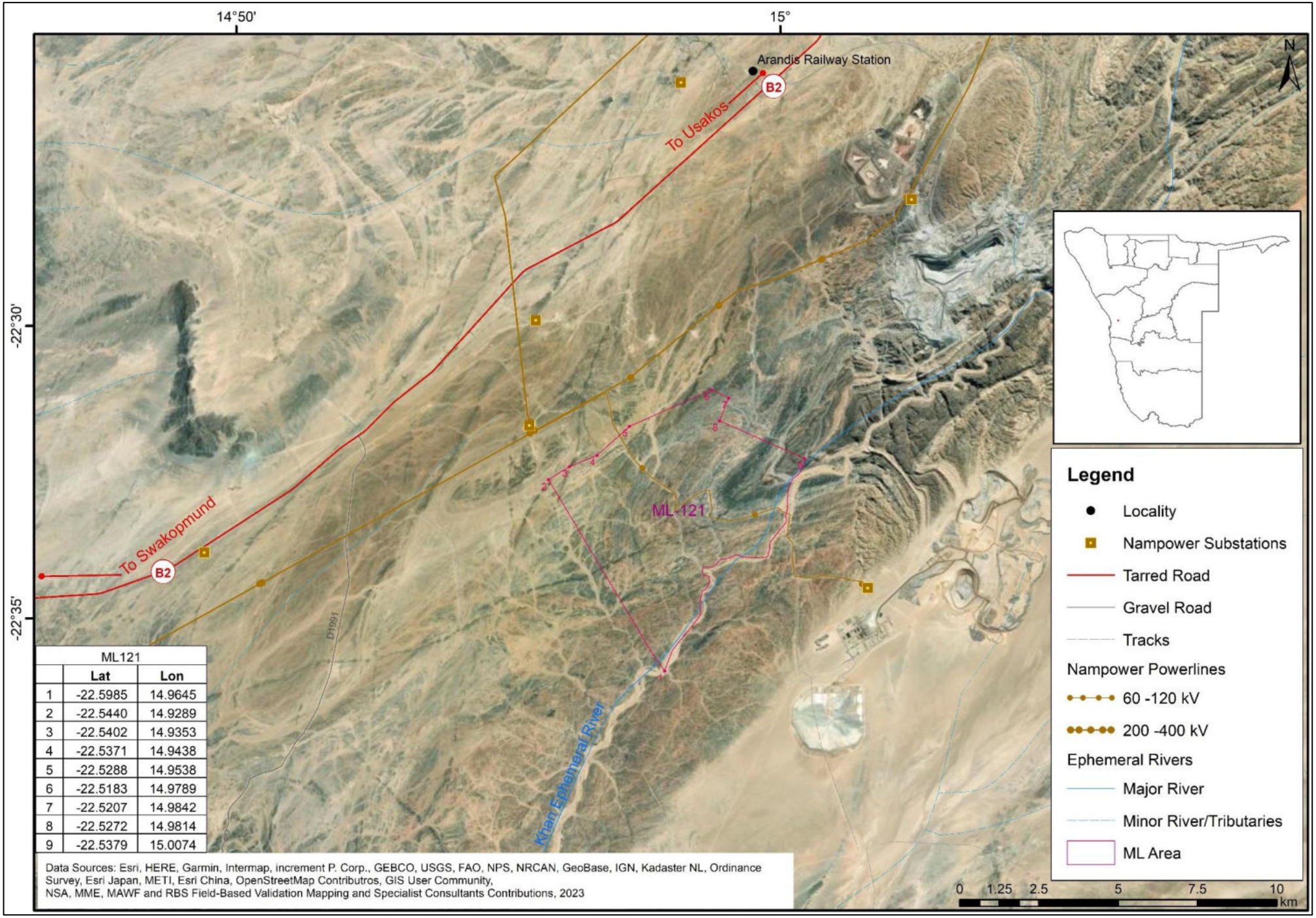


Figure 1.4: Detailed satellite map of the ML No. 121 and surrounding areas.

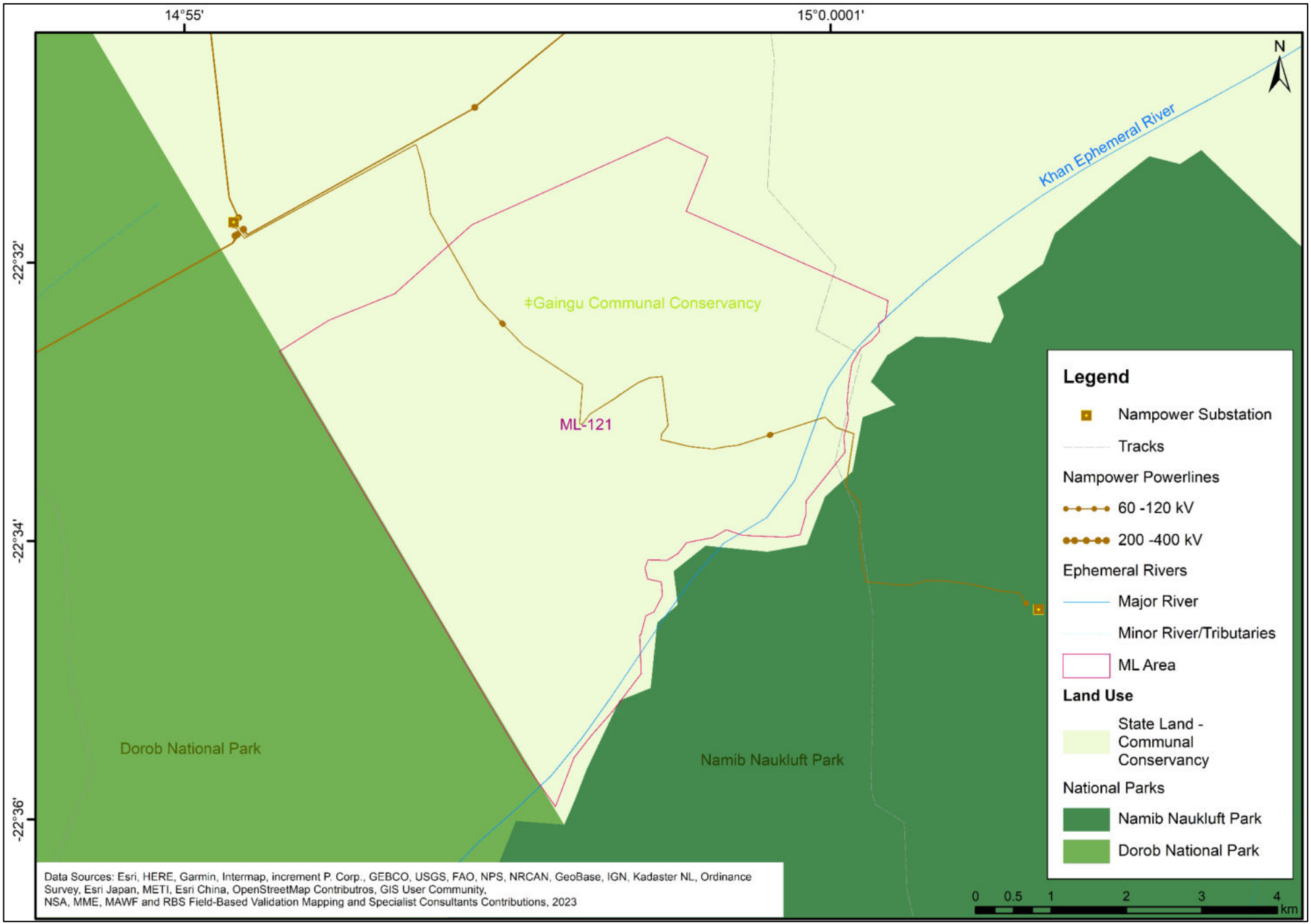


Figure 1.5: Detailed regional map of the ML No. 121 and surrounding land uses.

1.5 Summary of the Proposed Project

The following is the summary of the key components of the proposed project:

- **Commodity Group**: Dimension stone with special focus granites and other economic rock rocks. The Proponent, has applied to the Competent Authority (Ministry of Mines and Energy (MME)) to include base and rare metals, industrial minerals, precious metals, and semi-precious stone group of minerals on ML 121.

- **Size of Deposit**: Multiple quarries have been opened with mining only focused on one quarry based on the market needs and all supported by ongoing exploration activities.

- **Estimated duration of the operations**: An ML is valid for a maximum period of 25 years and renewable as provided for in the Minerals (Prospecting and Mining) Act, 1992, (Act No. 33 of 1992).

- **Socioeconomic benefits** / **Project Motivation**: The Proponent has invested extensively in the Namibian economy in last 20 years and in particular the Erongo Region. The project continues to create employment opportunities, value addition, in-situ potential underground minerals resources and high beneficiation opportunities in Namibia and additional socioeconomic benefits in terms of capital investments, license rental fees, royalties payable to Government, export earnings, foreign direct investments and various taxes payable to the Government.

- **Mining Technique:** Quarry, with a diamond wire saws and stone cutting machines used for cutting out small block 2 m x1 m x 0,6 m (majority), and larger blocks 2,8 m x1 ,3 x 0,8 m (minority) rectangular blocks.

- **Processing**: Further processing of the mined-out and sorted / graded granite blocks will take place at the processing plant. At the processing plant, a giant saw is used to cut up the granite into more manageable pieces.

- **Sources of water supply:** Greywater supplies from Arandis and groundwater from a local borehole drilled.

- **Sources of electricity supply**: National grid, diesel generator and solar.

- **Mining and operational equipment**: Multiple excavators, wheel-loaders, forklift loaders, diesel generator sets, four-cylinder mining machines, wire saw machines, giant saws, semi-automatic drilling machines, containers, trucks, 4 by 4 cars and air-compressors, and.

- **Waste Rock**: Waste rock is being stockpiled and used for other engineering applications such as coastal defences and mine final rehabilitation process. Fine grounded materials from the giant saw are being tested for potential use in soil enhancements for improved crops production applications in the agricultural industry. The effective capacity of the waste rock facility will vary but is likely to be in range of 120 × 90 m^3, calculated with 0.85 as capacity utilisation coefficient of waste rock per quarry area opened and fully operated.

1.6 Summary of the Receiving Environment

1.6.1 Climate

The climate patterns of the ML No. 121 and surrounding areas can be characterised as follows and as summarised in Figs. 1.6 and 1.7:

- The rainfall around ML area is less than 50 mm per year. The weather station situated at Rössing Uranium Mine which is in proximity of the proposed project area indicates a mean annual rainfall mainly showers between 30 and 35 mm in the area, while on the upper areas of the Khan River catchment, an average annual rainfall of 400 mm is received.

- Coastal fog that brings moisture in frequent but small amounts, which moderates the heat and moisture extremes on the western side.

- A steep rainfall gradient across the short breadth of the Namib and relatively wetter areas in the eastern part of the region. The rain and fog gradients run in opposite directions, with the zone of low precipitation from both sources in the middle zone.

- The wind regime which includes prominent southerly and south-westerly winds during the summer, and north-easterly winds in the winter that sometimes reach gale force and mobiles the entire desert surface, and.

- The Erongo region has different climate zones running parallel to the coastline four coastal climatic zone including the Coastal Foggy Zone, Middle Desert Zone, Eastern Desert Zone, Pro-Namibian Zone, the escarpment and the Namibian Highlands. The proposed project area is within the Middle Desert Zone.

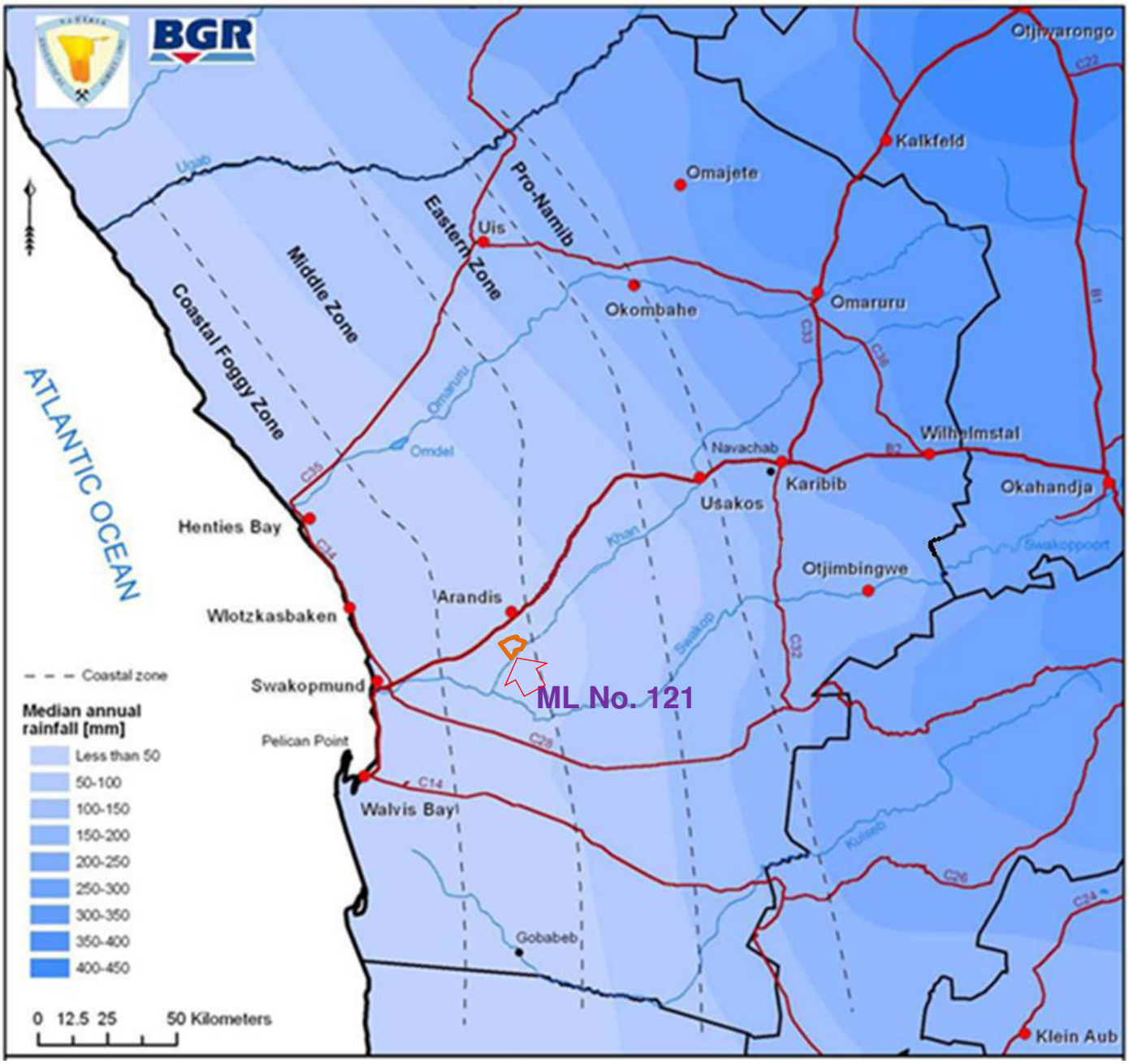


Figure 1.6: Median annual rainfall of central Namib Desert showing the location of the project area, ML No. 121 (Source: Ministry of Mines and Energy (MME), 2010).

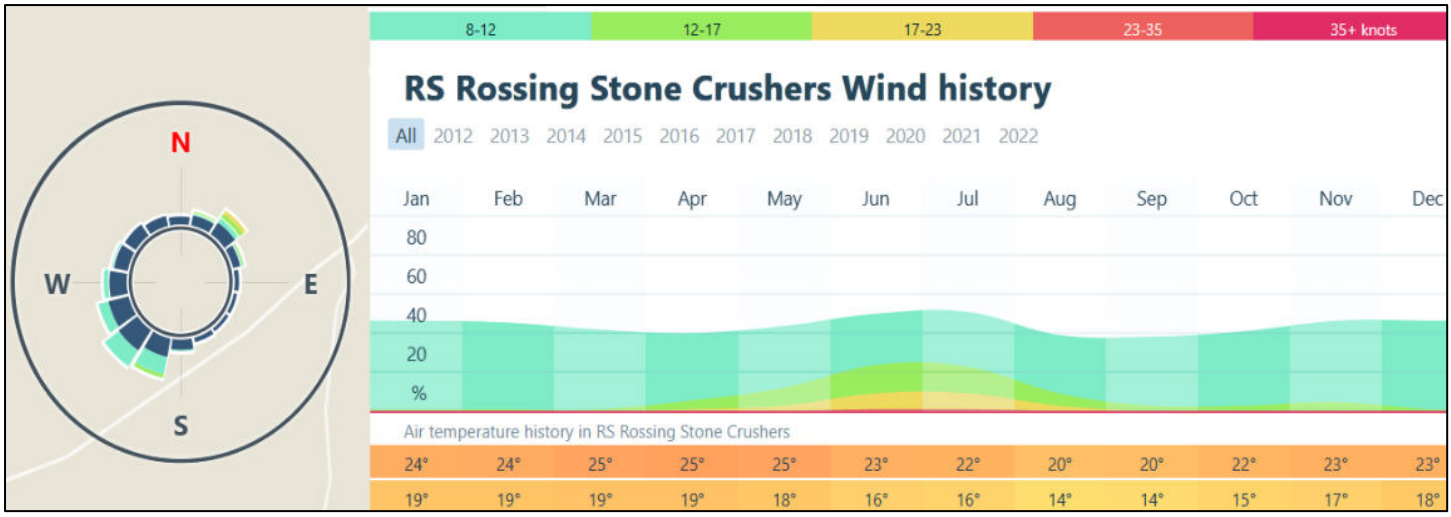


Figure 1.7: Historical weather data from the Rössing Uranium Mine weather stations situated to the northeast of the ML area (Source: https://windy.app/).

1.6.2 Topography

The ML area falls within the western edge Great Escarpment. The area is characterised by relatively flat topography, with the exception of local ridges and hills where more competent rocks occur, forming conspicuous topographic elevated surface expressions. Small, ephemeral rivers that flow only when it rains and dry most of the year dominate the general drainage. The local topographic profile ranges from 400 to 550 mamsl the north-eastern and northwest portions of the ML area respectively (Fig. 1.8).

1.6.3 Habitats and Ecosystem

Locally, the ML area falls at the edge of the central western escarpment and inselbergs and west highlands boundary (Fig. 1.9). Overall, it is estimated that at least 54 reptile, 5 amphibian, 45 mammal, 129 bird species (breeding residents), at least 20-47 species of larger trees and shrubs (>1m) and up to 50 grasses are known to or expected to occur in the general ML area of which a high proportion – especially reptiles (53.7%) – are endemics species. The most important areas in the general ML No. 121 isa are:

(i) **Rocky area – e.g., Dolerite hills/ridges and granite outcrops:** Rocky areas including the targeted granite resources generally have high biodiversity and consequently viewed as important habitat for all vertebrate fauna and flora. Escarpments, mountains and inselbergs are generally considered as sites of special ecological importance with granite domes are high in biotic richness and endemism (Curtis and Barnard 1998). Dolerite hills/ridges in particular have unique fauna – e.g., *Pachydactylus* and *Rhoptropus* species – and flora – e.g., *Aloe asperifolia*, *A. namibensis*, various *Commiphora* species, etc. Marble outcrops (white geology) have unique fauna – e.g., the endemic and range restricted *Pedioplanis husabensis*.

(ii) **Ephemeral drainage lines**: Ephemeral drainage lines usually support larger trees and consequently viewed as important habitat for all vertebrate fauna and flora. Ephemeral rivers are viewed as sites of special ecological importance mainly for its biotic richness; large desert-dwelling mammals; high value for human subsistence and tourism (Curtis and Barnard 1998). Such vegetated rivers in an otherwise extreme arid environment are unique habitat and a virtual lifeline to many desert dwelling faunas. Temporary rainwater pools and seeps are also known to occur in some of the major Ephemeral Rivers making these habitats a virtual lifeline to various desert dwelling fauna, and.

(iii) **Gravel plains**: Gravel plains in the area are known to host a variety of important lichen species as well as patches of *Aloe asperifolia*, while quartz dominated areas are known habitat for Lithop species.

Vertebrate fauna species most likely to be adversely affected by the proposed mining and ongoing exploration activities in the ML No. 121 would be sedentary reptile species associated with specific geology granite ridges/hills/outcrop targeted for mining– e.g., Pedioplanis husabensis and various Pachydactylus and Rhoptropus species. Important flora potentially adversely affected would be Aloe asperifolia, A. namibensis, various Commiphora species and Lithops ruschiorum var. ruschiorum and L. gracilidelineata var. gracilidelineata.

1.6.4 Geology

The stratigraphic succession in the study area has been considerably disrupted by tectonics. As a result, it becomes difficult to reconcile the stratigraphic column without involving structural complications. Many portions of the stratigraphic column, at both unit and formational scale, have been either thrust duplicated or thrust out along the NW AMC Khan Dome contact, and progressively thickened along the NE verging AMC contact. Most, if not all lithological contacts have been significantly tectonised. The stratigraphic column has been modified from 1967 to include the Nosib Formation within the Damara Sequence. The lower and upper stages were consequently separated into the Etusis and Khan Formations respectively (Table 1.1 and Fig. 1.10).

A large detachment fault is suspected to occur along the NW flank of the Khan Dome, which appears to have given rise to a thrust duplex or thrust stack. This is now believed to be the manifestation of a splay of the Omaruru Lineament Zone (OMLZ). A very large dilational flower structure is resident on the saddle between the Khan Dome and the Rossing Dome, both having undergone ***differential rotation***, due to ***en echelon,*** fractures/shears along the Welwitschia/Omaruru splay Lineaments oblique intersection. The degree of strain accommodated by the various formations, due to their contrasting rheologies, has resulted in considerable unequal thickening and thinning around the limbs of the AMC cored domes. Four and possibly five distinct geological divisions can be made on the field work and literature studies.
An 800Ma hiatus in deposition is recorded on the 2014 stratigraphic column, between the Abbabis Metamorphic Complex and the Damara Sequence. Essentially this suggests that no Palaeo-Proterozoic is recorded in this time interval. This would seem unlikely, and possibly these rocks have yet to be recognised.

Table 1.1: Reconciled simplified stratigraphic column (D.A.M. Smith/2214 Walvis) as compared to the stratigraphic column of the 1:250 000 2214 Walvis Bay geological map.

Stratigraphy (1967)	**Stratigraphy (2014)**	**Lithologies**	**Intrusive**
Superficial Deposits	Tertiary	Regolith deposits of calcrete, gypcrete, alluvium.	
Unconformity	Unconformity		
Stormberg Series	Karroo Supergroup	Flood basalts	Dolerite, felsite, porphyritic rhyolite.
Unconformity	Unconformity		
Khomas Series	Khomas Group	Schist, granite.	Evolved Li pegmatites, syn-post tectonic granites, quartz veins and blows, Karroo age dykes.
Upper Hakos Series	Aris Formation	Granite, schist.	"
Chuos Series	Chuos Formation	Glaciogenic mixtite.	"
Lower Hakos Stage	Rossing Formation	Dolomitic Granite.	"
Unconformity	Unconformity		
Nosib Formation 1.)Navachab Amphibolite		Amphibolite Hornfels and intercalated biotite quartzite.	"
1.)Nosib Upper Stage	Khan Formation	Grey green metarkose, biotite quartzite, felspathic quartzite.	"
2.)Nosib Lower Stage	Etusis Formation	Red-tan felspathic to pure quartzites, local basal conglomerate.	"
Unconformity			"
Abbabis Formation 1.)Biotite Schist 2.)Dolomitic Granite and calc-silicates. 3.)Abbabis Gneiss	Abbabis Metamorphic Complex (paragneiss, orthogneiss, amphibolite, schist, calcsilicate and migmatite).	Felspathic metarenites, biotite schist, para and orthoamphibolite, dolomitic granite, quartzite, augen gneiss, migmatite.	"

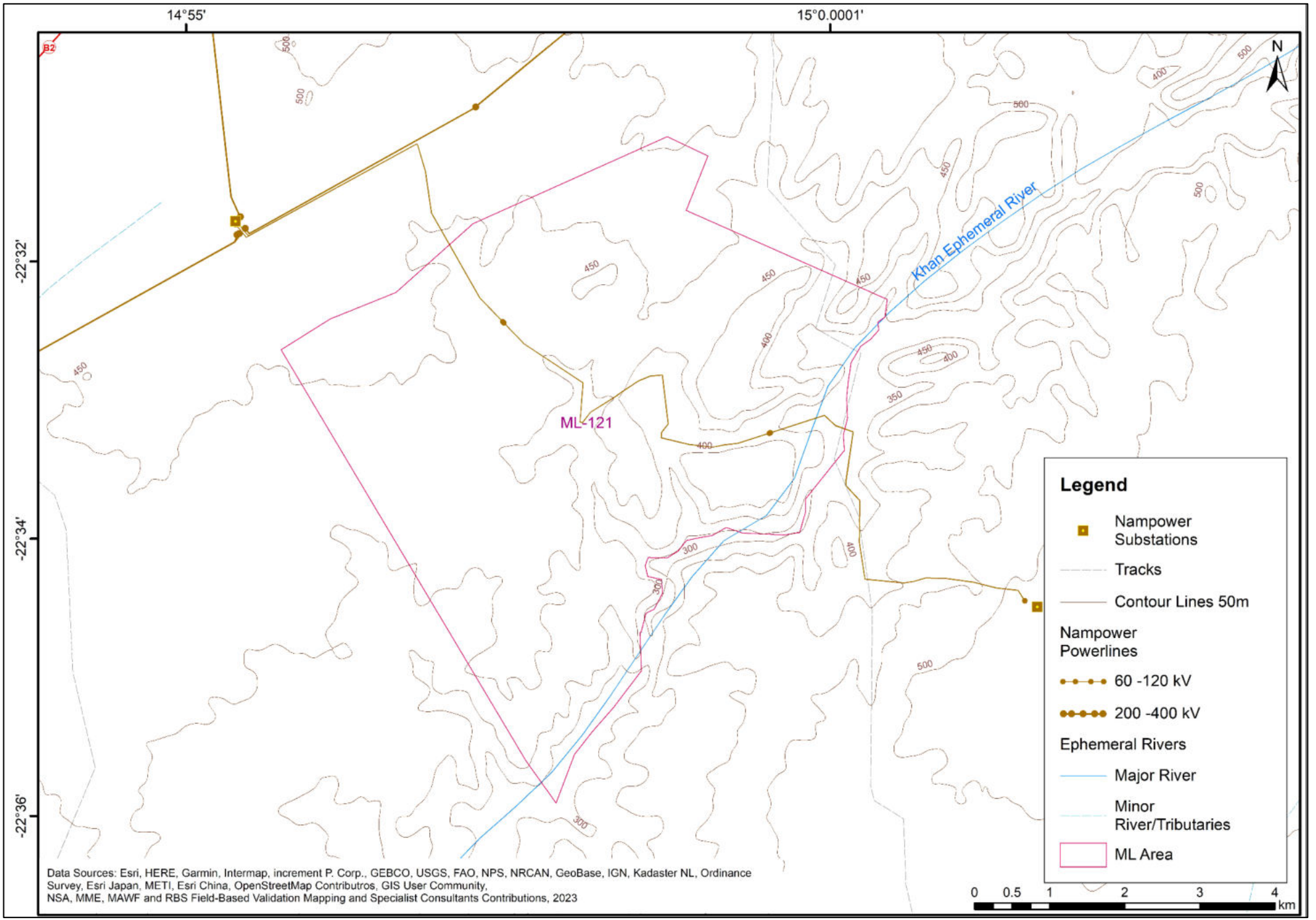


Figure 1.8: Detailed topographic map of the ML No. 121 and surrounding areas.

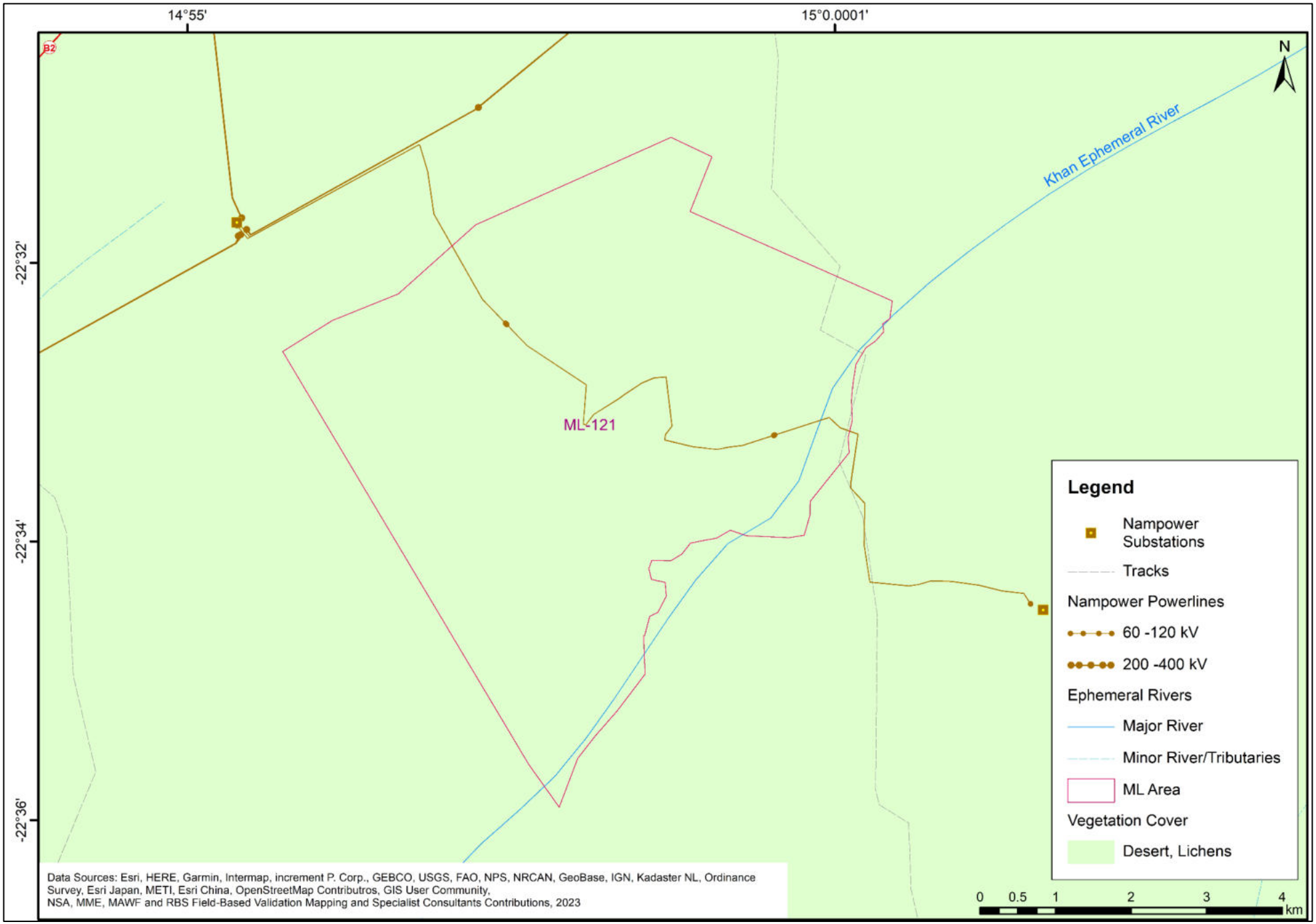


Figure 1.9: Vegetation map showing the location of the ML No. 121 and other licenses all falling within the western highland vegetation zone.

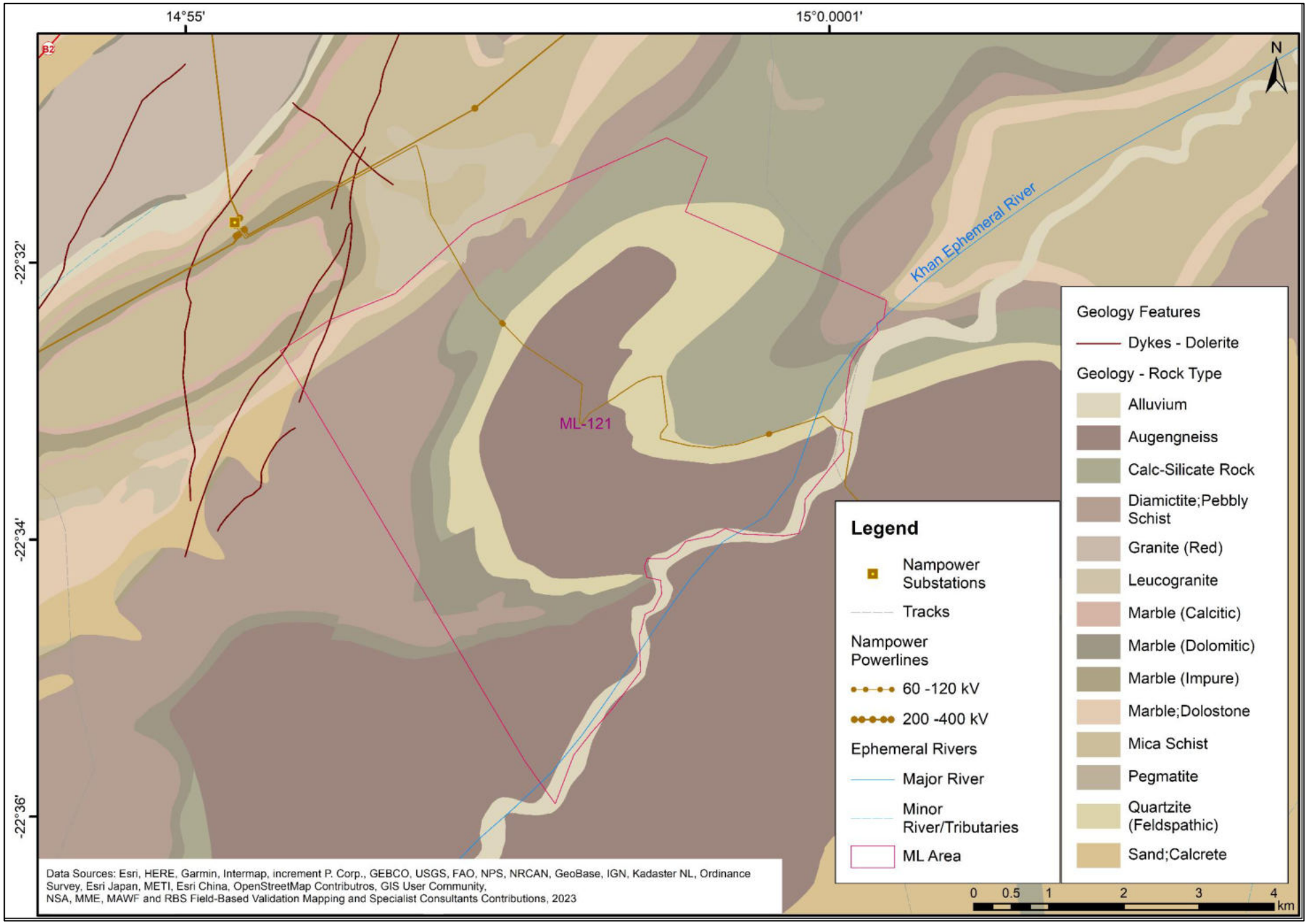


Figure 1.10: Simplified local geological map of the ML No. 121.

1.6.5 Water

Groundwater as well as surface water (only during the rainy season) from ephemeral river channels is the sources of water supply in the area as well as much of the Erongo Region. According to the Department of Water Affairs, (2001), the Erongo Region and in particular the ML area generally has a low groundwater potential (Fig. 1.11). The area with aquifer potential, more or less reflects the rainfall distribution, decreasing westwards. Knowledge of the aquifers in this area is sparse, due to the low number of boreholes and few on groundwater. Recharge from rainfall is an important parameter determining the groundwater potential as well as the degree of metamorphism of local rocks.

The groundwater potential of rocks decreases, as the degree of metamorphism increases. Crystalline rocks normally exhibit a very low tendency to store water, typical of the pegmatite zones and the alternating bands within the banded dolomitic granite and biotite-quartz schist found within the project area. The groundwater potential of these rock units is generally low, to locally moderate. Possible targets for water resources in this area are mainly fractured zones and faults that outcrop on the surface without impermeable infillings. But the success rate and yields for these rock types are generally low. The area along major ephemeral rivers may be more promising due to well developed fractures and faults that give rise to good recharge potential during the rainy season, typical of the local ephemeral spring found within the ML Area. The possible water sources for the proposed mining operations will be from groundwater sources. The hard-rock aquifer can supply sustainably at yields of up to 5 m^3/h per borehole as seen from past drilling records.

1.6.6 Socioeconomic

The ML No. 121 falls within the Dâures Constituency, Erongo Region in Namibia (Fig. 1.12). Dâures Constituency is bordered by the Omaruru Constituency in the east, Karibib Constituency in the southwest, Arandis Constituency in the west (Fig. 1.12). The Dâures Constituency is the largest constituency in the Erongo Region with an area of 13,490 km2. It has a population of approximately 12000 of which the majority depend on communal subsistence farming for their livelihood. The name Dâures is derived from the Khoe Khoegowab name of the Brandberg mountain which is the highest in Namibia. The constituency office is in Okombahe, with additional settlement offices in Uis and Okombahe. Omatjete, Tubusis and Okongue are other rural residential clusters in the Arandis.

The Erongo Region extending over 63,720 km^2 and the majority of the population lives in urban settlements, principally Swakopmund and Walvis Bay (Fig. 1.12). The surge in uranium exploration and mining operations has seen significant growth in various downstream industries in the coastal towns. The region has the second highest income per capita in the country after Khomas Region, and its relative prosperity is derived from fishing, mining and tourism.

Major mining activities in the region are Rössing Uranium, the Navachab gold mine, Langer Heinrich Uranium, Husab Uranium and the coastal salt operations. Other uranium projects that are also expected to advance further are those of Bannerman, Reptile Uranium and Swakop Uranium, but these do not exhaust the list of potential uranium operations in Erongo Region. The main commodities mined are uranium and gold. Extensive salt mining occurs along the coast at Walvis Bay and smaller companies operate at Cape Cross and Ugab.

Within the Erongo Region, access to economic opportunities and resources in the region is highly variable especially to rural communities. This is usually due to the isolation and underdeveloped infrastructures within these rural communities and is a situation experienced across all regional parts of the country. The uneven pattern to development, benefits and economic opportunity significantly has results in a regional Gini co-efficient of 0.60, with 19.7% of the population being poor and 7.1% being extremely poor (National Planning Commission, 2006, 2007 and 2012). The Erongo Regional Council has adopted developed strategies to address poverty reduction and economic development, with primarily focus on rural areas by initiating measures to insure sound management of the region's natural resources (www.erc.com.na).

The Region's main focal areas for development include water resources, the environment, and tourism, fishing and marine resources.

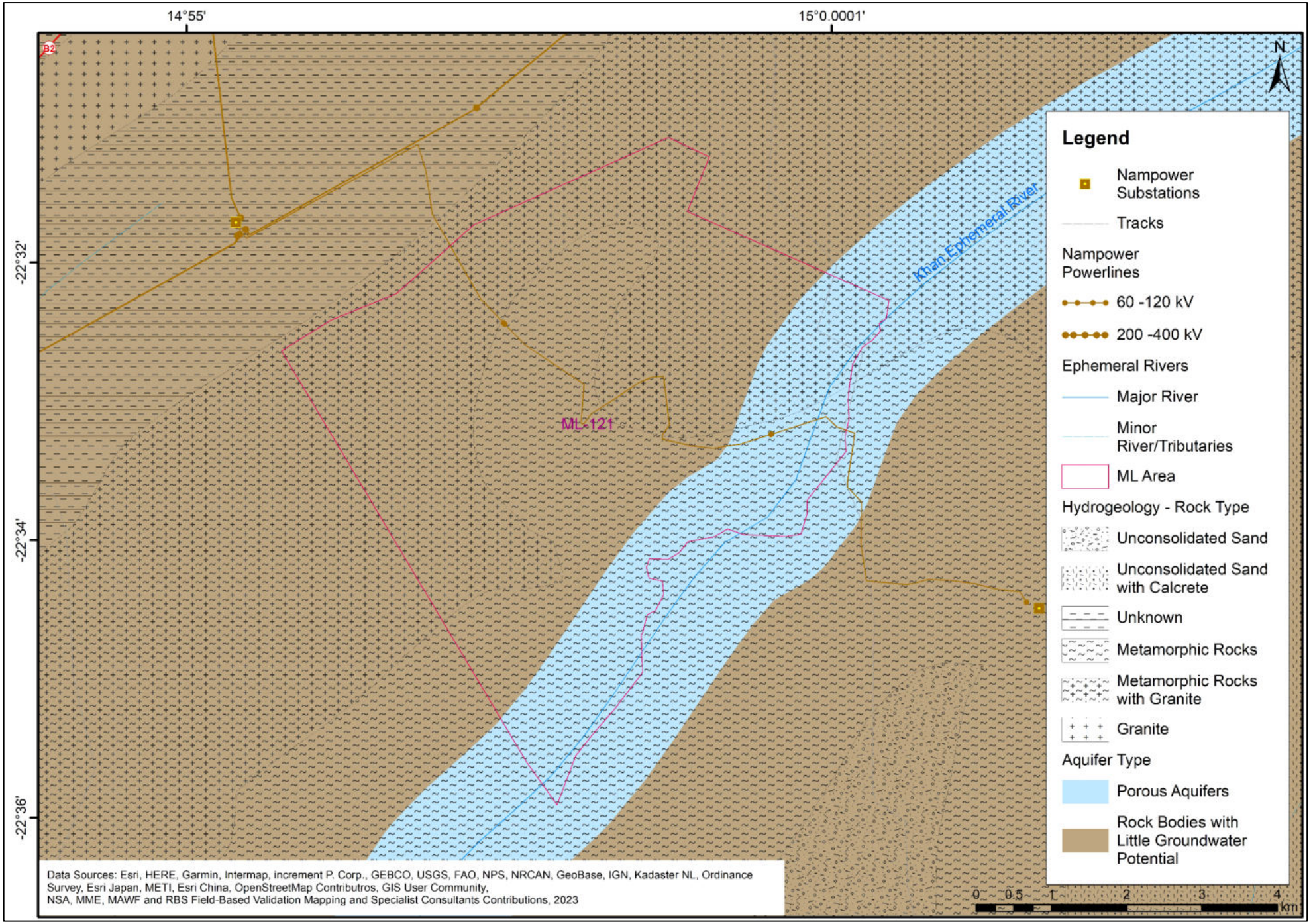


Figure 1.11: Simplified local hydrogeological map of the ML No. 121.

Figure 1.12: Map of the Erongo Region showing the location of the ML No. 121 (Source: www.erc.com.na).

1.6.7 Archaeology, Historical and Cultural Resources

The following are the key recommended actions related to archelogy in the ML Area:

(i) Contractors working on the site should be made aware that under the National Heritage Act, 2004 (Act No. 27 of 2004) any items protected under the definition of heritage found in the course of development should be reported to the National Heritage Council.

(ii) The chance finds procedure as outlined in the EMP must be implemented at all times, and.

(iii) Detailed field survey should be carried out if suspected archaeological resources or major natural cavities / shelters have been unearthed during the mining operations.

2. OBJECTIVES OF THE EMP

2.1 Summary Objectives

This EMP provides a detailed plan of actions required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively. The EMP also provides the management actions with roles and responsibilities requirements for the successful implementation of environmental management strategies by the Proponent.

2.2 EMP Management Linkages

The mitigation measures described in this EMP report are based on the impacts assessment results detailed in the EIA Report. The EMP must be continuously updated during the implementation of the proposed project. Within the framework of the existing Sustainability Policy of the Proponent, the EMP is to be incorporated in the Environmental Management System (EMS) of the company. This EMP Reports incorporates the provisions of the Namibian Environmental regulations and policies as well as international environmental best practices in mining development, operational, rehabilitation, closure and aftercare activities.

2.3 Summary of Impact Assessment Results

2.3.1 Summary of Impacts Assessment Methodology

The following is the summary of the proposed mining operations and ongoing exploration activities developmental stages that have been assessed in the EIA Report with mitigation measures provided in this EMP Report: Preconstruction, construction, operation, ongoing exploration activities, monitoring and rehabilitation, and decommissioning, closure and aftercare.

The detailed outline of all the activities associated with each of the above project developmental stages as sources of potential environmental impacts are outlined in Table 2.1. The impact assessment methodology has adopted a two-dimensional matrix approach in predicting the potential impacts of the proposed project on the receiving environment.

The two-dimensional matrix consisted of the following cross-referencing (Tables 2.2 and 2.3):

- The activities linked to the project that could have an impact on the receiving environment, and.
- The existing environmental and social conditions that could possibly be affected by the project.

The impact assessment considerations included land disturbance/land use impacts. potential impacts to specially designated areas. impacts to soil, water and air resources. impacts to vegetation, wildlife, wildlife habitat, and sensitive species. visual, cultural, paleontological, socioeconomic and potential impacts from hazardous materials are provided in the EIA Report.

2.3.2 Summary of Impact Assessment Results

In order to determine the likely environmental impacts as well as the overall significant impacts of individual sources associated with the proposed mining operations and ongoing exploration activities within the ML No. 121 (Table 2.1), an impact identification and assessment process was undertaken as detailed in this report. Details of the impact assessment results, definitions, methodology as well as the baseline \ receiving environment are provided in the EIA Report.

As detailed in the EIA Report, the significant impact identification and assessment processes focused on the evaluation of the influences of the proposed project activities pathways and the likely targets or receptor (receiving environment). In this process, components of the project activities that are likely to impact the natural environment (physical, biological and socioeconomic) were broken down into individual development stages and activities.

The summary of the overall impact and significant impact assessment results as detailed in the EIA Report associated with the proposed activities / sources of potential impacts with respect to the receiving environment that could potentially be affected are presented in Tables 2.2 and 2.3 respectively.

The overall summary of the impact assessment results before and after the implementation of the mitigation as detailed in this EMP Report for selected key potential environmental issues likely to be associated with the proposed mining operations and ongoing exploration activities in the ML No. 121 are shown in Table 2.4.

Table 2.1: Outline of proposed project developmental stages and all the associated activities as sources of potential environmental impacts.

PROJECT PHASE	DEVELOPMENT ACTIVITIES FOR EACH PHASE	
PRE-CONSTRUCTION	1. Site investigations to inform the mine design and layout	
	2. Engineering design of the pit areas and the support facilities	
	3. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure	
	4. Access roads upgrading of existing tracks / creation of new routes as may be required	
	5. Implementation of the human resources, community and social programs for the operational phase of the project	
	6. Top soil removal and storage for the pit areas and supporting infrastructure	
	7. Development of the temporary construction camp	
	8. Installation of containerised offices, workshops, storage facilities.	
CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads
		2. Waste rock and mine blocks stockpiles
		3. Water supply systems
		4. Power infrastructure, including powerline and distribution systems (Generator and Solar)
		5. Administration blocks and warehouses
		6. Fuel supply and storage
		7. Workshop and equipment maintenance facilities
		8. Wastewater treatment systems
		9. Domestic solid waste disposal storage / transfer facility
		10. Storm water management in the pit and supporting infrastructure
	PIT AREA	1. Mining operations
		2. Actual and stripping of the overburden to create direct access to the fresh granite
		3. Ore production for test mining operations
		4. Test mining and commissioning
OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations as maybe required)	
	2. Transportation of the mined blocks from pit to the sorting	
	3. Storage and transportation of granite blocks for further processing	
	4. Waste rock management / reprocessing / recovery	
	5. Ongoing exploration support	
	6. Ongoing rehabilitation and maintenance	
	7. Waste water management	
	8. Municipal solid waste management / transfer to Arandis	
	9. Environmental performance monitoring	
DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	
	2. Closure of open pits	
	3. Closure of solid waste transfer station	
	4. Backfill all excavated areas	
	5. Closure of the mined blocks storage area	
	6. Decommissioning of water and electricity infrastructure	
	7. Overall land reclamation	
	8. Restoration of internal roads	
	9. Revegetation and aftercare as may be required	

Table 2.2: Mining operations and ongoing exploration activities – overall impact assessment matrix results as detailed in the EIA Report.

SCALE		DESCRIPTION
0		no observable effect
1		low effect
2		tolerable effect
3		medium high effect
4		high effect
5		very high effect (devastation)

				RECEPTORS / TARGETS THAT MAY BE IMPACTED							
				PHYSICAL AND SOCIOECONOMIC ENVIRONMENT				BIOLOGICAL ENVIRONMENT			
SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES		Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic- Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g. HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION	1. Site investigations to inform the mine design and layout		3 (-)	1 (-)	3 (+)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)
		2. Engineering design of the pit areas and the support facilities		3 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)
		3. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure		3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
		4. Access roads upgrading of existing tracks / creation of new routes as may be required		3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		5. Implementation of the human resources, community and social programs for the operational phase of the project		3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Waste rock and mine blocks stockpiles	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Water supply systems	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			4. Power infrastructure, including powerline and distribution systems (Generator and Solar)	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			5. Containerised administration blocks and warehouses	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			6. Fuel supply and storage	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			7. Workshop and equipment maintenance facilities	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			8. Wastewater treatment systems	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			9. Domestic solid waste disposal storage / transfer facility	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			10. Storm water management in the pit and supporting infrastructure	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		MINE WORKINGS	1. Mining operations	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Actual and stripping of the overburden to create direct access to the fresh granite	3 (-)	1 (-)	3 (+)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Ore production for test mining operations	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)
			4. Test mining and commissioning	3 (-)	1 (-)	3 (+)	1 (-)	2(-)	2(-)	2(-)	2(-)

Table 2.2: *Cont.*

SCALE	DESCRIPTION
0	no observable effect
1	low effect
2	tolerable effect
3	medium high effect
4	high effect
5	very high effect (devastation)

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES	RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Natural Environment – Air, Noise, Water, Green Space, Climate Change	PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Socioeconomic- Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g. HIV Aids,	PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Archaeological Cultural, Historical and Spiritual Resources	BIOLOGICAL ENVIRONMENT: Flora	BIOLOGICAL ENVIRONMENT: Fauna	BIOLOGICAL ENVIRONMENT: Habitat	BIOLOGICAL ENVIRONMENT: Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Transportation facilities, including access roads to the site and on-site roads	3(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		2. Waste rock and mine blocks stockpiles	3(-)	1(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		3. Water supply systems	3(-)	1(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		4. Power infrastructure, including powerline and distribution systems (Generator and Solar)	3(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		5. Containerised administration blocks and warehouses	3(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		6. Fuel supply and storage	2(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		7. Workshop and equipment maintenance facilities	2(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		8. Wastewater treatment systems	1(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
		9. Domestic solid waste disposal storage / transfer facility	1(-)	0(-)	3(+)	1 (-)	1(-)	2(-)	1(-)	1(-)
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Storm water management in the pit and supporting infrastructure	0(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		2. Mining operations	3(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		3. Actual and stripping of the overburden to create direct access to the fresh granite	3(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		4. Ore production for test mining operations	3(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		5. Test mining and commissioning	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		6. Transportation facilities, including access roads to the site and on-site roads	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		7. Transportation facilities, including access roads to the site and on-site roads	2(+)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		8. Waste rock and mine blocks stockpiles	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)
		9. Water supply systems	2(-)	0(-)	3(+)	1 (-)	2(-)	2(-)	2(-)	2(-)

Table 2.3: Mining operations and ongoing exploration activities - overall significant impact assessment matrix results as detailed in the EIA Report.

IMPACT SEVERITY	IMPACT LIKELIHOOD				
	Extremely Unlikely [0]	Unlikely [1]	Low Likelihood [2]	Medium Likelihood [3]	High Likelihood [4]
Slight [A]	[A0]	[A1]	[A2]	[A3]	[A4]
Low [B]	[B0]	[B1]	[B2]	[B3]	[B4]
Medium [C]	[C0]	[C1]	[C2]	[C3]	[C4]
High [D]	[D0]	[D1]	[D2]	[D3]	[D4]

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES			RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT				BIOLOGICAL ENVIRONMENT			
					Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic-Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g. HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION	1. Site investigations to inform the mine design and layout			B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
		2. Engineering design of the pit areas and the support facilities			B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
		3. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure			B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
		4. Access roads upgrading of existing tracks / creation of new routes as may be required			B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
		5. Implementation of the human resources, community and social programs for the operational phase of the project			B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1.	Transportation facilities, including access roads to the site and on-site roads	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			2.	Waste rock and mine blocks stockpiles	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			3.	Water supply systems	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			4.	Power infrastructure, including powerline and distribution systems (Generator and Solar)	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			5.	Containerised administration blocks and warehouses	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			6.	Fuel supply and storage	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			7.	Workshop and equipment maintenance facilities	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			8.	Wastewater treatment systems	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			9.	Domestic solid waste disposal storage / transfer facility	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			10.	Storm water management in the pit and supporting infrastructure	B4 (-)	A1(-)	D3 (+)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
		MINE WORKINGS	1.	Mining operations	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			2.	Actual and stripping of the overburden to create direct access to the fresh granite	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			3.	Ore production for test mining operations	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			4.	Test mining and commissioning	B4 (-)	A1(-)	D3 (+)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)

Table 2.3: *Cont.*

IMPACT SEVERITY	IMPACT LIKELIHOOD				
	Extremely Unlikely [0]	Unlikely [1]	Low Likelihood [2]	Medium Likelihood [3]	High Likelihood [4]
Slight [A]	[A0]	[A1]	[A2]	[A3]	[A4]
Low [B]	[B0]	[B1]	[B2]	[B3]	[B4]
Medium [C]	[C0]	[C1]	[C2]	[C3]	[C4]
High [D]	[D0]	[D1]	[D2]	[D3]	[D4]

			RECEPTORS / TARGETS THAT MAY BE IMPACTED							
			PHYSICAL AND SOCIOECONOMIC ENVIRONMENT				BIOLOGICAL ENVIRONMENT			
SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES	Natural Environment – Air, Noise, Water, Green Space, Climate Change	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic- Human Rights, Natural and Social Capital Job, Investment, Taxes and Social Issues e.g. HIV Aids,	Archaeological Cultural, Historical and Spiritual Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations as maybe required)	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		2. Transportation of the mined blocks from pit to the sorting	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		3. Storage and transportation of granite blocks to for further processing	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		4. Waste rock management / reprocessing / recovery	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		5. Ongoing exploration support	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		6. Ongoing rehabilitation and maintenance	B2 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		7. Waste water management	B2 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		8. Municipal solid waste management / transfer to Arandis or Swakopmund	A1(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		9. Environmental performance monitoring	A1(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		2. Closure of open pits	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		3. Closure of solid waste transfer station	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		4. Backfill all excavated areas	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		5. Closure of the mined blocks storage area	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		6. Decommissioning of water and electricity infrastructure	B4 (-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		7. Overall land reclamation	A1(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		8. Restoration of internal roads	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)
		9. Revegetation and aftercare as may be required	C3(-)	A1(-)	D3 (+)	A1(-)	A1(-)	A1(-)	A1(-)	A1(-)

Table 2.4: Summary of the impact assessment results before and after the implementation of the mitigation for selected key potential environmental issues likely to be associated with the proposed mining operations and ongoing exploration activities.

ENVIRONMENTAL IMPACT OR ISSUE	SIGNIFICANCE RATING	
	BEFORE MITIGATION	AFTER MITIGATION
1. Impacts on Climate Change and air quality (PM_{10} & dust outfall including metals)	Low (-)	Very Low to negligible
2. Impacts on soil / habitats/ ecosystem	Medium (-)	Low
3. Impacts on flora / habitats/ ecosystem	Low (-)	Very Low to negligible
4. Impacts on invertebrates/ habitats/ ecosystem	Medium (-)	Very Low to negligible
5. Impacts on reptiles/ habitats/ ecosystem	Medium (-)	Very Low to negligible
6. Impacts on birds/ habitats/ ecosystem	Medium (-)	Very Low to negligible
7. Impacts on mammals/ habitats/ ecosystem	Medium (-)	Very Low to negligible
8. Impact on groundwater levels / resource	Low (-)	Low and localised
9. Impacts on groundwater quality (offices, ablutions, waste, refuelling)	Medium (-)	Low and localised
10. Impacts on groundwater quality (from waste management area drainage)	Medium (-)	Low and localised
11. Impacts on volumes of surface runoff	Low (-)	Very Low to negligible
12. Impacts on surface water quality	Medium (-)	Low and localised
13. Impacts of solid and liquid waste	Medium (-)	Low and localised
14. Electricity demand	Low (-)	Low
15. Impacts of power line	Low (-)	Low
16. Visual impacts and lighting	Low (-)	Very Low to negligible
17. Impacts of water demand	Medium (-)	Low
18. Impacts of water supply pipeline	Low (-)	Very Low to negligible
19. Road traffic and NamPort Walvis Bay Port Facility	Low (-)	Low localised
20. Mine rehabilitation, closure and aftercare	Medium (+)	High positive impact
21. Local positive socioeconomic including benefits of direct and indirect employment	High (+) Medium term	High long-term positive impact
22. Regional (Erongo region) and National (Namibia) overall positive socioeconomic benefits	High (+) Medium term	High long-term positive impact
23. Impacts related to other land users / conflict / coexistence	Medium (-)	Very low localised impact
24. Negative Socioeconomic and HIV/AIDS	Low (-)	Low
25. Labour and human rights	High (+)	High (+)
26. Occupational Health and Safety	Low (-)	Low and localised impact
27. Emergency Response Plan	Low (-)	Low and localised impact

2.4 Hierarchy of EMP Mitigation Measures Implementation

A hierarchy of methods for mitigating significant adverse effects has been adopted in order of preference and as follows:

(i) Enhancement, e.g., prioritising local employment opportunities and services or provision of new habitats.

(ii) Avoidance, e.g., corporate policy to promote coexistences or sensitive design to avoid effects on ecological receptors.

(iii) Reduction, e.g., limitation of effects on receptors through design changes, and.

(iv) Compensation, e.g., community benefits.

2.5 Roles and Responsibilities for Mitigation Measures Implementation

2.5.1 Overview

Management of the environmental elements that may be affected by the different activities of the proposed mining operations and ongoing exploration activities mining and ongoing exploration activities is an important element of this EMP. The EMP identifies the activity groups / environmental elements, the aspects / targets, the indicators, the schedule for implementation and who should be responsible for the management to prevent major impacts that the different project activities may have on the receiving environment as assessed in the EIA with the impact assessment results summarised in Tables 2.2 - 2.3.

It is highly imperative that there is an effective and response organisational structure of Namibia Nuclear Corporation (Pty) Ltd that defines the roles, responsibilities and authority to implement the provisions of this EMP. The summary of such a structure is shown in Fig. 2.1. Provision shall be made, on an ongoing basis, for sufficient management support and human and financial resources.

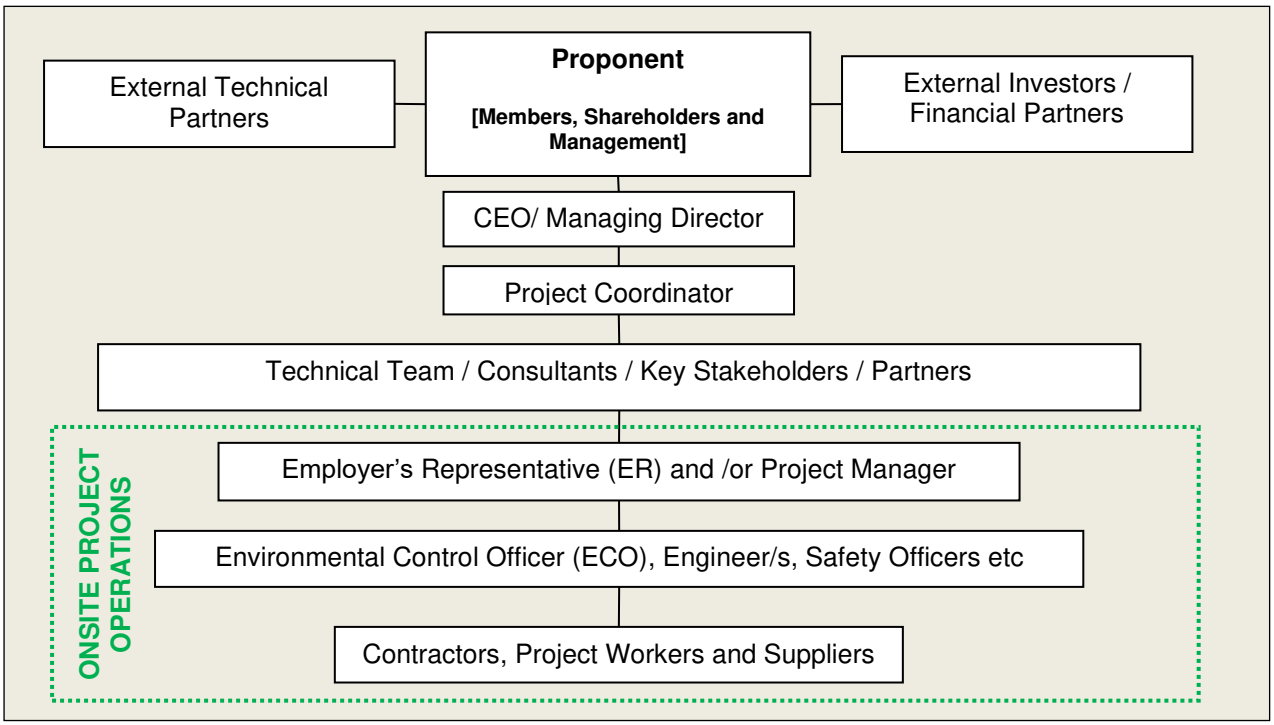


Figure 2.1: Namibia Nuclear Corporation (Pty) Ltd indicative organisational structure for EMP implementation for the proposed mining operations and ongoing exploration activities.

2.5.2 Employer's Representative (ER)

Namibia Nuclear Corporation (Pty) Ltd is to appoint an **ER** with the following responsibilities covering the overall socioeconomic aspects, preconstruction, construction, operation, ongoing exploration activities, monitoring and rehabilitation and decommissioning, closure and aftercare phases of the proposed mining operations and ongoing exploration activities:

- Act as the Employer's (Namibia Nuclear Corporation (Pty) Ltd) on-site project manager and implementing agent.
- Appoint the Environmental Control Officer (ECO).
- Ensure that the Employer's responsibilities are executed in compliance with the relevant legislation and the EMP for the construction stage.
- Ensure that all the necessary environmental authorizations and permits have been obtained.
- Assist the Contractor in finding environmentally responsible solutions to challenges that may arise (with input from the ECO).
- Should the ER be of the opinion that a serious threat to, or impact on the environment may be caused by the construction operations, he/she may stop work. the Employer must be informed of the reasons for the stoppage as soon as possible.
- The ER or as may be contractually delegated, has the authority to institute disciplinary proceedings in accordance with the provisions of the national laws for transgressions of basic conduct rules and/or contravention of the EMP.
- Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the ER can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied.
- Report to the Employer on the implementation of this EMP on site (with input from the ECO and/or independent environmental auditor).
- Maintain open and direct lines of communication between the Employer, ECO, Contractor and stakeholders with regards to environmental matters, and.
- Attend regular site meetings and inspections.

2.5.3 Environmental Control Officer (ECO)

The **ECO** has the following responsibilities covering the overall socioeconomic aspects, preconstruction, construction, operation, ongoing exploration activities, monitoring and rehabilitation and decommissioning, closure and aftercare phases of the proposed mining operations and ongoing exploration activities:

- Assist the ER in ensuring that the necessary environmental authorizations and permits have been obtained.
- Assist the ER and Contractor in finding environmentally responsible solutions to challenges that may arise.
- Conduct environmental monitoring as per EMP requirements.
- Oversee basic conduct rules and/or contraventions of the EMP to the ER.
- Advise the ER on the removal of person(s) and/or equipment not complying with the specifications of the EMP.

- ❖ Carry out regular site inspections (on average once per week) of all construction areas with regards to compliance with the EMP. report any non-compliance(s) to the ER as soon as possible.

- ❖ Organize for an independent internal audit on the implementation of and compliance to the EMP to be carried out half way through the construction period. audit reports to be submitted to the ER.

- ❖ Organize for an independent post-construction environmental audit to be carried out before operations commence.

- ❖ Continuously review the EMP and recommend additions and/or changes to the EMP document.

- ❖ Monitor the Contractor's environmental awareness training for all new personnel coming onto site.

- ❖ Keep records of all activities related to environmental control and monitoring. the latter to include a photographic record of the construction and environmental control and rehabilitation process, and a register of all major incidents, and.

- ❖ Attend regular site meetings.

2.5.4 Contractors and Subcontractors

The responsibilities of the **Contractors and Subcontractors** covering the overall socioeconomic aspects, preconstruction, construction, operation, ongoing exploration activities, monitoring and rehabilitation and decommissioning, closure and aftercare phases of the proposed mining operations and ongoing exploration activities include:

- ❖ Comply with the relevant legislation and the EMP for the Construction Phase of the proposed mine.

- ❖ Preparation and submission to Namibia Nuclear Corporation (Pty) Ltd of the following Management Plans:

    - o Environmental awareness training and inductions.

    - o Emergency preparedness and response.

    - o Waste management procedure, and.

    - o Health and safety requirements.

- ❖ Ensure adequate environmental awareness training for senior site personnel.

- ❖ Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement. the ECO is to provide the course content and the following topics, at least but not limited to, should be covered:

    - o The importance of complying with the relevant Namibian, international and best practice legislation.

    - o Roles and Responsibilities, including emergency preparedness.

    - o Basic rules of conduct (Do's and Don'ts).

    - o EMP: aspects, impacts and mitigation.

- Disciplinary procedures in accordance with the provisions of the law for failure to adhere to the EMP, and.
- Health and Safety requirements.

❖ Record keeping of all environmental awareness training and induction presentations, and.

❖ Attend regular site meetings and environmental inspections.

2.5.5 Construction Supporting Teams

The construction of the mine infrastructures and mine workings with activities as outlined in Table 3.1 will require an array of specialist teams working very closely with their suppliers and core Namibia Nuclear Corporation (Pty) Ltd onsite operations team.

The following is a summary of some of the specialists that will be required as part of the team of contractors and subcontractors covering the overall socioeconomic aspects during preconstruction, construction, operation, ongoing exploration activities, monitoring and rehabilitation and decommissioning, closure and aftercare phases of the proposed mining operations and ongoing exploration activities:

❖ Mining, structural, civil and mechanical engineers and crane contractors, electrical contractors and other specialist teams, each with their respective sub-contractors and suppliers, would report directly to the Employer's Representative (ER), acting as the onsite Project Manager.

3. THE EMP

3.1 Overview

This EMP Report is one of the most important outputs of the environmental assessment process and is the synthesis of all the proposed mitigation measures and monitoring actions, set to a timeline and with specific assigned responsibilities. The aim of the EMP is to assist Namibia Nuclear Corporation (Pty) Ltd (the Proponent), Contractors and Subcontractor to ensure that the day-to-day operations as well as medium to long term strategies are carried out in an environmentally responsible manner, thereby preventing or minimising the negative effects and maximising the positive effects of the project-related activities on the natural receiving environment.

The EMP provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively. The EMP also provides the management actions with roles and responsibilities requirements for implementation of environmental management strategies by the Proponent through the Contractors and Subcontractors who will be undertaking the various activities of the proposed mining operations and ongoing exploration activities. The EMP gives commitments including financial and human resources provisions for effective management of the likely environmental liabilities during and after the implementation of the proposed mining operations and ongoing exploration activities programme.

Separate Management Plans (MPs) have been prepared for the mining operations and ongoing exploration activities covering the overall socioeconomic aspects, preconstruction, construction, operation, ongoing exploration activities, monitoring and rehabilitation and decommissioning, closure and aftercare phases of the proposed mining operations and ongoing exploration activities. The MPs are presented as comprehensive matrices: for each Activity/Process and related Aspects (defined by the International Organisation for Standardisation ISO 14001:2004 as element of an organisation's activities or products or services that can interact with the environment; environment is defined as surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation) and Impacts (any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects), Management Actions required to address the impacts arising directly and indirectly from the various aspects of the proposed mining project, with Responsible Persons and Timing for each, are listed.

3.2 Project Socioeconomic Management Plans (MPs)

Based on the findings of the impact assessment undertaken in EIA Report and summarised in Tables 2.2 and 2.3 of this EMP Report, the proposed mining operations and ongoing exploration activities will have local, regional and national positive impacts. The ML No. 121 is situated in a highly prospective area for dimensions stones (granite) associated with local Damara metamorphic rocks. The proposed mining operations and ongoing exploration activities will have good socioeconomic benefits including value addition to the potential granite resources in the area which otherwise would not have been known if the exploration in the ML No. 121 did not take place. Namibia Nuclear Corporation (Pty) Ltd.

The proposed project development will have great positive benefits at local (Arandis and Walvis Bay Areas), regional (Erongo Region) and national (Namibia) levels and these benefits include the following:

(i) Provide direct and many more indirect contracts and employment opportunities, to local Namibians especially in the Erongo Region where the quarries and the stones processing plants are all located. Around 386 people are directly employed by the Group.

(ii) Other direct and indirect socioeconomic benefits in terms of increased in local communities purchasing power and support to local businesses and services providers including the local authorities of Arandis and Walvis Bay.

(iii) Additional socioeconomic benefits will also be realised at regional and national levels in terms of capital investments, license rental fees, royalty taxes payable to Government, export

earnings, foreign direct investments and various taxes payable to the Government. The Group has invested greatly in the Namibian economy and in particular the Erongo Region.

(iv) Support to the increase in local minerals resources value addition and beneficiation opportunities through the operations of the Arandis and Walvis Bay stone processing plants.

(v) Support to the local skills transfer and training of local Namibians in dimension stones mining and processing techniques and technological know-how.

(vi) Socioeconomic benefits including upgrading and maintenance of the local road and water infrastructures in the local areas for greater benefits of the local community, and.

(vii) Through ongoing exploration and the potential discovery of additional economic minerals resources and the expansion of the proposed mining and minerals processing operations will have much greater local (Arandis Area), regional (Erongo Region) and national (Namibia) socioeconomic benefits.

In order to enhance the above listed likely positive socioeconomic benefits / impacts that the mining operations and ongoing exploration activities may have on the local, regional and national environments, mitigation measures have been provided in this EMP and are presented in Table 3.1.

Overall, however, the mining operations and ongoing exploration activities may also have some socioeconomic negative impacts during the preconstruction, construction, operation, ongoing exploration activities, monitoring and rehabilitation and decommissioning, closure and aftercare phases. Mitigation measures to the likely negative socioeconomic impacts as outlined in Table 3.2.

Table 3.1: Socioeconomic mitigation measures for enhancement of positive impacts.

ASPECT	IMPACT	OBJECTIVE	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
1) Creation of employment opportunities	• Direct economic impact would arise from employment opportunities for unskilled or semi-skilled workers. Through the provision of employment, the quality of life of these people will improve.	• Prioritise equal recruitment of local people and Namibian citizens in all structures of the company	Namibia Nuclear Corporation (Pty) Ltd shall: • Stipulate that local resident should be employed for temporary unskilled/skilled and where possible in permanent unskilled/skilled positions as they would reinvest in local economy. However, due to low skills levels of the local population, the majority of skilled positions would be filled with people from outside the area. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible • Ensure that contractors adhere to Namibian Affirmative Action, Labour and Social Security, Health and Safety laws. • The local authorities, community organizations and community leaders could be informed on final decisions regarding the project and the potential job opportunities for locals. • Stipulate a preference for local contractors in its tender policy. The procurement of services and goods from local entrepreneurs and the engagement of local businesses should be favoured and promoted providing that it is financially and practically feasible. • Undertake a skills audit, develop a database of local businesses that qualify as potential service providers and invite them to the tender process. • Scrutinise tender proposals to ensure that minimum wages were included in the costing.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Ongoing throughout the proposed mining operations and ongoing exploration activities lifecycle
2) Expanded local and regional economic opportunities	• Local economy could be boosted. Induced economic impact would arise from products and services purchased by employees and contractors with the increased availability of money broadening the economic base and boosting the economy at the Constituency level as well as regional level.	• Prioritise the procurement of local goods and services			
3) Opportunities for skills development.	• Opportunities for skills development, knowledge transfer and training	• Prioritise employees skills development and training opportunities	• Project offers experience and on job skills development, particularly for low or semi-skilled workers. This would raise the workers experience and skills to secure jobs in future. • Promising employees could be identified and training and skills development programme could be initiated. • The project could organize business partnerships with local entrepreneurs or small SMEs. • Service providers to provide opportunities for skills transfer. • Provide opportunities for employees re-skilling		

Table 3.2: Socioeconomic mitigation measures for management of negative impacts.

ASPECT	IMPACT	OBJECTIVE	MANAGEMENT ACTIONS	RESPONSIBILITY	ASPECT
1) Unrealistic employment opportunities to be provided by the mining operations and ongoing exploration activities	• In-flux of workers employed by contractors as well as a potential influx of job seekers, resulting in potential mushrooming of informal settlements around the mining operations and ongoing exploration activities.	• Address unrealistic expectations about the job opportunities by informing the local authorities, community organisations and community leaders on final decisions regarding the project and the potential job opportunities • Promote coexistence between the mining operations and ongoing exploration activities and the local communities, farmers, local authorities, community organisations and community leaders	• It is almost impossible to prevent people from moving into an area in search of job opportunities. Addressing unrealistic expectations about the job opportunities could assist by informing the local authorities, community organisations and community leaders on final decisions regarding the project and the potential job opportunities. • Notify the land-owner(s) if there is an increase in the number of new settlements / housing structures being created around the mine compared to the baseline.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Ongoing throughout the proposed mining operations and ongoing exploration activities lifecycle
	• Increased crime rates often associated with alcohol and drug abuse. This could be the result of unsuccessful jobseeker needing to find alternative source of income or could be the result of contract workers		• Contract companies to submit a code of conduct, stipulating disciplinary actions where employees are guilty of criminal activities in and around the vicinity of the mining operations and ongoing exploration activities area/s of influence. Disciplinary actions should be in accordance with Namibian legislation. Contract companies could implement a no-tolerance policy regarding the use of alcohol and workers should submit to a breathalyser test upon reporting for duty daily.		
2) Workers and influx of people seeking employment opportunities may create conflicts with the local people / farmer or between employees and job seekers	• mining operations and ongoing exploration activities employees and contractor coexistence with the local farmers and also result in stock theft, poaching and damage to farm infrastructure, for example, fences and gates.		• Develop a code of conduct for the mining operations and ongoing exploration activities employees and contractors to address conflicts that may arise. • Develop a compensation policy or framework for stock losses and/or damage to neighbouring farms infrastructure that can be linked to the mining operations and ongoing exploration activities. • Ensure that all employees are informed of the consequences of stock theft and trespassing on adjacent farms. • Ensure that employees who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged in accordance with the national laws. All dismissals must be in accordance with Namibia's labour legislation		
3) Arandis Town Council Overwhelmed by a sudden increase in the local population	• Increased demands on formal housing, school placements, municipal services, infrastructure and health services		• The local authorities, community organisations and community leaders could be informed on final decisions regarding the project and the potential job opportunities and the need for housing, school placements, municipal services, infrastructure and health services in the town of Arandis • Coordinate with the Arandis Town Council on the provisions of serviced land for housing for the employees of the mining operations and ongoing exploration activities		

3.3 Preconstruction and Construction EMP

The main activities of the preconstruction stage will be the bush clearing, widening and grading including rehabilitation, of the existing internal access roads within the ML area and creation of temporary constriction facilities and other mine supporting infrastructures. The following is the summary of the preconstruction activities of the proposed mining operations and ongoing exploration activities:

1. Site investigations to inform the mine design and layout.
2. Engineering design of the pit areas and the support facilities.
3. General site clearing of the quarry areas, administration block, waste rock, supporting infrastructure.
4. Access roads upgrading of existing tracks / creation of new routes as may be required.
5. Implementation of the human resources, community and social programs for the operational phase of the project.
6. Top soil removal and storage for the pit areas and supporting infrastructure.
7. Development of the temporary construction camp, and.
8. Installation of containerised offices, workshops, storage facilities.

The construction stage of the proposed mining operations and ongoing exploration activities will cover all the activities associated with the proposed mining operations and ongoing exploration activities mine supporting infrastructures and mine workings as outlined in Table 3.3. The EMP makes provisions for management of a wider array of activities that will be associated with the construction activities.

Table 3.4 outlines the EMP framework for both the preconstruction and construction stages of the proposed mining operations and ongoing exploration activities development.

Table 3.3: Summary of the construction activities covering the proposed mining operations and ongoing exploration activities mine infrastructures and mine workings.

PROJECT PHASE		DEVELOPMENT ACTIVITIES FOR EACH PHASE
CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads
		2. Waste rock and mine blocks stockpiles
		3. Water supply systems
		4. Power infrastructure, including powerline and distribution systems (Generator and Solar)
		5. Containerised administration blocks and warehouses
		6. Fuel supply and storage
		7. Workshop and equipment maintenance facilities
		8. Wastewater treatment systems
		9. Domestic solid waste disposal storage / transfer facility
		10. Storm water management in the pit and supporting infrastructure
	PIT AREA	1. Mining operations
		2. Actual and stripping of the overburden to create direct access to the fresh granite
		3. Ore production for test mining operations
		4. Test mining and commissioning

Table 3.4: EMP mitigation measures for the preconstruction and construction stages.

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
1) Management and Monitoring	• Social and Environmental Performance	• Ensure that all aspects related to the EMP are implemented during the upgrade/construction and rehabilitation of access road(s). • Hold regular site meetings/inspections. Make provision in the minutes of the meetings for reporting on all aspects of the EMP related to the upgrade/construction and rehabilitation of the access road(s). • Adhere to the regulations, rules, procedures, current and future land use of the surrounding area.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Throughout the Preconstruction and Construction Phases of the proposed mining operations and ongoing exploration activities
2) Consultation and Disclosure	• Social and Environmental Performance	• Maintain open and direct lines of communication between the Employer, ECO, Contractor and I&APs with regards to environmental matters. • Consult with project affected communities in a structured and culturally appropriate manner throughout the project process. Consultation should be "free" (*of external manipulation, interference or coercion, and intimidation*), "prior" (*timely disclosure of information*) and "informed" (*relevant, understandable and accessible information*). • Adequately incorporate project affected communities' concerns.		
3) Grievance Mechanism	• Social and Environmental Performance	• Implement a grievance mechanism for receiving and resolving any concerns and grievances related to the project's social and environmental performance throughout the project life cycle. • Inform the affected communities about the mechanism in the course of the community engagement process. it must be readily accessible to all segments of the affected communities. • Address concerns promptly and transparently and in a culturally appropriate manner.		
4) Training including awareness and inductions	• Social and Environmental Performance	• Train employees, contractors and Subcontractors in matters related to the project's social and environmental performance, Namibia's regulatory requirements • Ensure adequate environmental awareness training for all senior site personnel. • Give environmental induction presentations to all site personnel prior to work commencement.		

Table 3.4: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
5) Labour and Working Conditions	• Social and Environmental Performance	• Establish, maintain and improve the worker-management relationship. Base the employment relationship on equal opportunity and fair treatment and no discrimination to be allowed. • Comply with Namibia's labour and employment laws and prevent unacceptable forms of labour, i.e. harmful child and forced labour. • Promote safe and healthy working conditions and the protection and promotion of worker health. • Prepare a Human Resources Policy and document and communicate the Working Conditions and Terms of Employment. • Respect Collective Agreements and the right of workers to organize and bargain collectively. • Prepare a Retrenchment Plan. • Implement a Grievance Mechanism.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Throughout the Preconstruction and Construction Phases of the proposed mining operations and ongoing exploration activities
6) Occupational Health and Safety	• Social and Environmental Performance	• Prepare and submit an Emergency Preparedness and Response Plan. • Adhere to all Namibian Health and Safety Regulations under the Labour Act and Mines Safety Regulations. • Occupational Health and Safety Training to be provided to all employees. • Ensure that qualified first aid can be provided at all times. • Provide and ensure the active use of Personal Protective Equipment (PPE).		
7) Community Health and Safety	• Social and Environmental Performance	• Prevent communicable disease (e.g sexually transmitted diseases (STDs) such as HIV/AIDS transmission): provide awareness, surveillance and active screening and treatment of employees. prevent illness among employees in local communities (through health awareness and education initiatives). ensure ready access to medical treatment, confidentiality and appropriate care, particularly with respect to migrant workers. and promote immunization.		

Table 3.4: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
Community Health and Safety **(Cont.)**	• Unauthorized public access	• Community Safety	• Use gates on the access road(s) and the entire mine site must be fenced off. • Mine site should not be accessible to anyone from the public. • Notice or information boards relating public safety hazards and emergency contact details should be put up at the gate(s) and at the mine site. • Create a viewpoint area, possibly including an information centre, for the public/tourists as part of the early stages of the Closure Plan provisions.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Throughout the Preconstruction and Construction Phases of the proposed mining operations and ongoing exploration activities
	• Construction	• Change in land.	• Restrict construction activities to demarcated / disturbed areas. all other areas will be regarded as "no go" zones in order to minimize the impact on the surrounding land. • Adhere to the regulations, rules, procedures, current and future regional and local land use plans.		
8) Mine Infrastructures and Mine Workings layout planning	• Mine Infrastructures and Mine Workings Layout	• Visual	• Minimise the presence of secondary structures: minimise number of access roads, and bury intra-project power lines. • Adhere to the regulations, rules, procedures, current and future regional and local land use plans for the area.		
9) Mine Infrastructures and Mine Workings design specifications	• Mine Infrastructures and Mine Workings appearance	• Visual	• Structural height and colour must be kept uniform. • Mine infrastructures and mine workings installation must be painted with a non-reflective coating to avoid high reflections. • Avoid using graphics or lettering on the mine infrastructures and mine workings		
	• Construction Activities	• Disturbance of fauna and flora and habitat alteration	• The planning and design to ensure minimum impact to the environment. • No trees or natural vegetation may be removed from the ML area for the making of fires or sale. • No animal may be injured, fed, trapped, hunted or harmed in any way. • No off-road driving will be allowed. • No trespassing on adjoining properties is allowed and no livestock, game or vegetation are to be interfered with.		

Table 3.4: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
10) Construction facilities assumed to be a (tented) temporary facilities and other supporting infrastructure. Adhere to the regulations, rules, procedures, current and future land use plans of the local area.	• Disturbance of fauna and flora and habitat alteration	• The planning and design to ensure minimum impact to the environment. • No trees or natural vegetation may be removed for the making of fires. • No animal may be injured, fed, trapped, hunted or harmed in any way. • No off-road driving will be allowed • Speed limit of not more than 40 km / h. • No trespassing on adjoining properties is allowed and no livestock, game or vegetation are to be interfered with.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Throughout the Preconstruction and Construction Phases of the proposed mining operations and ongoing exploration activities
	• Pollution of biophysical environment (air, soil and water)	• No fires will be allowed, unless a specific area has been identified and set aside by the ER for the cooking of food. • Vehicle maintenance/servicing/washing not to be allowed anywhere on site/at the camp. • Portable toilets to be provided and used at the camp. • Sanitary wastewater to be released into a French drain system. • Use bio-degradable detergents on site. • Enforce proper waste (hazardous and non-hazardous) management practices (as per Waste Management Plan) – waste and litter to be disposed of in scavenger and weatherproof bins and the refuse to be collected by the contractor and disposed of an approved waste disposal site at least once a week or as may be required.		
	• Occupational Health and Safety	• No fires will be allowed, unless a specific area has been identified and set aside by the ER for the cooking of food. • Ensure that employees are trained in the use of appropriate firefighting equipment and ensure that such equipment is on hand at all times. • Comply with all electricity safety, generation and supply regulations. • Supply potable water for human consumption and other domestic uses. conduct chemical testing of water samples on a monthly basis (if applicable). • Make suitable arrangements, as far as practicable, for the maintenance of health, the prevention and overcoming of outbreaks of disease and of adequate first aid services. • Ensure that security arrangements are in place at all times.		

Table 3.4: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
11) Clearing of areas along existing internal access roads widening and grading /construction and always adhere to the regulations, rules, procedures, current and future land use plans of the local area.	• Disturbance of fauna and flora and habitat alteration	• Restrict activities to previously demarcated areas (borrow pits, haul and access roads (20 m from the centre line of the road), construction camp / supporting infrastructure, etc.). all other areas will be regarded as "no go" zones in order to minimize the impact on the surrounding land. • Minimize the removal of native plant species. no vegetation may be removed/damaged without direct instructions. • No off-road driving will be allowed. • No animal may be injured, fed, trapped, hunted or harmed in any way.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Throughout the Preconstruction and Construction Phases of the proposed mining operations and ongoing exploration activities
	• Soil erosion	• Sediment mobilisation and transport: reduce or prevent soil erosion (schedule activities to avoid heavy rainfall / strong winds periods. contour and minimize length and steepness of slopes. mulching to stabilize exposed areas. re-vegetate areas promptly. and design channels and ditches for post-construction flow). • Road design: limit access road gradients to reduce run-off induced erosion. provide adequate road drainage based on road width, surface material, compaction and maintenance. • Structural (slope) stability: provide effective short-term measures for slope stabilization, sediment and subsidence control until long-term measures (during operations) can be implemented. provide adequate drainage systems to minimize and control infiltration.		
	• Possible loss of the seed bank in the topsoil	• The upper layer of soil (10-20 cm), where alluvial, to be stripped and stockpiled separately (1-2 m high piles to allow for proper aeration). Install drainage to protect the topsoil pile from (water) erosion and cover it to protect it from (wind) erosion.		
12) Construction material borrow pit siting.	• Visual, pollution (traffic, noise and air), and land use	• Consider, in addition to material quality and quantity, the visual impact, potential traffic, noise and air pollution, and the potential loss of arable land when borrow pits are sited. Adhere to the regulations, rules, procedures, current and future regional and local land use plans.		

Table 3.4: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
13) Borrow pit management	• Disturbance of fauna and flora and habitat alteration	• Limit the number of borrow pits as far as possible. • The progression of stripping and excavation to allow for rehabilitation once the areas have been fully utilized.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Throughout the Preconstruction and Construction Phases of the proposed mining operations and ongoing exploration activities
	• Possible loss of the seed bank in the topsoil	• The upper layer of soil (10-20 cm), where alluvial, to be stripped and stockpiled separately (1-2 m high piles to allow for proper aeration). Install drainage to protect the topsoil pile from (water) erosion and cover it to protect it from (wind) erosion.		
	• Occupational and Community Safety	• Cut slopes not to be steeper than 30 degrees. • No under-cutting of the sides to be allowed. • Undertake excavations in a safe manner and in compliance with the relevant safety regulations (Labour Act and Mine Safety Regulations).		
	• Social and Environmental Performance	• Cut slopes not to be steeper than 30 degrees. • Use excess rock spoil to fill borrow pits. material to be neatly shaped and no loose material to be left inside the borrow pits. • No waste is allowed to be dumped in borrow pits. • Evenly spread top soil over the entire area to allow for the re-growth of vegetation. • Replant previously removed native plant species in disturbed areas.		
14) Increased traffic, presence and movement of machinery, and the establishment of soil stockpiles.	• Air quality (dust or Particulate Matter (PM) pollution)	• Minimise the area in which the movement of construction machines will take place to reduce the effects of dust pollution / generation. • Minimize dust from material handling sources (e.g. conveyors and bins) by using covers and/or control equipment (e.g. water suppression). • Minimize dust from open area sources, including storage piles, by using control measures (install enclosures and covers, and increase the moisture content). • Avoid the excavation, handling and transport of erodible materials under high wind conditions or when a visible dust plume is present.		
15) Increased traffic/vehicle movement.	• Air quality (dust or Particulate Matter (PM) pollution)	• Maintain the road surface to preserve surface characteristics (e.g. texture and roughness). • Use dust control/suppression methods, such as applying water or non-toxic chemicals to minimize dust (oil and oil by-products is not a recommended measure to control road dust).		

Table 3.4: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	RESPONSIBILITY	TIMING
16) All mine Infrastructure construction	• Increased traffic/vehicle movement	• Air quality (dust or Particulate Matter (PM) pollution)	• Maintain the road surface to preserve surface characteristics (e.g. texture and roughness). • Use dust control/suppression methods, such as applying water or non-toxic chemicals to minimize dust (oil and oil by-products is not a recommended measure to control road dust).	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Throughout the Preconstruction and Construction Phases of the proposed mining operations and ongoing exploration activities
	• Increased traffic, presence and movement of machinery (exhaust from diesel engines)	• Air quality & Occupational and Community Health and Safety	• Fleet owners/operators to implement manufacturer recommended engine maintenance programs (to control vehicle emissions: Carbon Monoxide (CO), Nitrogen Oxide (NO_x), Sulphur Dioxide (SO_2), Particulate Matter (PM) and Volatile Organic Compounds (VOCs)).		
	• Presence of machinery, construction workers, infrastructure and associated equipment	• Visual and noise	• Avoid critical habitats (for site transmission and distribution rights of way, lines, towers and substations) through using existing utility and transport corridors (transmission and distribution) where possible.		
	• Increased traffic, movement of machinery	• Occupational and Community Safety	• Adopt best transport safety practices by implementing the following measures: emphasize safety aspects among drivers. improve driving skills and require licensing of drivers. adopt limits for trip duration. avoid dangerous routes and times of day. and use speed control devices. • Regularly maintain vehicles and use manufacturer approved parts. • Use locally sourced materials (where possible) to minimize transport distances. • Employ safe traffic control measures, including the use of traffic and safety warning signs and flag persons to warn of dangerous conditions.		
	• Mine Infrastructures and Mine Workings foundations	• Occupational Safety	• Ensure that all excavations are properly performed and in accordance with Occupational, Health and Safety (OH&S) regulations. • Ensure that the handling of concrete follow health and safety precautions (as per Material Safety Data Sheets (MSDS)).		

Table 3.4: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
17) Hazardous materials management.	• Social and Environmental Performance	• Establish hazardous materials management priorities (based on hazard analysis of risky operations based on Material Safety Data Sheets (MSDS). • Avoid, or minimize the use of hazardous materials. • Prevent uncontrolled releases of hazardous materials to the environment or uncontrolled reactions that may result in fire or explosion. • Make us of engineering controls (containment, automatic alarms and shut-off systems). Implement management controls (procedures, inspections and training, communication and drills) to address residual risks not prevented or controlled through engineering controls.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Throughout the Preconstruction and Construction Phases of the proposed mining operations and ongoing exploration activities
18) Hazardous materials management	• Pollution of biophysical environment (soil and water)	• Implement prevention and control measures for the use, handling and storage of hazardous materials: ○ Materials transfer: Regularly inspect, maintain and repair fittings/pipes/hoses. make use of drip trays/other drip containment measures at connection/possible overflow points. ○ Overfill protection: Use trained filling operators. install gauges on tanks to measure the volume inside. make use of dripless hose connections (vehicle tanks) and fixed connections (storage tanks). use a catch basin/drip tray around the fill pipe to collect spills. ○ Reaction, fire, and explosion prevention: Hazardous materials to be stored in marked containers and separate (from non-hazardous materials). incompatible hazardous materials (acids, bases, flammables, oxidizers, reactive chemicals) to be stored in separate areas and with containment facilities separating material storage. smoking or working with open flames not to be permitted in the presence of these substances. limit access to hazardous waste storage areas and clearly label and demarcate the area. conduct regular inspections of the areas and document the findings. prepare and implement spill response and emergency plans. train employees in the use of appropriate firefighting equipment and ensure that such equipment is on hand at all times.		

Table 3.4: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
Hazardous materials management **(*Cont.*)**	•	○ Secondary containment: use bunding (made of impervious, chemically resistant material) that can contain the larger of 110% of the largest tank or 25% of the combined tank volumes for above-ground tanks with a total storage volume equal or greater than 1,000 liters. • Train workers on the correct transfer and handling of fuels and chemicals and the response to spills. • Immediately report and clean up any accidental hydrocarbon spill: Spill-Sorb, Drizzat Pads, Enretech Powder or Peat Moss can be used to clean up small spills. in case of larger spills, the spill together with the polluted soil should be removed and disposed of at e.g. a biological remediation site.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Throughout the Preconstruction and Construction Phases of the proposed mining operations and ongoing exploration activities
19) Hazardous materials management.	• Occupational Health and Safety	• Implement hazard communication and training programs (including information on Material Safety Data Sheets (MSDS)) to make employees aware of workplace chemical hazards and how to respond to these. • Provide and ensure the active use of Personal Protective Equipment (PPE).		
20) Waste management: solid.	• Air quality	• Avoid the open burning of waste (whether hazardous, or non-hazardous).		
21) Waste management: non-hazardous and hazardous.	• Pollution of biophysical environment	• Prepare and submit a Waste Management Plan before construction commences. The generation of waste should be avoided or minimized as far as practicable. where it cannot be avoided, but has been minimized, waste should be recovered and reused. where waste cannot be recovered/reused, it should be treated, destroyed and disposed of in an environmentally sound manner. • Institute and maintain good housekeeping and operating practices. littering is not allowed. • Non-hazardous and hazardous waste to be collected and stored separately. • Hazardous waste: recycle petroleum (fuels and lubricants) waste products and collect and recycle batteries and print cartridges. The remainder to be transported to a recognized hazardous waste disposal site, with prior permission from the operator / owner.		

Table 3.4: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
22) Waste management: sanitary.	• Pollution of biophysical environment	• Portable toilets (1 toilet per 30 employees. preferred 1:15) to be provided. contents to be collected by an approved contractor and disposed of at an approved sewage site. Adhere to the regulations, rules, procedures, current and future regional and local land use plans.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Throughout the Preconstruction and Construction Phases of the proposed mining operations and ongoing exploration activities
23) Waste water management - waste water treatment.	• Pollution of biophysical environment	• Ensure that the discharge of process wastewater and/or sanitary wastewater and/or wastewater from utility operations and/or storm water to land conform to the regulatory requirements. Adhere to the regulations, rules, procedures, current and future regional and local land use plans.		
24) Waste water management - storm water management	• Soil erosion	• Regular inspection and maintenance of permanent erosion and runoff control features.		
25) Rehabilitation.	• Social and Environmental Performance	• Remove all equipment, waste, temporary structures, etc. from the construction facilities and work sites. • Reshape all disturbed areas (including stockpiles, borrow pits, and temporary detours and turnouts) to their original contours. • Cover disturbed areas with previously collected topsoil and spread evenly. • Manually rip disturbed areas, where compaction has taken place, and cover the areas with previously collected topsoil. • Replant any previously removed native plant species in disturbed areas. • Adhere to the regulations, rules, procedures, current and future regional and local use plans.		

3.4 Operational EMP

Once the construction of the proposed mining operations and ongoing exploration activities mine infrastructures and mine workings and mine testing has been completed, the development process will move into the operational phase in order to produce the minerals concentrates. Namibia Nuclear Corporation (Pty) Ltd will be responsible for fulfilling the requirements in the EIA and this EMP for the operational stage of the proposed mining operations and ongoing exploration activities in the ML No. 121.

A Project / Site / Health Safety and Environmental (HSE) Manager / Engineer shall be appointed by Namibia Nuclear Corporation (Pty) Ltd to oversee all the site operation as well as management of all the mine operational activities summarised as follows:

1. Mining operations (actual mining operations as maybe required).
2. Transportation of the mined blocks from pit to the sorting.
3. Storage and transportation of granite blocks for further processing.
4. Waste rock management / reprocessing / recovery.
5. Ongoing exploration support.
6. Ongoing rehabilitation and maintenance.
7. Waste water management.
8. Municipal solid waste management / transfer to Arandis or Swakopmund, and.
9. Environmental performance monitoring.

Table 3.5 outlines the EMPs for the operational stage of the proposed mining operations and ongoing exploration activities.

Adherence to the regulations, rules, procedures, current and future regional and local land use plans shall be observed at all time by the operational staff including consultants, contractors and subcontractors.

Table 3.5: EMP for the operation phase

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
1) All activities	• Management and Monitoring	• Social and Environmental Performance	• Ensure that all aspects related to the EMP are implemented during the operations phase. • Adhere to the regulations, rules, and procedures as well as current and future regional and local and use plans.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor Subcontractor	Ongoing throughout the Operational Phase
2) All activities	• Consultation and Disclosure	• Social and Environmental Performance	• Consult with project affected communities in a structured and culturally appropriate manner throughout the operations phase. Consultation should be "free" (*of external manipulation, interference or coercion, and intimidation*), "prior" (*timely disclosure of information*) and "informed" (*relevant, understandable and accessible information*). • Adequately incorporate project affected communities' concerns.		
3) All activities	• Grievance Mechanism (EP 6)	• Social and Environmental Performance	• Ensure a mechanism for receiving and resolving any concerns and grievances related to the project's social and environmental performance during the operations phase. • Address concerns promptly and transparently and in a culturally appropriate manner.		
4) All activities	• Training including awareness and inductions	• Social and Environmental Performance	• Train employees and contractors in matters related to the project's social and environmental performance, Namibia's regulatory requirements, and the requirements of the EMP Performance Standards. • Ensure adequate environmental awareness training for all personnel. • Give environmental induction presentations to all new personnel prior to work commencement.		
5) All activities	• Labour and Working Conditions	• Social and Environmental Performance	• Establish, maintain and improve the worker-management relationship. Base the employment relationship on equal opportunity and fair treatment and no discrimination to be allowed. • Comply with Namibia's labour and employment laws and prevent unacceptable forms of labour, i.e. harmful child and forced labour. • Promote safe and healthy working conditions and the protection and promotion of worker health. • Document and communicate the Working Conditions and Terms of Employment. • Respect Collective Agreements and the right of workers to organize and bargain collectively.		

Table 3.5: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
6) All activities	• Employment and procurement opportunities	• Socio-economic	• Ensure local recruitment (of registered contractors or qualified and certified personnel, registered and certified with the appropriate statutory authorities and procurement to maximize benefit to region.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Ongoing throughout the Operational Phase
7) All activities	• Occupational Health and Safety	• Social and Environmental Performance	• Adhere to all Namibian Health and Safety Regulations as prescribed in the Labour Act and Mines Safety Policy / Regulations. • Occupational Health and Safety Training to be provided to all employees. • Ensure that qualified first aid can be provided at all times. • Provide and ensure the active use of Personal Protective Equipment (PPE).		
8) All activities	• Community Health and Safety	• Social and Environmental Performance	• Prevent communicable disease (e.g. sexually transmitted diseases (STDs) such as HIV/AIDS transmission): provide surveillance and active screening and treatment of employees. prevent illness among employees in local communities (through health awareness and education initiatives). ensure ready access to medical treatment, confidentiality and appropriate care, particularly with respect to migrant workers. and promote immunization.		
9) All activities	• Unauthorized public access	• Community Safety	• Use gates on the access road(s) and the entire site must be fenced off. • Mine site should not be accessible to anyone from the public. • Notice or information boards relating public safety hazards and emergency contact details should be put up at the gate(s) and at the mine site. • Create a viewpoint area, possibly including an information centre, for the public/tourists as part of the ongoing rehabilitation for mine closure and aftercare land use options as possible tourism product in the general area.		
10) All activities	• Increased traffic/vehicle movement	• Air quality (dust or Particulate Matter (PM) pollution)	• Maintain the road surface to preserve surface characteristics (e.g. texture and roughness). • Use dust control/suppression methods, such as applying water or non-toxic chemicals to minimize dust (oil and oil by-products is not a recommended measure to control road dust).		

Table 3.5: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
11) All activities	• Increased traffic/vehicle movement (exhaust from diesel engines)	• Air quality & Occupational and Community Health and Safety	• Fleet owners/operators to implement manufacturer recommended engine maintenance programs (to control vehicle emissions: Carbon Monoxide (CO), Nitrogen Oxide (NO_x), Sulphur Dioxide (SO_2), Particulate Matter (PM) and Volatile Organic Compounds (VOCs)).	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Ongoing throughout the Operational Phase
12) All activities	• Increased traffic/vehicle movement	• Occupational and Community Safety	• Adopt best transport safety practices by implementing the following measures: emphasize safety aspects among drivers. improve driving skills and require licensing of drivers. adopt limits for trip duration. avoid dangerous routes and times of day. and use speed control devices. • Regularly maintain vehicles and use manufacturer approved parts. • Use locally sourced materials (where possible) to minimize transport distances. • Employ safe traffic control measures, including the use of traffic and safety warning signs and flag persons to warn of dangerous conditions.		
13) All activities	• Storm water management	• Attraction of species (birds and bats) to the area due to open water and subsequent injury, disturbance, or mortality of species	• Implement appropriate storm water management measures so as to avoid the presence of open water in the area. • Storm water around the mine site shall not be discharged into the Ephemeral Rivers / any public stream		

Table 3.5: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
14) All activities	• Water Management	• Resource use / depletion of natural resources	• Implement a water conservation program, promoting the continuous reduction in water consumption and achieving savings in water pumping, treatment and disposal costs, commensurate with the magnitude and cost of water use.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	Ongoing throughout the Operational Phase
15) All activities	• Hazardous materials management	• Pollution of biophysical environment (soil and water)	• Implement prevention and control measures for the use, handling and storage of hazardous materials. • Train workers on the correct transfer and handling of fuels and chemicals and the response to spills. • Immediately report and clean up any accidental hydrocarbon spill: Spill-Sorb, Drizzat Pads, Enretech Powder or Peat Moss can be used to clean up small spills. in case of larger spills, the spill together with the polluted soil should be removed and disposed of at e.g. a biological remediation site.		
		• Occupational Health and Safety	• Implement hazard communication and training programs (including information on Material Safety Data Sheets (MSDS)) to make employees aware of workplace chemical hazards and how to respond to these. • Provide and ensure the active use of Personal Protective Equipment (PPE).		
16) All activities	• Waste management: non-hazardous and hazardous	• Air quality	• Avoid the open burning of waste (whether hazardous, or non-hazardous).		
		• Pollution of biophysical environment	• As per Waste Management Plan. • Institute and maintain good housekeeping and operating practices. littering is not allowed. • Non-hazardous and hazardous waste to be collected and stored separately: • Non-hazardous waste to be transported to and disposed of at an approved waste disposal site. • Hazardous waste: recycle petroleum (fuels and lubricants) waste products and collect and recycle batteries and print cartridges. The remainder to be transported to a recognized hazardous waste disposal site, with prior permission from the site operator / owner.		
17) All activities	• Waste management: sanitary	• Pollution of biophysical environment	• Toilets and Shower Blocks to be provided on the site as part of the administration and supporting infrastructure. contents to be collected by an approved contractor and disposed of at an approved sewage site. Unless there will be a sewage plant?		
18) All activities	• Waste water management	• Pollution of biophysical environment	• Ensure that the discharge of process wastewater and/or sanitary wastewater and/or wastewater from utility operations and/or storm water to land conform to the regulatory requirements. • Discharge to any public stream is prohibited		

3.5 Closure, Decommissioning, Final Rehabilitation and Aftercare EMP

3.5.1 Regulatorily Requirements

In accordance with the provisions of the Minerals (Prospecting & mining) Act, 1992, Act No. 33 of 1992, the Environmental Management Act, 2007, Act No. 7 of 2007, the Water Act, 1956, Act No. 54 of 1956, the Atmospheric Pollution Prevention Ordinance, 11 of 1976 and Labour Act, 1992, Act No. 6 of 1992, Namibia Nuclear Corporation (Pty) Ltd shall prepared final mine closure and aftercare plan for the mining operations and ongoing exploration activities for approval by MME. The final mine closure and aftercare plan for the mining operations and ongoing exploration activities shall be reviewed prior to the implementation of the project and shall continue to be reviewed annually throughout the proposed Project lifecycle.

The implementation of the mining operations and ongoing exploration activities closure will take place at the end of the production mine life. The objective of establishing financial provision to be detailed in final mine closure and aftercare plan is to ensure that adequate funds are available at the time of a premature or planned mine closure. The financial provision for closure should reflect the real costs, and needs to be sufficient to reduce the liabilities and residual risks to an acceptable level at mine closure.

In the event of a default (Company going into administration) the Government and stakeholders will thus have a set of costed detailed design works and will be able to issue a tender and pay for works via the mining operations and ongoing exploration activities Environmental Rehabilitation Fund or any other funding instrument that has been capitalised during the operational stage of the mining operations and ongoing exploration activities in ML No. 121. This includes any outstanding rehabilitation at mine closure that has not been completed to the satisfaction of the regulators and to enable the formal relinquishment of the mining License (ML).

The final mine rehabilitation, closure and aftercare aspects considered with indicative cost estimate covers the following components:

(i) Stakeholder engagement (**N$200, 000.00**).

(ii) Social development (**N$1, 000, 000.00**).

(iii) Decommissioning, rehabilitation and removal (**N$ 3, 000, 000.00**).

(iv) Environmental management (**N$ 600,000.00**), and.

(v) Environmental Monitoring **(N$50, 000.00).**

The current estimated cost for permanent closure of the proposed mining and ongoing exploration activities in the ML No. 121 is **Four Million Eight Hundred and Fifty Thousand Namibia Dollar (N$4, 850, 000.00)**. The final mine closure and aftercare costs indicative figures must be reviewed and revised as follows:

(i) During the preparation of the Mine Closure Plan.

(ii) Before the implementation of the proposed mining operations and ongoing activities, and.

(iii) Annually during preconstruction, construction, operations and mine closure and aftercare stages of the proposed development.

3.5.2 Mine Closure Plan for ML No. 121

The Mine Closure Plan to be prepared shall consist of following five (5) steps that shall be implemented in consultation with the key stakeholders:

(i) Progressive rehabilitation: This will be implemented from the outset of the Project.

(ii) Project closure: Once production stops permanently; the number of workers will be reduced and a small labour force will be retained to permanently shut down the mine.

(iii) Decommissioning: Will be undertaken by a small crew or contractors who will be responsible for decommissioning or taking apart the mining supporting infrastructure such as the processing facilities and equipment.

(iv) Final rehabilitation/Remediation/reclamation: The objective of reclamation will be to return the ML area to an acceptable standard of socioeconomic use, ensuring that any landforms and structures are stable, and any watercourses are of acceptable water quality, and.

(v) Post-closure and aftercare including monitoring: Monitoring programmes will be used to assess the effectiveness of the reclamation measures and to identify any corrective action that may be needed during the post closure and aftercare stage.

Namibia Nuclear Corporation (Pty) Ltd is committed to minimising the impact of its operations on the local receiving environment covering physical, biological, socioeconomic environments and ecosystem functions, services, use and non-use values or passive uses. The mining operations and ongoing exploration activities Mine Closure Plan and the estimated final mine rehabilitation, closure and aftercare costs are based on a number of technical reports for the development of the mining operations and ongoing exploration activities prepared by various consultants.

Namibia Nuclear Corporation (Pty) Ltd will provide for expenditures associated with mining operations and ongoing exploration activities final rehabilitation, closure and aftercare costs and will comply with statutory obligations and stipulated requirements of the Ministry of Mines and Energy, the Ministry of Environment, Forestry and Tourism (MEFT), the Ministry of Agriculture, Water and Land Reform (MAWLF) as well as international best practices such as the Equator Principles (EPs) 1-10.

Namibia Nuclear Corporation (Pty) Ltd will make sure that the provision covers all the aspects of the envisaged environmental liabilities at mine closure. The ongoing rehabilitation shall be undertaken during the operational phase of the mine and shall be funded from the annual ongoing operational budget.

The monitoring of the mining operations and ongoing exploration activities Mine Closure Plan shall be undertaken in order to measure the achievement of outcomes for both the ongoing rehabilitation and final mine closure and aftercare activities. Both the ongoing rehabilitation and final mine closure and aftercare monitoring activities shall cover air quality and dust emissions, fauna and flora recovery in ongoing and final rehabilitated areas and short and long-term stability of the engineered structures such as waste rock Waste Management Area (WMA), excavated areas, drainage systems, sedimentation basin and surface and groundwater quality.

The implementation of ongoing rehabilitation activities while the mine is still operational is vital to the successful final mine closure, decommissioning, remediation/reclamation and post-closure and aftercare. The ongoing rehabilitation should involve the demolishing of redundant infrastructure and facilities, clean-up activities of waste and litter, removal of buried waste, landscaping (slope stability and erosion protection) and ecological restoration through landscape reshaping and re-vegetation works to be undertaken during the life of the mining operations and ongoing exploration activities as soon as practicable following the cessation of use of an area.

The following is the summary of the other key recommendations to be implemented by Namibia Nuclear Corporation (Pty) Ltd for the successful implementation of the mining operations and ongoing exploration activities Mine Closure Plan to be prepared:

1. Namibia Nuclear Corporation (Pty) Ltd commits that each year the Company will review the mining operations and ongoing exploration activities Mine Closure Plan and costs and make annual contributions to the mining operations and ongoing exploration activities Environmental Rehabilitation Fund to provide for the final mining operations and ongoing exploration activities rehabilitation, closure and aftercare costs. It's important that an updated mining operations and ongoing exploration activities Mine Closure Plan containing more technical detail and higher

cost-estimation accuracy than the current plan is prepared as part of the updated project feasibility during the operational stage of the mining operations and ongoing exploration activities as may be applicable.

2. All the drawings and designs of the mining operations and ongoing exploration activities closure supporting infrastructure such as sedimentation basin, Waste Management Area (WMA), concrete walls and pits shall be undertaken by a qualified engineer and once such drawings are available, they shall be included in the updated versions of this mining operations and ongoing exploration activities Mine Closure Plan, and.

3. Continuous monitoring of the following key areas during the mining operations and ongoing exploration activities preconstruction, construction, operation with ongoing rehabilitation and monitoring and final rehabilitation and decommissioning, closure and aftercare shall be undertaken around the mine site and ML area:

    (a) The long-term stability of the surface excavations (pits, working faces, other evacuation and Waste Management Area (WMA).

    (b) Short and long-term water management.

    (c) Long-term impacts on surface and groundwater sources (water quality), and.

    (d) Fauna and flora recoveries and diversity.

3.5.3 Mine Closure Plan Mitigation Measures

The mine closure, decommissioning, final rehabilitation and aftercare EMP will cover the long-term stability and environmental sustainability maintenance of all the remaining supporting infrastructures such pits and waste rock. The following is summary of the activities that will be undertaken as part of the final mine closure and aftercare stages for the proposed mining operations and ongoing exploration activities in the ML No. 121:

1. Implementation of sustainable socioeconomic plan.
2. Closure of open pits,
3. Closure of solid waste transfer station.
4. Backfill all excavated areas.
5. Closure of the mined blocks storage area.
6. Decommissioning of water and electricity infrastructure.
7. Overall land reclamation.
8. Restoration of internal roads, and.
9. Revegetation and aftercare as may be required

This EMP Report makes provisions for management of a wider array of activities that will be associated with the proposed mining operations and ongoing exploration activities in the ML No. 121 covering the mine closure, decommissioning, final rehabilitation and aftercare stages. Table 3.6 outlines the EMP framework for the closure and aftercare stages of the proposed mine. Table 3.7 summarise key mine components to be addressed in the ongoing and final mine closure plan.

Table 3.6: EMP for progressive rehabilitation, final closure and aftercare stages.

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBILITY	TIMING
1) Mine closure and aftercare stages	Ongoing and Final closure and aftercare stages	Social and Environmental Performance & Visual	• Isolate (electrically) the mine site from the substation. • Disassemble the steel works and cut off at the top of the foundation concrete. rehabilitate the hardstand area. • Remove all above-ground substation infrastructure and re-use, recycle or dispose of it. • Conduct a site contamination assessment. remove any contaminated material and dispose of at an appropriate disposal facility. • Break up foundations at all the mine site and remove for disposal in the open pits. • Dig up below-ground substation infrastructure and remove. • Conduct a validation survey to ensure that all contaminated material at the substation has been removed. remove any contaminated material and dispose of at an appropriate disposal facility. • Rehabilitate access tracks not required for ongoing land use activities. • Remove all other equipment, waste, etc. from the area. • Reshape WMAs and all disturbed areas to the surrounding contours. • Secure mining pit areas through fencing and closing aces • Rehabilitate all excavated and disturbed areas • Manually rip disturbed areas, where compaction has taken place, and cover the areas with previously collected topsoil. • Replant any previously removed native plant species in disturbed areas.	• Namibia Nuclear Corporation (Pty) Ltd • Contractor • Subcontractor	• During Closure and Aftercare Stages
2) Closure	• Loss of jobs and income	• Socio-economic	• Implement a skills training programme during the operations phase.		• Ongoing throughout the Operational Phase

Table 3.7: Mine components to be addressed in the ongoing and final closure of the mining operations and ongoing exploration activities.

Components	Aspects to be Addressed
Pit Area/s	o Pits stability o Groundwater and rainwater management o Security and unauthorised access o Wildlife entrapment o Effects of drainage into and from the workings
Mine Supporting Facilities	o Removal of containers, buildings and foundations o Clean-up of workshops, fuel and reagent o Disposal of scrap and waste materials o Re-profiling and revegetation of site
Waste management areas	o Slope stability o Effects of leaching and seepage on surface and groundwater o Dust generation o Visual impact o Special considerations for some types of mines such as uranium mines
Water Management Facilities	o Restoration or removal of dams, reservoirs, settling ponds, culverts, pipelines, spillways or culverts which are no longer needed o Surface drainage of the site and discharge of drainage waters o Maintenance of water management facilities
Landfill / Waste Disposal Facilities	o Disposal or removal from site of hazardous wastes o Disposal and stability of treatment sludge o Removal of sewage treatment plant o Prevention of groundwater contamination o Prevention of illegal dumping o Security and unauthorised access
Infrastructure	o Removal of power and water supply o Removal of haul and access roads o Reuse of transportation and supply depots

4. ENVIRONMENTAL PERFORMANCE MONITORING

4.1 Environmental Performance Monitoring to be Undertaken

The environmental monitoring process of the EMP performances for the proposed mining operations and ongoing exploration activities development as well as all the supporting infrastructures such as roads, powerline and water supply within the ML No. 121 is divided into two parts and these are:

(i) Monitoring activities and effects to be undertaken by the Environmental Control Officer (ECO), and.

(ii) Preparation of an Environmental Monitoring Report covering all activities related to this EMP throughout the life cycle of the proposed mine to be undertaken by the Environmental Control Officer (ECO).

As part of the provisions of this EMP and the conditions of the ECC that will be issued by the Office of the Environmental Commissioner (OEC) in the Ministry of Environment, Forestry and Tourism, continuous environmental monitoring and reporting shall be undertaken as provided in the regulations and this EMP. The reporting process will form part of the ongoing environmental monitoring programme. Environmental monitoring programme is part of this EMP performances assessment and will need to be compiled and submitted as determined by the regulator (OEC).

The process of undertaking appropriate monitoring as per specific topic and tracking performances against the objectives and documenting all environmental activities is part of internal and external auditing to be coordinated by the Environmental Control Officer (ECO) / External consultant / suitable qualified in-house resource person. Tables 4.1 – 4.9 outline the type of information that shall need to be recorded on a regular by the Environmental Control Officer (ECO) as part of the monitoring process of the activities and the effects.

The second part of the monitoring of the EMP performance will require a report outlining all the activities related to effectiveness of the EMP at the end of the proposed mine life to be undertaken by the Environmental Control Officer (ECO). The types of the data sets to be used in the preparation of such a report are outlined in Tables 4.1 - 4.9.

The objective will be to ensure that corrective actions are reviewed and steps are taken to ensure compliance for future EIA and EMP implementation. The report shall outline the status of the environment and any likely environmental liability after completion of the proposed project. The report shall be submitted to the OEC in the Ministry of Environment, Forestry and Tourism (MEFT) together with the final mine closure report.

Table 4.1: Monitoring of environmental performance implementation / environmental awareness training.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there an Environmental awareness training programme?					
How many people have been given environmental awareness training?					
Is a copy of the EMP on site?					
How effective is the awareness training? Do people understand the contents of the EMP? Where are the weaknesses? Ask 3 people at random various questions about the EMP.					

Table 4.2: Monitoring of environmental performance for the temporal and permanent structures.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are the temporal and permanent structures positioned to avoid sensitive zones, ephemeral river channels and potential sensitive sites?					
Has new infrastructure been created? If so, what, and how well planned / built with respect to environment?					
Have toilets and showers been provided? Where are they situated?					
Do receptacles for waste have scavenging animal proof lids?					
What litter is there – who is littering?					
Are there facilities for the disposal of oils / etc and how often is it removed to an approved disposal site?					
Is there evidence of oil / diesel spills inside or outside of bunded areas?					
What fuel source is being provided for cooking?					
Housekeeping					

Table 4.3: Environmental data collection.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are records being kept?					
Birds' mortality records as result of collision with the mine associated infrastructure?					
Birds nesting activities around the mine site?					
Noise level?					
Air Quality?					
Have archaeological sites been found / disturbed / described?					
Other key environmental data sets?					

Table 4.4: Health, Safety and Environment (HSE).

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there First Aid Kit containing anti-histamines etc?					
Are dangerous areas clearly marked off?					
Do vehicles appear to maintain the recommended speed limits?					
Do vehicles drive with headlights on along the gravel roads at all times?					

Table 4.5: Recruitment of labour.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
What labour source is used?					
How has the recruitment practice been done?					

Table 4.6: Management of the natural habitat and surficial materials management.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Has there been any development done on or very close sensitive areas?					
Has anyone been caught with plants or animals in their possession?					
Has there been wilful or malicious damage to the environment?					
Has topsoil / seed bank layer been removed from demarcated development areas and appropriately stored?					

Table 4.7: Tracks and off-road driving.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are existing tracks used and maintained?					
What new tracks have been developed and are they planned?					
What evidence is there of off-road driving? Who appears to be responsible?					
Are corners being cut, what type of turning circle are there? Three-point turns vs. U turns?					
Have unnecessary tracks been rehabilitated and how well?					
Comments					

Table 4.8: Management of surface and groundwater.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
How is potable water supplied and how often? Position of tanks?					
Is water being wasted?					
Is there any leakage from pipes or taps?					
Were water samples taken regularly and measured?					

Table 4.9: Public relations.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Have any complaints been made about the mine construction and or operational activities by the different stakeholders? If so, what, and how was the issue resolved?					

5. ENVIRONMENTAL AWARENESS AND TRAINING

5.1 Overview on Environmental Awareness Guidance

(i) The Environmental Rules apply to EVERYBODY. This includes all permanent, contract, or temporary workers as well as any other person who visits the mine site. Any person who visits the mine site will be required to adhere to the company Code of Conduct, which enshrines industry best environmental practice.

(ii) The ENVIRONMENT means the whole surroundings around us. The environment is made-up of the soil, water, air, plants and animals. and those characteristics of the soil, water, air, plant and animal life that influence human health and wellbeing.

(iii) If any member of the WORK FORCE does not understand, or does not know how to keep any of Environmental Rule or Procedure, that PERSON must seek advice from the ENVIRONMENTAL CONTROL OFFICER (ECO), SITE MANAGER or CONTRACTOR. The PERSON that does not understand must keep asking until she/he is able to keep to the all the Environmental Rules and Procedures.

(iv) Personnel who knowingly contravene the Environmental Rules and Procedures will be subject to the Company's disciplinary procedures.

5.2 Environmental Awareness Training Materials

5.2.1 Natural Environmental Management Guidance

- Never feed, tease or play with, hunt, kill, destroy or set devices to trap any wild animal (including birds, reptiles and mammals), livestock or pets. Do not bring any wild animal or pet to the mine site.
- Do not pick any plant or take any animal out of the mine site area. You will be prosecuted and asked to leave the project area.
- Never leave rubbish and food scraps or bones where it will attract animals, birds or insects. Rubbish must be thrown into the correct rubbish bins or bags provided.
- Protect the surface vegetation by not driving over it unnecessarily.
- Do not drive over, build upon, or camp on any sensitive habitats for plants and animals.
- Do not cut down any part of living trees / bushes for firewood, and.
- Do not destroy bird nest, dens, burrow pits, termite hills etc or any other natural objects in the area.

5.2.2 Vehicle Use and Access Guidance

- Never drive any vehicle without a valid licence for that particular vehicle and do not drive any vehicle that appears not to be road-worthy.
- Never drive any vehicle when under the influence of alcohol or drugs.
- DO NOT make any new roads or tracks without permission. Stay within demarcated areas.
- Avoid U-Turns and large turning circles. 3-point turns are encouraged. Do not ever drive on rocky slopes or vegetated dune areas.
- Stay on the road, do not make a second set of tracks and do not cut corners.

- ❖ DO NOT SPEED - keep to the designated speed limit on the tracks and site roads.
- ❖ No off-road driving is allowed. and
- ❖ Vehicles may only drive on demarcated roads.

5.2.3 Air Emission and Dust Reduction

- ❖ Manage the speed for all vehicles on the mine and community roads to reduce dust emissions.
- ❖ Stock piles should be covered with dust binding chemical to reduce fugitive emissions.
- ❖ Chemical binding substance can be applied to road surfaces to supress dust particle and reduce emission within the mine which will reduce fugitive emissions in the community.
- ❖ Recycling water can be sprayed on roads, stockpiles and conveyors to suppress dust thus reducing dust emissions.
- ❖ Continuous weather monitoring on site. and
- ❖ Employ loading practices for trucks by excavators to minimise dust generation.

5.2.4 Noise and Vibrations Emission Reduction

- ❖ Speed reduction can reduce noise associated with vehicles and trucks movements and ensure that vehicles are services regularly.
- ❖ Machinery that meets Namibian and international noise emissions will be used.
- ❖ Careful selection of equipment and insulation and sound enclosures around machinery can control noise.
- ❖ Regular and extensive monitoring of noise impact associated with blasting as well as other mining operations.
- ❖ Blasting times will be managed to minimise the impact of noise and vibration, and.
- ❖ Designing detonation sequence with delays between holes so that blast waves from individual holes do not occur simultaneously.

5.2.5 Preventing Pollution and Dangerous Working Conditions Guidance

- ❖ Never throw any hazardous substance such as fuel, oil, solvents, etc. into streams or onto the ground. Never allow any hazardous substance to soak into the soil.
- ❖ Immediately tell your supervisor or Environmental Control Officer / Site Manager when you spill, or notice any hazardous substance being spilled anywhere in the mine.
- ❖ Report to your Supervisor or Environmental Control Officer / Site Manager when you notice any container, which may hold a hazardous substance, overflow, leak or drip.
- ❖ Immediately report to your supervisor or Environmental Control Officer / Site Manager when you notice overflowing problems or unhygienic conditions at the ablution facilities.
- ❖ Vehicles, equipment and machinery, containers and other surfaces shall be washed at areas designated by the Contractor or Environmental Control Officer/ Site Manager, and.

- ❖ If you are not sure how to transport, use, store or dispose any hazardous substance - ASK your supervisor or Environmental Control Officer / Site Manager for advice.

5.2.6 Saving Water Guidance

- ❖ Always use as little water as possible. Reduce, reuse and re-cycle water where possible.
- ❖ Report any dripping or leaking taps and pipes to your supervisor or Environmental Control Officer or Site Manager, and.
- ❖ Never leave taps running. Close taps after you have finished using them.

5.2.7 Disposal of Waste Guidance

- ❖ Learn to know the difference between the two main types of waste, namely: General and hazardous wastes.
- ❖ Learn how to identify the containers, bins, drums or bags for the different types of wastes. Never dispose of hazardous waste in the bins or skips intended for general waste or construction rubble.
- ❖ Never burn or bury any waste within mining license area.
- ❖ Never overfill any waste container, drum, bin or bag. Inform your supervisor or the Environmental Control Officer / Site Manager if the containers, drums, bins or skips are nearly full.
- ❖ Never litter on the site, in the field or along any road. No illegal dumping.
- ❖ Littering is prohibited.

5.2.8 Religious, Cultural, Historical and Archaeological Objects Guidance

- ❖ If you find any suspected religious, cultural, historical or archeologically object or site around the mine, you must immediately notify your supervisor or Environmental Control Officer **/** Site Manager, and.
- ❖ Never remove, destroy, interfere with or disturb any religious, cultural, historical or archaeological object or site around the mine site.

5.2.9 Dealing with Environmental Complaints Guidance

- ❖ If you have any complaint about dangerous working conditions or potential pollution to the environment, immediately report this to your supervisor or the Environmental Control Officer / Site Manager, and.
- ❖ If any person complains to you about noise, lights, littering, pollution, or any other harmful or dangerous condition, immediately report this to your supervisor or the Environmental Control Officer / the Site Manager.

5.3 Environmental Personnel Register

The Environmental Awareness Training will be undertaken as part of the Site General Induction and an Environmental Personnel Register will be signed by every person who receives or attends the Environmental Awareness Training or who has the training material explained to him or her or in possession of the training material.

6. SUMMARY OF THE REGULATORY REGISTER AND PERMITS

6.1 Applicable National Legislations

Table 6.1 summarises the key selected legislations relevant applicable to the ongoing exploration in the ML No. 121. The following is the summary of all other relevant national legislative instruments applicable to the proposed mining ongoing exploration operations in the ML No. 121:

1. The Constitution of the Republic of Namibia of 1990.
2. The Minerals (Prospecting and Mining), 1992 (Act, No. 33 of 1992).
3. Environmental Management Act, No. 7 of 2007 and the EIA Regulations, 2012.
4. Water Act 1996, (Act No. 54 of 1956) (Regulations in respect of Subterranean water control Areas SWA).
5. Forestry Act 2001, (Act No. 12 of 2001) as amended by the Forest Amendment Act, 2005 (Act No. 13 of 2005).
6. National Heritage 2004 (Act No. 27 of 2004).
7. The Labour Act 2007, (Act No. 11 of 2007) (Regulations relating to the Health & Safety of Employees at Work promulgated in terms of Section 101 of the Labour Act, 1992 (Act No. 6 of 1992 - GN156, GG 1617 of 1 August 1997).
8. Public Health 1919 (Act No. 36 of 1919).
9. Soil Conservation Act, 1969, (Act No. 76 of 1969).
10. Hazardous Substances Ordinance, 1974 (No. 14 of 1974).
11. Nature Conservation Ordinance, 1975, (No. 14 of 1975).
12. The Health Act, 1988, (Act No. 21 of 1988).
13. Atmospheric Pollution Prevention Ordinance, 1976, (No. 11 of 1976).
14. Explosives Act, 1956 (Act No. 26 of 1956).
15. Petroleum Products and Energy Act, No. 13 of 1990, and regulations relating to the purchase, sale, supply, acquisition, usage, possession, disposal, storage, transportation, recovery and refinement of used mineral oil as published in GN 112 of 1991 (GG 281 of 21 October 1991) (“1991 regulations”) and the petroleum product regulations published in GN 155 of 2000 (GG 2357 of 23 June 2000) (“2000 regulations”), the Petroleum Products and Energy Amendment Act, No. 29 of 1994 and the Petroleum Products and Energy Amendment Act, 2000
16. Namibian Water Corporation Act, 1997 (Act No. 12 of 1997).
17. Road Traffic and Transport Act, 1999 (Act No. 22 of 1999).
18. Communal Land Reforms Act, 2002 (Act No. 5 of 2002).
19. Medicines and Related Substances Control Act, 2003 (Act No. 13 of 2003).
20. Allied Health Professions Act, 2004 (Act No. 7 of 2004).
21. Electricity Act, 2007, (Act No. 4 of 2007).

Table 6.1: Legislation relevant to the ongoing exploration operations in the ML No. 121.

LAW	SUMMARY DESCRIPTION
Constitution of the Republic of Namibia, 1990	The Constitution is the supreme law in Namibia, providing for the establishment of the main organs of state (the Executive, the Legislature, and the Judiciary) as well as guaranteeing various fundamental rights and freedoms. Provisions relating to the environment are contained in Chapter 11, article 95, which is entitled "promotion of the Welfare of the People". This article states that the Republic of Namibia shall – "actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at … maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilisation of living natural resources on a sustainable basis for all Namibians, both present and future. The Government shall provide measures against the dumping or recycling of foreign nuclear waste on Namibian territory."
Minerals (Prospecting and Mining) Act, 1992 ***Ministry of Mines and Energy (MME)***	The Minerals Act governs minerals prospecting and mining. The Act *provides for the reconnaissance, prospecting, and mining for, and disposal of, and the exercise of control over minerals in Namibia. and to provide for matters incidental thereto. A new Minerals Bills is currently under preparation.*
Environmental Management Act (2007) - ***Ministry of Environment, Forestry and Tourism*** **(MEFT)**	The purpose of the Act is *to give effect to Article 95(l) and 91(c) of the Namibian Constitution by establishing general principles for the management of the environment and natural resources. to promote the co-ordinated and integrated management of the environment. to give statutory effect to Namibia's Environmental Assessment Policy. to enable the Minister of Environment and Tourism to give effect to Namibia's obligations under international conventions*. In terms of the legislation it will be possible to exercise control over certain listed development activities and activities within defined sensitive areas. The listed activities in sensitive areas require an Environmental Assessment to be completed before a decision to permit development can be taken. The legislation describes the circumstances requiring Environmental Assessments. Activities listed as per the provisions of the Act will require Environmental Assessment unless the Ministry of Environment, Forestry and Tourism, in consultation with the relevant Competent Authority, determines otherwise and approves the exception.
Water Act 54 of 1956 **Minister of Agriculture, Water and Land reform (MAWLR)**	This Act provides for the control, conservation and use of water for domestic, agricultural, urban, and industrial purposes. In terms of Section 6, there is no right of ownership in public water and its control and use is regulated and provided for in the Act. In accordance with the Act, the proposed project must ensure that mechanisms are implemented to prevent water pollution. Certain permits will also be required to abstract groundwater (already obtained) as well as for "water works". The broad definition of water works will include the reservoir on Site (as this is greater than 20,000m^3), water treatment facilities and pipelines. Due to the water scarcity of the area, all water will be recycled (including domestic wastewater) and the Mine will be operated on a zero-discharge philosophy. It will, therefore, not be necessary to obtain permits for discharge of effluent. Section 23 of the Act requires environment rehabilitation after closure of the Mine, particularly, in this instance to obviate groundwater pollution and potential pollution resulting from run-off. This Act is due to be replaced by the Water Resources Management Act 24 of 2004.
Forest Act 12 of 2001 - **Minister of Environment, Forestry and Tourism (MEFT)**	The Act provide for the establishment of a Forestry Council and the appointment of certain officials. to consolidate the laws relating to the management and use of forests and forest produce. to provide for the protection of the environment and the control and management of forest fires. Under Part IV Protection of the environment, Section 22(1) of the Act, it is unlawful for any person to: cut, destroy, or remove: (a) any vegetation which is on a sand dune or drifting sand or in a gully unless the cutting, destruction or removal is done for the purpose of stabilising the sand or gully or (b) any living tree, bush or shrub growing within 100m of a river, stream, or watercourse. Should either of the above be unavoidable, it will be necessary to obtain a permit from the Ministry. Protected tree species as listed in the Regulations shall not be cut, destroyed, or removed.
Hazardous Substance Ordinance 14 of 1974 ***Ministry of Health and Social Services***	Provisions for hazardous waste are amended in this act as it provides "*for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances. to provide for the prohibition and control of the importation, sale, use, operation, application, modification, disposal or dumping of such substance. and to provide for matters connected therewith"*

Table 6.1: *Cont.*

Agricultural (Commercial) Land Reform Act, 1995, Act No.6 of 1995 ***Ministry of Agriculture, Water and Land Reform*** **(MAWLR)**	This Act provide for the acquisition of agricultural land by the State for the purposes of land reform and for the allocation of such land to Namibian citizens who do not own or otherwise have the use of any or of adequate agricultural land, and foremost to those Namibian citizens who have been socially, economically or educationally disadvantaged by past discriminatory laws or practices. to vest in the State a preferent right to purchase agricultural land for the purposes of the Act. to provide for the compulsory acquisition of certain agricultural land by the State for the purposes of the Act. to regulate the acquisition of agricultural land by foreign nationals. to establish a Lands Tribunal and determine its jurisdiction. and to provide for matters connected therewith.
Explosives Act 26 of 1956 (as amended in SA to April 1978) - ***Ministry Home Affairs, Immigration, Safety and Security (MHAISS)***	All explosive magazines are to be registered with the Ministry of Mines and Energy as accessory works. In addition, the magazines must be licensed as required by Section 22. The quantity of explosives and the way it is stored must be approved by an inspector. The inspector has powers to enter the premises at any time to conduct inspections regarding the nature of explosive, quantity and the way it is stored. At closure, all explosives are to be disposed of accordingly.
Atmospheric Pollution Prevention Ordinance 11 of 1976. ***Ministry of Health and Social Services (MHSS)***	This regulation sets out principles for *the prevention of the pollution of the atmosphere and for matters incidental thereto.* Part III of the Act sets out regulations pertaining to atmospheric pollution by smoke. While preventative measures for dust atmospheric pollution are outlined in Part IV and Part V outlines provisions for Atmospheric pollution by gases emitted by vehicles.
The Nature Conservation Ordinance, Ordinance 4 of 1975, ***Ministry of Environment, Forestry and Tourism*** **(MEFT)**	During the Mine's activities, care must be taken to ensure that protected plant species and the eggs of protected and game bird species are not disturbed or destroyed. If such destruction or disturbance is inevitable, a permit must be obtained in this regard from the Minister of Environment, Forestry and Tourism. Should the Proponent operate a nursery to propagate indigenous plant species for rehabilitation purposes, a permit will be required. At this stage, however, it is envisaged that this type of activity will be contracted out to encourage small business development.
Labour Act, 1992, Act No. 6 of 1992 as amended in the Labour Act, 2007 (Act No. 11 of 2007 **Ministry of Labour, Industrial Relations and Employment Creation (MLIREC)**	The labour Act gives effect to the constitutional commitment of Article 95 (11), to promote and maintain the welfare of the people. This Act is aimed at establishing *a comprehensive labour law for all employees. to entrench fundamental labour rights and protections. to regulate basic terms and conditions of employment. to ensure the health, safety and welfare of employees* under which provisions are made in chapter 4. *Chapter* 5 of the act improvises on the *protection of employees from unfair labour practice.*
Petroleum Products and Energy Act 13 of 1990 ***Ministry of Mines and Energy (MME)***	Any consumer installation as envisaged in this Act must be licensed. Appropriate consumer installation certificate will need to be obtained from the Ministry for each fuel installation. The construction of the installation must be designed in such a manner as to prevent environmental contamination. Any certificate holder or other person in control of activities related to any petroleum product is obliged to report any major petroleum product spill (defined as a spill of more than 200ℓ per spill) to the Minister. Such person is also obliged to take all steps as may be necessary in accordance with good petroleum industry practices to clean up the spill. Should this obligation not be met, the Minister is empowered to take steps to clean up the spill and to recover the costs thereof from the person. General conditions apply to all certificates issued. These include conditions relating to petroleum spills and the abandonment of the Site. The regulation further provides that the Minister may impose special conditions relating to the preparation and assessment of environmental assessments and the safe disposal of petroleum products.
National Heritage Act 27 of 2004 ***Ministry of Education, Arts and Culture (MEAC)***	This Act provides provisions for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. The proposed activities will ensure that if any archaeological or paleontological objects, as described in the Act, are found during the implementation of the activities, such a find shall be reported to the Ministry immediately. If necessary, the relevant permits must be obtained before disturbing or destroying any heritage

6.2 Key Regulators / Competent Authorities

The environmental regulatory authorities responsible for environmental protection and management in relation to the proposed project including their role in regulating environmental protection are listed in Table 6.2.

Table 6.2: Government agencies regulating environmental protection in Namibia.

AGENCY	RESPONSIBILITY
Ministry of Mines and Energy (MME)	The competent authority for minerals prospecting and mining activities in Namibia. Issues Exclusive prospecting License (EPL), Mining Licenses (ML) and Mining Claims (license) as well as all other minerals related permits for processing, trading and export of minerals resources. In accordance with the provisions of the Petroleum Products and Energy Act 13 of 1990 ("the Petroleum Products Act") and the regulations thereof, only 210 L of diesel can be stored onsite without a license for own use. In order to store more than 210L of diesel for own use a site-specific Consumer Installation License is required. The application of a Consumer Installation License requires the applicant to have undertaken Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) in order to apply for Environmental Clearance Certificate (ECC) in accordance with the provisions of the Environmental Management Act, 2007, (Act No. 7 of 2007) and the EIA Regulations 30 of 2012.
Ministry of Environment, Forestry and Tourism (MEFT)	Issue of Environmental Clearance Certificate (ECC) based on the review and approval of the Environmental Assessments (EA) reports comprising Environmental Scoping, Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) prepared in accordance with the Environmental Management Act (2007) and the Environmental Impact Assessment Regulations, 2012. The National Botanical Research Institute's (NBRI) mandate is to study the flora and vegetation of Namibia, in order to promote the understanding, conservation and sustainable use of Namibia's plants for the benefit of all. The Directorate of Forestry (DOF) is responsible for issuing of forestry permits with respect to harvest, transport, and export or market forest resources.
Ministry of Agriculture, Water and Land Reform (MAWLR)	The Directorate of Resource Management within the Department of Water Affairs (DWA) at the MAWLR is currently the lead agency responsible for management of surface and groundwater utilisation through the issuing of abstraction permits and waste water disposal permits. DWA is also the Government agency responsible for water quality monitoring and reporting. The ML No. 121 covers part of the Farms Odien and Fairview falling within the ǂGaingu Communal Conservancy owned by the Government of Namibia in line with the Agricultural (Commercial) Land Reform Act, 1995, Act No.6 of 1995 and Communal Land Reforms Act, 2002 (Act No. 5 of 2002). Access to the surface land rights and negotiation of an agreement shall be concluded with the Department of Land Reform, Erongo Regional Land Board and the Oe-≠Gân Traditional Authority.
Ministry of Home Affairs, Immigration, Safety and Security (MHAISS)	The Explosive Department within the Namibian Police are responsible for licensing to purchase, store and use of explosive magazines for exploration or mining related blasting that may be undertaken in the ML No. 121

6.3 International and Regional Treaties and Protocols

Article 144 of the Namibian Constitution provides for the enabling mechanism to ensure that all international treaties and protocols are ratified. All ratified treaties and protocols are enforceable within Namibia by the Namibian courts and these include the following:

- The Paris Agreement, 2016.
- Convention on Biological Diversity, 1992.
- Vienna Convention for the Protection of the Ozone Layer, 1985.
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1987.
- United Nations Framework Convention on Climate Change, 1992.

- ❖ Kyoto Protocol on the Framework Convention on Climate Change, 1998.
- ❖ Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, 1989.
- ❖ World Heritage Convention, 1972.
- ❖ Convention to Combat Desertification, 1994. and
- ❖ Stockholm Convention of Persistent Organic Pollutants, 2001.
- ❖ Southern Africa Development Community (SADC) Protocol on Mining, and.
- ❖ Southern Africa Development Community (SADC) Protocol on Energy.

6.4 Standards and Guidelines

Industrial effluent likely to be generated by the proposed activities must comply with provisions of the Government Gazette No 217 dated 5 April 1962 (Table 6.3) while the drinking water quality comparative guideline values are shown in Table 6.4. The only key missing components to the regulatory frameworks in Namibia are the standards, and guidelines with respect to gaseous, liquid, and solid emissions. However, in the absence of national gaseous, liquid, and solid emission limits for Namibia, the proposed project shall target the Multilateral Investment Guarantee Agency (MIGA) gaseous effluent emission level and liquid effluent emission levels (Table 6.5). Noise abatement measures must target to achieve either the levels shown in Table 6.6 or a maximum increase in background levels of 3 dB (A) at the nearest receptor location off-site (MIGA guidelines).

Table 6.3: R553 Regional Standards for Industrial Effluent, in Government Gazette No 217 dated 5 April 1962.

Colour, odour and taste	The effluent shall contain no substance in concentrations capable of producing colour, odour or taste	
pH	Between 5.5 and 9.5	
Dissolved oxygen	At least 75% saturation	
Typical faecal coli	No typical faecal coli per 100 ml	
Temperature	Not to exceed 35 °C	
Chemical demand oxygen	Not to exceed 75 mg/l after applying a correction for chloride in the method	
Oxygen absorbed	Not to exceed 10 mg/l	
Total dissolved solids (TDS)	The TDS shall not have been increased by more than 500 mg/l above that of the intake water	
Suspended solids	Not to exceed 25 mg/l	
Sodium (Na)	The Na level shall not have been increased by more than 50 mg/l above that of the intake water	
Soap, oil and grease	Not to exceed 2.5 mg/l	
Other constituents	Residual chlorine	0,1 mg/l as Cl
	Free & saline ammonia	10 mg/l as N
	Arsenic	0,5 mg/l as As
	Boron	1,0 mg/l as B
	Hexavalent Cr	0,05 mg/l as Cr
	Total chromium	0,5 mg/l as Cr
	Copper	1,0 mg/l as Cu
	Phenolic compounds	0,1 mg/l as phenol
	Lead	1,0 mg/l as Pb
	Cyanide and related compounds	0,5 mg/l as CN
	Sulphides	1,0 mg/l as S
	Fluorine	1,0 mg/l as F
	Zinc	5,0 mg/l as Zn

Table 6.4: Comparison of selected guideline values for drinking water quality (after Department of Water Affairs, 2001).

Parameter and Expression of the results			WHO Guidelines for Drinking-Water Quality 2nd edition 1993		Proposed Council Directive of 28 April 1995 (95/C/13-1/03) EEC	Council Directive of 15 July 1980 relating to the quality intended for human consumption 80/778/EEC		U.S. EPA Drinking water Standards and Health Advisories Table December 1995		Namibia, Department of Water Affairs Guidelines for the evaluation of drinking-water for human consumption with reference to chemical, physical and bacteriological quality July 1991			
			Guideline Value (GV)		Proposed Parameter Value	Guide Level (GL)	Maximum Admissible Concentration (MAC)	Maximum Contaminant Level (MCL)		Group A Excellent Quality	Group B Good Quality	Group C Low Health Risk	Group D Unsuitable
Temperature	t	°C		-	-	12	25		-	-	-	-	-
Hydrogen ion concentration	pH, 25° C	-	R	<8.0	6.5 to 9.5	6.5 to 8.5	10		-	6.0 to 9.0	5.5 to 9.5	4.0 to 11.0	<4.0 to >11.0
Electronic conductivity	EC, 25° C	mS/m		-	280	45	-		-	150	300	400	>400
Total dissolved solids	TDS	mg/l	R	1000	-	-	1500		-	-	-	-	-
Total Hardness	$CaCO_3$	mg/l		-	-	-	-		-	300	650	1300	>1300
Aluminium	Al	µ g/l	R	200	200	50	200	S	50-200	150	500	1000	>1000
Ammonia	NH_4^+	mg/l	R	1.5	0.5	0.05	0.5		-	1.5	2.5	5.0	>5.0
	N	mg/l		1.0		0.04	0.4		-	1.0	2.0	4.0	>4.0
Antimony	Sb	µ g/l	P	5	3	-	10	C	6	50	100	200	>200
Arsenic	As	µ g/l		10	10	-	50	C	50	100	300	600	>600
Barium	Ba	µ g/l	P	700	-	100	-	C	2000	500	1000	2000	>2000
Berylium	Be	µ g/l		-	-	-	-	C	4	2	5	10	>10
Bismuth	Bi	µ g/l		-	-	-	-		-	250	500	1000	>1000
Boron	B	µ g/l		300	300	1000	-		-	500	2000	4000	>4000
Bromate	BrO_3^-	µ g/l		-	10	-	-	P	10	-	-	-	-
Bromine	Br	µ g/l		-	-	-	-		-	1000	3000	6000	>6000
Cadmium	Cd	µ g/l		3	5	-	5	C	5	10	20	40	>40
Calcium	Ca	mg/l		-	-	100	-		-	150	200	400	>400
	$CaCO_3$	mg/l		-	-	250	-		-	375	500	1000	>1000
Cerium	Ce	µ g/l		-	-	-	-		-	1000	2000	4000	>4000
Chloride	Cl^-	mg/l	R	250	-	25	-	S	250	250	600	1200	>1200
Chromium	Cr	µ g/l	P	50	50	-	50	C	100	100	200	400	>400
Cobalt		µ g/l		-	-	-	-		-	250	500	1000	>1000
Copper after 12 hours in pipe	Cu	µ g/l	P	2000	2	100	-	C	TT##	500	1000	2000	>2000
		µ g/l		-	-	3000[1]	-	S	1000	-	-	-	-
Cyanide	CN^-	µ g/l		70	50	-	50	C	200	200	300	600	>600
Fluoride	F^-	mg/l		1.5	1.5	-	at 8 to 12 °C: 1.5	C	4	1.5	2.0	3.0	>3.0
		mg/l		-	-	-	at 25 to 30 °C: 0.7	P,S	2	-	-	-	-
Gold	Au	µ g/l		-	-	-	-		-	2	5	10	>10
Hydrogen sulphide	H_2S	µ g/l	R	50	-	-	undetectable		-	100	300	600	>600
Iodine	I	µ g/l		-	-	-	-		-	500	1000	2000	>2000
Iron	Fe	µ g/l	R	300	200	50	200	S	300	100	1000	2000	>2000
Lead	Pb	µ g/l		10	10	-	50	C	TT#	50	100	200	>200
Lithium	Li	µ g/l		-	-	-	-		-	2500	5000	10000	>10000
Magnesium	Mg	mg/l		-	-	30	50		-	70	100	200	>200
	$CaCO_3$	mg/l		-	-	7	12		-	290	420	840	>840
Manganese	Mn	µ g/l	P	500	50	20	50	S	50	50	1000	2000	>2000
Mercury	Hg	µ g/l		1	1	-	1	C	2	5	10	20	>20
Molybdenum	Mo	µ g/l		70	-	-	-		-	50	100	200	>200
Nickel	Ni	µ g/l		20	20	-	50		-	250	500	1000	>1000
Nitrate*	NO_3^-	mg/l	P	50	50	25	50		45	45	90	180	>180
	N	mg/l		-	-	5	11	C	10	10	20	40	>40
Nitrite*	NO_2^-	mg/l		3	0.1	-	0.1		3	-	-	-	-
	N	mg/l		-	-	-		C	1	-	-	-	-
Oxygen, dissolved	O_2	% sat.		-	50	-	-		-	-	-	-	-
Phosphorus	P_2O_5	µ g/l		-	-	400	5000		-	-	-	-	-
	PO_4^{3-}	µ g/l		-	-	300	3350		-	-	-	-	-
Potassium	K	mg/l		-	-	10	12		-	200	400	800	>800
Selenium	Se	µ g/l		10	10	-	10	C	50	20	50	100	>100
Silver	Ag	µ g/l		-	-	-	10	S	100	20	50	100	>100
Sodium	Na	mg/l	R	200	-	20	175		-	100	400	800	>800
Sulphate	SO_4^{2-}	mg/l	R	250	250	25	250	S	250	200	600	1200	>1200
Tellurium	Te	µ g/l		-	-	-	-		-	2	5	10	>10
Thallium	Tl	µ g/l		-	-	-	-	C	2	5	10	20	>20
Tin	Sn	µ g/l		-	-	-	-		-	100	200	400	>400
Titanum	Ti	µ g/l		-	-	-	-		-	100	500	1000	>1000
Tungsten	W	µ g/l		-	-	-	-		-	100	500	1000	>1000
Uranium	U	µ g/l		-	-	-	-	P	20	1000	4000	8000	>8000
Vanadium	V	µ g/l		-	-	-	-		-	250	500	1000	>1000
Zinc after 12 hours in pipe	Zn	µ g/l	R	3000	-	100	-	S	5000	1000	5000	10000	>10000
		µ g/l		-	-	5000	-		-	-	-	-	-

P: Provisional
R: May give reason to complaints from consumers

C: Current. P: Proposed. S: Secondary.
T#: Treatment technique in lieu of numeric MCL.
TT##: treatment technique triggered at action level of 1300 µ g/l

Table 6.5: Liquid effluent emission levels (MIGA /IFC).

Pollutant	**Max. Value**
pH	6-9
Total suspended solids	50 mg/l
Total metals	10 mg/l
Phosphorous (P)	5 mg/l
Fluoride (F)	20 mg/l
Cadmium (Cd)	0.1 mg/l

Table 6.6: Noise emission levels (MIGA /IFC).

	Maximum Allowable Leq (hourly), in dB(A)	
Receptor	Day time (07:00 – 22:00)	Night time (22:00 – 07:00)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

6.5 Recommendations on Permitting Requirements

It is hereby recommended that the Proponent must follow the provisions of all relevant national regulatory throughout the proposed project lifecycle and must obtain the following permits/ authorisations as may be applicable / required as the proposed project develops:

(i) Valid ML No. 121 as may be applicable from Department of Mines in the MME.

(ii) Valid ECC from the Department of Environmental Affairs in the MEFT.

(iii) The Proponent shall apply for a fresh water abstraction and waste water discharge permits from the Department of Water Affairs (DWA) in the MAWLR before drilling a water borehole and discharge wastewater into the environment respectively, and.

(iv) All other permits as may be become applicable during the proposed mining and ongoing exploration operations including the lease agreement to be concluded with the owners of the commercial / communal farmland portions of Farms Odien and Fairview falling within the ǂGaingu Communal Conservancy as may be required to support the proposed mining operations and ongoing exploration activities.

7. CONCLUSION AND RECOMMENDATIONS

7.1 Summary of Conclusions

This EMP provides for mining of dimension stones only and if there is a need for new modifications that may require regulatory approvals such as mining of new commodity as granted in the ML 121 other than dimension stones, an increase in the size or additional new land to the ML area, the Proponent will be required to apply for a new / amended ECC before such modifications may be implemented. This EMP Report provides for the migration measures with respect to the significant impacts as delineated in the EIA Report and covers the following proposed project developmental stages:

(i) Preconstruction and site clearing for quarry and supporting infrastructure area such as storage / yard area/ supporting containerised area/ access and all related services points for water and energy supplies as may be required.

(ii) Construction of the proposed quarry and supporting infrastructure.

(iii) Operation, ongoing monitoring and rehabilitation, and.

(iv) Decommissioning, closure and aftercare.

Based on the extent, duration, intensity and likely negative and positive impacts of the proposed mining operations and ongoing exploration activities development, this EMP Report incorporates and provides for all the relevant mitigation measures with respect to likely impacts and recommendations to be implemented by the Proponent.

7.2 Recommendations

It's hereby recommended that Namibia Nuclear Corporation (Pty) Ltd takes all the necessary steps to implement all the recommendations of this EMP for the successful implementation and completion of the proposed mining operations and ongoing exploration activities from construction to final mine closure and aftercare stages. The following are the recommended actions to be implemented by the Proponent (Namibia Nuclear Corporation (Pty) Ltd):

(i) The Proponent will undertake to implement the conditions of the land lease agreement to be concluded with the owners of the commercial / communal farmland portions of Farms Odien and Fairview falling within the ǂGaingu Communal Conservancy as may be required to support the proposed mining operations and ongoing exploration activities.

(ii) The Proponent shall implement and adhere to all the provisions of this EMP report.

(iii) Mitigation measures shall be implemented as detailed in this EMP report.

(iv) The Proponent shall adhere to all the applicable national regulations and standards as well as Good International Industry Practices (GIIP) such as the EPs 1-10 guidelines framework.

(v) The Proponent shall adopt the precautionary approach / principles in instances where baseline information, national or international guidelines or mitigation measures have not been provided or do not sufficiently address the site-specific project impact.

(vi) As part of the continuous key stakeholder consultation and engagement processes, a stakeholder register and grievance mechanism shall be developed as shown in Tables 7.1 and 7.2. A grievance feedback mechanism shall be created to receive, track and respond to questions and complaints from community members, individual or group affected or likely to be by the proposed mining operations and ongoing exploration activities (Tables 7.1 and 7.2).

(vii) Appoint an Environmental Control Officer to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and sub-contractors in the field during the whole duration of the proposed project.

(viii) Provide with other support, human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned mine project life cycle.

(ix) Develop an environmental induction and awareness programme for all the workforce, contractors and subcontractors.

(x) Service provider contracts shall incorporate provisions for environmental and social management and liabilities.

(xi) Implement internal and external monitoring of the actions and management strategies developed during the project duration and a final Environmental Monitoring report to be prepared by the Environmental Control Officer and to be submitted to the regulators and to end the proposed mine project, and.

(xii) Develop and implement a monitoring programme that will fit into the overall company's EMS as well as for any future EIA related to the expansion of the current delineated resources or development of completely new mine site within the ML No. 121 area.

All the responsibilities to ensure that the recommendations are executed accordingly, rest with the Proponent (Namibia Nuclear Corporation (Pty) Ltd). The Proponent shall provide all appropriate resource requirements for the implementation of this EMP as well as the mining operations and ongoing exploration activities.

It is the responsibility of the Proponent to make sure that all members of the workforce including contractors and subcontractors are aware of this EMP provisions and its objectives.

Table 7.1: Sample of the Stakeholder Register.

No.	Name/ Organisation	Contact Details	Questions/Comments	Feedback/Response
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				

Table 7.2: Sample of the Grievance Form.

Name of Commenter/Aggrieved			
Name of Organisation/Position			
Address			
Telephone/Fax			
Email Address			
Most Effective Means to Send a Response	Mail	Email	Phone
Date of Comment/Grievance			
Date Inputted			
Nature and Location of Comment/Grievance			
Received By			
Initial Response Details and Sent By:			
Date of Initial Response			
Resolved/Addressed By			
Nature of Resolution			
Date of Resolution			
Signed By: Community Liaison Officer (CLO)			