Lepidico Chemicals Namibia (Pty) Ltd

Final Environmental Social Impact Assessment (ESIA) Report for the Karibib Project, Mining License (ML) No. 204, Karibib District, Erongo Region,
WEST-CENTRAL NAMIBIA

JULY 2020

Lepidico Chemicals Namibia (Pty) Ltd
P. O. Box 90898
Klein Windhoek
WINDHOEK, NAMIBIA

PROPONENT, LISTED ACTIVITIES AND RELATED INFORMATION SUMMARY

TYPE OF AUTHORISATIONS

Renewal and Transfer of Environmental Clearance Certificate (ECC)

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM (MEFT)

ECC APPLICATION REFERENCE No.

APP-001552

NAME AND ADDRESS OF THE PROPONENT

Lepidico Chemicals Namibia (Pty) Ltd
(80% Owned by Lepidico Limited)

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COMPETENT AUTHORITY

Ministry of Mines and Energy (MME)

PROPOSED PROJECT

Renewal and Transfer of ECC for Mining License (ML) No. 204, Karibib Project
Karibib District, Erongo Region, Namibia

PROJECT LOCATION

Karibib District, Erongo Region, West Central Namibia
Latitude: -22.102132, Longitude: 15.998186

ENVIRONMENTAL CONSULTANTS

Risk-Based Solutions (RBS) CC
(Consulting Arm of Foresight Group Namibia (FGN) (Pty) Ltd)
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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Dr Sindila Mwiya
PhD, PG Cert, MPhil, BEng (Hons), Pr Eng

Summary Profile and Qualification of the Environmental Assessment Practitioner (EAP) / International Consultant Projects Director – Dr Sindila Mwiya

Dr Sindila Mwiya has more than eighteen (18) years of practical field-based technical industry experience in Environmental Assessment (SEA, EIA, EMP, EMS), Energy (Renewable and Non-renewable energy sources), onshore and offshore resources (minerals, oil, gas and water) exploration / prospecting, operation and utilisation, covering general and specialist technical exploration and recovery support, Health, Safety and Environment (HSE) permitting for Geophysical Surveys such as 2D, 3D and 4D Seismic, Gravity and Electromagnetic Surveys for mining and petroleum (oil and gas) operations support, through to engineering planning, layout, designing, logistical support, recovery, production / operations, compliance monitoring, rehabilitation, closure and aftercare projects lifecycles. The great array of highly technical specialist knowledge and field-based practical experiences of Dr Sindila Mwiya has now been extended to supporting the development of Environmentally Sustainable, automated / smart and Climate Change resilient homes, towns and cities.

Through his companies, Risk-Based Solutions (RBS) CC and Foresight Group Namibia (FGN) (Pty) Ltd which he founded, he has undertaken more than 200 projects for Local (Namibian), Continental (Africa) and International (Global) based clients. He has worked and continues to work for Global, Continental and Namibian based reputable resources (petroleum and mining / minerals) and energy companies such as EMGS (UK/ Norway), CGG (UK/ France/Namibia), BW Offshore (Norway/Singapore /Namibia), Shell Namibia B. V. Limited (Namibia/ the Netherlands), Tullow Oil (UK/Namibia), Debmarine (DBMN) (Namibia), Reconnaissance Energy Africa Ltd (ReconAfrica) (UK/Canada/Namibia), Osino Resource Corporation (Canada/Germany/Namibia), Desert Lion Energy Corporation (Canada/ Australia/ Namibia), Petrobras Oil and Gas (Brazil) / BP (UK)/ Namibia, REPSOL (Spain/ Namibia), ACREP (Namibia/Angola), Preview Energy Resources (UK), HRT Africa (Brazil / USA/ Namibia), Chariot Oil and Gas Exploration (UK/ Namibia), NABIRM (USA/ Namibia), Serica Energy (UK/ Namibia), Eco (Atlantic) Oil and Gas (Canada / USA/ Namibia), ION GeoVentures (USA), PGS UK Exploration (UK), TGS-Nopec (UK), Maurel & Prom (France/ Namibia), GeoPartners (UK), PetroSA Equatorial Guinea (South Africa / Equatorial Guinea/ Namibia), Preview Energy Resources (Namibia / UK), Sintezneftegaz Namibia Ltd (Russia/ Namibia), INA Namibia (INA INDUSTRIJA NAFTE d.d) (Croatia/ Namibia), Namibia Underwater Technologies (NUTAM) (South Africa/Namibia), InnoSun Holdings (Pty) Ltd and all its subsidiary renewable energy companies and projects in Namibia (Namibia / France), HopSol (Namibia/Switzerland), Momentous Solar One (Pty) Ltd (Namibia / Canada), OLC Northern Sun Energy (Pty) Ltd (Namibia) and more than 100 local companies. Dr Sindila Mwiya is highly qualified with extensive practical field-based experience in petroleum, mining, renewable energy (Solar, Wind, Biomass, Geothermal and Hydropower), Non Renewable energy (Coal, Petroleum, and Natural Gas), applied environmental assessment, management and monitoring (Scoping, EIA, EMP, EMS) and overall industry specific HSE, cleaner production programmes, Geoenvironmental, geological and geotechnical engineering specialist fields.

Dr Sindila Mwiya has undertaken and continues to undertake and manage high value projects on behalf of global and local resources and energy companies. Currently, (2020-2023) Dr Sindila Mwiya is responsible for permitting planning through to operational and completion compliance monitoring, HSE and engineering technical support for multiple major upstream onshore and offshore petroleum, minerals and mining projects, Solar and Wind Energy Projects, manufacturing and environmentally sustainable, automated / smart and Climate Change resilient homes developments in different parts of the World including Namibia. Currently, Dr Sindila Mwiya is developing a 16 Ha commercial and residential Mwale Mwiya Park in the Town of Katima Mulilo, Zambezi Region, Namibia as one of first advanced Environmentally Sustainable, automated / smart and Climate Change resilient development in Namibia. He continues to work as an International Resources Consultant, national Environmental Assessment Practitioner (EAP) / Environmentally Sustainable, automated / smart and Climate Change resilient homes developer, Engineering / Technical Consultant (RBS / FGN), Project Manager, Programme Advisor for the Department of Natural and Applied Sciences, Namibia University of Science and Technology (NUST) and has worked as a Lecturer, University of Namibia (UNAM), External Examiner/ Moderator, NUST, National (Namibia) Technical Advisor (Directorate of Environmental Affairs, Ministry of Environment, Forestry and Tourism (MEFT) / DANIDA – Cleaner Production Component) and Chief Geologist for Engineering and Environment Division, Geological Survey of Namibia, Ministry of Mines and Energy and a Field-Based Geotechnician (Specialised in Magnetics, Seismic, Gravity and Electromagnetics Exploration and Survey Methods) under the Federal Institute for Geoscience and Natural Resources (BGR) German Mineral Exploration Promotion Project to Namibia, Geophysics Division, Geological Survey of Namibia, Ministry of Mines and Energy.

He has supervised and continues to support a number of MScs and PhDs research programmes and has been a reviewer on international, national and regional researches, plans, programmes and projects with the objective to ensure substantial local skills development, pivotal to the national socioeconomic development through the promotion of sustainable natural resources coexistence, management, development, recovery, utilisation and for development policies, plans, programmes and projects financed by governments, private investors and donor organisations. From 2006 until 2017, he has provided extensive technical support to the Department of Environmental Affairs (DEA), Ministry of Environment, Forestry and Tourism (MEFT) through GIZ in the preparation and amendments of the Namibian Environmental Management Act, 2007, (Act No. 7 of 2007), new Strategic Environmental Assessment (SEA) Regulations, preparation of the updated Environmental Impact Assessment (EIA) Regulations as well as the preparation of the new SEA and EIA Guidelines and Procedures all aimed at promoting effective environmental assessment and management practices in Namibia.

Among his academic achievements, Dr Sindila Mwiya is a holder of a PhD (Engineering Geology/Geotechnical / Geoenvironmental / Environmental Engineering and Artificial Intelligence) – Research Thesis: Development of a Knowledge-Based System Methodology (KBSM) for the Design of Solid Waste Disposal Sites in Arid and Semiarid Environments, MPhil/PG Cert and BEng (Hons) (Engineering Geology and Geotechnics) qualifications from the University of Portsmouth, School of Earth and Environmental Sciences, United Kingdom. During the 2004 Namibia National Science Awards, organised by the Namibian Ministry of Education, and held in Windhoek, Dr Sindila Mwiya was awarded the Geologist of the Year for 2004, in the professional category. Furthermore, as part of his professional career recognition, Dr Sindila Mwiya is a life member of the Geological Society of Namibia, Consulting member of the Hydrogeological Society of Namibia and a Professional Engineer registered with the Engineering Council of Namibia.

Windhoek, Namibia July 2020

MAIN SPECIALIST CONSULTANTS / SPECIALIST MANAGERS

1. **Dr Sindila Mwiya** – ESIA Projects Director / EAP – 2017 and 2020

2. **Dr Vita Stankevica** – Socioeconomic Specialist and Quality Control 2017 and 2020

3. **Mr Gift Kamupingene**, representing GiG Agri-Advice & Supplies CC - Socioeconomic Baseline Report – 2020

4. **Dr Peter Cunningham** - Flora and Fauna Specialist 2017 and 2020

5. **Namib Hydrosearch –** Specialist Report on Hydrogeological Baseline Assessment and Groundwater Exploration -2017

6. **Dr S. Onjefu** and **Ms N. Hamatui**- Air Quality and Noise Impact Assessment - 2017

7. **Dr I. Maposa** – Modelling Air Quality and Noise for Future Trends - 2017

8. **Dr John Kinahan** - Archaeological Assessment - 2017

9. **Ms Meriam Kauyama and Ms. Christine Links** (Administrative Consultants) Public consultation support and logistics -2017 and 2020

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NON-TECHNICAL SUMMARY

1. Overview

Lepidico Chemicals Namibia (Pty) Ltd ("Proponent") holds mineral rights for the Karibib Project under the Mining License (ML) No. 204, situated in the Karibib District, Erongo Region, west-central Namibia. The Proponent is 80% owned by Lepidico Limited ("Lepidico"), a lithium exploration and development company listed on the Australian Securities Exchange and 20% owned by Huni Urib Holding Company, a local shareholder.

The ML 204 covering a total area of 6930Ha was granted by the Ministry of Mines and Energy ("Component Authority") on the 19th June 2018 and will expire on the 18th June 2028. The Karibib Project covering the ML 204 comprises the Rubicon and Helikon 1 mining sites. The Rubicon and Helikon areas are well known lithium deposits that have been explored and mined since the 1930s and 1950s respectively. Lepidico has completed a definitive feasibility study for the Karibib Project following the implementation of an infill drilling programme. In order to implement the proposed mining operation, the Proponent is required to have undertaken an Environmental Assessment (EA) in support of the application for Environmental Clearance Certificate (ECC) as provided for in the National Environmental Management Act, 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA) Regulation, 2012. The current ECC was granted by the Environmental Commissioner in the Ministry of Environment and Tourism ("Environmental Regulator") now called the Ministry of Environment, Forestry and Tourism (MEFT) in September 2017 and will expire in September 2020. The current ECC was granted following the completion of the EA process covering the preparation of Scoping, EIA and EMP Reports by Risk-Based Solution ("RBS") CC in 2017. The renewed ECC will need to be transferred from Desert Lion Energy (DLE) (Pty) Ltd (previous Proponent) now renamed Lepidico Chemicals Namibia (Pty) Ltd (current Proponent).

In addition to the compliance to the provisions of the national mining and environmental legislations for the Karibib Project, Lepidico is committed to meeting Good International Industry Practice (GIIP) that defines leading industry best practices as provided for in the Equator Principles (www.equator-principles.com). As such, this Environmental Social Impact Assessment (ESIA) Report has been prepared to support the application for renewal and transfer of the Environmental Clearance Certificate (ECC). All the mitigation measures for proposed project activities with significant impacts on the receiving environment as detailed in this ESIA report are presented in the Environmental Social Management Plan (ESMP) Report.

2. Summary of the Proposed Project

According to Lepidico (2020), the Karibib Project under the ML 204 consists of six deposits which have been mined previously for petalite and certain other minerals including tantalite. The deposits are located within an existing Mining License area which is central to a larger area which covers approximately 1,000 km^2 and is prospective for the discovery of additional lithium deposits. In 2019, Lepidico completed an in-fill drilling program for the two larger deposits at Rubicon and Helikon 1. Ore Reserves at Karibib, Namibia total 6.7 million tonnes grading 0.46% Li_2O, 0.23% rubidium and 320ppm caesium, a 60% conversion from Mineral Resources of 11.24 million tonnes, which highlights the potential for further Ore Reserve expansion. The Project is expected to consist of two open pit mines, a mineral concentrator and associated infrastructure. The following is the summary of the proposed mine development as published by Lepidico:

(i) Open pit mines will be developed on the Rubicon and Helikon 1 deposits only. Mining will be using conventional diesel-powered mining equipment.

(ii) Social benefits – creation of 115 direct jobs with indirect job creation (services and support industries) estimated at seven times that number (The Chamber of Mines of Namibia, 2012) and livelihoods being created to benefit Namibian families.

(iii) Symbiotic co-existence with local farmers and communities.

(iv) Enhancement of local community infrastructure through roads and water supply.

(v) Community support programs developed and focussed on critical resources, health and education, diversity, and sustainable micro business development.

(vi) A mineral concentrator will be installed close to the Rubicon pit. The processing facilities will use conventional crushing and grinding with mineral separation by froth flotation.

(vii) The processing rate has been reduced to 330,000 tonnes per annum for up to four years, then increasing to 540,000 tonnes per annum for a project life (including construction, commissioning, and closure) of circa 18 years.

(viii) The plant tailings will be filtered to a moisture content of circa 15% to recycle process water.

(ix) The mine waste from Rubicon and the tailings will be co-disposed in a single landform structure to facilitate progressive rehabilitation, closure, and stability. Geochemical testing has been completed confirming that the process tailings is low risk.

(x) The Project will be supplied by a 66kV powerline to be developed by Lepidico Chemicals Namibia (Pty) Ltd and operated by Namibia Power Corporation (NamPower) (Pty) Ltd.

(xi) The project will use existing infrastructure including the access road, a haul road from Helikon 1 to Rubicon, the borehole field, and other minor facilities.

(xii) Lepidico Chemicals Namibia (Pty) Ltd adheres to the Equator Principles and International Finance Corporation's Environmental and Social Performance Standards. These are to be reflected in the updated documentation.

(xiii) Lepidico Chemicals Namibia (Pty) Ltd has undertaken socioeconomic studies to develop a Corporate Social Responsibility (CSR) program. These have been incorporated into the documentation such this Environmental and Social Impact Assessment (ESIA), and.

(xiv) Sustainable closure – industry best practice closure plans that will rectify mining and processing legacy issues. The Project will be designed for closure in-line with the Best Practice Guide for Mining in Namibia. The Project Mine Closure Plan has been prepared to be updated annually is attached to the ESMP Report as Annex 1.

3. Summary of Alternatives Project Development

The various initial alternatives have been considered as part of the Environmental Assessment Study for the proposed Karibib Project in the ML 204 and will need to be continuously reviewed at various stages of the project development. The following alternatives have been considered:

- **Location:** Several small lithium deposits with other base and rare metals, precious metals and semi-precious stones minerals occurrences are known to exist in different parts of Namibia, and some have been explored by different companies over the years. The lithium deposits found around the ML 204 area have been explored and mined over many years. Based on the historical records available as well as the positive results of the feasibility study as well as excellent supporting infrastructure, there is good opportunity to develop the proposed mining operations within the ML 204. The development of the proposed mining operations will have greater benefit to the local farm area, Karibib and Namibia.

- **Mining Methods**: The mining techniques will use opencast mining method as the most favourable and economic mining technique.

- **Other Alternative Land Uses**: The ML 204 area covers 6930Ha of the 15160 Ha Farm Okongava 72 which has been bought by the Government from a commercial farmer in 2014 for resettlement of previously disadvantaged landless Namibians. Although no formal

resettlement has been implemented by the Government, there are already some families estimated to be around 28 who have settled on the farm without Government permission. Previously, and in addition to the existence of exploration and mining activities, the farm was used for commercial agriculture with cattle and small stock farming as the main key land uses of the surrounding area.

- **Potential Land Use Conflicts**: As a resettlement farm, the current and likely future land use of the area is moving towards communal / subsistence and small-scale commercial farming of cattle and small stock coexisting with minerals exploration and mining operations. In addition, there are also proposals to incorporate the Farm Okongava 72 into the proclaimed settlement land of Otjimbingwe Settlement falling under the Erongo Regional Council (ERC). However, the proposed mining operations only covers about 6% of the whole Farm Okongava 72 and the proposed mining operations is only targeting the areas around the old Rubicon and Helikon Mines which are already disturbed / excavated and not suitable for agricultural related activities being undertaken by the communal / subsistence farmers. This clearly demonstrates that the proposed mining operations will fully coexist with the other current and future land uses such as agriculture. Furthermore, the proposed mining operations will address the current poor state of the environment around the farm area and guarantee effective rehabilitation of the area in line with the current regulations which were absent at the time when the current old mines were operational and abandoned, and.

- **Ecosystem**: Overall ecosystem functions and services can be classified as low with no major outstanding landscape beauty within the farm area.

4. Methodology and Impact Assessment

The impact assessment covering this ESIA Report and the preparation of the ESMP report has been undertaken in line with the provisions of the national legislations and Equator Principles (www.equator-principles.com). The assessment process covered the following proposed mining, ongoing exploration and supporting infrastructures (roads, powerline, and water supply) developmental stages:

(i) Preconstruction.

(ii) Construction.

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

(iv) 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 have been assessed. The impact assessment methodology 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:

- The activities linked to the project that are supposed to have an impact on man and the environment, and.

- The existing environmental and socioeconomic 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, climate change, socioeconomic and potential impacts from hazardous materials. The summary of key potential environmental concerns expected during site preparation and the construction of mine infrastructures including test mining operations are outlined in Table 1, while those associated with the proposed mine operation, ongoing monitoring and rehabilitation, closure and aftercare stages are outlined in Table 2.

Table 1: Summary of key potential environmental concerns during site preparation and the construction of mine infrastructures including test mining operations.

Potential Sources of Concern	Nature of Potential Concern	Assessment	Significance
Climate Change and Air Quality			
1. Operation and maintenance of vehicles and any on-site power generation facilities	❖ Potential releases of particulate matter, carbon monoxide, oxides of nitrogen, sulphur dioxide, and volatile organic compound	Negative Impacts	Localised Low Impacts
2. Fuel and chemical transportation, handling and storage	❖ Potential releases of volatile organic compounds and other harmful substances		
3. Site preparation and construction activities	❖ Potential releases of particulate matter		
Surface (Local Ephemeral River) and Ground Water Vulnerability			
1. Operation and maintenance of vehicles and any on-site power generation facilities	❖ Potential releases of substances such as suspended solids, trace metals, oil, degreasers, and detergents and other harmful substances that could affect water quality and aquatic ecosystems	Negative Impacts	Localised Low Impacts
2. Fuel and chemical transportation, handling and storage	❖ In the event of spills, potential releases of petroleum products or chemicals that could affect surface waters or groundwater as well as aquatic ecosystems		
3. Site preparation and construction activities	❖ Potential release of sediments, increasing concentrations of total suspended solids in receiving waters		
4. Sewage and wastewater disposal	❖ Potential releases of nutrients and other contaminants		
5. Construction of site access roads, water supply infrastructure and powerlines	❖ Potential release of sediments along the routes, increasing total suspended solids in receiving waters ❖ Potential for acidic drainage if sulphide-bearing minerals are exposed during construction ❖ Stream crossings for access roads may affect aquatic ecosystems ❖ Increased road access in remote areas may lead to increased illegal hunting, poaching and collection of exotic fauna and flora species		
Soil Quality and Terrestrial Ecosystems			
1. Fuel and chemical transportation, handling, and storage	❖ In the event of spills, potential releases of petroleum products or chemicals that could affect soils, vegetation, and wildlife	Negative Impacts	Localised Low Impacts
2. Operation of vehicles	❖ Vehicle operations may result in collisions with wildlife ❖ Increased noise could disrupt wildlife		
3. Site preparation and construction activities associated with the proposed mining and exploration activities	❖ Clearing of vegetation around mining and exploration sites may have impacts on biodiversity, particularly if any rare, threatened or keystone species are present ❖ Activities may disrupt and dislocate local wildlife and any migratory wildlife in the area ❖ Some animals may be drawn to the site as a result of improper waste disposal or kitchen odours, which could lead to potential hazards for both workers and the animals		
4. Construction / upgrading of the main access, new powerlines and water supply infrastructure	❖ Construction activities may disrupt and dislocate wildlife and any migratory wildlife in the area ❖ Increased road access in remote areas may lead to increased hunting, stressing wildlife populations ❖ Vehicle operations may result in collisions with wildlife		
Noise			
1. Noise from construction activities, including vehicle operations, drilling and blasting	❖ Noise may affect local wildlife populations, and well as people living in communities near the exploration / mining activity	Negative Impacts	Localised Low Impacts

Table 2: Summary of key potential environmental concerns during mine operation, ongoing monitoring and rehabilitation, decommissioning, closure and aftercare stages.

Potential Sources of Concern	Nature of Potential Concern	Assessment	Significance
All others Impacts			
Land disturbance	Footprints of the mining and minerals processing facilities, exploration and mine supporting infrastructures	Negative Impacts	Localised Low to Medium Impacts
New waste management area	Can require large area; involves movement of materials, runoff and leachate management during the rainy season, dusting, and aesthetic considerations		
Reclamation	Both mine and waste rock area can represent major concerns due to the extent of the waste rock and pit areas and other mine supporting infrastructure footprints		
Slope Instability / Rock falls	Mining pits, waste management area and other excavations slope stability and potential failures are major challenges		
Noise and dust	Pits operations, haulage roads, waste rock / stock-piles and normal plant operations, equipment, and vehicles movement around the mine site and between pit areas and waste rock dumps and mill can be a source of dust and noise		
Blasting effects	Noise and vibration can be a concern requiring careful management		
Mine water	Mine water volume influenced by precipitation, surface and groundwater ingress. Elevated metals levels from the operations is a concern. Mine water may contain high metals contents.		

5. Summary of ESIA Conclusions and Recommendations

This ESIA report has been prepared in accordance with the national applicable regulations as well as the EPs 1-10 based on the International Finance Corporation (IFC) guidelines. All findings and recommendations of the key specialist studies with respect to the proposed Karibib Project development as undertaken in 2017 and some specialist studies such flora and fauna and socioeconomic baseline updated in 2020 have all been incorporated and presented in this ESIA report with mitigation measures provided in the ESMP Reports.

Based on the outcomes of the impact assessment as undertaken in this report, the proposed Karibib Project development in the ML 204 poses localised negative impacts to the receiving environment with greater offset /trade-offs/ benefits in the form of socioeconomic and environmental reclamation of the currently abandoned mine sites. The extent of the proposed mining and minerals processing and ongoing exploration operations are limited in area extent with respect to the ore body, the Rubicon and Helikon 1 pits and supporting infrastructures areas.

Focusing on developing and utilising the already disturbed areas from previous exploration and mining operations will be beneficial to the future rehabilitation of the historical impacts. Due to the localised

extent of the potential negative impacts, compared to the likely positive impacts, the Karibib Project is classified as a Category B project in terms of the Equator Principle 1: Review and Categorisation and Finance Corporation's (IFC) environmental and social categorisation process.

It is hereby recommended that a detailed ESMP Report be prepared to address all the identified impacts including the historical, current and future social and environmental impacts that may be associated with the proposed Karibib Project preconstruction, construction, operation, ongoing monitoring and rehabilitation and decommissioning, closure and aftercare lifecycle developmental stages.

It is hereby recommended that the proposed Karibib Project shall go ahead and be issued with the new Environmental Clearance Certificate (ECC) that must also be transferred from Desert Lion Energy (Pty) Ltd (Previous Proponent) to Lepidico Chemicals Namibia (Pty) Ltd (Current new Proponent).

Mitigation measures that will enhance the positive impacts and minimise the negative impacts have been developed and management strategies are provided in the Environmental Social Management Plan (ESMP) Report for implementation by the Proponent, Lepidico Chemicals Namibia (Pty) Ltd.

1. PROJECT BACKGROUND

1.1 Introduction

Lepidico Chemicals Namibia (Pty) Ltd ("**Proponent**") holds mineral rights for the Karibib Project under the Mining License (ML) No. 204, situated in the Karibib District, Erongo Region, west-central Namibia (Fig. 1.1). The ML 204 covering a total area of 6930 Ha was granted by the Ministry of Mines and Energy ("**Component Authority**") on the 19th June 2018 and will expire on the 18th June 2028. The ML 204 is granted for base and rare metals, industrial minerals, precious metals, precious stones, and semi-precious stones.

1.2 Lepidico Chemicals Namibia (Pty) Ltd

The Proponent is 80% owned by Lepidico Limited ("**Lepidico**") a lithium exploration and development company focused on unlocking the value of hard rock lithium-rich mica deposits and 20% owned by Huni Urib Holding Company, a local shareholder. Lepidico is listed on the Australian Securities Exchange and 100% owner and developer of the L-Max® process technology and has the exclusive rights to the LOH-Max® technology, proprietary processes which have the potential to commercially extract lithium chemicals and other valuable by-products from unconventional mineral sources.

1.3 National Legislation and Good International Industry Practice (GIIP)

1.3.1 Environment Clearance Requirements (ECC)

The national legislation governing minerals prospecting and mining activities in Namibia fall within the jurisdiction of the Competent Authority (Ministry of Mines and Energy (MME)) responsible for granting authorisations in form of Mining Claims (MCs), Reconnaissance Licenses, Exclusive Exploration Licences (EPLs) and Mining Licenses (MLs). The Minerals (Prospecting and Mining) Act (No 33 of 1992) is the most important legal instrument governing minerals prospecting and mining activities in Namibia.

The proposed mining, minerals processing and ongoing exploration activities in the ML No. 204 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 cause significance negative impact on the receiving physical, biological and socioeconomic environments. All listed activities cannot be undertaken without an Environmental Clearance Certificate (ECC). To obtain an ECC, the Proponent is required to have undertaken Environmental Assessment (EA) comprising Environmental Scoping, 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). In fulfilment of the environmental requirements, the Proponent appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant led by Dr Sindila Mwiya as the Environmental Assessment Practitioner (EAP) to prepare the EIA and EMP Reports as provided for the national legislation in order to support the application for Environmental Clearance Certificate (ECC) for the listed activities.

The Proponent is hereby applying for the renewal and transfer of the Environmental Clearance Certificate (ECC) as shown in Fig. 1.1. The ECC was granted by the Environmental Commissioner in the Ministry of Environment and Tourism ("**Environmental Regulator**") now called the Ministry of Environment, Forestry and Tourism (MEFT) in September 2017 and will expire in September 2020. The renewed ECC will need to be transferred from Desert Lion Energy (DLE) (Pty) Ltd (previous Proponent) now renamed Lepidico Chemicals Namibia (Pty) Ltd (current Proponent). The current ECC was granted following the completion of an Environmental Assessment (EA) process covering the preparation of Scoping, EIA and EMP Reports by Risk-Based Solution ("RBS") CC in 2017. In accordance with the provisions of the national legislation, the applications for renewal and transfer of the current ECC for the Karibib Project requires the Proponent to submit to the Environmental Commissioner the updated EIA and EMP Reports together with the completed ECC applications for transfer and renewal.

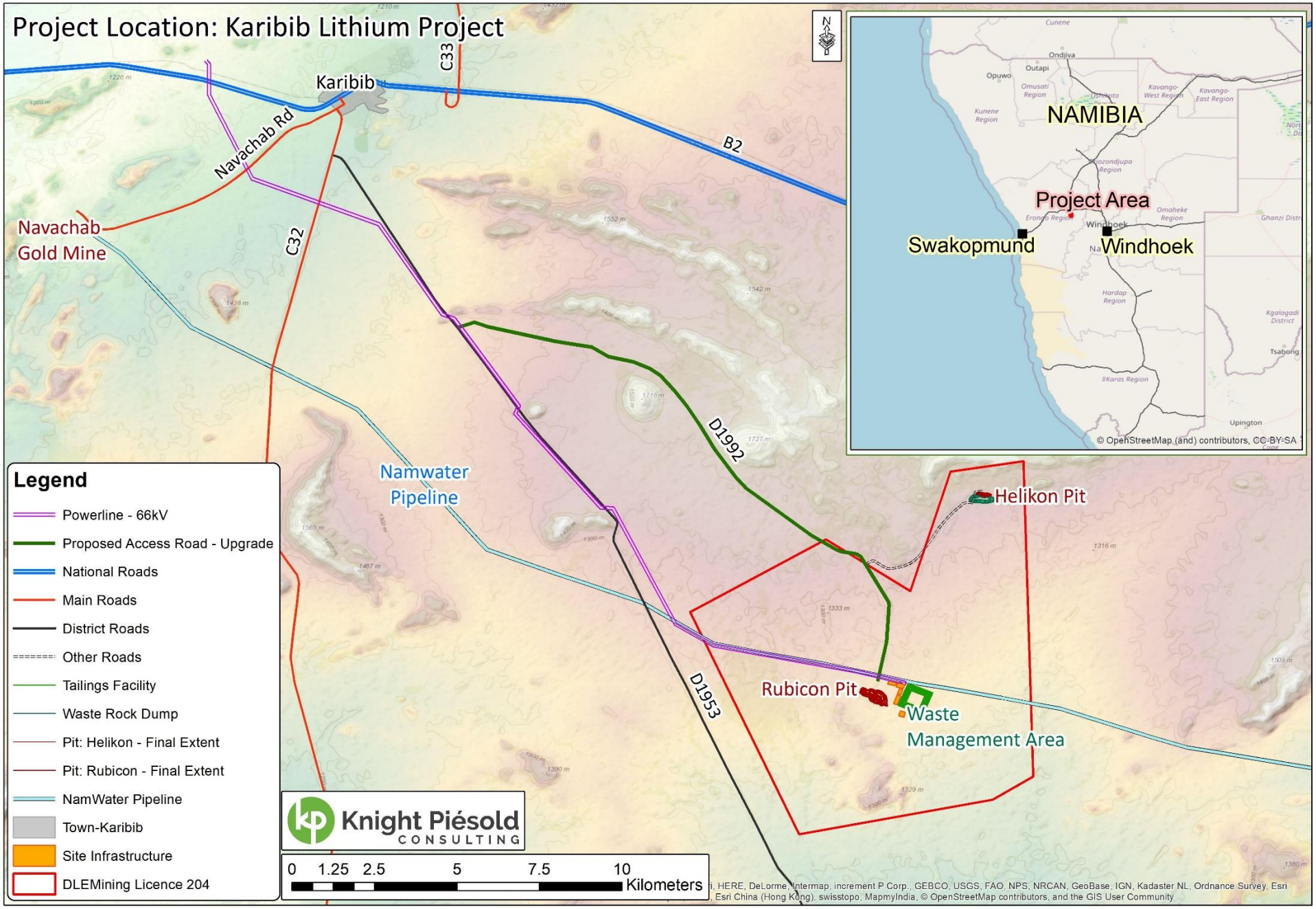

Figure 1.1: Location of the Karibib Project (Source: Knight Piésold, 2020).

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

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05 September 2017

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

The Managing Director
Desert Lion Energy (Pty) Ltd
P.O. Box 90898
Klein Windhoek

Dear Sir/Madam

SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE PROPOSED MINE DEVELOPMENT COVERING PHASE 1 AND PHASE 2 IN-SITU MINING LICENSE APPLICATION, POWER LINE, ROADS AND WATER SUPPLY AND OTHER SUPPORTING INFRASTRUCTURES IN THE EXCLUSIVE PROSPECTING LICENSE NO.5439, KARIBIB, ERONGO REGION.

Environmental Impact Assessment and Environmental Management Plan submitted are sufficient as these have made an adequate provisions of the environmental management concerning the proposed activities. From this perspective regular environmental monitoring and evaluations on environmental performance should be conducted. Targets for improvements should be established and monitored from time to time.

This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project. I issue the clearance with the following condition that all applicable permits should be obtained.

On the basis of the above, this letter serves as an environmental clearance certificate for the project to commence. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from this project's activities. Instead, full accountability rests with Desert Lion Energy (Pty) Ltd and their consultant.

This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office.

Yours sincerely,

MINISTRY OF ENVIRONMENT AND TOURISM
P/Bag 13306
Windhoek, Namibia
2017 -09- 08
Office of the Environmental Commissioner

Teofilus Nghitila
ENVIRONMENTAL COMMISSIONER

"Stop the poaching of our rhinos"

All official correspondence must be addressed to the Permanent Secretary

Figure 1.2: Copy of the ECC granted in September 2017 and will expire in September 2020. The ECC was granted to Desert Lion Energy (Pty) Ltd (previous Proponent) renamed to Lepidico Chemicals Namibia (Pty) Ltd (current Proponent) hence the renewed ECC will also need to be transferred from Desert Lion Energy (Pty) Ltd to Lepidico Chemicals Namibia (Pty) Ltd.

1.3.2 Good International Industry Practice (GIIP)

In addition to the compliance to the provisions of the national mining and environmental legislations for the Karibib Project, Lepidico is committed to meeting Good International Industry Practice (GIIP) that defines leading industry best practices as provided for in the Equator Principles (www.equator-principles.com).

According to the Equator Principles document effective July 2020 (www.equator-principles.com) the Equator Principles ("**EPs**") are a risk management framework, voluntarily adopted by Equator Principles Financial Institution (EPFI) for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making. The Equator Principles are intended to serve as a common baseline and framework for EPFI to identify, assess and manage environmental and social risks when financing Projects. The EPs have greatly increased the attention and focus on social/community standards and responsibility, including robust standards for indigenous peoples, labour standards and consultation with locally affected communities (www.equator-principles.com).

In accordance with the Equator Principle 1: Review and Categorisation and Finance Corporation's (IFC) environmental and social categorisation process, the Karibib Project has the magnitude of potential environmental and social risks and impacts, including those related to biodiversity, to be categorised as either category A or B, defined as follows:

- Category A – Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible, or unprecedented, and.

- Category B – Projects with potential limited adverse environmental and social risks and/or impacts that are few, generally site-specific, largely reversible, and readily addressed through mitigation measures.

Based on the outcomes of the previous environmental assessment process that was conducted in 2017, the Karibib Project can be classified as a Category B Project. This classification will however be reviewed based on the outcomes of the current process of updating the current environmental reports in support of the application for the renewal and transfer of the current ECC. There can be a range in the scale of potential environmental and social risks and impacts within Projects classified as Category B. In general terms, higher risk Category B Projects will be treated similarly to Category A Projects, and lower risk Category B Projects could be treated in a lighter regime. The EPFI that may finance the Karibib Project shall, at their own discretion, determine the appropriate level of Assessment Documentation, review, and/or monitoring required to address these risks and impacts in accordance with the EPs 1-10. The required Assessment Documentation shall be adequate, accurate and objective evaluation and presentation of the environmental and social risks and impacts, whether prepared by the client, consultants, or external experts.

In accordance with Equator Principle 2: Environmental and Social Assessment, a Category A and, as appropriate, Category B Projects, the Assessment Documentation shall include an Environmental and Social Impact Assessment (ESIA) and Environmental Social Management Plan (ESMP). One or more specialised studies may also need to be undertaken. For other Category B and potentially C Projects, a limited or focused environmental or social assessment may be appropriate, applying applicable risk management standards relevant to the risks or impacts identified during the categorisation process.

In making a clear distinction with respect to the use of terminologies in this environmental assessment process, the term EIA is used to define the national (Namibian) EIA process, and the terms ESIA and ESMP are used when referring to the adoption of internationally compliant environmental and social assessments in line with the GIIP.

Therefore, this ESIA Report has been prepared by Risk-Based Solution (RBS) CC in support of the Environmental Assessment Process to update the previous EIA and EMP Reports to ESIA and ESMP Reports in support of the applications for renewal and transfer of the ECC and in compliant with both national legislation and GIIP based on EPs 1-10.

1.3.3 Project Screening and Categorisation

The implementation of the ESIA and ESMP process leading to the preparation of this ESIA Report is built on the EIA and EMP process that was undertaken in 2017 and 2020. The ESIA and ESMP process commenced with the screening and preparation of the BID / Scoping Report for project registration with the MEFT. The project screening outcomes clearly established that the Karibib Project activities are listed in the national legislation, the Environmental Management Act, 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA) Regulation, 2012.

The listing of these activities means that the Karibib Project requires an ECC which can only be obtained by undertaking an EA covering EIA and EMP process. Additionally, the proposed Karibib Project has also been screened against the EPs. Under the EPs, the Karibib Project has been determined to fall under Category B and requiring ESIA and ESMP Reports to be prepared as part of the Assessment Documentations.

1.3.4 Conformance and Commitments Register (CR)

The preparation of this ESIA Report for the Karibib Project conforms to the requirements of both the national legislations and Good International Industry Practice (GIIP) such as the Equator Principles and International Finance Corporation (IFC) environmental management guidelines and frameworks. Conformance with the potential GIIP requirements that will finance the Karibib Project is an ongoing effort to be undertaken throughout the lifecycle of the proposed project.

The Proponent has demonstrated its commitment to conforming with both the national regulatory framework and GIIP through the implementation of the EA covering the BID/ Scoping, this ESIA and ESMP. During the implementation of the Karibib Project, the Proponent will be required to implement the mitigation measures as detailed in the ESMP Report as well as monitoring of the environmental performances to be supported by internal and external environmental audits. Conformance to both national and GIIP such as the EPs shall be demonstrated through evidence presented at each environmental audit event that may be undertaken throughout the lifecycle of the proposed Karibib Project.

1.4 History of the Project

According to Diehl, (1992), exploration of the pegmatite, mainly for beryl, started in 1930 and since 1951, Rubicon has been selectively mined for petalite, amblygonite, lepidolite, beryl, quartz and accessory pollucite and bismuth as well as the oxidation products of the latter. The lithium orebodies within the Erongo Region are believed to be one of the most extensive pegmatite field in the World first mined in the 1950s by a German mining company, Kloechner. Within the general ML 204 area, there are three known historic mining sites, respectively: Rubicon, Helikon and Otjua.

The previous minerals rights holders of the Rubicon Lithium mine, mined beryl, tantalum, amblygonite, petalite and lepidolite with target head grades of between 1.7% and 3.8% Li_2O. Mining methods applied included a combination of open pit and room-and-pillar stopping to a depth of about c.30 m. The ore was handpicked, sorted and processed to a final concentrate. Material that was either not required or did not meet the exceptionally high in-situ grades was discarded in multiple waste dumps surrounding the mine.

These dumps were the focus of the exploration and mining operations that have been undertaken by Desert Lion Energy (Pty) Ltd in 2018 before it was taken over by Lepidico and renamed Lepidico Chemicals Namibia (Pty) Ltd. Lepidico Chemicals Namibia (Pty) Ltd has undertaken further exploration activities and prepared a feasibility report with positive results focusing on mining the in-situ ore linked to the local pegmatites within the ML 204.

1.5 Project Motivation

The proposed Karibib Project will provide many benefits to Namibia. These benefits include the following:

(i) Provide 115 direct jobs to benefit Namibians with indirect job creation (services and support industries) estimated at seven times that number (The Chamber of Mines of Namibia, 2012) and livelihoods being created to benefit Namibian families.

(ii) Socioeconomic benefits including upgrading and maintenance of road and water infrastructures in the local farm area for greater benefits of the local community.

(iii) Greater environmental benefits and Government financial savings through remediation of the targeted previously abandoned and unrehabilitated mine sites around the ML 204 area.

(iv) Value addition to the in-situ potential minerals resources in the area which otherwise would not have been known if the proposed mining and ongoing exploration activities in ML 204 did not take place.

(v) 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 (Karibib Area), regional (Erongo Region) and national (Namibia) socioeconomic benefits, and.

(vi) Additional socioeconomic benefits will also be realised at regional and national levels in terms of capital investments, license rental fees, royalties payable to Government, export earnings, foreign direct investments, and various taxes payable to the Government.

1.6 Site Description, Land Use, and Infrastructure

1.6.1 Site Description

The Karibib Project falls within the Karibib District with the town of Karibib, which is approximately 27 km northwest of ML being the nearest major town (Fig. 1.3). Swakopmund, the regional centre of the Erongo Region and Walvis Bay the main Port, are situated about 193 km and 236 km along the B2 road and to the west of the Karibib Project area. Namibia's capital city, Windhoek, is located approximately 211 km via the B2 and B1 Roads and falls to the southeast of Project Area (Fig. 1.1).

Locally, the 6930 Ha ML 204 area falls within the 15160 Ha Farm Okongava Ost No. 72 area, which is a Government owned Farm purchased in 2014 from a private owner for resettlement purpose of landless Namibians (Figs. 1.3-1.5). Currently, the farm is occupied by few subsistence cattle and small stock farmers from the local area of Otjimbingwe (Figs. 1.4 and 1.5). The footprint of the proposed Karibib Project is 800Ha of the 15160Ha farm area (Fig. 1.5).

The area covered by the ML 204 is not pristine and is dominated by a number of old mine excavations, waste rock and tailings dumps linked to the historical exploration and mining operations dating back to the 1950s when mining started in the area (Fig. 1.6 and Diehl, 1992). The proposed mining and exploration operations within the ML 204 will address some of the current poor state of the local environment that has been abandoned and not been rehabilitated over many years of historical exploration and mining operations (Fig. 1.6 and Plates 1.1-1.4).

1.6.2 Current Land Uses

The main key land use of the ML 204 area is agriculture comprising cattle and small stock farming. Minerals exploration and mining operations are well known activities in the area dating back to the

1950s. A number of lodges are found in the general surrounding areas but not necessary within the proposed project boundary, the ML 204.

Bush thickening or encroachment is viewed as an economic problem in the general area but does not seem to be an issue within the proposed project area. The area is not part of the communal conservancy system in Namibia with no protected area nearby the ML area.

The minerals license areas cover the only lithium ore deposit in Namibia that has been mined in the past and associated with the Rubicon and Helikon pegmatites swarms found within the ML 204 area.

1.6.3 Supporting Infrastructure and Services

The project area is accessed via the maintained C32 gravel road heading south out of Karibib for 2km and then joining with the local D1992 gravel road for 6 km before turning into the gated Okongava Ost No. 72 farm where approximately 24km of a series of maintained local farm roads service the project areas of Rubicon and Helikon Mine Sites (Fig. 1.4).

Rubicon will be the main mining and mineral processing facility supported by all the infrastructure. The ML 204 area is serviced by several internal local network of historical mining and prospecting roads, some of which require high clearance 4 x 4 vehicles that may need to be upgraded. The total driving distance from Karibib to the ML 204 is approximately 30 km.

The proposed Karibib Project mining and mineral processing and ongoing exploration activities will require the following supporting infrastructures and services as assessed in this ESIA Report with mitigation measures detailed in the ESMP Report:

(i) External and internal roads network: The Proponent has already upgraded the already existing external and internal road networks and created additional new access road linking Rubicon and Helikon mine sites. The upgrading and creation of the external and internal roads networks was already assessed in the previous EIA that was conducted in 2017.

(ii) Water supply: Raw water will be sourced from the existing solar powered boreholes field development, supplemented by the existing NamWater pipeline connection. The required water supply infrastructures were already assessed in the previous EIA that was conducted in 2017.

(iii) Energy: Proposed mining operations in ML 204 will use electricity and will require the construction of a new powerline from the Karibib Marble station situated to west of the Town of Karibib. The proposed new powerline route is covered in separate environmental assessment with NamPower being the Proponent. NamPower expects to supply power sourced from 80% renewable sources by 2025.

(iv) Onsite administrations and offices (supporting infrastructure): The Proponent will utilise the existing buildings and develop additional new structures to support the proposed project development. The development of new structure shall be undertaken around the already existing structures / disturbed areas.

(v) Staff transport arrangements from Karibib to the mine site will be provided by the Proponent, and.

(vi) Karibib based staff accommodation services: Will use the already existing properties in Karibib.

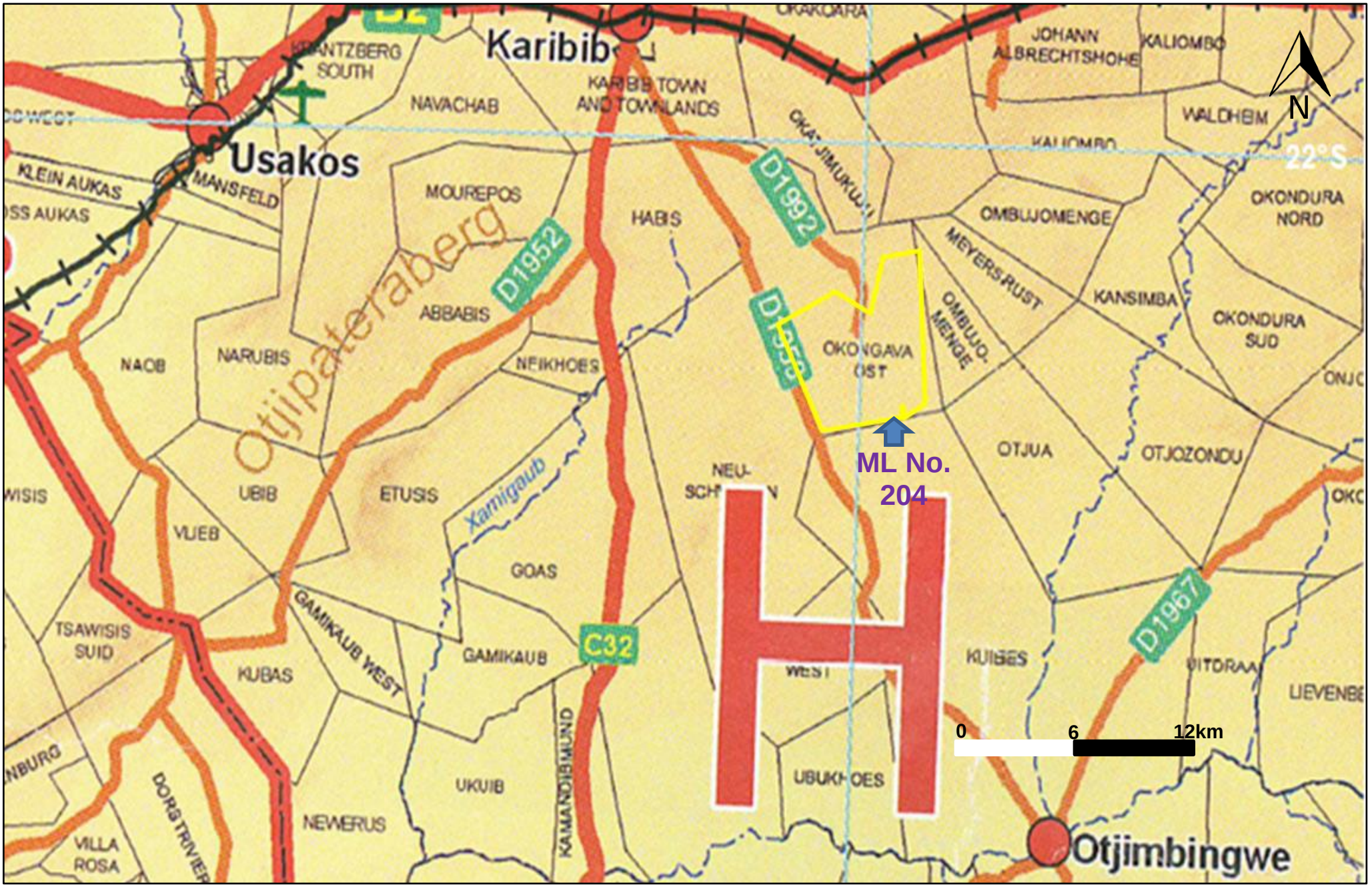


Figure 1.3: Commercial farmland covered by the ML 204 and existing access (Source: Namibia 1:1000000 Registration Divisions Map Extract).

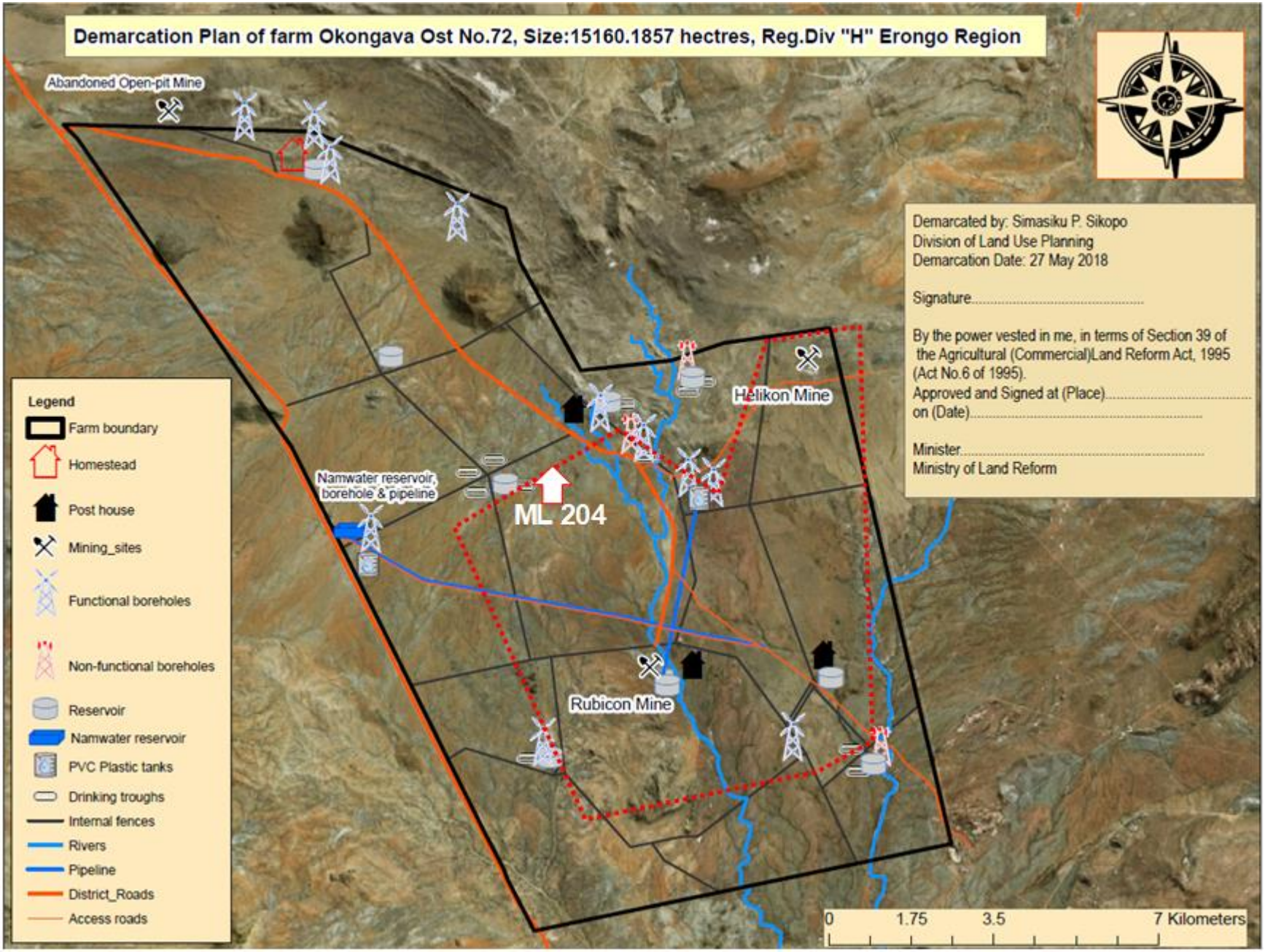


Figure 1.4: Detailed overview of the 15160 Ha Farm Okongava Ost No.72 area with respect to the 6930 Ha area of the ML 204 (Source: Lepidico, Base map Department of Land Reform, Ministry of Agriculture, Water and Land Reform, 2020).

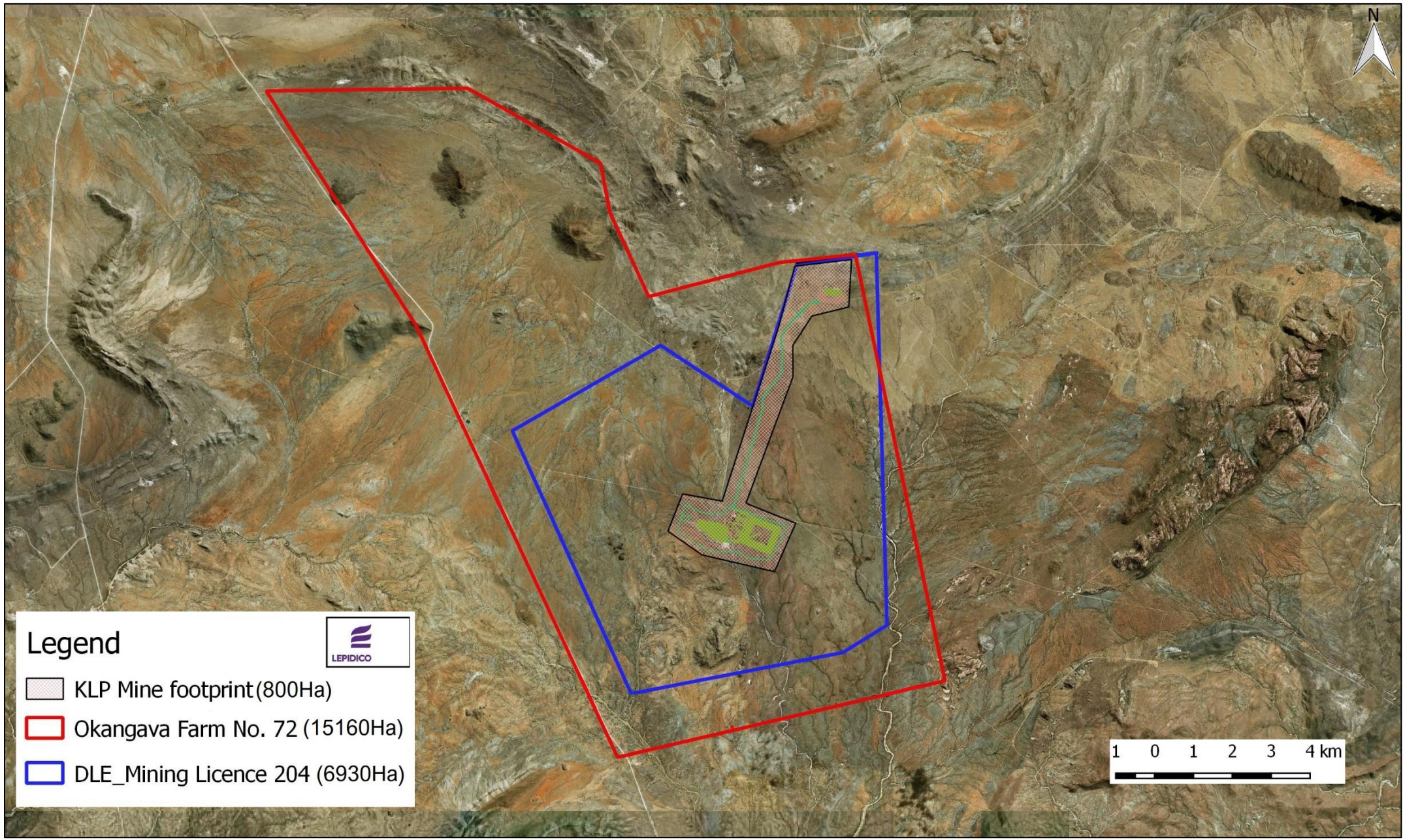


Figure 1.5: The 800Ha area footprint of the proposed Karibib Project with respect to the 6930 Ha area of the ML 204 and 15160Ha area of the Farm Okongava Ost No.72 (Source: Lepidico, 2020).

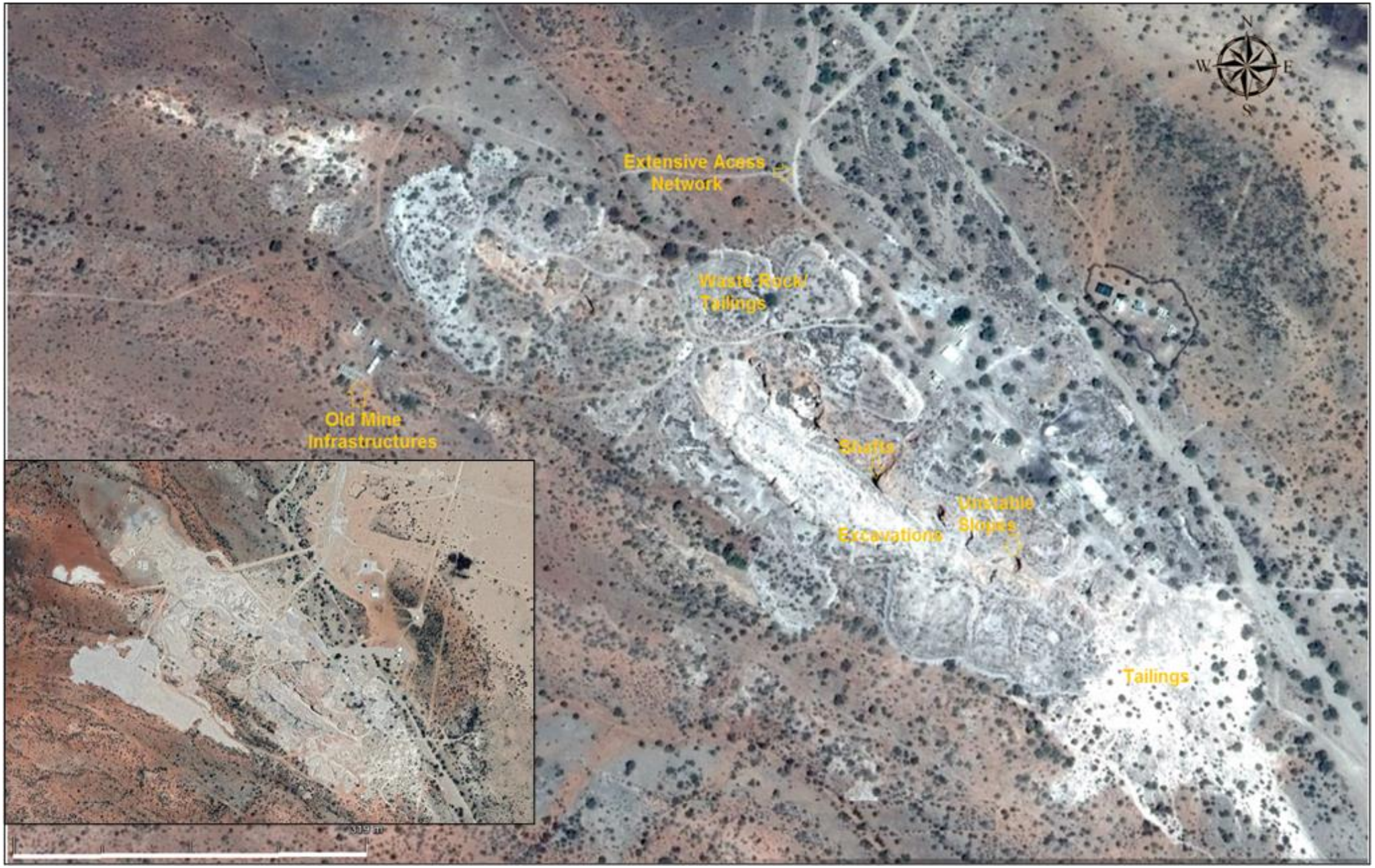


Figure 1.6 Example of the current poor state of the environment around the Rubicon Old Mine Area (main target) within the ML 204 with historic open shafts, tailings, waste rock and excavation dating back to the 1950s when mining started in the area (Google Earth, 2016 and Google Map insert image, 2020).

Plate 1.1: Example of the poor state of environment around the Rubicon old mine area showing historical abandoned unstable excavations and shafts that will be subject to extensive remediation, mining and final rehabilitation (RBS Geotagged Image Series, 2017).

Plate 1.2: Example of poor state of environment around the Rubicon old mine area showing old abandoned buildings that will be renovated and used for the proposed mining operations (RBS Geotagged Image Series, 2017).

Plate 1.3: Example of poor state of environment around the Helikon old mine area showing old abandoned buildings, excavations, waste rock and tailings that will be used for the proposed mining operations (RBS Geotagged Image Series, 2017).

Plate 1.4: Example of the poor state of environment around the Helikon old mine area showing abandoned unstable excavations and shafts that will be subject to extensive remediation, mining and final rehabilitation (RBS Geotagged Image Series, 2017).

1.7 Methodology and Terms of Reference

1.7.1 Overview

Risk-Based Solutions (RBS) was appointed by the proponent to prepare the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports in order to support the applications for Environmental Clearance Certificates (ECC) for the proposed Karibib Project mining operations within the ML 204. The impact assessment process has been undertaken in accordance with the Terms of Reference (ToR) (Annex 1) and the requirements of the Environmental Impact Assessment Regulations, 2012 and the Environmental Management Act, 2007, (Act No. 7 of 2007). All the activities for the proposed Karibib Project have been assessed against the receiving environment covering the physical, biological, socioeconomic and ecosystem services (function, use values and non-use) (Table 1.1 and Annex 1).

1.7.2 Approach Summary of the Environmental Assessment

This ESIA Report has been prepared based on the outcomes of screening and impact assessment process with aim of identify the environmental and social aspects that required studying in the ESIA. During the scoping stages undertaken in 2017 and now in 2020 (Annex 1), Terms of Reference (ToR) for collection and review of the baseline environment and stakeholders consultation process were prepared. The preparation of this ESIA Report started with the review of the proposed project activities and baseline data sets in order to develop a detailed understanding of the social and environmental aspects that have the potential to be affected by the proposed project activities. The review process resulted in updating of the project description, assessment approach to include both the national and international GIIP such as the EPs and updating of the fauna, flora and socioeconomic baseline reports as attached to this ESIA Report as Annexes. The national requirements have based on the provisions of the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 and the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) as illustrated in the Fig. 1.7.

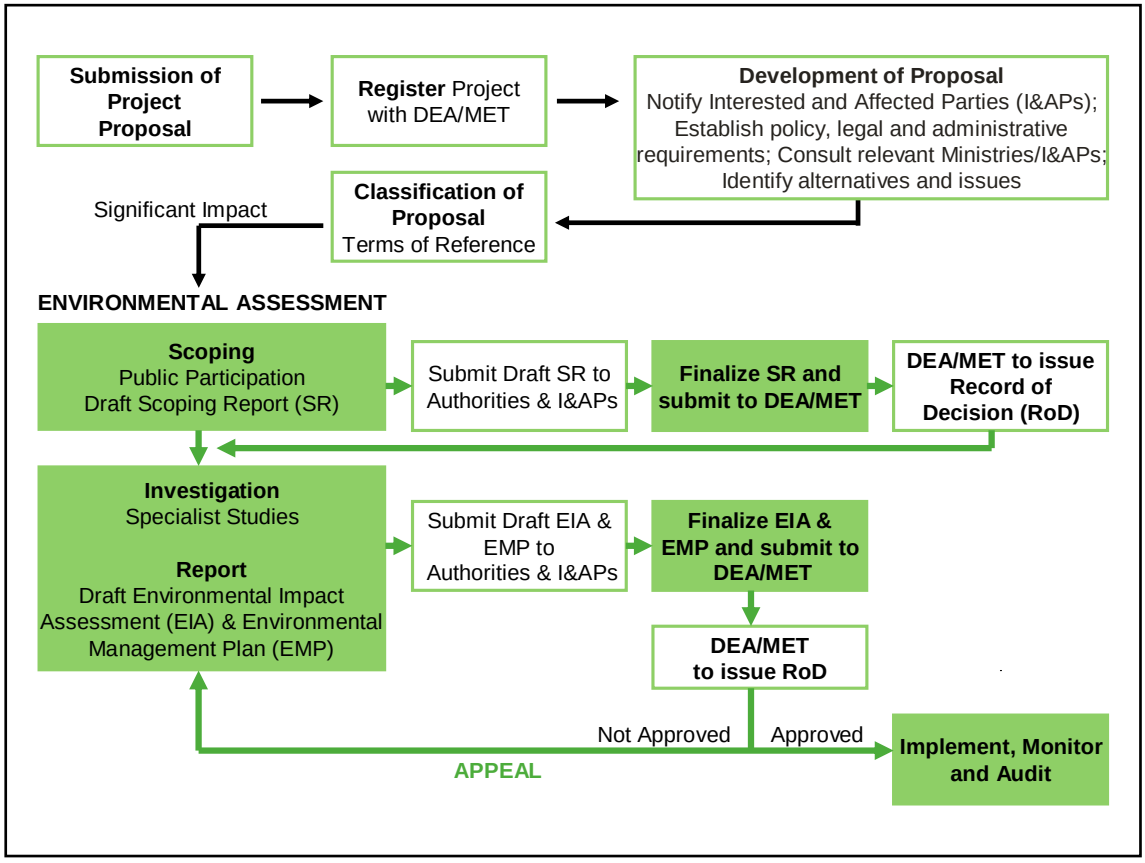


Figure 1.7: Schematic presentation of Namibia's Environmental Assessment Procedure in line with the provisions of the EIA Regulations No. 30 of 2012 and the EMA, 2007, (Act No. 7 of 2007).

In addition to the conformity with the national requirements, the preparation of this ESIA has also incorporated the high level environmental and social aspects of EPs for implementation by the Proponent in the operation of the all the activities of the Karibib Project throughout the project lifecycle and in complementing the national legislative framework (Fig. 1.8). The following is the summary of the EPs 1-10 that have been taken into consideration the environmental assessment process:

- Principle 1: Review and categorisation.
- Principle 2: Environmental and Social Assessment.
- Principle 3: Applicable environmental and social standards.
- Principle 4: Environmental and Social Management System and Equator Principles Action Plan.
- Principle 5: Stakeholder engagement.
- Principle 6: Grievance mechanism.
- Principle 7: Independent review.
- Principle 8: Covenants.
- Principle 9: Independent monitoring and reporting, and.
- Principle 10: Reporting and transparency.

The above principles are based on International Finance Corporation (IFC) performance standards on social and environmental sustainability and the World Bank Group's Environmental, health and safety general guidelines applied globally and across industry sectors by Equator Principle Financial Institution (EPFI) Banks.

The Equator Principles (EPs) are a sustainability risk management framework for projects financed by the financial institutions that have adopted the Equator Principles (EPFIs). The EP apply to certain financial products above specified value thresholds. EP4 decreases the threshold for in-scope Project-Related Corporate Loans from a total aggregate loan amount of US$100 million to US$50 million. Thus, both the total aggregate loan amount and the EPFI's commitment needs to be at least US$50 million.

There has also been an addition to the scope of applicability of the EPs in the form of project-related refinancing and project-related acquisition financing provided the following criteria are met (www.equator-principles.com):

- The underlying project was financed in accordance with the EPs framework.
- There has been no material change in the scale or scope of the project.
- The project has not yet occurred at the time of the signing of the facility or loan agreement.

The EP require the proposed exploration and mining project in the ML 204 to address the following issues in meeting international finance corporation financing standards:

1. Assessment of the baseline environmental and social conditions.
2. Consideration of feasible environmentally and socially preferable alternatives.
3. Requirements under host country laws and regulations, applicable international treaties and agreements including the 2015 Paris climate change agreement.

4. Protection and conservation of biodiversity (including endangered species and Sensitive ecosystems in modified, natural, and critical habitats) and identification of Legally protected areas.

5. Sustainable management and use of renewable natural resources (including Sustainable resource management through appropriate independent certification Systems).

6. Use and management of dangerous substances.

7. Major hazards assessment and management.

8. Efficient production: total energy consumed per output scaling factor, delivery and use of energy.

9. Pollution prevention and waste minimisation, pollution controls (liquid effluents and Air emissions), and waste management.

10. Greenhouse gas emissions level and emissions intensity.

11. Water usage, water intensity, water source.

12. Land cover, land use practices.

13. Consideration of physical climate risks and adaptation opportunities, and of viability of project operations under changing weather patterns/climatic conditions.

14. Cumulative impacts of existing Projects, the proposed Project, and anticipated future Projects.

15. Consideration of actual or potential adverse Human Rights impacts and if none were identified, an explanation of how the determination of the absence of Human Rights risks was reached, including which stakeholder groups and vulnerable populations (if Present) were considered in their analysis.

16. Labour issues (including the four core labour standards), and occupational health and safety.

17. Consultation and participation of affected parties in the design, review, and implementation of the Project.

18. Socio-economic impacts.

19. Impacts on affected communities and disadvantaged or vulnerable groups.

20. Gender and disproportionate gender impacts.

21. Land acquisition and involuntary resettlement.

22. Impacts on Indigenous Peoples, and their unique cultural systems and values including impacts to lands and natural resources subject to traditional ownership or under customary use.

23. Protection of cultural property and heritage.

24. Protection of community health, safety, and security (including risks, impacts and management of Project's use of security personnel), and.

25. Fire prevention and life safety.

The above potential EPs environmental and social issues have been linked to the national requirements and addressed as may be applicable to the Karibib Project in this ESIA Report with mitigation measures provided in the ESMP Report (Fig. 1.9). The Constitution of the Republic of Namibia, the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA)

Regulations No. 30 of 2012 as well as other associated laws with respect to exploration, mining water, land, energy, labour and health and safety all provides for the mechanism of assessing key issues associated with development projects in Namibia such as the proposed exploration and mining operations in the ML 204.

The only key missing components to the regulatory frameworks in Namibia are benchmarks, limits, standards and guidelines with respect to gaseous, liquid and solid emissions. In the absence of national gaseous, liquid and solid emission limits for Namibia, this ESIA Report has adopted the Multilateral Investment Guarantee Agency (MIGA) gaseous effluent emission level and liquid effluent emission levels. Noise abatement measures also adopted the MIGA guidelines.

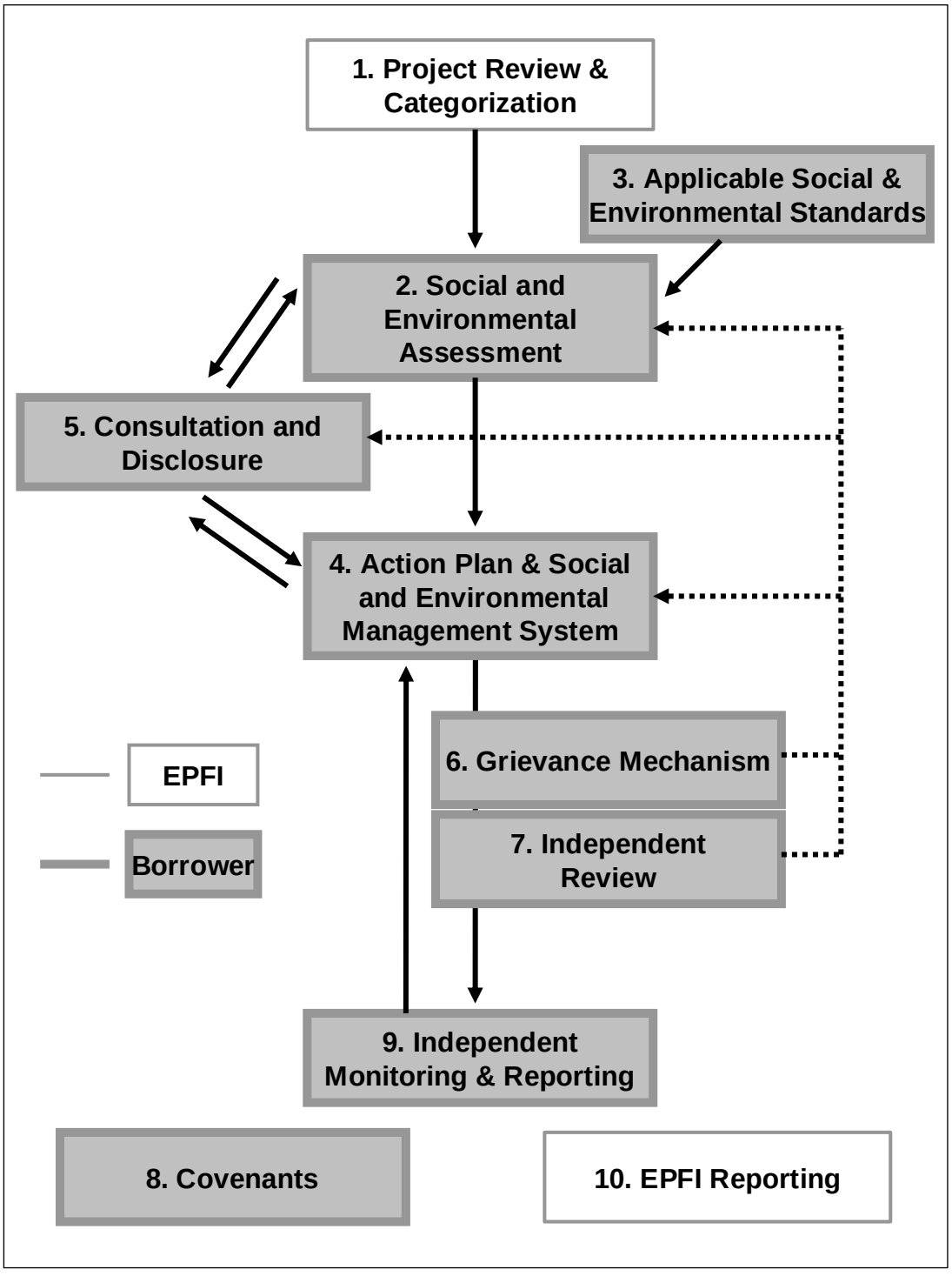


Figure 1.8: Schematic presentation of the 2006 Equator Principles.

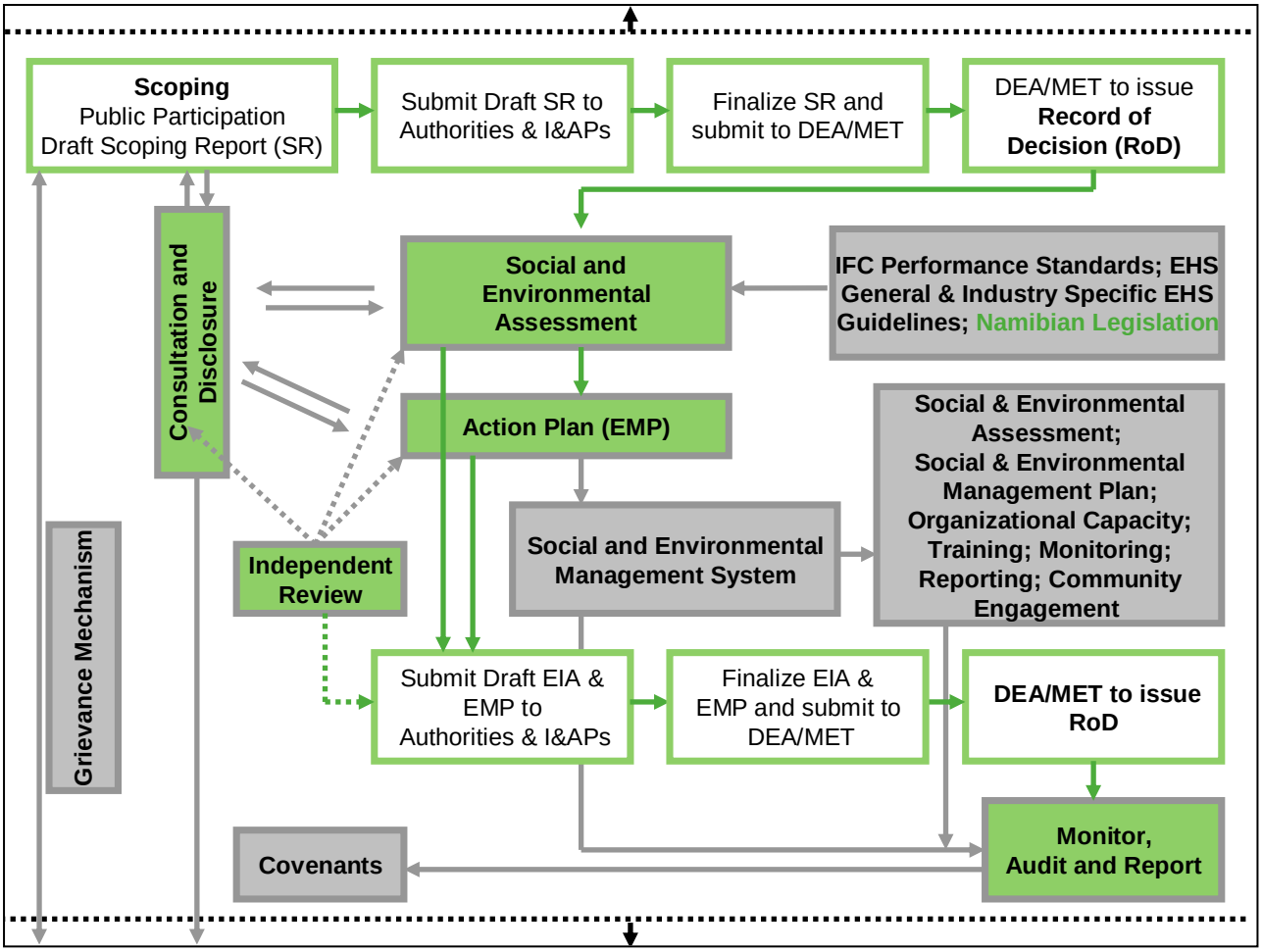


Figure 1.9: Schematic presentation of Namibia's Environmental Assessment Procedure, incorporating the Equator Principles and International Finance Corporation Performance Standards.

1.7.3 Environmental Assessment Process and Steps

The processes and steps that have been followed in the preparation of this ESIA Report took into considerations the provisions of the Environmental Impact Assessment Regulations, 2012, the Environmental Management Act, 2007, (Act No. 7 of 2007) and the GIIP (Figs. 1.7-1.9).

The complete lifecycle of the proposed Karibib Project development inclusive of the supporting infrastructure such as powerline have all been assessed in this ESIA Report. The key developmental stages that have been included are: Preconstruction, construction, operation with ongoing monitoring and rehabilitation and decommissioning, closure, and aftercare.

1.7.4 Assumptions and Limitations

The following assumptions and limitations underpin the approach adopted, overall outcomes and recommendations of the environmental assessment process and this ESIA Report:

- The proposed Karibib Project activities as well as all the plans, maps, ML 204 Boundary / coordinates and appropriate data sets received from the Proponent, project partners, regulators, Competent Authorities and specialist consultants are assumed to be current and valid at the time of conducting the studies and preparation of this ESIA Report.

- The impact assessment outcomes, mitigation measures and recommendations provided in the ESIA and ESMP Reports are valid for the lifecycle of the proposed Karibib Project.

- ❖ A precautionary approach has been adopted in instances where baseline information and impact assessment guidelines were insufficient or unavailable or site-specific project activities were not yet available, and.

- ❖ Mandatory timeframes as provided for in the EIA Regulations No. 30 of 2012 and the EMA, 2007, (Act No. 7 of 2007) have been observed.

1.7.5 Impact Assessment Process

1.7.5.1 Overview

The overall impact assessment approach shall be undertaken in accordance with the provisions of the national EIA Regulations and EPs guidelines and will adopt the Leopold matrix framework which is one of the internationally best-known matrix assessment methodology available for predicting the impact of a project on the receiving environment. The assessment process will take into considerations the proposed activities, trade-offs, alternatives, and issues to be considered as outlined in Table 1.1. Further inputs have been provided by specialist consultants.

1.7.5.2 Evaluation of Project Activities Impacts

The impact assessment and evaluation process has been based on considering the proposed Karibib Project as the source of impact. The receiving environment has been considered as the receptor / target that may be impacted positively or negatively by the activities of the proposed Karibib Project. The components of the receiving environment encompassed the following:

- ❖ Physical Conditions / Natural Environment – Air, noise, water, green space, climate change, built environment – houses, roads, transport systems, buildings, infrastructure, etc.

- ❖ Biological Conditions: fauna, flora, habitats, and ecosystem - services, function, use values and non-use etc., and.

- ❖ Socioeconomic Conditions: Social, economic, labour, gender, human rights, natural and social capital, archaeological, cultural resources, and cultural issues

In evaluating the degree of potential negative impacts, the following factors have been taken into consideration:

(i) Impact Severity: The severity of an impact is a function of a range of considerations, and.

(ii) Likelihood of Occurrence (Probability): How likely is the impact to occur?

In evaluating the severity of potential negative environmental impacts, the following factors have been taken into consideration:

- ❖ Receptor/ Resource Characteristics: The nature, importance, and sensitivity to change of the receptors / target or resources that could be affected.

- ❖ Impact Magnitude: The magnitude of the change that is induced.

- ❖ Impact Duration: The time period over which the impact is expected to last.

- ❖ Impact Extent: The geographical extent of the induced change, and.

- ❖ Regulations, Standards and Guidelines: The status of the impact in relation to regulations (eg. discharge limits), standards (eg. environmental quality criteria) and guidelines.

The overall impact severity with respect to the impact duration, geographical extent and probability occurrence have been categorised using a semi quantitative approach as shown in Table 1.2.

Table 1.1: Summary ToR for the Karibib Project activities, alternatives, trade-offs, and key issues considered in the Environmental Assessment.

PROJECT PHASE	DEVELOPMENT ACTIVITIES FOR EACH PHASE		KEY ISSUES EVALUATED AND ASSESSED IN THE ESIA AND MITIGATION MEASURE PRESENTED IN THE ESMP
PRE-CONSTRUCTION	1. General site clearing of the pit areas, administration block, waste rock, tailings, supporting infrastructure (Office blocks, water and electricity other site infrastructure		1. Potential land use conflicts / opportunities for coexistence between proposed Karibib Project activities and other current and future land uses 2. Impacts on the Physical Environment ❖ Natural Environment such as air, noise, water, dust etc. ❖ Built Environment such as existing houses, roads, transport systems, buildings, energy and water and other supporting infrastructure ❖ Socioeconomic, Archaeological and Cultural impacts on the local societies and communities 3. Impacts on the Biological Environment ❖ Flora, Fauna, Habitat and Ecosystem functions, services, use values and non-Use or passive use 4. Applicable EPs key issues ❖ Assessment of the baseline environmental and social conditions ❖ Consideration of feasible environmentally and socially preferable alternatives ❖ Requirements under host country laws and regulations, applicable international treaties and agreements including the 2015 Paris climate change agreement ❖ Protection and conservation of biodiversity (including endangered species and Sensitive ecosystems in modified, natural and critical habitats) and identification of Legally protected areas ❖ Sustainable management and use of renewable natural resources (including Sustainable resource management through appropriate independent certification Systems) ❖ Use and management of dangerous substances ❖ Major hazards assessment and management ❖ Efficient production: total energy consumed per output scaling factor, delivery and Use of energy ❖ Pollution prevention and waste minimisation, pollution controls (liquid effluents and Air emissions), and waste management ❖ Greenhouse gas emissions level and emissions intensity ❖ Water usage, water intensity, water source ❖ Land cover, land use practices ❖ Consideration of physical climate risks and adaptation opportunities, and of viability of project operations under changing weather patterns/climatic conditions ❖ Cumulative impacts of existing Projects, the proposed Project, and anticipated future Projects ❖ Consideration of actual or potential adverse Human Rights impacts and if none were identified, an explanation of how the determination of the absence of Human Rights risks was reached, including which stakeholder groups and vulnerable populations (if Present) were considered in their analysis. ❖ Labour issues (including the four core labour standards), and occupational health and safety ❖ Consultation and participation of affected parties in the design, review, and implementation of the Project ❖ Socio-economic impacts ❖ Impacts on affected communities, and disadvantaged or vulnerable groups ❖ Gender and disproportionate gender impacts ❖ Land acquisition and involuntary resettlement ❖ Impacts on Indigenous Peoples, and their unique cultural systems and values including impacts to lands and natural resources subject to traditional ownership or under customary use ❖ Protection of cultural property and heritage ❖ Protection of community health, safety and security (including risks, impacts and management of Project's use of security personnel), and ❖ Fire prevention and life safety.
CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads 2. Processing plant infrastructure including foundation and the entire structures 3. Co-disposal Waste Management Area for tailing and waste rock 4. Waste rock and ore stockpiles 5. Water supply systems 6. Onsite power infrastructure, including power distribution and metering systems 7. Administration blocks and warehouses 8. Fuel supply and storage facilities 9. Workshop and equipment maintenance 10. Chemicals and explosives storage facility 11. Wastewater treatment systems 12. Municipal solid waste storage / transfer facilities 13. Storm water management around the plant, waste rock and tailings 14. Testing the mining and processing facilities	
	MINE WORKINGS	1. Excavation, drilling and blasting to create direct access to the ore body 2. Actual pit excavation and stripping of the overburden to create access to the ore 3. Ore production for test mining operations 4. Test mining and commissioning	
OPERATION	1. Mining operations (actual mining operations including excavation, drilling, blasting as maybe required) 2. Transportation of the mined materials from pit to the processing plant for sorting, two (2) stage crushing, screening and stockpile of concentrate 3. Transportation and storage of concentrate to be exported through the Port of Walvis Bay to Lepidolite Chemical Conversion Plant in Abu Dhabi 4. Management and disposal of the co-disposal facility comprising tailings and waste rock materials 5. Management of industrial and domestic wastewater 6. Storage and management of hazardous materials 7. Ongoing exploration support 8. Ongoing rehabilitation and maintenance		
DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan 2. Closure / secure the open pits 3. Closure and secure the co-disposal Waste Management Area (WMA) 4. Backfill all excavated areas / sites except the pits 5. Closure of all storage sites (waste, rock, ore etc) 6. Decommissioning of onsite water and electricity infrastructure 7. Overall land reclamation around the ML area 8. Restoration of internal roads 9. Revegetation and aftercare as may be required		

Table 1.2: Impact assessment matrix used for assessing the overall likely impacts that the proposed Karibib Project developmental stages and the associated activities on the receiving environment sensitivity (natural, built, socioeconomic, flora, fauna, habitat and ecosystem) with respect to duration, geographical extent and probability occurrence.

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, Archaeological and Cultural Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION	1.	General site clearing of the pit area, administration block, waste rock, tailings, water and electricity other supporting infrastructure							
		2.	Access roads clearing / upgrading							
		3.	Topsoil removal and storage for all operations							
		4.	Development of the temporary construction facilities							
		5.	Installation of campsites, offices, workshops, storage.							
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads							
			2. Processing plant infrastructure including foundation and the entire structures							
			3. Co-disposal Waste Management Area for tailing and waste rock							
			4. Waste rock and ore stockpiles							
			5. Water supply systems							
			6. Onsite power infrastructure, including power distribution and metering systems							
			7. Administration blocks and warehouses							
			8. Fuel supply and storage facilities							
			9. Workshop and equipment maintenance							
			10. Chemicals and explosives storage facility							
			11. Wastewater treatment systems							
			12. Municipal solid waste storage / transfer facilities							
			13. Storm water management around the plant, waste rock and tailings							
			14. Testing the mining and processing facilities							
		MINE WORKING	1. Excavation, drilling and blasting to create access to the ore body							
			2. Pit excavation and stripping of the overburden to access the ore body							
			3. Ore production for test mining operations							
			4. Test mining process							

Table 1.2: *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			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, Archaeological and Cultural Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations including excavation, drilling, blasting as maybe required)							
		2. Transportation of the mined materials from pit to the processing plant for sorting, two (2) stage crushing, screening and stockpile of concentrate							
		3. Transportation and storage of concentrate to be exported through the Port of Walvis Bay to Lepidolite Chemical Conversion Plant in Abu Dhabi							
		4. Management and disposal of the co-disposal facility comprising tailings and waste rock materials							
		5. Management of industrial and domestic wastewater							
		6. Storage and management of hazardous materials							
		7. Ongoing exploration support							
		8. Ongoing rehabilitation and maintenance							
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan							
		2. Closure / secure the open pits							
		3. Closure and secure the co-disposal Waste Management Area (WMA)							
		4. Backfill all excavated areas / sites except the pits							
		5. Closure of all storage sites (waste, rock, ore etc)							
		6. Decommissioning of onsite water and electricity infrastructure							
		7. Overall land reclamation around the ML area							
		8. Restoration of internal roads							
		9. Revegetation and aftercare as may be required							

1.7.6 Assessment of the Overall Significant Impacts

1.7.6.1 Overview

The determination of the significance of the negative impacts / key issues caused by the proposed Karibib Project activities as key sources of such impact has been based on the environmental baseline results and the intensity of the likely negative impact. The assessment focused on the degree to which the proposed project activities are likely to results in unwanted consequences on the receptor covering the receiving environment (natural, built, socioeconomic, flora, fauna, habitat, and ecosystem).

1.7.6.2 Summary of the Sources of Impacts

The main key sources of impacts that have been used in the determination of the significant impacts / key issues posed by the proposed Karibib Project activities comprised the preconstruction, construction, operation with ongoing monitoring and rehabilitation and decommissioning, closure and aftercare. Each of the main sources of impacts have been evaluated against the receiving environment as potential receptors with respect to potential pathways (Tables 1.1 and 1.2).

1.7.6.3 Determination of the Overall Likely Significant Impacts

To determine the overall significant impact for each individual source associated with the proposed Karibib Project activities, an impact identification and assessment process has been undertaken as part of this ESIA.

The ESIA impact identification and assessment processes focused on the environment interaction approach with respect to the proposed Karibib Project activities, alternatives and the likely targets or receptor / key issues (Table 1.1).

In this process, components of the project activities that are likely to impact the natural environment (physical, biological, and social) shall be broken down into individual development stages and activities as shown in Table 1.2.

The results of the overall significant impacts assessment associated with the proposed Karibib Project activities / sources of potential impacts of significant impacts with respect to the receiving environment that could potentially be affected, resulting in key issues are presented in Chapter 5 of this ESIA Report and as shown in Table 1.3.

Table 1.3: Assessment matrix used for assessing the likely significant impacts with respect to proposed Karibib Project developmental stages and the associated activities on the receiving environment (natural, built, socioeconomic, flora, fauna, habitat, and ecosystem).

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: 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, Archaeological and Cultural Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION	1.	General site clearing of the pit area, administration block, waste rock, tailings, water and electricity other supporting infrastructure							
		2.	Access roads clearing / upgrading							
		3.	Topsoil removal and storage for all operations							
		4.	Development of the temporary construction facilities							
		5.	Installation of campsites, offices, workshops, storage.							
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads							
			2. Processing plant infrastructure including foundation and the entire structures							
			3. Co-disposal Waste Management Area for tailing and waste rock							
			4. Waste rock and ore stockpiles							
			5. Water supply systems							
			6. Onsite power infrastructure, including power distribution and metering systems							
			7. Administration blocks and warehouses							
			8. Fuel supply and storage facilities							
			9. Workshop and equipment maintenance							
			10. Chemicals and explosives storage facility							
			11. Wastewater treatment systems							
			12. Municipal solid waste storage / transfer facilities							
			13. Storm water management around the plant, waste rock and tailings							
			14. Testing the mining and processing facilities							
		MINE WORKINGS	1. Excavation (Phase 1), drilling and blasting (Phase 2) to create access to the ore body							
			2. Pit excavation and stripping of the overburden to access the ore body							
			3. Ore production for test mining operations							
			4. Test mining process							
			5. Excavation (Phase 1), drilling and blasting (Phase 2) to create access to the ore body							

Table 1.3: *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]

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, Archaeological and Cultural Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations including excavation, drilling, blasting as maybe required)							
		2. Transportation of the mined materials from pit to the processing plant for sorting, two (2) stage crushing, screening and stockpile of concentrate							
		3. Transportation and storage of concentrate to be exported through the Port of Walvis Bay to Lepidolite Chemical Conversion Plant in Abu Dhabi							
		4. Management and disposal of the co-disposal facility comprising tailings and waste rock materials							
		5. Management of industrial and domestic wastewater							
		6. Storage and management of hazardous materials							
		7. Ongoing exploration support							
		8. Ongoing rehabilitation and maintenance							
	CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan							
		2. Closure / secure the open pits							
		3. Closure and secure the co-disposal Waste Management Area (WMA)							
		4. Backfill all excavated areas / sites except the pits							
		5. Closure of all storage sites (waste, rock, ore etc)							
		6. Decommissioning of onsite water and electricity infrastructure							
		7. Overall land reclamation around the ML area							
		8. Restoration of internal roads							
		9. Revegetation and aftercare as may be required							

1.7.7 Mitigation Measures for Significance Impacts

Based on the finding of this ESIA Report, an ESMP Report has been prepared detailing the mitigation measures that the Proponent shall implement in minimising and maximising the likely effects of negative and positive impacts respectively.

The following is the summary of the guiding principles with respect to the mitigation measures as presented in the ESMP Report in order of preference and in addressing the impacts assessed to have likely significant adverse effects on the receiving environment:

(i) Enhancement, e.g. provision of new habitats

(ii) Avoidance, e.g. 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.

1.8 Structure of the Report

The following is the summary structure outline of this scoping report.

- **Section 1: Project Background** covering Introductions, regulatory requirements, project motivation, site description, Terms of Reference summary, Environmental Assessment Process and Steps and Structure of report.

- **Section 2: Description of the Proposed Project** covering site description, proposed project design and activities to be undertaken.

- **Section 3: Regulatory Framework providing** a summary of the applicable legislations and permitting requirements.

- **Section 4: Receiving Environment** covering physical environment (climate, water, air quality, and geology), Biological environment (flora, fauna and ecosystem services and functions) and socioeconomic environment.

- **Section 5: Assessment of Likely Impact** covering assessment procedure, summary of likely Impacts covered in the ESIA and the method of assessment, and.

- **Section 6: ESIA Conclusions and Recommendations** covering the key issues identified and summarised recommendations.

2. PROPOSED KARIBIB PROJECT

2.1 Overview

Lepidico Chemicals (Namibia) (Pty) Ltd (the Proponent) is proposing to develop the Karibib Project which will encompass two open pit mines at Rubicon and Helikon 1, a processing plant (mineral concentrator) producing a lithium rich mineral concentrate, and the associated infrastructure to support the operation.

The development is based on established mineral resources of 11.24 million tonnes grading 0.43% Li_2O with additional exploration potential upside. Production is planned to start in the third quarter of 2022.

The Proponent completed an in-fill drilling program in 2019. The mineral resources defined are sufficient to support a project development of a minimum of 18 years including up to two years of construction, 14 years of production and the mine closure and rehabilitation program. The Proponent is planning to extend the production life of the project through near mine exploration to define additional resources and the reprocessing of approximately 0.7Mt of existing surface stockpiles which have an estimated grade of 0.7% Li_2O. Processing of these stockpiles alone will extend the production life of the Project by approximately two years and facilitate rehabilitation of pre-existing disturbed land.

The scope of the proposed operation includes conventional open pit mining of ore from the deposits at Rubicon and Helikon 1. Ore will be transported to a mineral concentrator located at Rubicon. The concentrator will use crushing, grinding and froth flotation to produce a lithium rich concentrate. The concentrate will be transported from the Karibib Project to export facilities in Walvis Bay. From there it will be exported to the United Arab Emirates for downstream conversion to lithium chemicals and associated coproducts. The Proponent intends to recruit its own workforce for the Karibib Project supported by Namibian logistics and supply contractors. To support the operation the existing minor internal access roads will be graded and widened, and a new power line will be constructed from the Marble substation at Karibib. The existing water infrastructure will be utilised.

2.2 Exploration and Feasibility Study

2.2.1 Exploration Stage

The exploration phase for the proposed development has been completed even though near mine and regional exploration will be undertaken to define additional resources to support longer Project life or expansions.

In 2019 an in-fill drilling programme was completed on the two larger Rubicon and Helikon 1 deposits. The drilling programme consisted of 90 diamond holes totalling a depth of 5,254 metres. Lepidico initiated a reinterpretation of the mineralisation within the pegmatites into three distinct types: high-grade massive lepidolite zone, lower-grade disseminated lepidolite zone, and a zone dominated by clusters of dark lithium-bearing mica.

All previous drilling was re-logged according to these domains. This greatly assisted in understanding the distribution of lithium within the pegmatites, and the subsequent interpretation of mineralised domains, resulting in greater confidence in resource classification.

The confirmed Mineral Resource Estimate from October 2018 was updated with the results from the infill drilling programme. The resultant Mineral Resource Estimate was published in January 2020 as per Table 2.1 under the Australian mineral resources Joint Ore Reserve Committee (JORC) reporting code.

Table 2.1: Karibib Project mineral resource estimates (Source: Lepidico, 2020).

Deposit	Resource Category	Tonnes (M)	Li_2O (%)	Rb (%)	Cs (ppm)	Ta (ppm)	K (%)	Cut-off (% Li_2O)	Effective Date
Rubicon	Measured	1.56	0.53	0.28	335	47	2.24	0.15	28.01.2020
	Indicated	5.72	0.36	0.20	232	37	2.11	0.15	28.01.2020
	Total	**7.29**	**0.40**	**0.22**	**254**	**39**	**2.13**	0.15	28.01.2020
Helikon1	Measured	0.64	0.65	0.25	520	61	1.90	0.15	28.01.2020
	Indicated	0.94	0.50	0.22	531	74	1.81	0.15	28.01.2020
	Inferred	0.17	0.70	0.29	1100	150	2.18	0.15	28.01.2020
	Total	**1.75**	**0.58**	**0.24**	**584**	**77**	**1.88**	0.15	28.01.2020
Rubicon + Helikon 1	Measured	2.20	0.57	0.27	389	51	2.14	0.15	28.01.2020
	Indicated	6.66	0.38	0.22	274	42	2.06	0.15	28.01.2020
	Inferred	0.17	0.70	0.29	1100	150	2.18	0.15	28.01.2020
	Total	**9.04**	**0.43**	**0.23**	**318**	**46**	**2.08**	0.15	28.01.2020
Helikon2	Inferred	0.216	0.56					0.20	18.10.2018
Helikon3	Inferred	0.295	0.48					0.20	18.10.2018
Helikon4	Inferred	1.510	0.38					0.20	18.10.2018
Helikon5	Inferred	0.179	0.31					0.20	18.10.2018
Global	**Measured**	**2.20**	**0.57**	**0.27**	**389**	**51**	**2.14**		28.01.2020
	Indicated	**6.66**	**0.38**	**0.22**	**274**	**42**	**2.06**		28.01.2020
	Inferred	**2.37**	**0.43**						28.01.2020
	Total	**11.24**	**0.43**						28.01.2020

2.2.2 Feasibility Study

The Feasibility Study into the proposed development has been completed and comprises the following key elements:

1. Open pit geotechnical drilling to inform the mine design.
2. Production planning for ore and concentrate.
3. Metallurgical test work to design the concentrator processing facilities.
4. Engineering design of the mineral concentrator.
5. Engineering design of the support facilities including workshops and all buildings.
6. Geotechnical site investigations and characterisation of the process plant tailings to inform the storage requirements.
7. Design of a Waste Management Area to co-dispose of mine waste from Rubicon and process plant tailings. The process pant tailings will be filtered to recover water and dry stacked with the mine waste.
8. Design of a mine waste facility for the Helikon 1 pit.
9. Engagement with NamPower to provide grid power supply. Design of the power line and substations.
10. Access road upgrade design.
11. Human resources planning.
12. Engagement with Namibian equipment and services providers for mining, construction, logistics and consumables.

13. Development of community and social programs.

14. Downstream facilities design and product marketing studies.

15. Project development planning, and.

16. Development of environmental and social management programs for the operational phase of the project.

2.3 Project Planning, Design and Construction

2.3.1 Overview

The project planning, design and preconstruction stage of the project development will cover the following components:

- Preparation of designs, plans, field-based surveying, and layouts.
- Engagement of Namibian construction contractors.
- General site clearing of the plant site area, waste management area, supporting infrastructure, workshops, stores, and the power supply.
- Access road upgrading as required.
- Topsoil removal and storage and stockpiling of potential key resources material for rehabilitation, and.
- Development of the temporary facilities, including offices and stores.

2.3.3 Proposed Project Layout and Supporting Infrastructure

2.3.3.1 Overview

The proposed new project layout will be confined to the existing disturbed area as far as practically possible (Figs. 2.1 -2.3). The following is the summary of the proposed mine and infrastructure to be developed:

- Pit areas for Rubicon and Helikon.
- Ore stockpile area (Run of Mine pad).
- Processing plant – crushing, grinding, flotation and water recovery sections.
- Rubicon waste management area.
- Helikon waste dump.
- Administration, car park, offices, workshops, storerooms, ablution block, training / meeting room, canteen, clinic / First Aid, and stores etc.
- New powerline and substation.
- Wastewater treatment plant / storage, and.
- Fuel storage.

Note: appropriate permits will be obtained for transportation, storage and final disposal of the hazardous substances associated with the construction and operation of the Project.

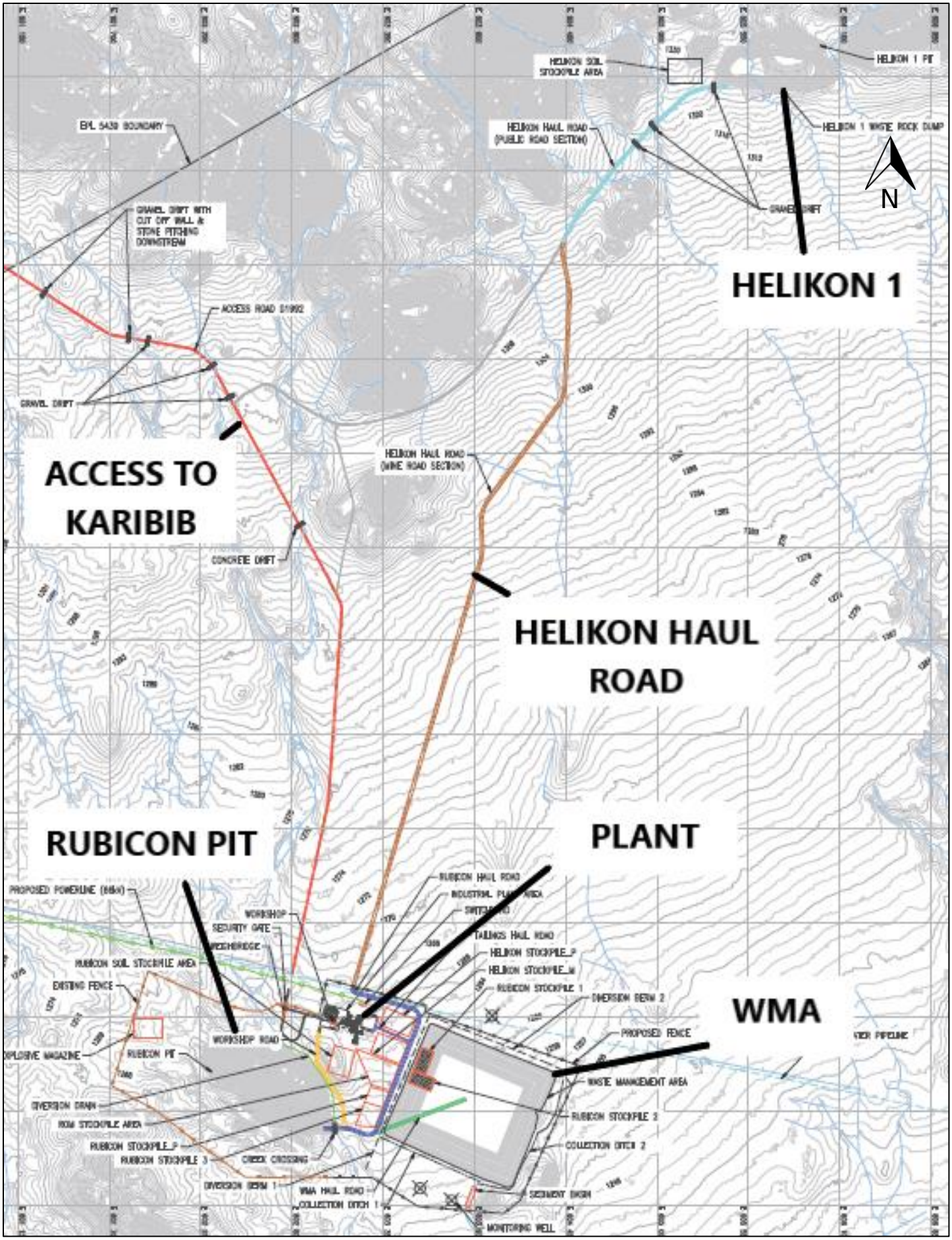


Figure 2.1: Karibib Project Overview on ML 204 (Source: Knight Piésold, 2020).

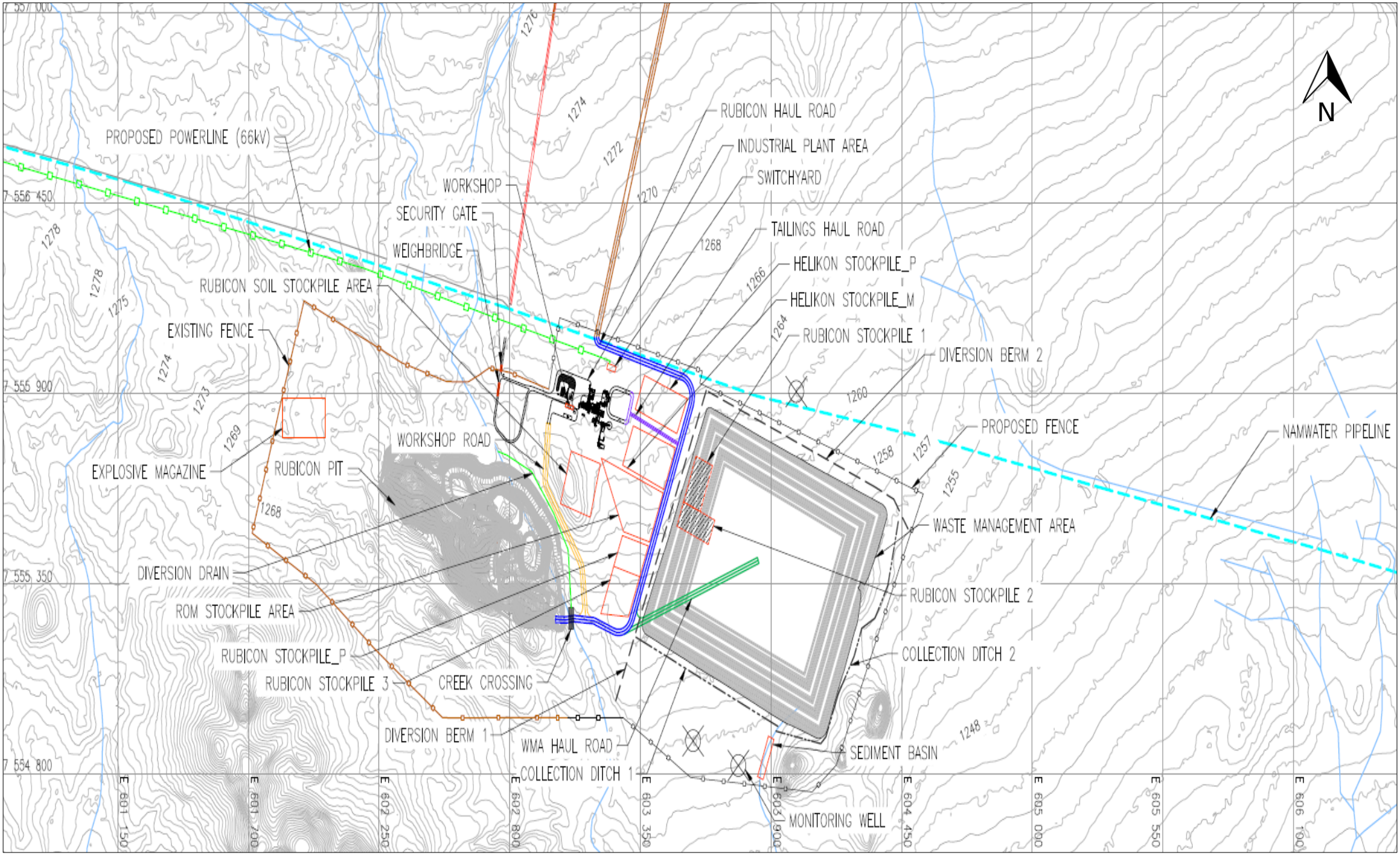


Figure 2.2: Rubicon operations general arrangement (Source: Knight Piésold, 2020).

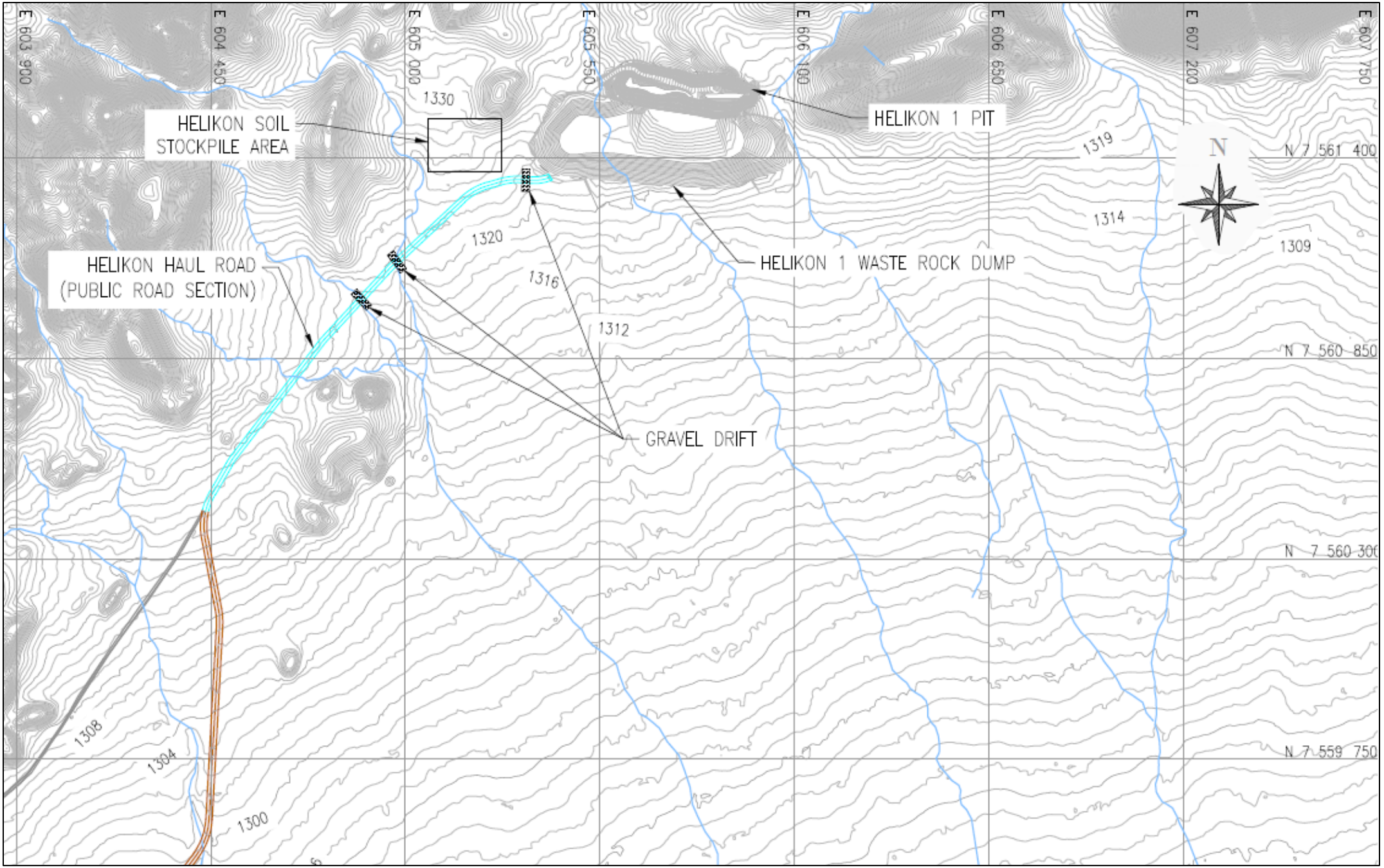


Figure 2.3: Helikon 1 open pit and waste management area general arrangement (Source: Knight Piésold, 2020).

2.3.3.2 Sources of Dust and Noise

Dust will be generated from vehicle and equipment movements, mining and processing operations, ore loading and offloading. Where practical high traffic roads like the main access road will be sealed using salt and compacted and watered regularly.

The stripped topsoil layer from disturbed areas will be stockpiled as it contains a seedbank highly relevant for final rehabilitation of disturbed areas and the waste management areas.

2.3.3.3 Water Supply Management

Water will be sourced from the existing boreholes field located on ML 204. Water will be used for processing and dust suppression on mine roads that cannot be sealed. Both concentrate and tailings from the process plant will be filtered to circa 15% moisture content. Thus 80% of water will be recycled and usage minimised. Water from the waste management area will be recycled.

Mine dewatering will potentially be available as another source. Water is available from the NamWater supply pipeline, but this will only be accessed as a last resort.

2.3.3.4 Power Supply Sources

Power for the project will be supplied from the NamPower grid. The 66 kV power line will connect to the grid at the Marble switchyard to the west of Karibib township. The power line will then follow the D1992 public road into the Rubicon project site.

2.3.4 Construction of Supporting Infrastructure and Mine

2.3.4.1 Supporting Infrastructure

All supporting infrastructures such as roads, onsite buildings, storage area, powerline route and water supply infrastructure will prioritise the use of the already disturbed areas. All the mining and processing infrastructures will be situated within the Mining License area. The supporting infrastructure such as roads will utilise the already existing roads and tracks. Accommodation for workers will be provided in Karibib and workers will be transported from Karibib to the Project site. Limited administration blocks including office, laboratory and workshop will be situated in the Mining License Area and will utilise the existing structures where possible. The processing plant will also be built next to the potential pit area to tie into existing infrastructure and minimise vehicle movement to limit dust. Facilities like workshops, stores and offices will be shared throughout the operation. It is not intended to build any of these facilities remotely at Helikon 1.

2.3.4.2 Liquid, Solid, and Hazardous Waste Management

Domestic sewage from the Project facilities will be treated on site and a French Drain System will be used for the management of the wastewater. A solid waste disposal storage / transfer facility shall be developed onsite. Solid waste from offices and canteen will be stored at the waste solid management storage / transfer facility to be removed regularly in containers to the General Waste facility at Karibib Municipal Waste disposal site. No burying of any waste on site will be permitted.

Hazardous waste will have to be disposed of at the Hazardous Waste facility at Walvis Bay. Recycling of suitable, non-combustible materials, such as metals and glass is recommended.

Some of the reagents will be recovered in the process water that will be recovered from the waste management area. This shall be circulated back to the process plant and with only small quantities remaining in the tailings material or in the concentrates that are produced. No direct release of the reagents to the environment is allowed.

Servicing of vehicles will produce waste lubrication oils and hydraulic fluid, which will be sent for recycling or disposed of to a hazardous waste facility such as at Walvis Bay.

2.3.4.3 Open Pit Mining Operations

The mining techniques to be employed for the proposed project will be an open pit mining method using conventional diesel-powered equipment and a drill and blast, load, and haul operation.

The mining operations will involve extraction of the pegmatite mineralised zone to a depth of approximately 100 metres below surface. The open pits at Rubicon and Helikon 1 will be designed using similar parameters. The bench working heights will be 15m with a typical bench face angle of 75°. An 8m wide safety catch berm will be placed at every bench resulting in an inter ramp slope angle of typically 55°.

Rubicon pit will be mined in four stages and Helikon 1, two stages. The pit staging is determined by the most economic extraction of ore.

The mining sequence will be as follows:

1. Grade control definition of the pegmatite mineralisation to ensure it is suitable for processing and at the planned grade.

2. Drill of production holes and blasting using ammonium nitrate fuel oil emulsions which will be prepared and stored offsite at a facility in Karibib.

3. Excavating of waste and ore.

4. Haulage of ore from both pits to the Run of Mine pad at the Rubicon plant site.

5. Haulage of waste to the waste management area at Rubicon or Helikon, and.

6. Ancillary tasks including scaling of walls, grading, and watering of roads, dewatering of open pit workings etc.

The initial mining rate is 330,000 tpa of ore increasing to 540,000 tpa from year 5 of production. For the first two years of production the ratio of waste to ore ratio is 0.3:1. For the first 10 years it is 1.6:1.

2.3.4.4 List of Open Pit Mining Equipment

The following equipment will be used for open pit mining operations:

1. Hydraulic excavator with 2.7 cubic meter bucket for ore and waste mining (1 unit).

2. Off road mining dump trucks with a payload of circa 40t (4 units).

3. Bulldozer (1 unit).

4. Production blast hole drill rig, capable of drilling 76-127mm holes (1 unit).

5. Motor Grader (1 unit).

6. 20 tonne excavators for general duties (1 unit).

7. On road dump trucks with a payload of circa 20t (2 units) for haulage from Helikon to Rubicon. and
8. Site support vehicles includes a small truck mounted crane and flatbed truck, welding and compressor units, service truck and light vehicles.

The equipment will be serviced and maintained in a purpose-built workshop close to the plant site.

2.3.5 Commissioning, Operations and Ongoing Monitoring

2.3.5.1 Mineral Concentrator Description

The concentrator is designed to recover the main lithium bearing minerals found at Rubicon and Helikon 1 using conventional froth flotation. These minerals include amblygonite, lepidolite and lithian muscovite. Amblygonite is a phosphate mineral and lepidolite and lithian muscovite are micas. The two main mineral types require different flotation conditions for recovery.

The ore from both Rubicon and Helikon 1 open pits will be stockpiled on the Run of Mine pad. On the pad it will be blended and then fed into a two-stage crushing plant consisting of a primary jaw crusher and a secondary cone crusher. This will reduce the size of the ore from 450mm to an 80% passing size of15mm.

The crushed ore will then be ground in water in a rubber lined ball mill using 85mm steel balls for grinding media. In close circuit with hydrocyclones the ore will be ground to an 80% passing size of 180 microns. After grinding the ore is deslimed in two stages of small diameter cyclones which remove ultrafine biotite feldspar as a waste stream. This ultrafine material would otherwise consume flotation reagents and increase process losses.

The deslimed ore is then processed using froth flotation to recover the valuable lithium rich minerals into the froth concentrate. Firstly, amblygonite is floated using soda ash to raise the pH to 9 and a mineral collector designed to recover phosphates. Secondly, the mica minerals are recovered under different conditions, using sulphuric acid to reduce the pH to 2.5 and a mineral collector specific to micas. The mica minerals require two stages of flotation – roughing and cleaning. After flotation the concentrate streams are combined, and the pH is adjusted to greater than 7 using hydrated lime. The stream is then thickened and filtered to produce a filter cake of 15% and to recover the water for recycling.

The concentrate is then bagged into 1.2 tonne capacity super sacks and placed in a storage area prior to transport to Walvis Bay on flat-bed trucks. At Walvis Bay the concentrate bags are containerised (20 bags per container) prior to export.

The tailings stream from flotation is combined with the deslime cyclone overflows and neutralised prior to dewatering using thickening and pressure filtration to a water content of 15%. The filter will discharge the cake into a concrete bunker from where it will be handled by front end loader and trucked to the waste management area.

Process plant services will include process water, fire water, potable water and low and high pressure compressed air.

Water for the process plant will be supplied from the existing water storage tank and boreholes field.

Power will be supplied into the site from Karibib at a voltage of 66kV. The voltage will be stepped down to 11kV for use in the process plant. The 66/11kV substation will be located adjacent to the process plant.

The ancillary buildings including offices, crib rooms, first aid facilities, workshops and stores will be integrated into the process plant area to minimise impact from construction and vehicle movement.

The processing plant general view is shown in Fig. 2.4 with a simplified schematic of the process plant flowsheet shown in Fig. 2.5.

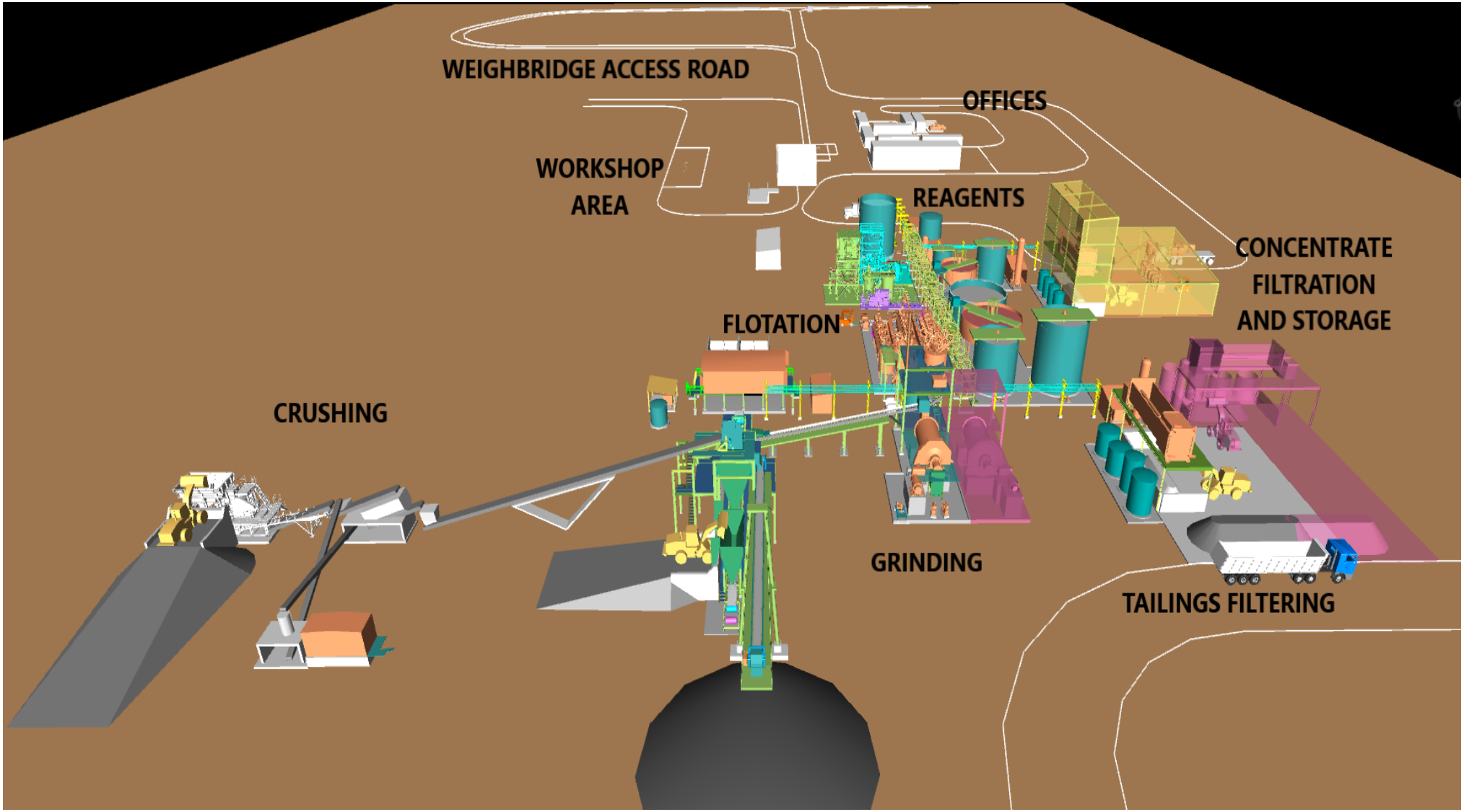


Figure 2.4: Processing Plant general view (Source: Lepidico, 2020).

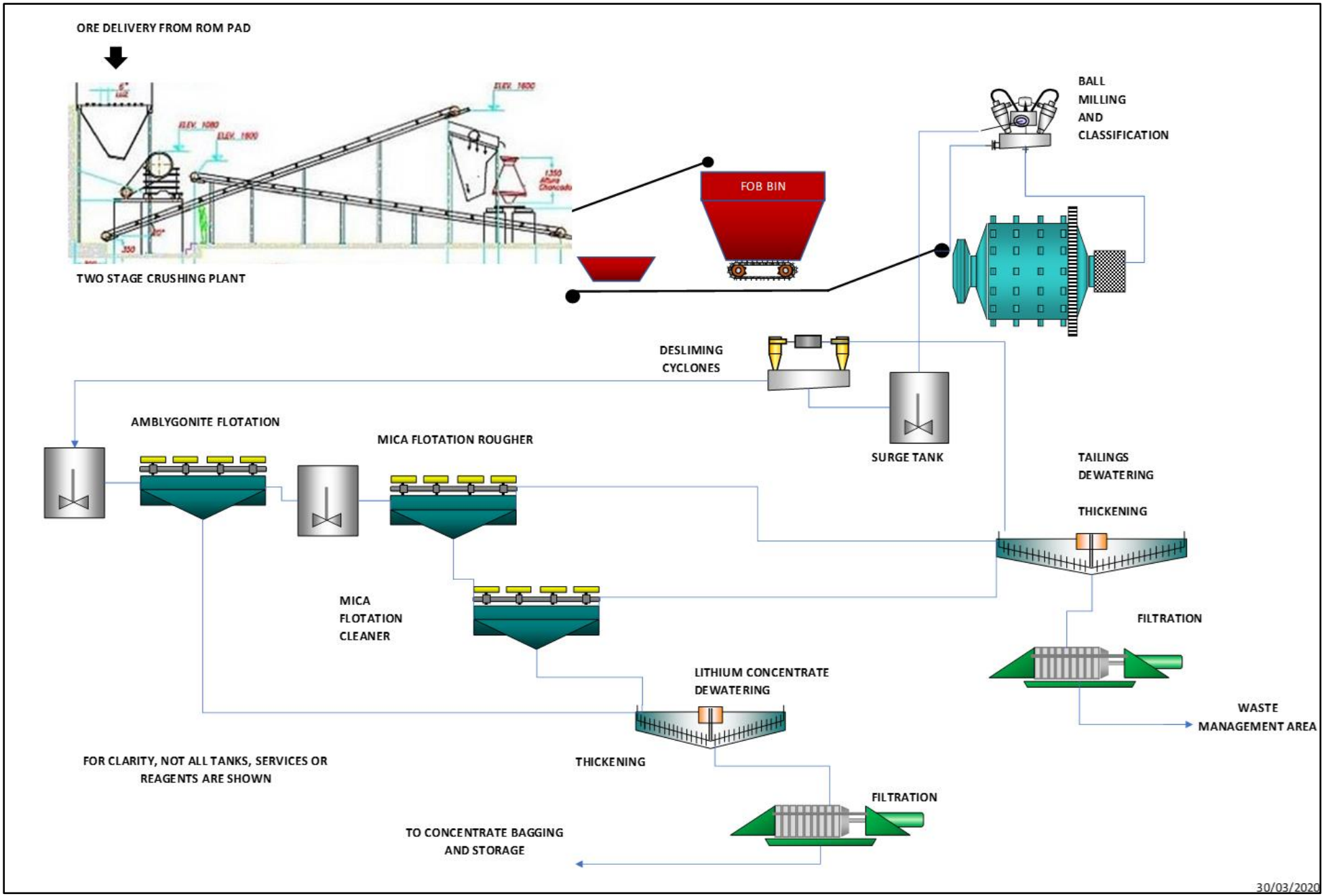


Figure 2.5: Simplified processing plant flowsheet (Source: Lepidico, 2020).

2.3.5.2 Storage, Transport to Walvis Bay

The lithium rich concentrate will be bagged to minimise dust, losses, and contamination. It will be stored on site and then transported to Walvis Bay on flat-bed trucks carrying 36 tonnes net weight. On average five trucks will depart per day.

2.3.5.3 Waste Management Area

The tailings from the process plant will be co-disposed with the waste rock from the Rubicon mining operation is a facility called the Waste Management Area (WMA). This is combining of fine material from the plant with coarse waste rock from the mine results in a single landform structure which is much more structurally stable than a conventional tailings dam. It also enables progressive rehabilitation of the external walls of the structure and rapid final rehabilitation at project closure.

The WMA will be constructed adjacent to the process plant and Rubicon mine exits and be built in five stages progressively over the life of the project. The main design criteria are as follows:

- Storage of approximately 15.1 Mm^3 of waste rock and 4.5 Mm^3 of filtered tailings over the Project life in a combined waste facility.
- Overall waste rock to tailings ratio of 3.15:1.
- Placement of waste immediately to the east of the Rubicon Open Pit.
- WMA Geometry:
    - 3H:1V outer slopes, interior slopes ranging from 2.5H:1V to 1.5H:1V.
    - 10 m high lifts, where appropriate, and.
    - 5 m wide benches between lifts.
- WMA Placement Strategy, per Stage and Lift:
    - Placement of a perimeter embankment of waste rock, at least 10 m wide, to create a paddock for the filtered tailings, keep the tailings away from the WMA face and maintain overall slope stability, and.
    - Co-disposal of waste rock and/or tailings within the created basin. The co-disposed material will be placed in 1 m thick lifts, blended (if appropriate) and compacted.

The proposed storage and raising plan for the WMA includes 5 lifts of material, occupying an area of approximately 68 ha. The staged expansion of the WMA is summarised below.

- Stage 1: Storage Requirement (Years 1 through 4 of operations): Approximately 214,000 m^3 of waste rock and 640,000 m^3 of tailings. The waste rock and tailings are stored in a 10 m lift (Lift 1A) of the WMA. Initially some in-situ material will be excavated from the footprint of Stage 1.
- Stage 2: Storage Requirement (Years 5 through 7 of operations): Approximately 925,000 m^3 of waste rock and 1.02 Mm^3 of tailings. The waste rock and tailings are stored in a 10 m lift (Lift 1B) of the WMA.
- Stages 3 and 4: Storage Requirement (Years 8 through 10 of operations): Approximately 3.2 Mm^3 of waste rock and 1.06 Mm^3 of tailings Storage Solution: The waste rock and tailings are stored in two lifts of the WMA, as follows:
    - Lift 1C (10 m lift): Approximately 826,000 m^3 of waste rock is required for embankment construction, and.

- Lift 2A (2.5 m lift): Approximately 169,000 m^3 of waste rock is required for embankment construction.

❖ Stage 5: Storage Requirement (Years 11 through 13 of operations): Approximately 10.7 Mm^3 of waste rock and 1.8 Mm^3 of tailings. Stage 5 will include the capping of the structure using mine waste, so the tailings is not left exposed in any area. The WMA will then be covered using the pre-stripped stockpiled soils and revegetation using local species based on the seedbank of the soils.

Geochemical test work has demonstrated that the tailings are benign and is none acid forming and any seepage that occurs will have no impact on the underlying groundwater quality. Any supernatant water will be recovered and returned to the process. The waste rock is also benign and does not contain sulphides. Downstream monitoring bores will be installed to measure ground water levels and quality throughout the project. Fig. 2.6 shows the schematic demonstration of the envisaged co-disposal process.

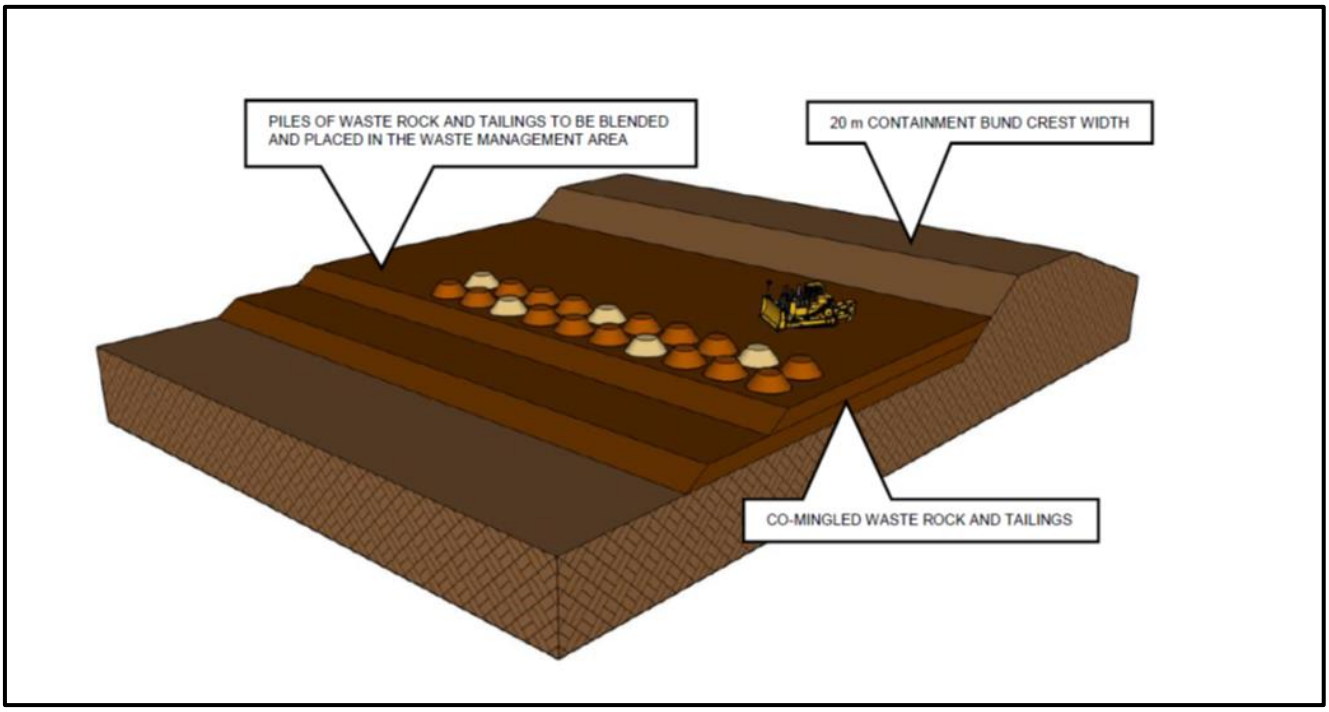


Figure 2.6: Waste Management Area Co-Disposal Schematic (Source: Lepidico, 2020).

2.4 Alternatives to Project Development

2.4.1 Approach and Methodology

This section of the reports evaluates alternative ways to undertake the proposed project and identify possible project development alternatives. The following is the summary of the key issues (components) of the proposed mine development that have been evaluated:

❖ Mine location.

❖ Supporting infrastructure location.

❖ Mine layout and mining methods.

❖ Mineral processing (beneficiation) techniques.

- Tailing impoundment method, and.
- No-action' alternative.

The key aspect of the approach and assessment methods / criteria used to assess each of the components covered the following:

- **Environmental characterisation**: This focused on characterising the local and regional environment surrounding the proposed mine. These include elements such as climate, geology, hydrology, hydrogeology, water quality and potential impacts on the local Ephemeral River, terrestrial and bird life.
- **Technical characterisation**: This focused on characterisation of the engineered elements of each alternative such as remediation, reprocessing, open pit and supporting infrastructure such as access roads.
- **Project economic characterisation**: The overall focus has been on the life of project economics. All aspects of the proposed mine have been considered including investigation, design, construction, operation, closure, post closure care and maintenance, water management, associated infrastructure, compensation payments and land use or lease fees.
- **Socioeconomic characterisation**: This focused on how the proposed mine may influence local and regional land users. Elements that have been considered include characterisation and land use, cultural significance, presence of archaeological sites and employment and/or training opportunities.

2.4.2 Alternatives for Mine Location

The location of the proposed mine has no alternative that have been identified because the ore deposit exists where it is. Nonetheless, it's important to note that the proposed mine falls within an area that has been subjected to exploration and mining since the 1930s. Short and long term environmental, technical and socioeconomic aspects associated with the proposed mine location from preconstruction through operation, mine closure and ultimately post-closure maintenance and monitoring have all been considered. Table 2.2 summarises the results of the assessment.

Table 2.2: Proposed mine location short and long term environmental, technical, and socioeconomic aspects.

Mine Location	Characterisation	Alternatives Evaluated	Rationale
Environmental	Short and long term environmental, technical and socio-economic aspects associated with the proposed mine location from preconstruction through operation, mine closure and ultimately post-closure maintenance and monitoring have all been considered	None	No alternative that have been identified because the ore deposit exists at this specific location
Technical			
Project Economics			
Socioeconomic			

2.4.3 Alternatives for Supporting Infrastructure Location

The location of key mine supporting infrastructure such as access roads, administration blocks, ore processing facilities (e.g., beneficiation plants) and the location of waste disposal facilities, including facilities for the disposal of overburden and tailings have all been evaluated.

The location of these facilities has been chosen to protect public safety and minimize impact on critical resources, such as surface waters (Public Streams), groundwater and ecologically important wildlife habitat. Table 2.3 summarises the results of the assessment.

Table 2.3: Alternatives to the locations of key mine supporting infrastructure such as access roads, administration blocks, ore processing facilities (e.g., beneficiation plants) and the location of waste disposal facilities.

Location Mine Supporting Infrastructure	Characterisation	Alternatives Evaluated	Rationale
Environmental	Climate, geology, hydrology, hydrogeology, water quality and potential impacts on public streams (Ephemeral Rivers) terrestrial and bird life	Site optimisation with preferences given to suitable areas based on the recommendation of the specialist studies and mapping. Ground and surface water as the key source of water supply with generators, solar as sources of energy coupled with a new powerline to support the plant	The location of these facilities has been chosen to protect public safety and minimize impact on critical resources, such as surface (Ephemeral Rivers) waters, groundwater, or ecologically important wildlife habitat. The selected locations have taken into considerations the recommendations of the specialist studies and the selected sites are the least environmental impacts and availability
Technical	All engineering requirements have been used in the assessment of the infrastructural support locations	The following are key aspects considered: ❖ Eco designs. ❖ Visual impact. ❖ Single corridor alignment for all supporting infrastructures	All the key alternatives evaluated have been built into the project design as follows: ❖ Eco designs and less visual impacts have been key to the designs of administration blocks, WMAs, and all other supporting infrastructures. ❖ Access road, powerline, and water infrastructure all to follow a single corridor.
Project Economics	Investigation, design, construction (inclusive of borrow development and royalties), operation, closure, post closure care and maintenance	The following key project economic have been evaluated: Capital cost ❖ Operational cost ❖ Closure cost ❖ Capital ❖ Operational ❖ Closure	The location of the supporting infrastructure has taken into consideration the size of the deposit, grade and price of resources in determining the most possible longer life of mine cost with lowest underlying economic risk
Socioeconomic	Land use, cultural significance, presence of archaeological sites and employment and/or training opportunities	The following key socioeconomic alternatives have been evaluated: ❖ Local land use perception ❖ Presence of immovable sites / assets ❖ Presence of mitigable sites ❖ Surrounding land use	As a resettlement farm, the current and likely future land use of the area is moving towards communal / subsistence and small-scale commercial farming of cattle and small stock coexisting with minerals exploration and mining operations. In addition, there are also proposal to incorporate the Farm Okongava 72 into the Otjimbingwe Settlement. However, the proposed mining operations only covers about 6% of Farm Okongava 72 and targeting the areas around the old Rubicon and Helikon Mines which are already disturbed and not suitable for agricultural related activities.

2.4.4 Alternatives Mine Layout and Mining Methods

The mine layout and the selected open pit mining method has taken into consideration various short and long term environmental, technical, and socioeconomic aspects. However, a mining company may be able to change from an open-pit extraction method to an underground extraction method or both, to preserve surface resources in an event that other factors such as economics favours this option. An underground mine will cover less area in terms of mine layout and will better protect surface waters (Ephemeral Rivers), groundwater and the surrounding ecologically important wildlife habitats (Table 2.4).

There are significant differences between open pit mines and underground mines in terms of implications for environmental management. One of the most significant differences is that open pit mines result in a larger area of surface disruption and tend to produce much larger volumes of waste rock than underground mines (Table 2.4). The proposed mine will be an open pit and Table 2.5 summarises the results of the alternative assessment.

Table 2.4: Comparison of open pit and underground mines, highlighting differences in environmental management concerns.

ENVIRONMENTAL ASPECT	OPEN PIT MINE	UNDERGROUND MINE
❖ Land Disturbance	Relatively large area	Smaller disturbed area than for open pit mines
❖ Waste Rock Disposal	Can require large area. involves trucking, runoff and leachate management, dusting, and aesthetic considerations	Less waste rock than open pit mines, but may involve similar management considerations
❖ Tailings	Tailings volumes generally larger due to large volume of ore processed	Tailings volumes generally smaller
❖ Reclamation	Both mine and waste rock area can represent major concerns due to the extent of the waste rock and pit	Waste rock can be a concern, as can seepage or overflow of water from the mine workings
❖ Land Subsidence	Not a concern	Can be a concern
❖ Rock falls and Slope Stability requirements	Major concern	Major concern
❖ Truck Noise	Truck traffic between pit and waste rock dumps and mill can be a serious noise problem	Normally not a concern
❖ Vent Fan Noise	Not a concern	Requires careful consideration/mitigation
❖ Blasting Effects	Noise and vibration can be a concern requiring careful management	Noise and vibration could also be a concern at underground mines, particularly when the mine workings are relatively shallow
❖ Dust	Can be a concern due to pit operations, haulage roads and waste rock piles	Can be a concern due to haulage roads and waste rock piles
❖ Mine Water	Mine water volume influenced by precipitation, surface, and groundwater ingress. Elevated ammonium levels from blasting can be a concern. High sediment loadings are common. Mine water may contain metals and may have a low pH.	Mine water volume normally quite stable. Elevated ammonium levels from blasting can be a concern. High sediment loadings are common. Mine water may contain metals and may have a low pH.

Table 2.5: Alternative assessment of the proposed mine layout and the selected open pit mining method.

Mine Layout and Mining Methods	Characterisation	Alternatives Evaluated	Rationale
Environmental	Climate, geology, hydrology, hydrogeology, water quality and potential impacts on Ephemeral Rivers, fauna, and flora	❖ Size of the footprint in relation to other land uses ❖ Level of likely negative impacts in terms of the surrounding environmental resources.	The open pit mining method and the extent of the mine layout has been selected based on the near surface nature of the ore body, existing land disturbance from historical mining and the favourable economic feasibility
Technical	Open pit, underground or both open pit and underground design mine layout and mining methods	The following are key aspects considered in the technical part of evaluating the alternative locations: ❖ Rock competence. ❖ Slope stability. ❖ Overall geotechnical engineering properties of the local soils and rocks	
Project Economics	Investigation, design, construction (inclusive of borrow development and royalties), operation, closure, post closure care and maintenance, water management, associated infrastructure, compensation payments and land use or lease fees	The following key project economic have been evaluated: ❖ Capital cost ❖ Operational cost ❖ Closure cost ❖ Capital ❖ Operational ❖ Closure	
Socioeconomic	Land use, cultural significance, presence of archaeological sites and employment and/or training opportunities	The following key socioeconomic alternatives that have been evaluated: ❖ Land use perception ❖ Presence of immovable sites ❖ Presence of mitigable sites ❖	

2.4.5 Tailing Impoundment Method

There are two (2) main alternatives for the disposal of tailings that have been considered for the proposed Karibib Project. The two (2) alternatives considered as follows:

(i) Use of a wet tailings impoundment facility or ‘tailings pond’, and.

(ii) Dewatering and disposal of dry tailings as paste backfill or ‘dry tailings co-disposal with disposal’.

Of all potential advantages associated with disposal of tailings in paste form, the environmental benefits are among the most promising and favoured for the proposed project. As regulatory and societal demands on the mining industry continue to increase, use of paste technology may provide an avenue for minimizing or even eliminating various environmental issues. The environmental benefits of surface disposal of paste can be divided into two main categories. those that stem from the physical and chemical characteristics of paste itself, and those that are more operational in nature.

First, very little free water is available for generation of a leachate, thereby reducing potential impacts on receiving waters and biological receptors. In addition, the permeability of a poorly sorted, run-of mill paste is significantly lower than that of classified, well-sorted tailings. In a surface scenario, this limits infiltration of rainfall which also results in a reduction of the seepage volume. When placed underground, the paste may represent a hydraulic barrier to groundwater flow, thereby limiting generation of a potentially onerous.

There are additional, operational aspects of surface disposal of paste that benefit the mine owner and the environment. The placement of pastes on the surface allows for increased flexibility in both facility siting and disposal strategy. The absence of a pond affords the use of management strategies that are much less restrictive, thereby opening the way for siting and disposal options that are least detrimental to the environment. In addition, the footprint of a paste facility will generally be smaller than that of an impoundment designed for an equivalent volume of tailings.

A second operational benefit results from the improved recovery of water. In arid regions, the reduced water use may represent an important economic incentive. A third benefit stems from the potential for concurrent reclamation and creation of a true “walk-away” facility at closure. As reclamation strategies can be incorporated into the placement options, land disturbance can be minimized during operation. This results in a reduction of visual impacts and operational hazards (e.g., dust generation). In addition, unnecessary loss of pre-mining land uses (wildlife habitat, etc.).

2.4.6 The No-Action Alternative

A comparative assessment of the environmental and social impacts of the ‘no-action’ alternative (a future in which the proposed project does not take place) has been undertake. An assessment of the environmental and social impacts of a future, in which the proposed mining project does not take place, is important to understanding what benefits might be lost if the project does not move forward. It’s important to note that the proposed project area is an old mine with extensive environmental damage that will benefit greatly if the mine is operated in this area. The operations of the mine will make sure that appropriate closure plan is implemented in consultation with the Ministry of Mines and Energy (MME) and Ministry of Environment, Forestry and Tourism (MET).

Other key loses that may never be realised if the proposed project does not go ahead included the following:

(i) About 115 direct job opportunities and an estimated additional 805 indirect jobs, contracts, services and associated Namibian livelihoods will be lost.

(ii) Other socioeconomic benefits such upgrade of the local infrastructure such roads, water and energy.

(iii) Loss of foreign direct investment.

(iv) Loss of Government income tax.

(v) Loss of royalties, and.

(vi) Loss of Value Added Taxes (VAT).

3. LEGISLATIVE FRAMEWORK

3.1 Overview

There are four sources of law in Namibia: (1) statutes (2) common law (3) customary law and (4) international law. These four kinds of law are explained in more detail in the other factsheets in this series. The constitution is the supreme law of Namibia. All other laws must be in line with it. The most important legislative instruments and associated permits\licenses\authorisations\concerts\ compliances applicable to the ongoing exploration and proposed mining operations in the ML 204 covering feasibility, mine preconstruction, construction, mining operation and ongoing rehabilitation, closure, decommissioning and aftercare stages include: Minerals exploration and mining, environmental management, land rights, water, atmospheric pollution prevention and labour as well as other indirect laws linked to the accessory services of exploration and mining operations.

3.2 Key Applicable Legislation

3.2.1 Minerals Exploration and Mining Legislation

The national legislation governing minerals prospecting and mining activities in Namibia fall within the jurisdiction of the Ministry of Mines and Energy (MME) as the Competent Authority (CA) responsible for granting authorisations. The Minerals (Prospecting and Mining) Act (No 33 of 1992) is the most important legal instrument governing minerals prospecting and mining activities in Namibia. A new Bill, to replace the Minerals (Prospecting and Mining) Act (No 33 of 1992) is being prepared and puts more emphasis on good environmental management practices, local participation in the mining industry and promotes value addition as prescribed in the Minerals Policy of 2003.

The Minerals (Prospecting and Mining) Act (No 33 of 1992) regulates reconnaissance, prospecting (exploration) and mining activities. Lepidico Chemicals Namibia (Pty) Ltd holds mineral rights under the Mining License (ML) No. 204 granted in accordance with the provisions of the Act and valid until the 18th June 2028. The Mining Commissioner, appointed by the Minister, is responsible for implementing the provisions of this Act including reporting requirements, environmental obligations as well as the associated regulations such as the Health and Safety Regulations.

Several explicit references to the environment and its protection are contained in the Minerals Act, which provides for environmental impact assessments, rehabilitation of prospecting and mining areas and minimising or preventing pollution.

Section 54 (3) obliges licence holders, on announcement of abandonment, to demolish accessory works, remove all debris and other objects brought onto the land, and to take the necessary steps to remediate ‘to the reasonable satisfaction’ of the Minister of Mines any damage to the environment.

Section 57(1) of the Minerals Act requires licence holders to apply ‘good mining practices’ with respect to environmental protection, natural resource conservation and the removal of accessory works or other goods that were erected, constructed or brought on the land for the mining activities.

Section 91 regulates applications for mining licences. Section 91(f iii) requires the application to include the way the applicant intends to: prevent pollution, deal with any waste, safeguard the mineral resources, reclaim and rehabilitate land disturbed by way of the prospecting operations and mining operations. and minimise the effect of such operations on land adjoining the mining area.

Section 99 (1) requires that licence holders:

(a) inform the Minister in writing before it intends to reduce or to stop mining:

- 6 months prior to permanent cessation of operations.
- 30 days before temporarily cessation of operations, and.

- 7 days before an intended reduction of operations.

(b) in the event of unexpected reduction or cessation of mining operations outside the mine's control, inform the Minister as soon as possible after the event has occurred.

Section 101(2) (2) stipulates that the licence holder must, no later than 180 days after cancellation or expiration of a mining licence, deliver to the MC:

(a) all records kept in terms of the provisions of subsection (1)(a).

(b) all maps and plans referred to in subsection (1)(b).

(c) all reports, photographs, tabulations, tapes and discs prepared by or on behalf of such person in the course of such prospecting operations, and.

(d) such other books, documents, records and reports as the commissioner may require by notification, in writing, addressed and delivered to such person.

Section 128 (1) states that if a ML is cancelled or expired, the Minister may, by notification in writing, require:

(a) the demolition of buildings and structures, and removal of debris and objects, and.

(b) the remedying of damage to the surface and the environment.

Although the provision is kept general, its importance and consequence for any mine closure should not be underestimated.

Section 128 (3) stipulates that failure to rehabilitate a mined area properly is an offence carrying a penalty of N$100 000 or five years imprisonment.

Section 130 relates to pollution control. Licence holders have a general duty of environmental care and are expected to practice continuous rehabilitation at its own cost in that it should immediately clean up a mineral spill or other form of pollution of the environment. If a company fails to do so, the Minister may order the company to comply and, if it still fails to comply, the Minister may instruct a third party to rehabilitate the area, and claim the cost from the polluter. the ML holder will be liable for spilling, pollution, loss, or damage.

3.2.2 Environmental Management Legislation

The Environmental Assessment (EA) process in Namibia is governed by the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) in the Ministry of Environment, Forestry and Tourism (MEFT). The objectives of the Act and the Regulations are, among others, to promote the sustainable management of the environment and the use of natural resources to provide for a process of assessment and control of activities which may have significant effects on the environment. The Minister of Environment, Forestry and Tourism (is authorised to list activities which may only be undertaken if an environmental clearance certificate has been issued by the environmental commissioner, which activities include those relating to exploration and mining operations.

The ongoing exploration and planned mining activities in the ML 204 by Lepidico Chemicals Namibia (Pty) Ltd falls within the categories of listed activities that cannot be undertaken without an Environmental Clearance Certificate (ECC). The current ECC that allows Lepidico Chemicals Namibia (Pty) Ltd to continue with exploration and the proposed mining activities will expire on the 4th September 2020. This ESIA report has been prepared in order to support the application for the renewal of the ECC and transfer the renewed ECC from the previous Proponent Desert Lion Energy (DLE) Pty Ltd to Lepidico Chemicals Namibia (Pty) Ltd.

In addition to the requirements for undertaking Environmental Assessment prior to the project implementation, the Environmental Management Act and the EIA Regulations also provide for obligations of the ML holder to provide for project rehabilitation and closure plan. In the regulations, the definition of "rehabilitation and closure plan" is a plan which describes the process of rehabilitation of an activity at any stage of that activity up to and including closure stage.

3.2.3 Land (Government Owned Land) Legislation

The ML 204 covers the Farm Okongava 72 owned by the Government of Namibia in line with the Agricultural (Commercial) Land Reform Act, 1995, Act No.6 of 1995. The Farm Okongava 72 was purchased by the Government for resettlement of Namibian citizens. Resettlement is aimed at improving the lives of displaced or dispossessed previously disadvantaged Namibians. Farms obtained by government for resettlement purposes are usually split into several sections, and dozens of families are being resettled on what had previously been one farm. Namibian citizens may obtain a portion of a farm for resettlement if they do not yet own farmland and if they belong to the previously disadvantaged population. In the allocation process, females score higher than males, people 25 years of age or older score higher than those below 25, and people with farming experience score higher than those without.

3.2.4 Water Legislation

Water Act 54 of 1956 under the Minister of Agriculture, Water and Land Reform (MAWLR) 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 ongoing exploration and proposed mining operations must ensure that mechanisms are implemented to prevent water pollution. Certain permits will also be required to abstract groundwater (**already obtained by Lepidico Chemicals Namibia (Pty) Ltd**) 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). The Act requires the ML holder to have a wastewater discharge permit (**to be obtain by Lepidico Chemicals Namibia (Pty) Ltd**) for discharge of effluent.

The Water Act, 1956, Act No. 54 of 1956 refer to long-term protection of water resources in the following sections:

- Section 21(5a) states that if a user cannot treat effluent to the desired standard or cannot return it to the appropriate public stream an exemption permit must be obtained from the Minister, and.

- Section 23(2) also allows the Minister to recover any costs from the licence holder to prevent the pollution of public or private water (including ground water) that occurs after mine closure as a result of seepage or drainage from mining or industrial activities. 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.

Regulation 21.1 made under Section 26 of the Water Act requires that areas used as depositing sites for tailings and waste (whether in operation or not) need to be adequately fenced and shall not without the approval of the Executive Director / Minister of Agriculture, Water and Land Reform be used for any other purpose.

The Water Act 54 of 1956 is due to be replaced by the Water Resources Management Act 24 of 2004 which is currently being revised. The Water Resource Management Act 2004 *provides for the management, development, protection, conservation and use of water resources.*

3.2.5 Atmospheric Pollution Prevention Legislation

The Atmospheric Pollution Prevention Ordinance, 11 of 1976 falling under the Ministry of Health and Social Services (MHSS) provide 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.

For the purposes of mine closure, a Licence Holder shall, in terms of Section 28 of the Atmospheric Pollution Prevention Ordinance, 11 of 1976, compile and submit to the Director of Health Services a dust prevention and management plan. thereafter the Director will issue a dust prevention certificate confirming that the licence holder has made adequate provision for dust pollution emanating from those parts of the mine that are due for closure. The licence holder may not commence with mine closure, nor dispose of any of its assets as part thereof, without such a certificate.

3.2.6 Labour, Health and Safety Legislations

The Labour Act, 1992, Act No. 6 of 1992 as amended in the Labour Act, 2007 (Act No. 11 of 2007), falling under the Ministry of Labour, Industrial Relations and Employment Creation (MLIREC) makes reference to severance allowances for employees on termination of a contract of employment in certain circumstances and health, safety and welfare of employees.

In terms of the Health Safety and Environment (HSE), the Labour Act, 2007 protects employees and every employer shall, among other things: provide a working environment that is safe, without risk to the health of employees, and that has adequate facilities and arrangements for the welfare of employees, provide and maintain plant, machinery and systems of work, and work processes, that are safe and without risk to the health of employees, and ensure that the use, handling, storage or transportation of hazardous materials or substances is safe and without risk to the health of employees. All hazardous substances shall have clear exposure limits and the employer shall provide medical surveillance, first-aid and emergency arrangements as fit for the operation.

3.2.7 Other Applicable National Legislations

Other Important legislative instruments applicable to the ongoing exploration and proposed mining operations in the ML 204 covering feasibility, preconstruction, construction, mining operation and ongoing rehabilitation, closure, decommissioning, and aftercare stages include the following (Table 3.1):

- Explosives Act 26 of 1956 (as amended in SA to April 1978) – Ministry of Home Affairs, Immigration, Safety and Security (MHAISS).
- National Heritage Act 27 of 2004 – Ministry of Education, Arts and Culture (MEAC).
- Petroleum Products and Energy Act 13 of 1990 – Ministry of Mines and Energy (MME).
- Nature Conservation Ordinance, No. 4 of 1975 – Ministry of Environment, Forestry and Tourism (MEFT).
- Forest Act 12 of 2001 – Ministry of Environment, Forestry and Tourism (MEFT).
- Hazardous Substances Ordinance 14 of 1974 – Ministry of Health and Social Services (MHSS), and.
- Public Health Act 36 of 1919 – Ministry of Health and Social Services (MHSS).

Table 3.1 summarises the key selected legislations relevant applicable to the ongoing exploration and proposed mining operations in the ML 204.

Table 3.1: Legislation relevant to the ongoing exploration and proposed mining operations in the ML 204.

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 3.1: *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 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 mining project will ensure that if any archaeological or paleontological objects, as described in the Act, are found during its construction, mining operations or closure that such find be reported to the Ministry immediately. If necessary, the relevant permits must be obtained before disturbing or destroying any heritage

3.3 Regulatory Agencies and Permits Register

3.3.1 Key Regulatory Agencies

The key regulatory authorities responsible for the activities associated with the ML 204 are listed in Table 3.2.

Table 3.2: Key government agencies with respect to the activities associated with the ML 204.

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. The ML 204 is already granted valid until the 18th June 2028. 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. 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, 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 wastewater disposal permits. DWA is also the Government agency responsible for water quality monitoring and reporting. The ML 204 covers the Farm Okongava 72 owned by the Government of Namibia in line with the Agricultural (Commercial) Land Reform Act, 1995, Act No.6 of 1995. Access to the surface land rights and negotiation of an agreement shall be concluded with the Department of Land Reform.
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 204

3.3.2 Regulatory Permits Register and National Standards

The ongoing exploration and proposed mining operations in the ML 204 covering feasibility, preconstruction, construction, mining operation and ongoing rehabilitation, closure, decommissioning and aftercare stages will require several permits. Table 3.3 shows the relevant permits / licenses required with respect to the activities of the ML 204.

Namibia only has standards and guidelines with respect to the freshwater and wastewater and lacks gaseous and noise limits. The comparative water quality guideline is shown in Table 3.4. The industrial effluent likely to be generated by the proposed mine must comply with provisions of the Government Gazette No 217 dated 5 April 1962 (Table 3.4).

Table 3.3: Permit register.

Activity	Applicable Legislation	Permitting Authority	Current Status
1. Exploration and Technical Reports	Minerals (Prospecting and Mining) Act, 1992	Ministry of Mines and Energy (MME)	**Updated documents are being prepared and to be Completed in May 2020**
2. Mining Licence (ML)			**ML 204 was granted on 19th June 2018 and expires 18th June 2028**
3. Land Rights over Government Owned Farmland, Farm Okongava 72	Agricultural (Commercial) Land Reform Act, 1995, Act No.6 of 1995	Ministry of Agriculture, Water and Land Reform	**An Agreement was negotiated between the ML 204 Holder and the Government in 2017 and operational arrangements with the resettled farmers are being reviewed**
4. Environmental Clearance Certificate (ECC)	Environmental Management Act, (Act No. 7 of 2007) and the EIA Regulations, 2012	Ministry of Environment, Forestry and Tourism (MEFT	**Current ECC will expire 4th September 2020. This Report will support the renewal and transfer of this ECC**
5. Construction, alteration of waterworks with capacity to hold more than 20,000L.	Water Act 54 of 1956 Water Resources Management Act, 2004 (No. 284 of 2004).	Ministry of Agriculture, Water and Land Reform	**Freshwater Abstraction and Wastewater Discharge Permits were Granted in 2017**
6. Freshwater Abstraction Permit: Use of groundwater other than that provided by NamWater.			
7. Discharge Permit: Discharge of effluents or construction of effluent facility or disposal site.			
8. Operating a diesel consumer installation more than 210L	Petroleum Products and Energy Act 13 of 1990	Ministry of Mines and Energy (MME).	**To Apply when Required**
9. Explosive Permit: License to purchase, store and use of explosive magazines for blasting	Explosives Act 26 of 1956 (as amended in SA to April 1978),	Ministry of Home Affairs, Immigration, Safety and Security (MHAISS)	**To Apply for License when required**
10. Removal, disturbances, or destruction of bird eggs.	Nature Conservation Ordinance 4, 1975.	Ministry of Environment, Forestry and Tourism (MEFT)	**No removals anticipated and no Permit Required**
11. Removal, disturbance of protected plants.			
12. Removal, destruction of indigenous trees, bushes, or plants within 100 yards of stream or watercourse.	Forestry Act, 12 of 2001.		
13. Scheduled processes in Controlled area.	Atmospheric Pollution Prevention Ordinance 11 of 1976	Ministry of Health and Social Services.	**No Permits Require but to meet Provisions**
14. Transport of hazardous substances	Minerals (Prospecting and Mining) Act, 1992		**To Apply for License when by the Contractor when required**
15. Construction of municipal waste disposal sites	Environmental Management Act, (Act No. 7 of 2007) and EIA Regulations	Ministry of Environment, Forestry and Tourism (MEFT)	**No permit required. All municipal related waste shall be disposed of at Karibib Municipal Waste Disposal Site**

Table 3.4: 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 3.5: R553 Regional Standards for Industrial Effluent, in Government Gazette No 217 dated 5 April 1962.

Colour, odour and	The effluent shall contain no substance in	
taste	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

3.4 Equator Principles, International and Regional Treaties and Protocols

3.4.1 Equator Principles

Lepidico adheres to the Equator Principles and International Finance Corporation's Environmental and Social Performance Standards. This ESIA and ESMP incorporates some high level environmental and social aspects of Equator principles for implementation by the Proponent in the operation of the all the activities of the ML 204 throughout the project lifecycle and in complementing the national legislative framework. The following Equator Principles are used to evaluate and manage the social and environmental impacts financed through institutions of Equator Principle signatory:

- Principle 1: Review and categorisation.
- Principle 2: Environmental and Social Assessment.
- Principle 3: Applicable environmental and social standards.

- Principle 4: Environmental and Social Management System and Equator Principles Action Plan.
- Principle 5: Stakeholder engagement.
- Principle 6: Grievance mechanism.
- Principle 7: Independent review.
- Principle 8: Covenants.
- Principle 9: Independent monitoring and reporting, and.
- Principle 10: Reporting and transparency.

The above principles are based on International Finance Corporation (IFC) performance standards on social and environmental sustainability and the World Bank Group's Environmental, health and safety general guidelines applied globally and across industry sectors Equator Principle Financial Institution (EPFI) Banks. The Equator Principles (EPs) are a sustainability risk management framework for projects financed by the financial institutions that have adopted the Equator Principles (EPFIs).

The EPs provide a framework and a minimum standard for financial institutions to identify, assess and manage the environmental and social risks and impacts of projects both prior to entering project financing documentation as well as throughout the project lifetime. The EPs apply globally across all industry sectors and are applicable to certain financial products (subject to value thresholds) offered by the EPFIs. Currently the EPs have been adopted by 101 financial institutions across 38 countries. EP4 strengthen the requirements for EPFIs to consider the potential environmental and social risks and impacts of projects mainly around human rights, climate change and biodiversity.

3.4.2 Applicable Scope of the Equator Principles to this ESIA Process

The Equator Principles apply to certain financial products above specified value thresholds. EP4 decrease the threshold for in-scope Project-Related Corporate Loans from a total aggregate loan amount of US$100 million to US$50 million. Thus, newly, both the total aggregate loan amount and the EPFI's commitment needs to be at least US$50 million. There has also been an addition to the scope of applicability of the EPs in the form of project-related refinancing and project-related acquisition financing provided the following criteria are met (www.equator-principles.com):

- The underlying project was financed in accordance with the EPs framework.
- There has been no material change in the scale or scope of the project.
- The project has not yet occurred at the time of the signing of the facility or loan agreement.

The Equator Principles requires the proposed exploration and mining project in the ML 204 to address the following issues in meeting international finance corporation financing standards:

1. Assessment of the baseline environmental and social conditions.
2. Consideration of feasible environmentally and socially preferable alternatives.
3. Requirements under host country laws and regulations, applicable international treaties and agreements including the 2015 Paris climate change agreement.
4. Protection and conservation of biodiversity (including endangered species and Sensitive ecosystems in modified, natural, and critical habitats) and identification of Legally protected areas.

5. Sustainable management and use of renewable natural resources (including Sustainable resource management through appropriate independent certification Systems).

6. Use and management of dangerous substances.

7. Major hazards assessment and management.

8. Efficient production: total energy consumed per output scaling factor, delivery and Use of energy.

9. Pollution prevention and waste minimisation, pollution controls (liquid effluents and Air emissions), and waste management.

10. Greenhouse gas emissions level and emissions intensity.

11. Water usage, water intensity, water source.

12. Land cover, land use practices.

13. Consideration of physical climate risks and adaptation opportunities, and of viability of project operations under changing weather patterns/climatic conditions.

14. Cumulative impacts of existing Projects, the proposed Project, and anticipated future Projects.

15. Consideration of actual or potential adverse Human Rights impacts and if none were identified, an explanation of how the determination of the absence of Human Rights risks was reached, including which stakeholder groups and vulnerable populations (if Present) were considered in their analysis.

16. Labour issues (including the four core labour standards), and occupational health and safety.

17. Consultation and participation of affected parties in the design, review, and implementation of the Project.

18. Socio-economic impacts.

19. Impacts on affected communities and disadvantaged or vulnerable groups.

20. Gender and disproportionate gender impacts.

21. Land acquisition and involuntary resettlement.

22. Impacts on Indigenous Peoples, and their unique cultural systems and values including impacts to lands and natural resources subject to traditional ownership or under customary use.

23. Protection of cultural property and heritage.

24. Protection of community health, safety, and security (including risks, impacts and management of Project's use of security personnel), and.

25. Fire prevention and life safety

The above potential Environmental and Social issues have been addressed in this ESIA Report in line with parliamentary national legal frameworks that provides for all the above issues. The Constitution of the Republic of Namibia, the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 as well as other associated laws with respect to exploration, mining water, land, energy, labour and health and safety all provides

for the mechanism of assessing key issues associated with development projects in Namibia such as the proposed exploration and mining operations in the ML 204.

The only key missing components to the regulatory frameworks in Namibia are benchmarks, limits, 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 3.6). Noise abatement measures must target to achieve either the levels shown in Table 3.7 or a maximum increase in background levels of 3 dB (A) at the nearest receptor location off-site (MIGA guidelines).

Table 3.6: 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 3.7: 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

3.4.3 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.

3.5 Recommendations on Regulatory Framework

The proposed exploration and mining project in the ML 204 shall meet all the applicable national legislation, regulations, standards, and guidelines as well as the EP and international and regional regulatory frameworks, standards, treaties and protocol.

It is hereby recommended that the Proponent shall comply with the provisions of all relevant and applicable national regulatory frameworks as described in this Chapter and Annex 2 with respect to the ongoing exploration and proposed mining operations in the ML 204 covering feasibility, preconstruction, construction, mining operation and ongoing rehabilitation, closure, decommissioning and aftercare stages.

4. RECEIVING ENVIRONMENT

4.1 Regional Physical Geography

The proposed Karibib Project area falls within the Erongo Region in the west-central part of Namibia within the Damara Orogen that dominates the structural basement of most central part of Namibia. On the Western part of the region is the Atlantic Ocean with Ugab River in the North and Kuiseb River as the southern boundary (Ministry of Mines and Energy (MME), 2010). The Namib Desert borders the Namibian coastline with Atlantic Ocean and stretching inwards to about 120-150 km. The Topography of Land rises steadily from sea level to about 1000m across the Namib Desert. Most of the land within Namib Desert is flat to undulating gravel plains, with occasional ridges and isolated inselberg hills and mountains. In the far north of the Erongo Region lies the Brandberg at a highest peak of 2579 m, making it the country's highest mountain.

Ephemeral rivers in Erongo region run from their inland catchment to seawards direction. These rivers include the Swakop River with its main tributary the Khan River, the Omaruru River, Kuiseb and Ugab River (Fig. 1.1). The surface flows of the ephemeral rivers in the region are short-lived during the rainy season from November to April but their alluvial aquifers are a good source of groundwater. Palaeochannels in the Omaruru River form the underground Omaruru delta providing a significant source of surface water for the central Namib. There are two water supply schemes in the Kuiseb (Gobabeb) namely, Swartbank and Rooibank which are supplying water to the town of Walvis Bay.

The project area falls within the Great Escarpment. The area is characterized 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 are dry most of the year dominate the general ML area. The elevation above mean sea level (amsl) ranges from 1,250 m, at the lowest point in the project area, to 1,709 m at the top of Jiperekkeneberg ridge to the northeast part of ML area, with an average elevation of 1,300 m.

4.2 Climatic Settings

4.2.1 Overview

The climate of the Karibib Project area comprises warm to hot daytime temperatures throughout the year, while the nights are mild to cool in winter. The mean annual rainfall is highly variable and may range between 200 - 300 mm (Fig. 4.1). The distribution of rainfall is extremely seasonal with almost all the rain falling in summer - from November to April with occasional with mean annual gross evaporation of about 3300 mm (Fig. 4.1). The local project area has the following three distinct seasonal characteristics:

- A dry and relatively cool season from April to August with average daytime highs of 23°C and virtually no rainfall during this period.

- A hot and dry season from September to December with minimal and variable rainfall falling (<20mm per month) and average daytime highs of 30°C, which regularly exceed 40°C, and.

- A hot and rainy season from January through to March with >50mm per month falling during this period (although this is extremely variable) and average high temperatures of 29°C.

The prevailing wind in the area seems to be dominated by winds from the north eastern and southwest quadrants. Locally, the situation may be different dues various influences including topographic effects.

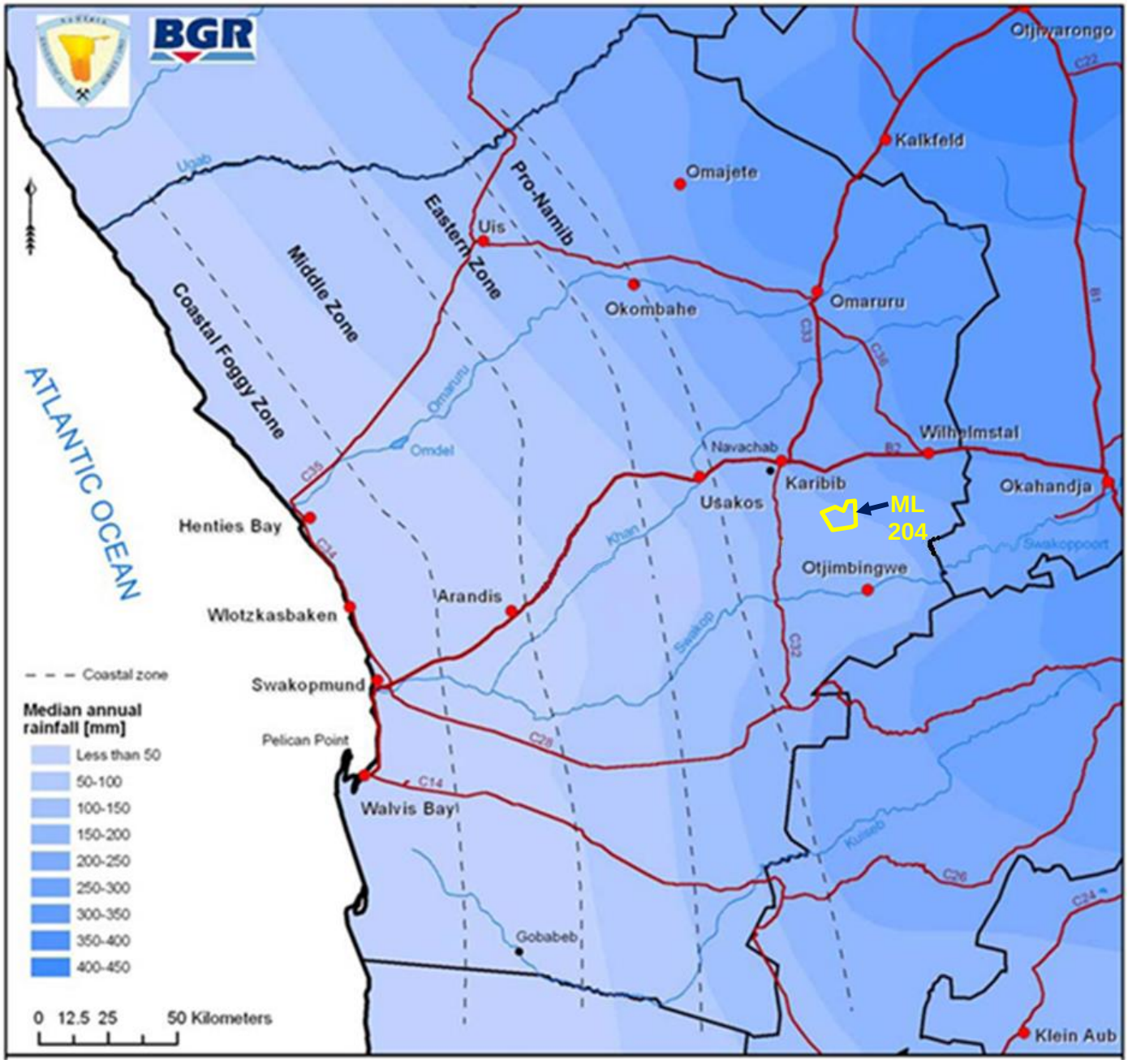


Figure 4.1: Median annual rainfall of central Namib Desert showing the location of the Karibib Project area, ML 204 (Source: Ministry of Mines and Energy (MME), 2010).

4.2.2 Wind Patterns

The Namib Desert is heavily influenced by high pressure systems, the sub continental high and the South Atlantic high. The coastal winds are driven by the South Atlantic high-pressure systems, resulting in strong winds prevailing from the south or south-west (Fig. 4.2). The cold Banguel Current on the Namibian coastline influences the South-westerly winds.

The Stronger winds experienced in the coastal towns and surroundings are mainly north-easterly or east winds. These winds are usually dry and hot with a wind speed of about 27km/hour. This influence is experience to up to 50 days annually between the months of April to September. Within the project area, stronger winds are dominated by the south-westerly or a north-easterly component. The wind is stronger in winter due to high pressure system of inland regions.

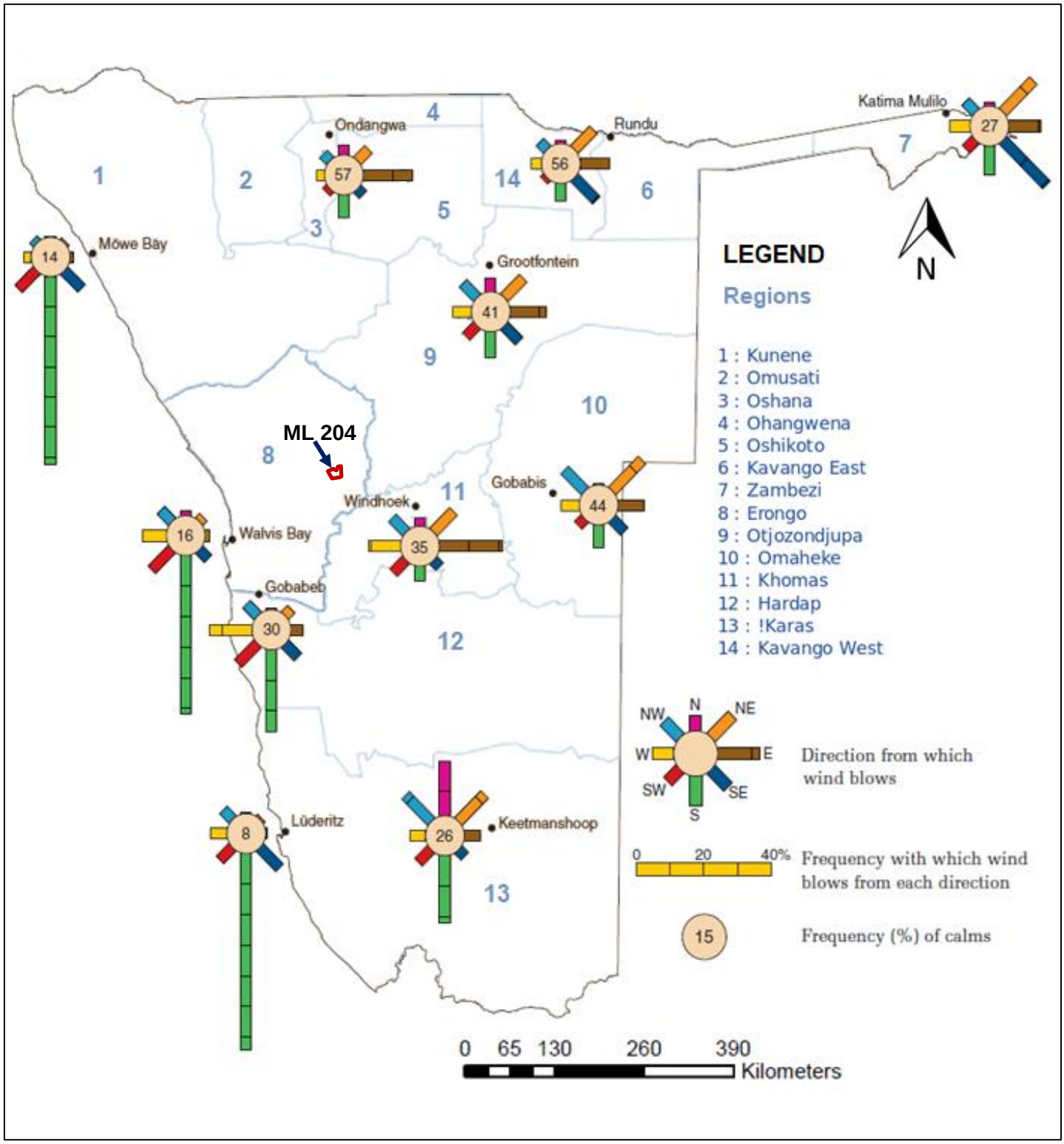


Figure 4.2: Regional wind patterns relative to the ML 204 location.

4.2.3 Regional and Local Air Quality Assessment

The need for air quality monitoring is important and shall be focused on evaluating the likely influence of any pollutant that may be associated with the proposed project activities. Ambient air quality monitoring for suspended particulate matter, sulphur dioxide, and nitrogen oxides should be carried out over a longer period during the operation of the mine. The aim should be to study diurnal and seasonal variation and spatial distribution of said pollutants. Dust fall rate measurements should also be carried out for a period of one month out of each season and for all the four seasons of the year. Mining and

associated activities may raise the background levels of particulate pollution in the local area. Material handling and processing plant, poorly maintained roads, resulting in transport of fine mined and processed materials dust by means of wind, are potential sources of particulate pollution in mining operations. Burning of fuel and transportation activities could be among the major sources of SO_2 and NO_x in mining operations.

Erongo Strategic Environmental Assessment (SEA) project has developed 20 Dust fallout monitoring networks with inclusion of existing mining projects across the Erongo region. In addition to the regional dust monitoring station, a total ten (10) dust monitoring station have been established within the ML 204 area.

The focal point for the dust monitoring station within the proposed project areas has been the Rubicon and Helikon old mine sites (Plate 4.1). The dust monitoring programme has been established in order to provide a trend analysis of dust deposition over a period of time. The recorded dust fallout results have been compared to the dust fallout limits as provided by Germany and South Africa as SANS (South African National Standard, 2005).

The main findings and the ongoing dust monitoring associated with the Erongo Strategic Environmental Assessment (SEA), (MME, 2010) as well as those implemented for the proposed project dust fallout activities in the Erongo Region can be summarised as in the slight impact range (< 150 mg/m²/day). Overall, the dust fallout was below the SANS residential limit of 600 mg/m²/day and most are below the German standard of 350 mg/m²/day for the general area.

4.2.4 Noise and Air Emissions

4.2.4.1 Assessment Overview and Approach

A specialist assessment of baseline and future noise and air emission trends were undertaken as part of the environmental assessment conducted in 2017 (Plate 4.1) and monitoring activities undertaken since October 2019 (Annexes 3-1 to 3-3). To achieve the project objectives, baseline noise monitoring of current levels on noise at the two (2) respective mining sites (Rubicon and Helicon) was conducted using an Integrating Sound Level Meter Class 2, with a C band filter for environmental monitoring (Annex 3-1).

A windshield was used to control the impact of wind speed and measurements were conducted at 1.8-meter height and an interval of 15 minutes and results were extrapolated to an hour rating to the continuous rating. The two sites' air quality was assessed using American Society for Testing and Materials standard method for collection and analysis of dust fallout (ASTM D1739). A portable Microdust Pro Real-time Dust Monitor serial number 1749391(Casella) was also used to account for hours and possible monthly dust concentration at the sites.

Since October 2019, Environmental Compliance Consultancy (ECC) has been conducting different work packages prior to mining, which includes baseline environmental monitoring, specifically air quality. For the air quality component, ECC did deploy eight (8) depositional dust monitoring stations on the 29th October 2019 at locations within and around the ML 204 (Annexes 3-2 and 3-3).

4.2.4.2 Results and Findings of the Specialist Study

The main aim of the baseline air quality assessment and modelling of the likely impact of the proposed project in the ML 204 determined the likely contaminant sources, possible pathways and targets with respect to the likely final process designs efficiency.

The baseline study found that the general air quality at the sites ranged from 16.61 to 101.88 (mg/m^{2}day) for Rubicon mine and 23.26 to 47.62 (mg/m^{2}day) for Helicon mine while noise levels ranged from 59.8 - 76.2 (dBA) for Rubicon mine and 56.6 - 67.9 (dBA) for Helicon mine (Annex 3-1). Both the baseline and monitoring studies has found that the existing air quality and noise pollution are below acceptable limit hence following or adopting the proposed recommendations will help to improve compliance during mining (Annexes 3-1 to 3-3).

Plate 4.1: Rubicon and Helikon dust monitoring stations established within the ML 204 as part of the EIA process (RBS Geotagged Image Series, 2017).

4.2.5 Recommendations on the Climatic Components

Based on the regional climatic data sets and the results of the specialist study, it's likely that a proportion of windblown dust will be generated during the proposed project lifecycle covering exploration, preconstruction, construction, operation, rehabilitation, closure and aftercare stages.

It was recommended that a weather station with dust fallout monitoring equipment be installed at Karibib Project before the implementation of the full-scale mining operations in order to generate long-term local data sets that could be used in the air quality modelling (Annex 3). A Weather station was installed in 2018 and is currently operational. Due to the proximity of other mines and quarries in the area, there will be potential for cumulative impacts on the air quality occurring. This is likely to occur when the threshold wind speed of 4.5 m/s is exceeded. The threshold wind speed is dependent on the erosion potential of the exposed surface, which is expressed in terms of availability of erodible material per unit area. Any factor that binds the erodible material will significantly reduce the availability of erodible material on the surface, thus reducing the erosion potential of the surface. Namibia does not have air quality standards. Nonetheless, the proponent, shall aim at reducing hazardous air pollutant (HAPs) emissions to levels that comply with long-term regional (SADC) and international standards air quality guidelines.

4.3 Ground Component

4.3.1 Topography

The ML 204 falls within the foothills of the escarpment, more specifically within the Otjipatera Mountain Range which has the highest point of 1,989 mamsl. The elevation above sea level ranges from 1,250 m, at the lowest point in the Project area, to 1,709 m at the top of Jiperekkeneberg ridge northeast of the ML area, with an average elevation of 1,300 m. The terrain is rocky and rugged in nature with steep slopes characterising the mountainous sections whilst the foothills of the mountains are flat and gently undulating. The drainage of the area is dendritic in nature with ephemeral streams, often steeply incised, forming small early stage tributaries into the Swakop River which one of the major ephemeral rivers of western Namibia.

4.3.2 Hydrology

The Karibib Project area lies in the Swakop River catchment, a large west flowing ephemeral river of the Country. Southwards flowing ephemeral tributaries of the Swakop River, namely the Audawib and the Omusema, drain the ML 204 area (Annex 4). Elevated areas to the north with exposed basement rocks form a surface water divide. Arid Region Rivers typically show extreme variability with extended dry periods followed by runoff that is rapidly initiated in response to summer rain. Groundwater recharge occurs during these flow events. The safeguarding of the ephemeral drainage system is therefore important for groundwater recharge. There are no natural permanent surface water bodies in the project area. The only large water body on the vicinity is the Swakoppoort Dam built on the Swakop River and is situated 80 km southeast of the ML area.

4.3.3 Regional Geology

The Karibib Project area falls within the Central Zone of the Damara Sequence which underlies most of Namibia (Miller, 1992). The oldest rocks within the Central Zone are the pre-Damaran basement that consists of gneiss and granite lithologies found in different parts of the zone (Miller, 1992).

According to Miller, (1983a), the sequence was deposited during successive phases of rifting, spreading, subduction and continental collision. Much of the basal succession (Nosib Group), laid down in or marginal to intracontinental rifts, consists of quartzite, arkose, conglomerate, phyllite, calc-silicate, subordinate, limestone, and evaporitic rocks. Local alkaline ignimbrites with associated subvolcanic intrusions ranging from 840 to 720 million years in age also form part of the regional geology (Miller, 1992).

According to Miller, (1992), widespread carbonate deposition followed and overlapped far beyond early rift shoulders (Kudis, Ugab and basal Khomas Subgroups). interbedded mica and graphitic schist, quartzite (some ferruginous), massflow deposits, iron-formation, and local within-plate basic lava point to variable depositional conditions south of a stable platform where only carbonates with very minor clastics occur (Otavi Group). Near the southern margin of the orogen, deep-water fans, facies equivalents of the carbonates were deposited on either side of a Southern Zone ocean separating Kalahari and Congo Cratons (Auas and Tinkas Formations). Thick schistose metagreywacke and metapelite (Kuiseb Formation) overlie the above rocks.

The lithostratigraphy of the Damara Sequence in the Central Zone (CZ) in which the ML 204 falls has been reviewed and significantly revised by Badenhorst (1987), who has also correlated the stratigraphy across the Omaruru Lineament. The stratigraphy of the CZ taken from Steven (1993) as slightly modified after Badenhorst, (1987) and (1988) is given in Table 4.1.

Table 4.1: Partial Lithostratigraphy of the Damara Sequence in Central Namibia (Karibib-Swakopmund Area) (Source: Venmyn Deloitte, 2014).

GROUP	SUB-GROUP	FORMATION	THICKNESS (m)	LITHOLOGICAL DESCRIPTION
Swakop	Khomas	Kuiseb	3,000	Biotite-rich quartzo-feldspathic schist, biotite-garnet-cordierite schist, minor amphibolite schist, quartzite, calc-silicate rock, and marble.
		Karibib	700	Marble, biotite schist, quartz schist and calc-silicate rock.
		Chuos	700	Diamictite, pebble- and boulder-bearing schist and minor quartzite
	Discordance			
	Ugab	Rössing	200	Very variable marble, quartzite, conglomerate, biotite schist, biotite cordierite schist and gneiss, aluminous gneiss, biotite-hornblende schist, and calc-silicate schist.
Unconformity or conformable transition				
Nosib		Khan	1,100	Various gneisses, quartzite, schist, conglomerate, minor marble, amphibolite, and calc-silicate rock.
		Etusis	3,500	Layered light red to greyish-brown quartzites with high feldspar content. In-between para-gneisses, biotite schists and conglomerates occur.

4.3.4 Local Geological Setting

The local geology of the proposed ML area comprises the Karibib Pegmatite Field with pegmatite intrusions hosted in biotite schists and carbonate lithologies of the Karibib Formation, in quartzites of the Chuos Formation, in basement gneisses of the Abbabis Complex and in granites of Damaran age.

According to Smith (1965), Brant (1983) and De Cock (1987), the local geology of the ML area comprises the following lithologies:

- Abbabis Metamorphic Complex made of quartz biotite schists (basement).
- Damaran Supergroup consisting of metasediments, ortho-amphibolites, quartzite, schists (mica schist, biotite schist, graphitic schist).
- Various intrusions (gabbros, diorites, granites, pegmatities, and dolerites), and.
- Alluvial and quaternary sediments overly the local hard rock.

The rocks have undergone polyphase folding with a NE–SW trend. An earlier phase of deformation produced NW trending folds which were later subjected to more powerful stresses producing the dominant NE fold trend.

The mineralised structures within the Karibib Project area are large, internally zoned Lithium- Caesium - Tantalum (Li-Cs-Ta), (LCT) pegmatite. The recent geology map compiled by the Proponent (based on detailed surface geological and structural mapping and on ground magnetic data) indicates that the pegmatite body comprises of stacked sills emplaced within pegmatitic granite. Additionally, large parts of the mineralized areas are covered by thick calcrete and alluvium, thus making surface mapping unreliable in those areas. The geology of the project area consists of:

- Overburden consists mainly of calcrete and alluvial.
- The Okongava Diorite: a medium grained diorite displaying evidence of syn-tectonic deformation and containing xenoliths of older meta-sedimentary.
- Pegmatitic granites: 2 types occur within the area:

    (i) A porphyritic biotite granite, light orange in colour with centimetre size of K Feldspar or perthite. A medium grained size facies also exists. Most of the pegmatites associated with this type of porphyritic granite are zoned and with lepidolite +- petalite, beryl, tantalite etc. mineralisation, and.

    (ii) A porphyritic leucogranite often associated with black tourmaline. Pegmatites associated to this granite are un-zoned and not mineralised.

Detailed information on the local geology including maps of the ML area for is contained in the Feasibility Study Report and associated supporting Technical Reports available from the Proponent on request.

4.3.5 Geotechnical Engineering Considerations

Rocks of varying geotechnical characteristics are expected within the pegmatite zones and alternating bands within the banded dolomitic marble and biotite-quartz schist country rock and covered by a variety of sediments in some places. No field and laboratory assessment of rock mass and detailed discontinuities survey were undertaken as part of this study. Table 4.2 outlines an indicative classification of the various discontinuities that are likely to be found in the area. Both low and high order discontinuities are likely to be found around the ML area.

Generally, dolomitic marble and biotite-quartz schist have good bearing capacities and depending on the dip and intersections of the various discontinuities, can withstand near vertical steep slopes. The rocks are also suitable for coarse concrete aggregate and some of the more quartz-rich varieties of the country rocks can be used for rock fills in various mine support infrastructural construction activities. The fine aggregates are generally available. The alluvium in the surrounding ephemeral river channels could be used as fine concrete aggregate for potential future mine development. However, these alluvial materials may also be too fine graded with possibly too high clay content, hence they must be

tested before being used for construction purposes. Clay and silt are quite common constituents of the alluvial terraces. Salt encrustations on the surface are indicating of the presence of a high content of soluble salts in these formations, which may endanger buried metal drainage pipes.

It's highly recommended that a field-based geotechnical engineering assessment followed by laboratory assessments must be undertaken before the implementation of deep excavation to have accurate figures of all the key geotechnical parameters.

Table 4.2: General rock structure scheme (Source: Mwiya, 2004).

GEOMETRY				CHARACTERISTIC				
DISCONTINUITY	LENGTH m	SPACING m	WIDTH m	TRANSMISSIVITY m^2/s	HYDRAULIC CONDUCTIVITY m/s	INFILLING THICKNESS m	EXAMPLE	INFLUENCE INDICATOR
LOW ORDER DISCONTINUITIES. ZONES OUTCROPS								
1^{ST} ORDER	$>10^4$	$>10^3$	$>10^2$	10^{-5} - 10^{-2}	10^{-7}- 10^{-5} AV. [10^{-6}]	10^0	Regional major fault systems	4 V. High
2^{ND} ORDER	10^3 - 10^4	10^2- 10^3	10^1 – 10^2	10^{-7} - 10^{-4}	10^{-8} – 10^{-6} AV. [10^{-7}]	10^{-1}	Local major fault zones	
3^{RD} ORDER	10^2 – 10^3	10^1 – 10^2	10^0 - 10^1	10^{-9} – 10^{-6}	10^{-9} – 10^{-7} AV. [10^{-8}]	$\leq 10^{-2}$	Local minor fault zones	
HIGH ORDER DISCONTINUITIES: INDEPENDENT OUTCROPS								
4^{TH} ORDER	10^1 – 10^2	10^0- 10^1	-	-	10^{-11}-10^{-9} AV.[10^{-10}]	-	Local major joint set or bedding	3 High
5^{TH} ORDER	10^0 - 10^1	10^{-1} - 10^0	-	-	10^{-12}-10^{-10} AV. [10^{-11}]	-	Local minor joints/ fractures	
6^{TH} ORDER	10^{-1} - 10^0	10^{-2} – 10^{-1}	-	-	10^{-13}-10^{-11} AV. [10^{-12}]	-	Local minor fissures / schistosity	2 Low
7^{TH} ORDER	$<10^{-1}$	$<10^{-2}$	-	-	$<10^{-13}$	-	Crystalline voids	1 V. Low

4.3.6 Sources of Water Supply

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 around Karibib including the ML204 area generally has a low groundwater potential. The area with aquifer potential, reflects the rainfall distribution, decreasing westwards. Knowledge of the aquifers in this area is sparse, due to the low number of boreholes and the few users of groundwater.

Recharge from rainfall is an important parameter determining the groundwater potential, but the degree of metamorphism affects the groundwater potential too. 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 marble 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 204 area.

There is a NamWater pipeline from the Swakoppoort Dam which dams the ephemeral Swakop River in the area which supplies water to the Navachab mine. The water supply pipeline dedicated for the Navachab Gold Mine is located within the ML204 area and close to the Rubicon mine site. Arrangements have already been made for NamWater to supply water to the Karibib Project and a pipeline linking the project area to the NamWater pipeline has been installed and operational.

According to the hydrogeological study under undertaken by Hydrosearch in 2017 (Annex 4), additional sources of water for the proposed mining operations could be obtained from the available limited groundwater. The groundwater resources are associated with the localised compartments of fractured rock and karstified carbonates. The hard-rock aquifer can supply sustainably at yields of up to 5 m^3/h per borehole as seen from past drilling records.

4.3.7 Evaluation of Water Vulnerability

4.3.7.1 Overview

Vulnerability assessment of surface water covered possible runoff, the presence of source factors and major flow routes such as ephemeral river channels, valleys and gullies as pathways and the presence of surface water body as a target. The groundwater assessments covered hydraulic properties and thickness of the unsaturated and saturated zones derived from geological and hydrogeological data. The assessment of the unsaturated characteristics was based on the ability for source factors to influence the system through known pathway factors such as discontinuities. The combined effects of unsaturated and saturated flow probabilities were used as indicator for groundwater vulnerability. However, groundwater or surface water will only be vulnerable to contamination if there are contaminant sources if there are pathways for contaminant migration and there are targets (surface water or groundwater) present within the project area.

Overall, the limited local groundwater resources found in the area form part of the unconfined aquifer system that is highly vulnerable to any sources of pollution that maybe associated with the proposed mining operations. During the rainy season, surface water bodies can be found along the major ephemeral river systems in the area with an active local spring. This surface water often recharges the local groundwater resources along the faults, solutions holes, and other discontinuities along the ephemeral rivers in the area. Therefore, surface water in the area could be vulnerable to pollution sources from the mining activities. It is important that all polluting activities such as for, waste rock stockpile, dirty water pond and ore stockpile must not be placed or undertaken in areas with high discontinuities, valleys or gullies connected to major ephemeral rivers systems in the area.

Management of wastewater from the onsite administration blocks and related infrastructures will utilise French Drains and upgraded wastewater treatment during the construction and operational phases respectively. Effective monitoring will need to be put in place to avoid under designing of the facilities that may results in overflow of wastewater into the surrounding receiving environment.

4.3.7.2 Water and Phases 1 - 3 Preconstruction and Construction Stages

Based on the hydrogeological baseline assessment and groundwater exploration specialist study undertaken by Hydrosearch 2017 (Annex 4), the surface construction of the tailings, dirty water pond, ore stockpile, waste rock dump, plant, haul roads as well as all the various potential seepages that could be associated with the various activities linked to the proposed mine preconstruction and construction activities will not breach to the groundwater levels and into key Ephemeral River channels in the area if all key mitigation measure are implemented as detailed in the ESMP.

Therefore, the proposed mining preconstruction and construction activities are not expected to have major negative impacts on the quality and groundwater levels of the proposed project site and surrounding areas.

4.3.7.3 Water and Phases 1 - 3 Operational Stages

The estimated water demand for the proposed Karibib Project will largely be associated with the mineral concentrator. The preliminary water consumption estimate is 213 m^3/day. The zone of influence of the likely groundwater level drawdown is not expected to notably impact the water in storage associated with the alluvium of the river channel that flows through the mine area due to the limited hydraulic connection between the alluvial aquifer and the proposed mine workings. This is based on the fact that the river channel material and some of the underlying country rocks are known to have low natural hydraulic conductivity (transmissivity) which will likely limits the interactions between the water contained within the alluvial sands in the river channel, the poor hydraulic properties country rock and the underlying aquifers.

The mine pit surface inflows during the rainy season as well as the seepage from the co-disposal Waste Management Facility holding waste rock and tailing with 15% moisture content, dirty water pond and ore stockpile are likely to be negligible due to the high moisture deficit around these facilities. Little contamination is expected to migrate away from the mining area towards the surrounding aquifers. Overall, the proposed mine operational activities are not expected to have major negative impacts on the quality and groundwater levels of the proposed project site and surrounding areas.

4.3.7.4 Water and Rehabilitation, Closure and Aftercare Stages

During the rehabilitation, closure and aftercare stages of the surface construction of the WMA, dirty water pond, ore stockpile, waste rock dump, plant, haul roads as well as all the various potential seepages that could be associated with the various activities of the proposed Karibib Project will not breach to the groundwater levels and into key Ephemeral River channels in the area if all key mitigation measure are implemented as detailed in the ESMP Repot.

4.3.7.5 Groundwater Monitoring Program

It is recommended that a groundwater monitoring program be implemented for the proposed Karibib Project mining and ongoing exploration activities. This will entail installation of dedicated groundwater level and quality monitoring boreholes around the ML 204 and water abstraction area as well as key surface infrastructure points including the WMA. The boreholes should aim to monitor the relevant aquifers parameters as detailed in the ESMP Report.

Groundwater samples should be collected for chemical analysis and the depth to groundwater level should be measured on a monthly basis during the first year of monitoring in order to build a baseline that characterise the natural seasonal changes that take place on site. It is recommended that during the first year of monitoring, a full suite of chemical parameters be analysed (Annex 4). Once the initial database is compiled the groundwater level and quality monitoring can be reduced to quarterly intervals. The number of chemical elements that shall be analysed can also be reduced to either reflect the elements as may be specified in both the freshwater and waste water abstraction permits to be issued by the Department of Water Affairs in the Ministry of Agriculture, Water and Land Reform (MAWLR).

4.4 Fauna

4.4.1 Reptiles

The high percentage of endemic reptile species (45.3%) associated with the rocky escarpment region of central western Namibia underscores the importance of this area without formal state protection. The most important species expected to occur in the general area are viewed as the tortoises *Stigmochelys pardalis* and *Psammobates oculiferus*. pythons – *P. anchietae* and *P. natalensis*. Namibian wolf snake (*Lycophidion namibianum*) – *Varanus albigularis* and some of the endemic and little-known gecko species – e.g. *Pachydactylus* species (Annex 5). Tortoises, snakes and monitor lizards are routinely killed for food or as perceived threats. Other important species are those viewed as “rare” – i.e. *Rhinotyphlops lalandei*, *Mehelya vernayi* & *Afroedura africana* – although very little is known about these species.

4.4.2 Amphibians

Of the seven species of amphibians that potentially could occur in the general area of which 2 species are endemic (*Poyntonophrynus hoeschi* and *Phrynomantis annectens*) (Griffin 1998b) and 1 species is classified as "near threatened" (*Pyxicephalus adspersus*) (Du Preez and Carruthers 2009) – i.e. high level (42.9%) of amphibians of conservation value from the general area (Annex 5). With the exception of these important species and due to the fact that there is no open permanent surface water in the area, amphibians are not viewed as inhabitants in the general area.

4.4.3 Mammals

Of the 87 species of mammals known and/or expected to occur in the general Karibib area, 9 species (10.3%) are classified as endemic. Rodents (of which 6 species – 23.1% – are endemic) and bats (of which 1 species is classified as "rare") are the groups least studied. Species of greatest concern in the general area are those viewed as "rare" in Namibia – i.e. Namibian wing-gland bat and Southern African hedgehog – and species classified as "near threatened" – i.e. Commerson's roundleaf bat, striped leaf-nosed bat and brown hyena, leopard – and "vulnerable" by the IUCN (2016) – i.e. cheetah & Hartmann's mountain zebra (Annex 5).

4.4.4 Birds

At least 217 bird species [mainly terrestrial "breeding residents"] occur and/or could occur in the general Karibib area at any time and include 12 of the 14 Namibian endemics (85.7% of all Namibian endemic species or 5.6% of all the species expected to occur in the area) (Annex 5). The most important bird species from the general area are those classified as endemic to Namibia of which the Damara hornbill and Herero chat are viewed as the most important due to the overall lack of knowledge of these species. Although also viewed as important, Rüppels korhaan is migratory throughout its range while the rockrunner inhabits inaccessible terrain and is widespread throughout mountainous areas in Namibia. Other species of concern are those classified as endangered (violet wood-hoopoe, Ludwig's bustard, white-backed vulture, black harrier, tawny eagle, booted eagle, martial eagle, black stork), vulnerable (lappet-faced vulture, secretarybird) and near threatened (Rűppel's parrot, kori bustard, Verreaux's eagle, peregrine falcon, marabou stork) (Simmons *et al.* 2015).

4.5 Flora

4.5.1 Trees/Shrubs and Grasses

At least 91 to 101 larger species of trees and shrubs are known and/or expected to occur in the general area of which 8 species (7.9%) expected to occur in the general Karibib area are classified as endemics, 4 species as near endemics, 23 species (22.8%) are protected by the Forest Act No 12. of 2001 and another 2 species by various other Forestry laws (Curtis and Mannheimer 2005 and Mannheimer and Curtis 2009), 5 species (4.9%) are protected under the Nature Conservation Ordinance No. 4 of 1975 while 6 species (5.9%) are classified as CITES Appendix 2 species (Annex 5). The endemic grass – *Eragrostis omahekensis* – is viewed as the most important species potentially occurring in the general area (Annex 5).

4.5.2 Aloes

Aloes are protected throughout Namibia and potentially occur in the general area. Other Aloes also viewed as important are *Aloe asperifolia*, *A. hereroensis* and *A. zebrina* (Rothmann 2004) (Annex 5).

4.5.3 Commiphora

Many endemic Commiphora species are found throughout Namibia with Steyn (2003) indicating that *Commiphora crenato-serrata* potentially also occurring in the general area.

4.5.4 Lithops

Lithops species – all protected (See Nature Conservation Ordinance No. 4 of 1975) – are also known to occur in the general area and are often difficult to observe, especially during the dry season when their aboveground structures wither. The closest species are currently only known to occur west of Usakos and include *Lithops gracilidelineata* var. *gracilidelineata* and *L. werneri* (Cole and Cole 2005) (Annex 5).

4.5.5 Ferns

At least 64 species of ferns, of which 13 species being endemic, occur throughout Namibia. Ferns in the general Karibib area include at least 15 indigenous species (*Actiniopteris radiata*, *Asplenium cordatum*, *Cheilanthes dinteri*, *C. eckloniana*, *C. marlothii*, *C. parviloba*, *Marselia aegyptiaca*, *M. ephippiocarpa*, *M. farinosa*, *M. macrocarpa*, *M. nubica*, *M. unicornis*, *M. vera*, *Ophioglossum polyphyllum* & *Pellaea calomelanos*) (Crouch *et al.* 2011 and Annex 5). The general area is under collected with more species probably occurring in the general area than presented above (Annex 5).

4.5.6 Lichens

The overall diversity of lichens is poorly known from Namibia, especially the coastal areas and statistics on endemicity is even sparser (Craven 1998). More than 100 species are expected to occur in the Namib Desert with the majority being uniquely related to the coastal fog belt (Wirth 2010). Lichen diversity is related to air humidity and generally decreases inland form the Namibian coast (Schults and Rambold 2007). Off road driving is the biggest threat to these lichens which are often rare and unique to Namibia. To indicate how poorly known lichens are from Namibia, the recent publication by Schultz *et al.* (2009) indicating that 37 of the 39 lichen species collected during BIOTA surveys in the early/mid 2000's was new to science (i.e. new species), is a case in point. Lichens are known to occur on rocky terrain in the mountainous terrain in the general area.

4.5.7 Other species

Other species with commercial potential that could occur in the general Karibib area include *Harpagophytum procumbens* (Devil's claw) – harvested for medicinal purposes and often over-exploited and *Citrullus lanatus* (Tsamma melon) which potentially has a huge economic benefit (Mendelsohn *et al.* 2002).

4.5.8 Important Habitat Areas

The most important areas in the Helikon and Rubicon mining areas are (Annex 5):

(i) **Hills**: Rocky areas generally have high biodiversity and consequently viewed as important habitat for all vertebrate fauna and flora. A hill in the Helikon area has a high density of *Aloe litoralis* (protected) as well as *Ficus cordata* (protected), *Sterculia africana* (protected) and *Commiphora glaucescens* (near endemic) individuals (Plate 4.2, Figs. 4.3 and 4.4).

(ii) **Ephemeral drainage lines**: The various ephemeral drainage lines are important habitat to larger trees, especially *Acacia erioloba* (protected), *Euclea pseudebenus* (protected), *Faidherbia albida* (protected) and *Ziziphus mucronata* (protected) (Figs. 4.3 and 4.4).

Plate 4.2: Hill with a high density of *Aloe litoralis* and other protected species on its northern aspect.

Figure 4.3: The patch of Aloe litoralis (and other protected species is located on the northern aspect of the hill (red oblong) in the Helikon area. Other important habitats are the hills indicated in white and the ephemeral drainage lines in blue.

Figure 4.4: The important habitats in the Rubicon mining area are the hills indicated in white and the ephemeral drainage lines in blue.

4.5.9 Conclusions

As all developments have potential negative environmental consequences, identifying the most important faunal species including high risk habitats beforehand, coupled with environmentally acceptable mitigating factors, lessens the overall impact of such development.

Vertebrate fauna species most likely to be adversely affected by the proposed mining/prospecting in the Helikon/Rubicon areas would be sedentary species (i.e. species with limited mobility) such as unique reptiles, Namibian wolf snake, and some of the endemic and little known gecko species, which have not been observed in the proposed mining and processing areas.

Amphibians are not viewed as important in the area and mammals are more mobile and although important species are known to occur and/or pass through the area none are expected to be specifically associated and/or expected to be negatively affected by the developments. Although general disturbances could affect bird species of concern are also mobile and not limited to the area.

Protected flora species are not associated with the development sites. Important areas in the general vicinity are viewed as hills and ephemeral drainage lines.

It is not expected that mining/prospecting developments will adversely affect any unique vertebrate fauna and flora in the Helikon and Rubicon areas.

4.6 Socioeconomic Environment of ML 204 Area

4.6.1 Overview

Politically, the proposed Karibib Project in the ML 204 falls within the Karibib Constituency, Erongo Region in Namibia. The total area of Karibib Constituency covers 14 535.8 km² amounting to 22.8

percent of the total area of Erongo Region (Republic of Namibia, 2014b). Karibib Constituency is bordered by the Omaruru Constituency in the north, Daures Constituency in the northwest, Arandis Constituency in the southwest and Otjozondjupa and Khomas Regions to the east (Annexes 6-1 and 6-2).

The ML 204 area falls within the Government owned resettlement farmland. The neighbouring farms are privately owned commercial farmland. Cattle and small stock farming are the dominant farming activity in the general ML 204area. The risk of farming is viewed as relatively high with the carrying capacity viewed as 20-30 kg/Ha (Mendelsohn *et al.* 2002) or 18-24ha/LAU (van der Merwe 1983). The tourism potential of this area is viewed as moderate to low (Mendelsohn *et al.* 2002, van der Merwe 1983). The nearest Town to the ML 204 is the mining Town of Karibib. The development of this project will have some socioeconomic contributions to the Town of Karibib which currently is dependent on the Navachab Gold Mine. There will be temporary employment opportunities and workers from the project area will be staying in the Town of Karibib. Potential for the development of a viable mining project will bring added local benefits and will contribute to the national economy through taxes, royalty and direct investment.

4.6.2 Socioeconomic Baseline Summary

The population of Karibib Constituency is 13,320 which is 8.8 percent of the total Erongo Region population. The Karibib Project is in the sparsely populated freehold farming area. Karibib Constituency is among the least densely populated area in Erongo Region with a population density of approximately 0.9 persons per km^2. According to socioeconomic baseline report conducted by Lepidico 2020 covering Karibib, Namdeb, Usakos and Otjimbingwe, the following is the summary of the key socioeconomic information associated with the Karibib Project (Annex 6-2):

(i) Household socio-demographic characteristic:

- The study revealed a diverse socio-economic profile of inhabitants in the study area while portraying similarities in social setups and lifestyle characteristics.

- In terms of gender of head of household, the study indicated that across target communities 55.3% and 44.7% of households interviewed were headed by males and females, respectively.

- Households in Usakos (43%) and Otjimbingwe (40.6%) were headed by relatively older people (>56 years of age) whereas the majority of heads of households in Karibib (42%) and Namdeb (30%) were in the age group of 31–40 years.

- In line with the observation that majority (59.4%) of residents in the study area were relatively younger people in the age groups of 18–35 years (accounting for 26.1%) and 36–60 years (33.2%), it turned out that majority of the households (57.9%) were headed by unmarried (single) persons.

- Across target communities, the average size of the household was 5.15, and ranged between 3.6 and 6.3 persons – being slightly higher than the national average. Otjimbingwe had larger household sizes, the largest being 26 members in one household.

- In terms of household composition, Usakos and Otjimbingwe had relatively more female than male adults, accounting for 19.6% vs. 17.1% and 15.3% vs. 12.7%, respectively. In contrast, Karibib and Namdeb had more male than female adults in the ratio of 19.6% vs. 17.2% and 19.6% vs. 11.8%, respectively

- The same trend was noticed for male and female youths across the study areas, except for Karibib where male youths accounted for 10.7% and female youths 15.7%.

- Children accounted for 30.7% (Usakos) to 38.1% (Otjimbingwe), whereas pensioners accounted for 1.3% (Namdeb) to 9.2% (Otjimbingwe) of households.

- Notably, overall the larger segment of persons in households consisted of able bodied persons (59.4%) than children (35.5%) – indicating availability of the critical mass that could be relied upon as labour for various household or community development activities and/or to be tapped into by potential employers, subject to skill-to-job matching.

- The study revealed that out of a total of 767 children, 89 (11.6%) were orphans. Within the study area, Usakos (with 20.5% of children in the household being orphans) had the highest orphans, followed by Namdeb (10.3%), Otjimbingwe (10.2%) and Karibib (4.8%).

- As for disability, the study showed that 3% (65 persons) of the sampled population (n = 2,188) had some form of disability. This figure is slightly lower than the national average of 4.7%.

- In terms of education level of heads of households, one quarter of household heads in Otjimbingwe did not attend any formal education, followed by Usakos (21%), Namdeb (16%) and Karibib (2%). On the same trend, a further 24.4%, 19.5%, 18% and 9.3% of household heads in Otjimbingwe, Usakos, Namdeb and Karibib respectively, ended their academic careers at primary school level.

- Attendance of secondary/high school by unemployed youth in target communities shows statistics that are higher than the national average. For example, on average 40.8% and 46.1% of unemployed female youth (UFY) and unemployed male youth (UMY) respectively, reached Grade 10. A further 34.8% and 34% of UFY and UMY respectively, reached Grade 12.

- In light of education levels as well as the diverse skills and experiences possessed by members of the target community, the study revealed that the target communities would have an abundance of low-skilled and unskilled labour – some of whom can be trained through e.g. on-the-job training, short-courses, and adult learning to assume various roles in different sectors and industries.

- Of relevance to Lepidico is the proportion of residents (Karibib – 28%. Namdeb – 18%. and Usakos – 17%) who indicated possession of key experience in mining and/or related fields.

- For convenience and ease of access, over 90% of pre-primary and primary school learners attended schools in their respective towns/places. However, for Namdeb most pre-primary (61.5%) and primary school (92.3%) learners attended pre-primary and primary schools in Karibib because education institutions are non-existent at that settlement.

- As regards to Junior and Senior Secondary (High) School, a similar trend in which town-based (local) schools were generally preferred over schools in other places was observed.

- Of the children (all being in the school-going age) segment within households, 96.8% were enrolled in formal education system, being in concurrence with national average for that age group.

- On average 14.0%, 34.4%, 21.2%, 24.8% and 2.4% were in pre-primary, primary, junior secondary and senior secondary (high) schools respectively, mainly across the study area.

- The study revealed that income sources were diverse, with a strong bias on social grants which sustained 27.8% of the households.

- ❖ Further, study noted that a relatively high number of heads of household in Namdeb (72%), Karibib (38%) and Otjimbingwe (18.9%) had no income. Similarly, majority of other household members did not have incomes – Namdeb (86%), Otjimbingwe (63.9%), Karibib (63.3%) and Usakos (46%).

- ❖ The only notable exception was 15% of households who had own businesses for additional income in Usakos. 15% in Otjimbingwe who had members employed as civil servants. and 14.7% who had own businesses in Karibib.

- ❖ Social grants were relied upon as the main income source by 52.8%, 41% and 15.3% of households in Otjimbingwe, Usakos and Karibib, respectively. Interestingly, despite having no reliable income, households in Namdeb also do not draw much from social grants, with only 2% drawing benefits from this grant mechanism of the state.

- ❖ Formal employment accounted for incomes of only 10.7%, 6.5%, 4.0% and 0.6% of household heads in Karibib, Usakos, Namdeb and Otjimbingwe, respectively.

- ❖ Reliable farming income was recorded by only 8.3%, 2.5% and 2.0% of households in Otjimbingwe, Usakos and Namdeb, respectively.

- ❖ Nearly half (48.3%) of the sampled households had a combined monthly income in the range of NAD 0 to 999. This was followed by the income bracket of NAD 1,000 to 2,999 which represented the average of income of 34% of households.

- ❖ Notably, nearly all income-earners (84.0%) residing at Namdeb are in the lowest income category. On the same trend, 93.9% of income-earners in Otjimbingwe were in the bottom two income categories.

- ❖ These observations, coupled with other findings pertaining to the socio-economic situation of residents, clearly confirm Namdeb and Otjimbingwe (and Usakos, to some extent) as multiple deprivation hotspots requiring massive investments and programs in the social development space to effectively address the plight of those in need.

(ii) Service provision and community needs

- ❖ Majority households and key informants are unsatisfied with municipal services due to a magnitude of reasons. At present, the town/village councils in the target communities do not have the financial resources or the professional and administrative capabilities to fulfil their mandate as perceived by communities.

- ❖ Based on survey findings, 52.5%, 40.0%, 12.0% and 36.7% of households in Usakos, Karibib, Namdeb and Otjimbingwe respectively, had access to formal credit facilities and/or financial services (mainly reputable commercial banks, Nampost and a few micro-lenders).

- ❖ Despite the importance of roads, it was evident that the maintenance of roads within the towns of Usakos and Karibib as well as the gravel road between Karibib and Otjimbingwe was sub-standard as per respondent's assertions.

- ❖ About 28.1% of households across the study area owned transport assets.

- ❖ In line with the aspirations of the government – which is to ensure that all Namibians have access to basic services especially water – none of the households confirmed total deprivation from water services.

- ❖ In Usakos, the main water source was piped water connected to dwellings (74.5%) and centralized public taps (24.5%). In Karibib, majority (76.0%) of residents obtained water

from public taps and only 22.7% had piped water (22.7%). Namdeb households largely depended on water provided through water tankers (58.0%) and natural open water sources e.g. ponds and rivers (28.0%). In Otjimbingwe, 82.8% obtained water from a public tap, and only 11.1% had water piped into their dwellings.

- ❖ The LAs of Karibib and Usakos as well as the settlement administration in Otjimbingwe try their best to ensure adequate public health conditions, including clean drinking water and acceptable treatment and disposal of human excreta and sewage. However, the LAs have been facing financial challenges which cripple effective service delivery – a key concern being ablution facilities.

- ❖ Considering that a significantly high number of households (Namdeb – 96.0%. Karibib – 72.0% and Otjimbingwe – 64.4%) did not have access/own ablution facilities and the fact that most households in the target communities resorted to 'bush/veld toilet' when nature calls, there is a looming danger which may see a repeat of outbreaks (e.g. Hepatitis E) such as those experienced in Windhoek and a few other towns in the recent years.

- ❖ As part of taking early action including associated preventative measures, the above calls for collection action and expedited investments in servicing new townships and settlements while managing rural-urban migration issues – the root cause of the mushrooming of these settlements or "shanty towns".

- ❖ A lot needs to be done in the health domain, with staffing, ambulance, mortuary, pharmacies, availability of drugs/vaccines, general health care service (which was reported as poor by some respondents as poor) being among the list of key issues requiring urgent attention.

- ❖ Overall, the main issues that were raised regarding LAs, and on which Lepidico could capitalize included, but not limited to:

  (i) Economic aspects (unemployment, poverty).

  (ii) Insufficient or lack of basic infrastructure (potable water, agro-marketing, irrigation, roads, ablution and sewage, electricity).

  (iii) Amenities (sports and playgrounds, public green areas).

  (iv) Law and order (police station, vehicles).

  (v) Education (teachers, classrooms, equipment, transportation), and.

  (vi) Health (staffing, ambulance, mortuary, pharmacies).

(iii) Prioritised needs of target communities:

- ❖ Target communities had very diverse opinions on development priorities – most of which discern from the perspective of service delivery and general destitution. Below are the top 3 broad categories of prioritized needs:

  (i) Mega projects/investments with high employment creation potential – to be aligned to the relatively abundant and diverse local labour.

  (ii) Well-equipped vocational centres for tailor-made trainings/skills enhancement, targeting unemployed youth, women or any interested community member(s), and.

  (iii) Diversification and value addition initiatives for food security enhancement and poverty alleviation, targeting vulnerable groups and farmers.

4.7 Archaeology

4.7.1 Regional Archaeological Setting

Modern humans and their ancestors have lived in Namibia for more than one million years, and there are fossil remains of lineal hominin ancestors as early as the Miocene Epoch. Namibia has a relatively complete sequence covering the mid-Pleistocene to Recent Holocene period, represented by thousands of archaeological sites mainly concentrated in the central highlands, escarpment, and Namib Desert (Fig. 4.5 and Annex 7).

The Recent Holocene archaeological sequence in Namibia, i.e. the last 5 000 years, is of particular importance because it provides the background evidence for the development and recent history of the indigenous peoples of Namibia before the advent of written historical records during the colonial era. Many archaeological sites from this period are of great significance to the understanding of Namibian history, and some are of global importance (Annex 7).

4.7.2 Local Archaeological Setting

In summary, the three area surveys previously undertaken in the vicinity of the ML 204 provide new evidence relating to the last one thousand years, with little indication of earlier occupation (Annex 7). The pre-colonial evidence points to impermanent settlement by groups of probably Khoe pastoralists. These people formed part of a regional-scale network with links to the Atlantic coast and inland sites where copper was produced.

The large assemblage of ceramic vessels from Habis represent an important addition to the regional archaeological picture. Evidence from the early colonial period relates to mining in the Karibib area and a combination of trade, missionary activity, and wagon repair in the Otjimbingwe area. Both Karibib and Otjimbingwe are centres of historical importance and have several National Monument sites recognized under the National Heritage Act (Annex 7).

4.7.3 Archaeological Desk Assessment

Based on the three previous field surveys it is safe to assume that ML 204 will have some sites of archaeological significance and that these will probably date to the late pre-colonial and early colonial periods. Early colonial remains are expected to be relatively abundant on ML 204, although it is likely that if these are related to historical mining activity, they will form part of the general area of mining interest in the vicinity of the now abandoned Helikon and Rubicon mines (Annex 7).

It is expected that the area of mining interest will be extensively disturbed and that little might remain of either pre-colonial or early colonial sites in the near vicinity. It is possible that rocky outcrop areas in the ML 204 will have rock shelters containing stratified archaeological deposits and that there may be some highly significant sites that would require detailed documentation and possibly mitigation measures to be adopted in the event of encroachment by mining activity.

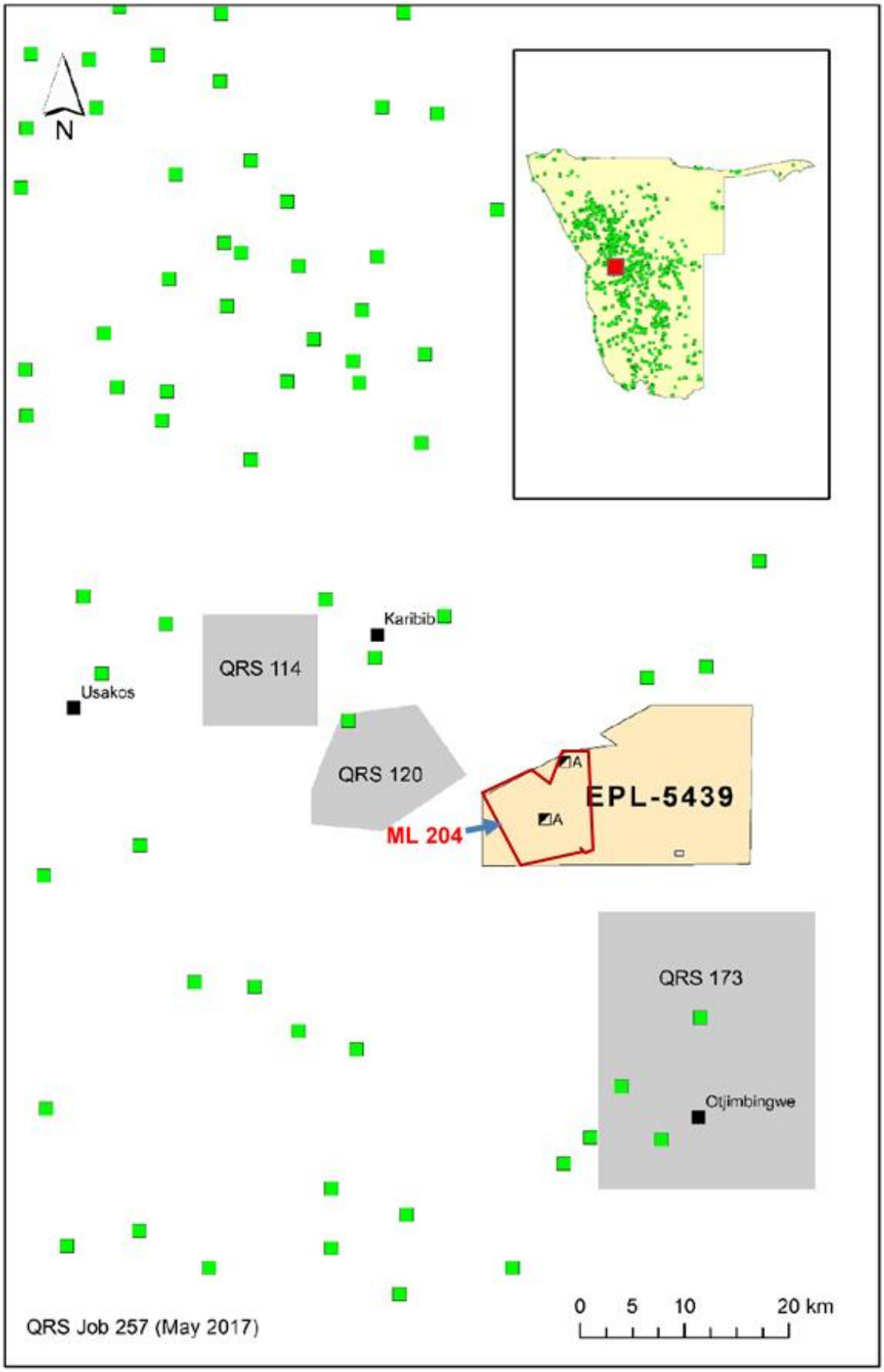


Figure 4.5: The location of the study area in relation to the general distribution of known archaeological sites in west central Namibia (green squares) and showing areas of intensive survey in the vicinity of the license area (represented as shaded grey polygons). The two sites marked A within ML 204 area are the Helikon and Rubicon mines.

4.7.4 Archaeological Conclusions and Recommendations

According to the archaeological assessment that was undertaken in 2017, the general ML 204 area probably has archaeological potential, although no archaeological sites have been recorded so far from within the ML 204 area itself. The expectation is therefore (Annex 7):

(i) A high likelihood of Holocene age archaeological sites, including rock art, associated with outcropping granite.

(ii) A high likelihood of late precolonial settlement sites throughout the entire tenement, especially in the vicinity of springs and seepages, and.

(iii) A high likelihood of early colonial settlement remains relating to the historical occupation of Karibib and Otjimbingwe.

The following are the key recommended actions related to archelogy in the ML 204area:

(i) Contractors working on the site should be made aware that under the National Heritage Act any items protected under the definition of heritage found during development should be reported to the National Heritage Council.

(ii) The Chance Finds procedure as outlined in the ESMP must always be implemented, and.

(iii) Detailed field survey should be carried out when the licence holder has identified specific targets for exploration, and before invasive exploration commences.

4.8 Stakeholder Consultations and Engagement

4.8.1 Overview

In 2017, Public notices were published in the local newspapers during the month of April 2017 (Figs. 4.5 - 4.8 and Annex 8). A stakeholder register was opened and despite telephonic inquiries with respect to contracts and employment opportunities, only one (1) written comments / inputs / objections were received during the period from 13th April 2017 to 12th May 2017 that was dedicated for public consultations in line with the provisions of the Environmental Assessment (EA) process in Namibia is governed by the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007).

Invitation / notices to stakeholders and the general public to participate in environmental assessment process issued through the local newspaper advertisements as well as via direct emails communications to key stakeholders institutions such as Line Ministries, Regional and Local Governments undertaken in 2017.

Lepidico has continued with the stakeholder consultations activities and the activities that have been undertaken in 2020 were conducted within the framework of the socioeconomic baseline study as shown in Annex 6-2. Direct consultation and engagement activities with the local farmers have also been implemented in 2020 and will continue throughout the proposed Karibib Project lifecycle.

4.8.2 2017 Institutional and Key Stakeholders Consultation Process

The 2017 institutional and key stakeholders process was undertaken through the newspaper advertisements as shown in Figs. 4.6 - 4.8 as well as specific written letters and submissions as shown in Annex 8. Institutional and key stakeholders were invited to submit written comments / inputs / objections with respect to the proposed mining operations and ongoing minerals exploration activities in the ML 204.

The following key stakeholders presentative were officially contacted through letters (Annexe 8):

1. Hon. Councillor, Karibib Constituency Office, Erongo Regional Council.
2. The Chief Executive Officer (CEO), Karibib Town Council.
3. Public Relations Officer, Karibib Town Council.
4. Hon. Councillor, Otjimbingwe Settlement Office, Erongo Regional Council.
5. Public Relations Officer, Erongo Regional Council.
6. Chief Regional Officer, Erongo Regional Council, and.
7. Ministry of Land (Contacted through the Proponent for possible Lease Agreement for the 30% portion of Farm Okongava 72) (Fig. 4.10).

Despite our persistent follow-ups for responses to our letters sent to the above stakeholders representatives, no written comments / inputs / objections have been received from the 1 – 6 key stakeholders representatives.

Through the communication with the Proponent, the Ministry of Land that owns Farm Okongava 72 had no objections to the proposed mining and exploration project. The two parties have agreed to enter negotiations to conclude the terms and conditions of the possible Lease Agreement for the proposed mining and minerals exploration project to go ahead.

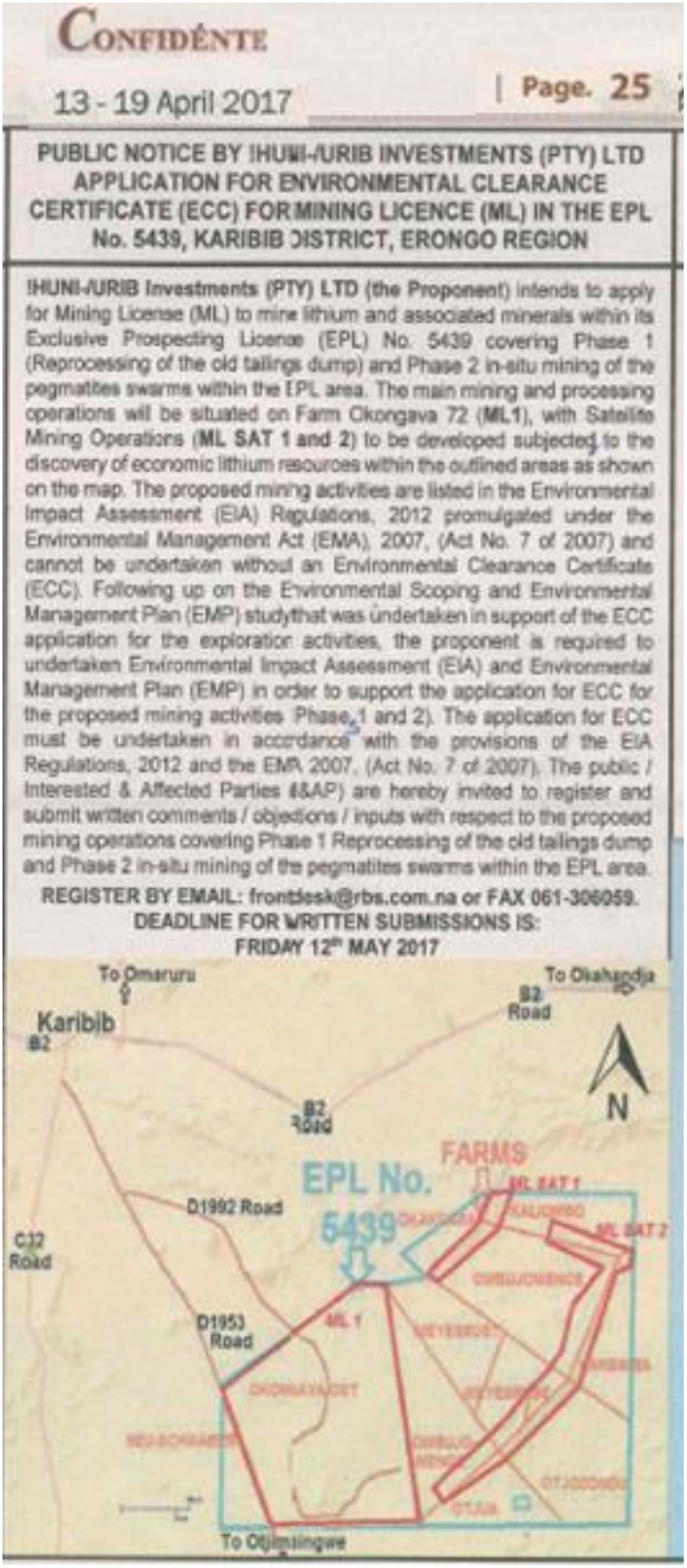
@whkobserver THURSDAY 13 APRIL 2017 | 23

PUBLIC NOTICE BY !HUNI-/URIB INVESTMENTS (PTY) LTD APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATE (ECC) FOR MINING LICENCE (ML) IN THE EPL No. 5439, KARIBIB DISTRICT, ERONGO REGION

!HUNI-/URIB Investments (PTY) LTD (the Proponent) intends to apply for Mining License (ML) to mine lithium and associated minerals within its Exclusive Prospecting Licence (EPL) No. 5439 covering Phase 1 (Reprocessing of the old tailings dump) and Phase 2 in-situ mining of the pegmatites swarms within the EPL area. The main mining and processing operations will be situated on Farm Okongava 72 (**ML1**), with Satellite Mining Operations (**ML SAT 1 and 2**) to be developed subjected to the discovery of economic lithium resources within the outlined areas as shown on the map. The proposed mining activities are listed in the Environmental Impact Assessment (EIA) Regulations, 2012 promulgated under the Environmental Management Act (EMA), 2007, (Act No. 7 of 2007) and cannot be undertaken without an Environmental Clearance Certificate (ECC). Following up on the Environmental Scoping and Environmental Management Plan (EMP) study that was undertaken in support of the ECC application for the exploration activities, the proponent is required to undertaken Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) in order to support the application for ECC for the proposed mining activities (Phase 1 and 2). The application for ECC must be undertaken in accordance with the provisions of the EIA Regulations, 2012 and the EMA 2007, (Act No. 7 of 2007). The public / Interested & Affected Parties (I&AP) are hereby invited to register and submit written comments / objections / inputs with respect to the proposed mining operations covering Phase 1 Reprocessing of the old tailings dump and Phase 2 in-situ mining of the pegmatites swarms within the EPL area.

REGISTER BY EMAIL: frontdesk@rbs.com.na or FAX 061-306059.
DEADLINE FOR WRITTEN SUBMISSIONS IS:
FRIDAY 12th MAY 2017

Figure 4.6: Copy of the public notice that was published in the Windhoek Observer newspaper dated Thursday 13th April 2017.



CONFIDENTE

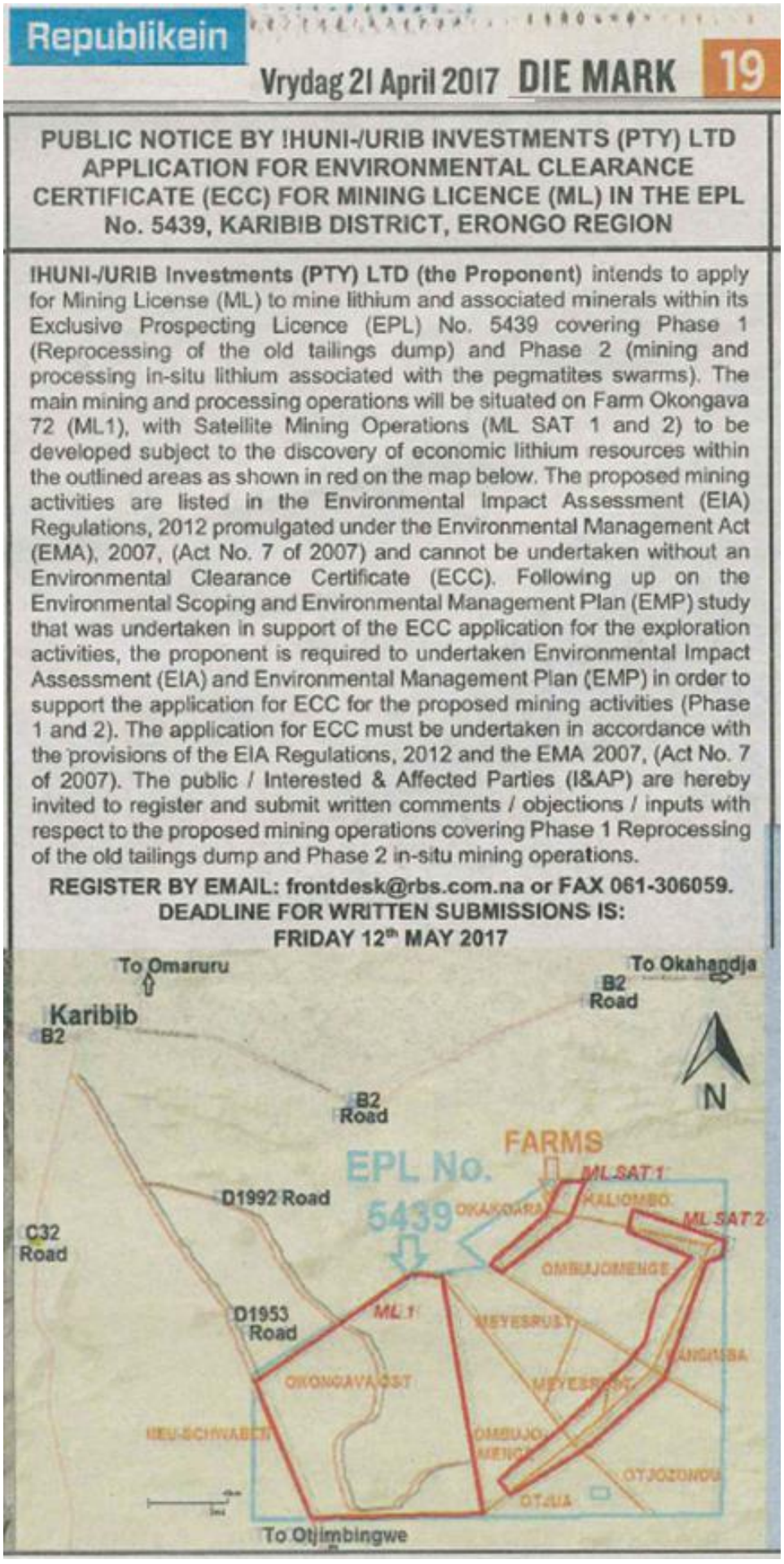
13 - 19 April 2017 | Page. 25

PUBLIC NOTICE BY !HUNI-/URIB INVESTMENTS (PTY) LTD APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATE (ECC) FOR MINING LICENCE (ML) IN THE EPL No. 5439, KARIBIB DISTRICT, ERONGO REGION

!HUNI-/URIB Investments (PTY) LTD (the Proponent) intends to apply for Mining License (ML) to mine lithium and associated minerals within its Exclusive Prospecting License (EPL) No. 5439 covering Phase 1 (Reprocessing of the old tailings dump) and Phase 2 in-situ mining of the pegmatites swarms within the EPL area. The main mining and processing operations will be situated on Farm Okongava 72 (**ML1**), with Satellite Mining Operations (**ML SAT 1 and 2**) to be developed subjected to the discovery of economic lithium resources within the outlined areas as shown on the map. The proposed mining activities are listed in the Environmental Impact Assessment (EIA) Regulations, 2012 promulgated under the Environmental Management Act (EMA), 2007, (Act No. 7 of 2007) and cannot be undertaken without an Environmental Clearance Certificate (ECC). Following up on the Environmental Scoping and Environmental Management Plan (EMP) studythat was undertaken in support of the ECC application for the exploration activities, the proponent is required to undertaken Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) in order to support the application for ECC for the proposed mining activities Phase 1 and 2). The application for ECC must be undertaken in accordance with the provisions of the EIA Regulations, 2012 and the EMA 2007, (Act No. 7 of 2007). The public / Interested & Affected Parties (I&AP) are hereby invited to register and submit written comments / objections / inputs with respect to the proposed mining operations covering Phase 1 Reprocessing of the old tailings dump and Phase 2 in-situ mining of the pegmatites swarms within the EPL area.

REGISTER BY EMAIL: frontdesk@rbs.com.na or FAX 061-306059.
DEADLINE FOR WRITTEN SUBMISSIONS IS:
FRIDAY 12th MAY 2017

Figure 4.7: Copy of the public notice that was published in the Confidente Newspaper dated 13-19th April 2017.



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Vrydag 21 April 2017 DIE MARK 19

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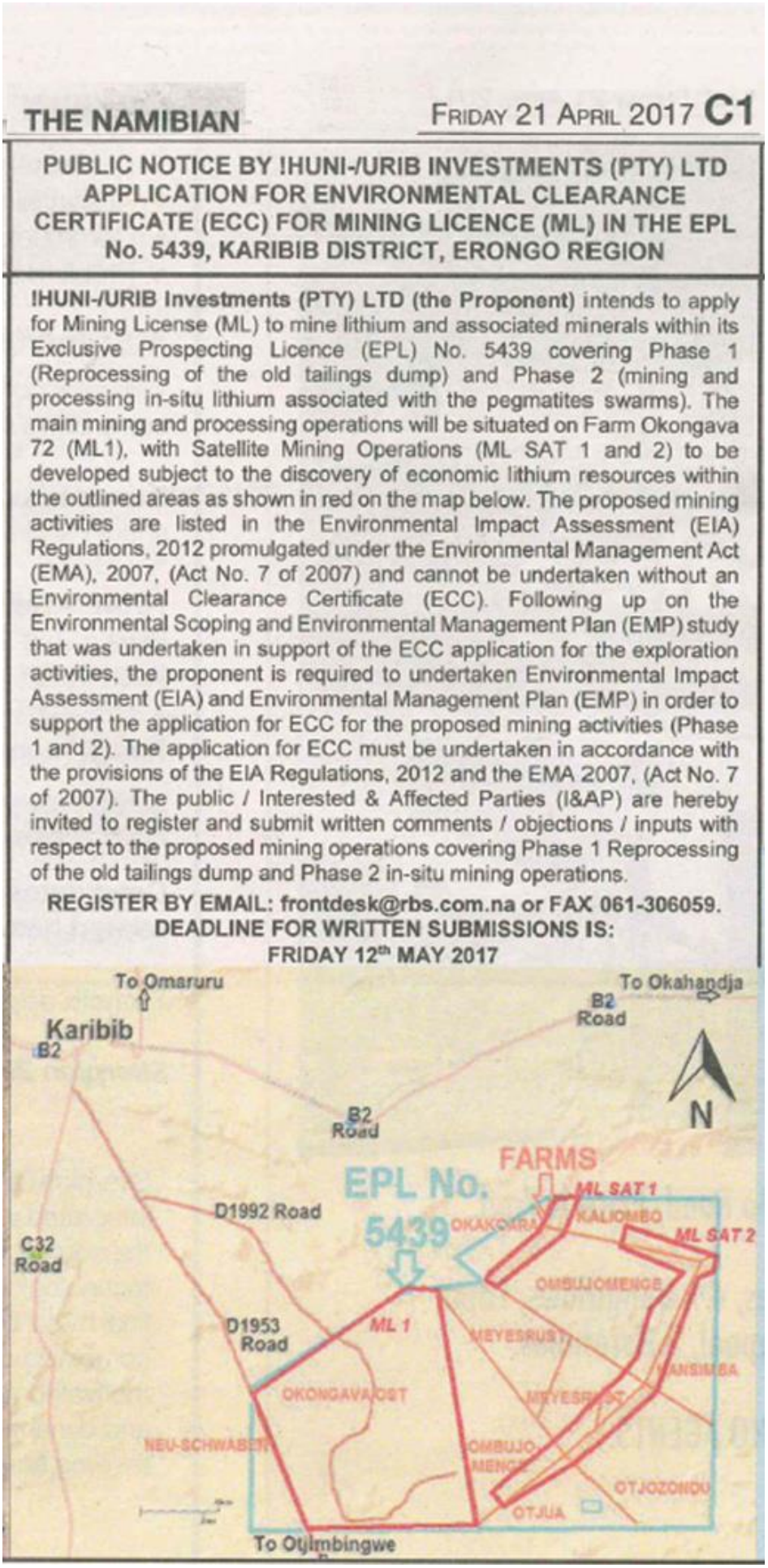
Figure 4.8: Copy of the public notice that was published in the Republikein Newspaper dated Friday, 21st April 2017.



THE NAMIBIAN FRIDAY 21 APRIL 2017 C1

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Figure 4.9: Copy of the public notice that was published in the Namibian Newspaper dated Friday, 21st April 2017.

4.8.4 Discussion of Issues Raised in 2017

The only registered stakeholder Michael Gaweseb raised the issue of local farming community likely to be affected by the proposed mining operations as well as wanting to know the shareholders structure of the Proponent (Annex 8). Detailed email communication feedback given to the relevant issues raised by Mr. Michael Gaweseb is included in Annex 8.

However, in order to put the issues of Farm Okongava 72 into context, it's important to understand that the resettlement claims by Mr. Michael Gaweseb and the various parties, started in 2014 before the current proposal to redevelop the Rubicon and Helikon old mines (Annex 8). The issues of Farm Okongava 72 have now remerged following the decision by the Ministry of Agriculture, Water and Land Reform to evict the 28 families, who resettled on the Farm Okongava 72 by the Tsoaxudaman Traditional Authority, without the blessing of the central Government.

In addition to the same issue of the local community likely to be affected raised by Michael Gaweseb, there were other newspaper articles on issues of land ownership, resettlement and use / evictions that were published in the local newspapers as a result of the proposed mining operations in the ML 204 (Annex 8). These issues were raised by some of traditional leaders of the Tsoaxudaman Traditional Authority and members of the Otjimbingwe Settlement who had a different understanding of the Government resettlement process for the Farm Okongava 72 as well as misunderstanding the scope of the proposed mining operations. Based on the articles published in the newspaper as detailed in Annex 8, some of the local community and the traditional leaders of the Otjimbingwe area believe in the following:

(i) That the former Minister of Land Reform, Hon. Minister Alpheus !Naruseb, had promised to give the Farm Okongava 72, to the Otjimbingwe residents so that they can expand the boundaries of the village, and.

(ii) That the entire farm will now be used for mining operations, which is not the case because the areas of interest are only around the old mine sites of Rubicon and Helikon.

According to the Hon. Governor of the Erongo Region as well as the laws governing resettlement process in Namibia, the Tsoaxudaman Traditional Authority had no rights whatsoever to resettle people on a farm owned by the Government. The 28 families believed to be occupying Farm Okongava 72 were not given the farm legally and they were resettled without following the government procedures and all related transparent criteria for resettling people on government owned farms. The claims by Mr. Michael Gaweseb, the Tsoaxudaman Traditional Authority, and some community members of the Otjimbingwe Settlement that the farm is being stolen from the community and given to the mining company are also not correct.

The proposed Project will only utilise 6% of the total area of Farm Okongava 72, which will be the areas around the old Rubicon and Helikon mines, which are already disturbed and not suitable for agricultural or any form of proclaimed urban land use related activities.

The area covered by the ML 204 is not pristine and is dominated by a number of old mines as well as excavations, shafts, waste rock and tailings dumps linked to the historical exploration and mining operations. According to Diehl, (1992), exploration of the pegmatite, mainly for beryl, started in 1930 and since 1951, Rubicon has been selectively mined for petalite, amblygonite, lepidolite, beryl, quartz and accessory pollucite and bismuth as well as the oxidation products of the latter. Since the 1930s, farming activities undertaken by various previous owners of Farm Okongava 72 has coexisted with the proposed mining operations and ongoing exploration activities on this specific farm. Unfortunately, in this situation, it's clear that the challenges and frustrations of access to land and resettlement process are being directed to the proposed exploration and mining operations unnecessary and yet the proposed project will have great local socioeconomic benefits.

Some of the socioeconomic benefits includes: Employment opportunities, upgraded and installation of roads and water infrastructures in the local farm area, greater environmental benefits and government financial savings through remediation of the targeted previously abandoned mine sites around the ML

area, value addition to the tailings, in-situ potential underground minerals resources, capital investments, license rental fees, royalties payable to Government, export earnings, foreign direct investments and various taxes payable to the Government and eventually trickling down to various community levels in Namibia including the Otjimbingwe Settlement.

Overall, however, and considering Farm Okongava 72 as a resettlement farm, the current and likely future land use of the area is moving towards communal / subsistence and small-scale commercial farming of cattle and small stock which can all coexist with the proposed minerals exploration and mining operations. Furthermore, the proposed mining operations will address the current poor state of the environment around the farm area and guarantee effective rehabilitation of the area in line with the current regulations which were absent at the time when the current old mines of Rubicon and Helikon were operational and eventually abandoned.

4.8.5 Discussion of Issues on Ongoing Stakeholder Consultation Process

Lepidico will continue to undertake consultations activities with the local farmers and key institutional stakeholders such as the local Karibib Local Authority, Traditional Authority at Otjimbingwe and key line Ministries such as the Ministry of Agriculture, Water and Land Reform, Ministry of Mines and Energy and the Ministry of Environment, Forestry and Tourism.

Based on the stakeholder consultation and engagement activities undertaken in 2020, no objections to the development of the proposed Karibib Project have been received from the local farmers and institutional stakeholders that have been consulted.

5. ASSESSMENT OF LIKELY IMPACTS

5.1 Overview

The impact assessment results detailed in this section of this ESIA Report is based on the review of the baseline conditions and has taken into account both the positive and negative impacts on the receiving environment associated with the proposed Karibib Project activities. The purpose of this ESIA report has been to identify and re-assess the 2017 undertaken potential environmental and social impacts assessment that could be a consequence of the proposed Karibib Project activities covering the complete project lifecycle from preconstruction to aftercare stages. Through such identification, potentially significant adverse impacts can be avoided, reduced, offset, or managed to the extent feasible, as part of the project design and with mitigation measures as detailed in ESMP.

The impact assessment process has been an iterative process that has taken place during the project design phase and has required close collaborations of the geological, engineering, mining, environmental and social specialists involved in the Karibib Project. Throughout the preparation of this ESIA Report as well as the ESMP Report, the layout of the proposed mining operations and supporting infrastructure such as the powerline route has undergone review and refinement.

5.2 Evaluation of Impacts

5.2.1 Impact Assessment Objectives

The overall objective of the impact assessment undertaken for this project focused attention specifically on the proposed Karibib Project impacts of potentially significant risk. The following approach has been undertaken regarding the concept of whether assessed key issues need to be actively addressed in the ESMP:

- If environmental aspects are evaluated to be of low significance, they do not require specific management plans, and need not be actively addressed in the ESMP (although they may still be listed and reported on).
- A decision on the need to actively address any issue with a "Medium" significance ranking will require consideration of other relevant factors, such as the nature of the impact, risks associated with possible cumulative aspects, and the degree of concern of stakeholders, and.
- If environmental aspects receive a "High" significance ranking, they must be addressed by means of active management, mitigation, or rehabilitation measures.

For each negative impact of high or medium significance, mitigation objectives are set (i.e. ways of reducing negative impacts), and attainable management actions are subsequently addressed in the EMP for mining and prospecting. Without management, these impacts would either breach statutory limits or be unacceptable to statutory authorities or to stakeholders, as they would result in a significant deterioration of one or more environmental resources.

The overall impact assessment approach has adopted the Leopold matrix framework which is one of the internationally best-known matrix assessment methodology available for predicting the impact of a project on the receiving environment.

5.2.2 Environmental Impact Assessment Rankings

To ensure consistency in the evaluation of environmental impacts associated with proposed Karibib Project, the rating criteria for the impact assessment have been standardised to include set definitions applied in the risk assessment (Table 5.1).

To the extent possible, allocation to rank categories is based on quantifiable criteria which can be measured as detailed in Table 5.1. Furthermore, when evaluating impacts, the allocated ranks refer to the resultant *impact* (e.g. area affected, or time that the result of the impact will last), and not of the

cause thereof (e.g. area actually mined, or time of active impact). Each activity has been assessed with respect to the type of effect that the aspect will have on the relevant component of the environment and includes, "what will be affected and how?" The criteria used to determine the significance rating of the impact(s) is detailed in Table 5.2.

Table 5.1: The criteria used in the evaluation of environmental impacts.

Rating	Definition of Rating
Status of the Impact – in terms of meeting the objective of maintaining a healthy environment.	
Positive	The impact benefits the environment
Negative	The impact results in a cost to the environment
Neutral	The impact has no effect
Probability – the likelihood of the impact occurring	
Negligible	Possibility negligible
Improbable	Possibility very low
Probable	Distinct possibility
Highly Probable	Most likely
Definite	Impact will occur regardless of preventive measures
Degree of confidence in predictions – in terms of basing the assessment on available information	
Low	Assessment based on extrapolated data
Medium	Information base available but lacking
High	Information base comparatively reliable
Extent – the area over which the impact will be experienced	
Site specific	Confined to within < 1 km of the project
Local	Confined to the study area or within 5 km of the project
Regional	Confined to the region, i.e. > 5 km but < National
National	Nationally
International	Beyond the borders of Namibia
Duration – the time frame for which the impact will be experienced	
Very short	Less than 2 years
Short-term	2 to 5 years
Medium-term	6 to 15 years
Long-term	More than 15 years
Permanent	Generations
Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment	
Negligible	Natural functions and processes are negligibly altered due to adaptation by the receptor(s) to high natural environmental variability
Mild	Natural functions and processes continue albeit in a modified way that **does not** appear to have a significant disruptive effect (i.e. changes are temporary)
Moderate	Natural functions and processes continue albeit in a modified way that **does** appear to have a noticeable disruptive effect (i.e. changes are permanent)
Severe	Natural functions or processes are altered to the extent that they temporarily cease resulting in severe deterioration of the impacted environment
Very Severe	Natural functions or processes permanently cease or are completely disrupted

Table 5.2: The criteria used to determine the significance rating of the impact(s).

Low:	Where the impact will have a negligible influence on the environment and no modifications or mitigations are necessary for the given project description. This would be allocated to impacts of any severity/ magnitude, if at a local scale/ extent and of temporary duration/time.
Medium:	Where the impact could have an influence on the environment, which will require modification of the project design and/or alternative mitigation. This would be allocated to impacts of moderate severity, locally to regionally, and in the short term.
High:	Where the impact could have a significant influence on the environment and, in the event of a negative impact, the activity(ies) causing it should not be permitted without substantial mitigation and management, and pro-active rehabilitation commitments (i.e. there could be a 'no-go' implication for the project). This would be allocated to impacts of severe magnitude, locally over the medium-term, and/or of severe magnitude regionally and beyond.

5.2.3 Likely Sources Positive Impacts

The proposed Karibib Project mining and ongoing exploration operations will not only have potential negative impacts on the receiving environment but also positive local, regional, and national impacts.

The following is summary of the positive socioeconomic impacts identified associated with the proposed project development:

- The contribution of taxes, royalties, and dividends- These will contribute to the national economy. Namibian Government will benefit in the form of taxes, royalties, and dividends. This also includes property and company income taxes to the Namibian Government.

- Employment – provision of work provides an income, with boosting the quality of life for employees and their families. which will also reduce unemployment and sustain the Namibian economy.

- Transfer of knowledge, skills and technology associated with different aspects of the Development – the use of new technologies will call for a new skills base which has to be transferred to employees.

- Investments in community development–The Company is committed the continual maintenance of the local infrastructure such roads and water supply that also benefits the local community. Furthermore, once in full operation, the company is also committed to support education (particularly in science and technology), health, welfare and sustainable income-generating community projects in Namibia, and.

- Secondary economic boost – the development will aid in sustaining secondary industries in Karibib, Erongo Region and elsewhere in Namibia.

5.2.4 Likely Sources of Negative Impacts

Table 5.3 summarise the key sources of likely negative impacts associated with the proposed Karibib Project mining and ongoing exploration operations in the ML 204 and it's inclusive of the supporting infrastructure such as roads, powerline, and water supply services.

The impact assessment covering this ESIA Report and the preparation of the ESMP Report has been undertaken in line with the following envisaged proposed Karibib Project developmental stages as detailed in Table 5.3:

(i) Preconstruction.

(ii) Construction.

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

(iv) Decommissioning, final rehabilitation, closure, and aftercare.

Table 5.3: Detailed proposed Karibib Project developmental stages.

PROJECT PHASE	DEVELOPMENT ACTIVITIES FOR EACH PHASE	
PRE CONSTRUCTION	1. General site clearing of the pit areas, administration block, WMA, supporting infrastructure (Office blocks, water and electricity other site infrastructure	
	2. Access roads clearing	
	3. Topsoil removal and storage	
	4. Development of the temporary construction facilities	
	5. Installation of campsites, offices, workshops, storage facilities.	
CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads
		2. Processing plant infrastructure including foundation and the entire structures
		3. Co-disposal Waste Management Area for tailing and waste rock
		4. Waste rock and ore stockpiles
		5. Water supply systems
		6. Powerline and local power infrastructure, including power distribution systems
		7. Administration blocks and warehouses
		8. Fuel supply and storage facilities
		9. Workshop and equipment maintenance
		10. Chemicals and explosives storage facility
		11. Wastewater treatment systems
		12. Municipal solid waste storage / transfer facilities
		13. Storm water management around the plant, waste rock and tailings
		14. Testing the mining and processing facilities
	MINE WORKINGS	1. Excavation, drilling and blasting as may be required to create direct access to the ore body
		2. Actual pit excavation and stripping of the overburden to create direct access to the ore body
		3. Ore production for test mining operations
		4. Test mining and commissioning
OPERATION, ONGOING REHABILITATION AND MONITORING	1. Mining operations (actual mining operations including excavation, drilling, blasting as maybe required)	
	2. Transportation of the mined materials from pit to the processing plant for sorting, two (2) stage crushing, screening and stockpile of concentrate	
	3. Transportation and storage of concentrate to be exported through the Port of Walvis Bay to Lepidolite Chemical Conversion Plant in Abu Dhabi	
	4. Management and disposal of the co-disposal facility comprising tailings and waste rock materials	
	5. Management of industrial and domestic wastewater	
	6. Storage and management of hazardous materials	
	7. Ongoing exploration support	
	8. Ongoing rehabilitation and maintenance	
DECOMMISSIONING CLOSURE AND AFTERCARE	10. Implementation of sustainable socioeconomic plan	
	1. Closure / secure the open pits	
	2. Closure and secure the co-disposal Waste Management Area (WMA)	
	3. Backfill all excavated areas / sites except the pits	
	4. Closure of all storage sites (waste, rock, ore etc)	
	5. Decommissioning of onsite water and electricity infrastructure	
	6. Overall land reclamation around the ML area	
	7. Restoration of internal roads	
	8. Revegetation and aftercare as may be required	

5.3 Impact Assessment Results

5.3.1 Positive Impact Assessment Results

Tables 5.4 - 5.10 summarises the impact assessment results associated with positive impacts which are mainly linked socioeconomic issues covering payment of taxes / royalties, employment, improved local infrastructure, training and skills transfer, boost to local economies, development of technology and technological advancement.

Table 5.4: Impact assessment results related to the payment of taxes / royalties to Namibia.

Contribution to national economy through payment of taxes and royalties	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	National: The proponent may use some international contractors, but the bulk of the support services will be reserved for Namibian companies
	Duration	Medium-term
	Intensity	Moderate
	Significance	High. The proponent will make a marked contribution to the Namibian economy through payment of taxes and royalties throughout the life of the proposed mine

Table 5.5: Impact assessment results related to the activities of employment creation.

Provision of employment opportunities boosting the local economy	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	National: Employees are mostly from Namibia
	Duration	Medium-term
	Intensity	High
	Significance	High. a significant number of especially Namibian families will be supported financially over the life of the proposed mining operations

Table 5.6: Impact assessment results related to the improvement of local infrastructure for the benefits of the local people.

Maintain the local infrastructure such as access road linking the mine to Karibib, roads, water supply and related services within Farm Okongava 72 for the benefits of the local communities	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	Local
	Duration	Medium-term
	Intensity	Moderate
	Significance	Medium

Table 5.7: Impact assessment results related to the Namibian training and skills transfer.

Provision of employee training and development of skills in industrialised lithium and associated with minerals exploration, mining and processing techniques including high value beneficiation proposed for Walvis Bay	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	International
	Duration	Long-term
	Intensity	High (=Severe)
	Significance	High

Table 5.8: Impact assessment results related to boosting of the local and regional economies.

Use of Karibib to house the mine workers and Walvis Bay as the logistics base and facilities, purchasing of local goods and services, use of local vendors, local employment and local economic boost.	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	Local to Regional
	Duration	Long-term
	Intensity	High (=Severe)
	Significance	High

Table 5.9: Impact assessment results related to the activities of the development of technology and technological advancement in the local mining industry.

Research and design associated with minerals exploration, mining, and processing techniques	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	International
	Duration	Permanent
	Intensity	Moderate
	Significance	High

Table 5.10: Impact assessment results related to the activities of the sponsorships of research, education, and community projects.

Creation of opportunities for research and education improved environmental knowledge / awareness with links to institutions of higher learning	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	Regional
	Duration	Medium-term
	Intensity	Moderate
	Significance	Medium

5.3.2 Negative Impact Assessment Results

5.3.2.1 Preconstruction

The preconstruction is very important from an environmental perspective. The preconstruction phase will cover site preparation (clearing, stripping, and grading) and upgrading of the already existing supporting infrastructure.

The following is the summary of the key activities that have been assessed in this ESIA with respect to the site preparation and construction of mine infrastructure phase:

(i) General site clearing of the pit areas (Rubicon and Helikon), administration block, waste management area, supporting infrastructure.

(ii) Maintenance of existing external and internal road accesses.

(iii) Topsoil removal and storage.

(iv) Development of the temporary construction facilities, and.

(v) Installation of campsites, offices, workshops, storage facilities.

Supporting infrastructure such as roads and water supply already exist in the ML 204 area. The preconstruction activities are likely to have potentially important environmental implications.

Potential concerns are related to highly localised negative impacts on natural environment (air quality, noise, water, soil), built environment (houses, roads, transport systems, buildings, infrastructure), socioeconomic, archaeological and cultural resources, flora, fauna, habitat and ecosystem (services, function, use values and non-use) (Tables 5.11 - 5.13).

Detailed mitigation measures are provided in the ESMP Report. The preconstruction related activities are also associated with the air quality, risk of spills and accidents, which could result in the release of contaminants such as chemicals, reagents and other substances into the receiving environment and results in harm including Occupational Health and Safety (OHS).

Table 5.11: Impact assessment results related to the activities of general site clearing of the pit areas, administration block, waste management areas, supporting infrastructure.

Preconstruction activities associated exploration, mining and supporting infrastructure	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Medium

Table 5.12: Impact assessment results related to the activities of maintenance of roads during the preconstruction stage.

Preconstruction activities associated with the maintenance of access road linking the ML area to Karibib as well as roads within the ML	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Medium

Table 5.13: Impact assessment results related to the activities of developing of the temporary construction facility by upgrading the existing and creation of new structures.

Preconstruction activities associated with the development of the temporary construction facilities by upgrading the existing structures and creation of additional new structures as may be required	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Medium

Table 5.14: Impact assessment results related to the activities of installing offices, workshops, storage facilities by upgrading the existing and creation of new structures.

Preconstruction activities associated with the installation of campsites, offices, workshops, storage facilities by upgrading the existing structures and creation of additional new structures as may be required	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Medium

Table 5.15: Impact assessment results related to the activities likely to affect Climate Change and local air quality and noise levels during site preparation and the construction of mine infrastructure.

POTENTIAL SOURCES OF CONCERN	NATURE OF POTENTIAL CONCERN	ASSESSMENT OF IMPACTS
1. Operation and maintenance of vehicles and any on-site power generation facilities	❖ Potential releases of particulate matter, carbon monoxide, oxides of nitrogen, sulphur dioxide, and volatile organic compounds	(i) **Extent:** Localised (ii) **Duration:** Short term (iii) **Intensity:** Medium and can be reduced to negligible with mitigation measures (iv) **Probability**: High but can be reduced to low with mitigation (v) **Confidence**: High (vi) **Significance:** Medium to low with mitigation
2. Fuel and chemical transportation, handling and storage	❖ Potential releases of volatile organic compounds and other harmful substances	
3. Site preparation and construction activities	❖ Potential releases of particulate matter	
4. Noise from preconstruction activities, including vehicle operations, drilling, and blasting	❖ Noise may affect local wildlife populations, and well as workers	

Table 5.16: Impact assessment results related to the activities likely to influence the local water quality and aquatic ecosystems during site preparation.

POTENTIAL SOURCES OF CONCERN	NATURE OF POTENTIAL CONCERN	ASSESSMENT OF IMPACTS
1. Operation and maintenance of vehicles and any on-site power generation facilities	❖ Potential releases of substances such as suspended solids, trace metals, oil, degreasers, and detergents and other harmful substances that could affect water quality and aquatic ecosystems	(i) **Extent:** Localised (ii) **Duration:** Short term (iii) **Intensity:** Medium and can be reduced to negligible with mitigation measures (iv) **Probability**: High but can be reduced to low with mitigation (v) **Confidence**: High (vi) **Significance:** Medium to low with mitigation
2. Fuel and chemical transportation, handling and storage	❖ In the event of spills, potential releases of petroleum products or chemicals that could affect surface waters or groundwater as well as aquatic ecosystems	
3. Site preparation and construction activities	❖ Potential release of sediments, increasing concentrations of total suspended solids in receiving waters	
4. Sewage and wastewater disposal	❖ Potential releases of nutrients and other contaminants	
5. Construction of site access roads and power lines	❖ Potential release of sediments along the routes, increasing total suspended solids in receiving waters ❖ Potential for acidic drainage if sulphide-bearing minerals are exposed during construction ❖ Stream crossings for access roads may affect aquatic ecosystems ❖ Increased road access in remote areas may lead to increased land degradation	

Table 5.17: Impact assessment results related to the activities affecting the local soil quality and terrestrial ecosystems during site preparation.

POTENTIAL SOURCES OF CONCERN	NATURE OF POTENTIAL CONCERN	ASSESSMENT OF IMPACTS
1. Fuel and chemical transportation, handling and storage	❖ In the event of spills, potential releases of petroleum products or chemicals that could affect soils, vegetation and wildlife	(i) **Extent:** Localised (ii) **Duration:** Short term (iii) **Intensity:** Medium and can be reduced to negligible with mitigation measures (iv) **Probability**: High but can be reduced to low with mitigation (v) **Confidence**: High (vi) **Significance:** Medium to low with mitigation
2. Operation of vehicles	❖ Vehicle operations may result in collisions with wildlife	
3. Site preparation and construction activities	❖ Clearing of vegetation on site may have impacts on biodiversity, particularly if any rare, threatened or keystone species are present ❖ Activities on site may disrupt and dislocate local wildlife and any migratory wildlife in the area ❖ Some animals may be drawn to the site as a result of improper waste disposal or kitchen odours, which could lead to potential hazards for both workers and the animals	
4. Construction of site access roads and power lines	❖ Construction activities may disrupt and dislocate wildlife and any migratory wildlife in the area ❖ Increased road access in remote areas may lead to increased hunting, stressing wildlife populations ❖ Vehicle operations may result in collisions with wildlife	

5.3.2.2 Construction Stage

The construction stage of the proposed Karibib Project mining development and ongoing exploration activities in the ML 204 will cover the mine supporting infrastructure and the actual mine workings.

These activities will last for periods ranging from six (6) months to two (2) years. The following are the key activities that have been assessed:

1. **Mine Supporting Infrastructure:**

   (i) Transportation facilities, including maintenance of existing roads to the site and on-site roads.

   (ii) Production plant and ore handling infrastructure including foundation and the entire structures.

   (iii) Industrial co-disposal Waste Management Area (WMA) for waste rock and tailings including stockpiles areas as may be required.

   (iv) Local water supply systems.

   (v) Electricity local substation and distribution systems.

   (vi) Administration blocks and warehouses.

   (vii) Fuel supply and storage.

   (viii) Workshop and equipment maintenance facilities.

   (ix) Explosives storage facility / bunker.

   (x) Wastewater treatment systems.

   (xi) Household / office solid waste disposal storage / transfer facility.

   (xii) Storm water management around the plant and Waste Management Area, and.

   (xiii) Testing the ore handling and processing facilities including stockpile areas as may be required.

2. **Mine workings**:

   (i) Excavation, drilling and blasting as may be required to create direct access to the ore body.

   (ii) Actual pit excavation including the stripping of the overburden to create direct access to the ore body.

   (iii) Ore production for test mining operations, and.

   (iv) Test mining and commissioning.

Tables 5.18 – 5.34 summarises impacts of the proposed construction of the mine supporting infrastructure and workings with respect to the natural environment (air quality, noise, water, soil), built environment (houses, roads, transport systems, buildings, infrastructure), socioeconomic, archaeological and cultural resources, flora, fauna, habitat and ecosystem (services, function, use values and non-use).

The construction related activities are also associated with the air quality, risk of spills and accidents, which could result in the release of contaminants such as chemicals, reagents and other substances into the receiving environment and results in harm including Occupational Health and Safety (OHS).

Table 5.18: Impact assessment results related to the activities of maintaining the existing transportation facilities, including the existing access road linking the mine site to the Town of Karibib and on-site roads linking various operational areas.

Upgrading and maintenance of the existing transportation facilities, including access roads to the site and on-site roads	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low (Will involve upgrading of existing roads)

Table 5.19: Impact assessment results related to the activities of constructing the processing plant and ore handling infrastructure including foundation and the entire structures.

Construction of processing plant and ore handling infrastructure including foundation and the entire structures	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low (Use already disturbed areas)

Table 5.20: Impact assessment results related to the activities of developing an industrial co-disposal Waste Management Area (WMA) for waste rock and tailings including stockpiles areas as may be required.

Development of the industrial co-disposal Waste Management Area (WMA) for waste rock and tailings including stockpiles areas as may be required	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Medium (Maximise use of already disturbed areas)

Table 5.21: Impact assessment results related to the activities of constructing additional freshwater water supply systems as may be required.

Construction of fresh water supply systems with respect to any additional pipelines connecting the existing boreholes	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low (Use already disturbed areas)

Table 5.22: Impact assessment results related to the activities of constructing the electricity local substation and distribution systems.

Construction of new electricity local substation, distribution systems and metering station	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate to High

Table 5.23: Impact assessment results related to the activities of building of the administration blocks and warehouses.

Construction of new administration blocks and warehouses	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate (Use already disturbed areas)

Table 5.24: Impact assessment results related to the activities of constructing an onsite fuel supply and storage.

Construction of fuel supply and storage	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate

Table 5.25: Impact assessment results related to the activities of workshop and equipment maintenance facilities.

Construction of workshop and equipment maintenance facilities	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate (Use already disturbed areas)

Table 5.26: Impact assessment results related to the activities of the explosives storage facility / bunker.

Construction of Explosives storage facility / bunker	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low (Use already disturbed areas / old mine compound)

Table 5.27: Impact assessment results related to the activities of the wastewater treatment systems.

Construction of wastewater treatment systems to support the proposed mining operations	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate (Use already disturbed areas)

Table 5.28: Impact assessment results related to the activities of the transfer station / facility for solid municipal related waste.

Household/ Office solid waste transfer facility. No burial of municipal / hazardous waste is allowed within the ML area. Municipal related waste shall be transferred to the Karibib Municipal Solid Waste Facility	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Low (Very limited area required over the already disturbed areas)

Table 5.29: Impact assessment results related to the activities of storm water management around the plant, waste rock and tailings.

Construction of peripheral storm water management around the plant, waste rock and tailings in order to prevent leachate from entering the local ephemeral rivers	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate

Table 5.30: Impact assessment results related to the activities of the testing the ore handling and processing facilities (Plant commissioning tests).

Testing of the ore handling and processing facilities prior to commissioning	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate

Table 5.31: Impact assessment results related to the activities of excavating, drilling and blasting as may be required to create direct access to the ore body.

Pre-mining excavation, drilling and blasting as may be required to create direct access to the ore body	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate

Table 5.32: Impact assessment results related to the activities of the actual pits excavation and stripping of the overburden to create direct access to the ore body.

Excavation of the actual pits including stripping of the overburden to create direct access to the ore body	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate

Table 5.33: Impact assessment results related to the activities of ore production for test mining operations.

Ore production for test mining operations and processing facilities prior to commissioning	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate -

Table 5.34: Impact assessment results related to the activities of the test mining and commissioning stage.

Test mining, commissioning of the mining operations and processing commissioning	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Very short
	Intensity	Low
	Significance	Moderate -

5.3.2.3 Mine Operations and Ongoing Exploration

5.3.2.3.1 Overview

The following is the summary of the key component of the proposed mining operations stage that has been assessed with respect to the natural environment (air quality, noise, water, soil), built environment (houses, roads, transport systems, buildings, infrastructure), socioeconomic, archaeological and cultural resources, flora, fauna, habitat and ecosystem (services, function, use values and non-use):

(i) Mining operations (actual mining operations including excavation, drilling, blasting as may be required).

(ii) Transportation of the mined materials from pits to the processing plant for, two (2) stage crushing, concentration, and stockpiling of concentrate.

(iii) Transportation and storage of concentrate to be exported through the Port of Walvis Bay to Chemical Conversion Plant in Abu Dhabi.

(iv) Management and disposal of the co-disposal facility comprising tailings and waste rock materials.

(v) Generation of industrial and domestic wastewater.

(vi) Ongoing rehabilitation and maintenance.

(vii) Use, storage, and management of hazardous materials including explosives and chemicals.

(viii) Mining, processing and minerals recovery impacts on the receiving environment, and.

(ix) Mining, processing, and minerals recovery impacts on the overall receiving environment.

Mining operations and ongoing explorations activities may also be associated with the climate change issues, risk of spills and accidents, which could result in the release of contaminants such as chemicals, reagents and other substances into the receiving environment and results in harm including Occupational Health and Safety (OHS).

5.3.2.3.2 Mining Operations

The primary environmental concerns associated with ore extraction activities are the disposal of waste rock, tailings and the release of mine water as well other emission linked to various equipment operations. Waste rock disposal and water management and treatment are further discussed below. Ore extraction activities can also affect the environment because of dust, noise and vibration, which are mainly the result of drilling and blasting, but may also be associated with transportation activities. The impact assessment of the proposed mining operation with respect to the receiving environment is shown in Table 5.35.

Table 5.35: Impact assessment results related to the activities of the actual mining operations.

Mining operations (actual mining operations including excavation, drilling, blasting as maybe required	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Moderate

5.3.2.3.3 Transportation of the Mined Ore for Processing

The primary environmental concerns associated with the transportation of the mined ore to the processing plant for crushing, screening and stockpile of concentrate and later to be further transported for export relates to the release of emissions, disposal of tailings and the management and treatment of wastewater as well as all other associated components of the receiving environment. The impact assessments for all forms of ore transportation activities and storage with respect to the receiving environment are shown in Tables 5.36 and 5.37.

Table 5.36: Impact assessment results related to the activities of transportation and storage of the mined materials around the pits and the processing plant areas.

Transportation of the mined materials from pits to the processing plant for sorting, two (2) stage crushing, screening, and stockpile of concentrate.	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Low (Highly localised)

Table 5.37: Impact assessment results related to the activities of storage and transportation of recovered minerals for export to Abu Dhabi through the Port of Walvis Bay.

Transportation and storage of concentrate to be exported through the Port of Walvis Bay to Lepidolite Chemical Conversion Plant in Abu Dhabi	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Low

5.3.2.3.4 Operation of the Co-Disposal Waste Management Area (WMA)

The production of both waste rock and tailings wastes will continues throughout the life of the proposed Karibib Project operations. Effluent from WMA will be sent to the Sedimentation basin. The key concern in the management of mine waste is the prevention or control of the release of contaminants that could have significant environmental impacts. Seepage from the WMA to the groundwater is also a concern especially during the rainy season. Seepage into the groundwater could result in the release of

contaminants through a permeable foundation layer or other instability. Failure of WMA or other containment structures can lead to severe environmental impacts and significant risks to human health and pollution of the local Ephemeral River channels. The impact assessment results for operating a WMA with respect to the receiving environment are shown in Table 5.39.

Table 5.38: Impact assessment results related to the activities of operating Co-Disposal Waste Management Area.

Operation of the tailings and waste rock Co-Disposal Waste Management Area during the mining operation	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Low

5.3.2.3.5 Generation of Industrial and Domestic Wastewater

The production of both industrial and domestic wastewater will continue throughout the operational life of the proposed Karibib Project. Industrial effluent will be sent to the sedimentation basin before being recycled back in the operations including being used for dust suppression. Domestic wastewater will be managed though the onsite sewerage system.

The key concern in the management of mine waste is the prevention or control of the release of contaminants that could have significant environmental impacts including potential pollution to the surface water and seepage to the groundwater resources. The impact assessment results of generation of industrial and domestic wastewater with respect to the receiving environment are shown in Table 5.39.

Table 5.39: Impact assessment results related to the activities of operating industrial and domestic wastewater systems.

Generation of industrial to be recycled and reused and domestic wastewater to be treated through an onsite treatment plant	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Moderate - High

5.3.2.3.6 Ongoing Exploration, Rehabilitation and Maintenance

To extend the life of the proposed Karibib Project mining operations, there will be a need to continue undertaking exploration activities. At the same time, there will be a need to continuously undertake ongoing rehabilitation and maintenance of the mined-out areas to make sure that the overall environmental liabilities for final rehabilitation are minimised during the operational stages. The environmental impacts assessment for the ongoing exploration, rehabilitation, and maintenance activities in support of mining operations are shown in Tables 5.40 and 5.41.

Table 5.40: Impact assessment results related to the activities of the ongoing exploration.

Ongoing exploration to support mining operations	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Moderate - High

Table 5.41: Impact assessment results related to the activities of the ongoing rehabilitation and maintenance.

Ongoing rehabilitation and maintenance to support final mine closure	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Moderate - High

5.3.2.3.7 Storage and Management of all Hazardous Materials

Table 5.42: Impact assessment results related to the activities of the use, storage and management of hazardous materials including explosives and chemicals.

Use, storage and management of hazardous materials including explosives and chemicals for mining operations and mineral processing	*Status*	Negative
	Probability	Improbable (There will be clear HSE Requirements and operational procedures to be implemented by well trained and qualified personnel).
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Low (Low volumes and dry conditions)

5.3.2.3.8 Mining, Processing and Minerals Recovery Impacts on Water

Management of freshwater resources is key primary environmental concern for the proposed mine. An effective water management program must incorporate the following cleaner production measures to:

- Segregate clean and contaminated water flows to help reduce the requirement for the treatment of effluent.
- Control and address seepage losses from WMA containment structures, and.
- Reduce, recycling and re-use of water.

Measures that can be used in water management include drainage ditches to divert off-site water and drainage ditches and diversions to control the flow of on-site water and prevent contamination in order to prevent contaminated waters from leaving the site before treatment. The impact assessment results of the Karibib Project mining, minerals processing, recovery, and exploration operations inclusive of all the supporting infrastructure activities on the receiving environment, covering the complete lifecycle of the proposed project are shown in Table 5.43.

Table 5.43: Impact assessment results related to the activities of mining, processing and minerals recovery impacts on water use.

Overall likely impacts on water use during mining and exploration operations including excavation, drilling, blasting as may be required for all activities	*Status*	Negative
	Probability	Definite (Local resources are very limited, and the company is committed to high water usage efficiency, reuse and recycling of water in all its operations)
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Moderate

5.3.2.3.9 Mining, Processing and Minerals Recovery Impacts on Climate Change

The proposed Karibib Project mining, minerals processing, and recovery and exploration operations inclusive of all the supporting infrastructure activities are likely to be associated with the releases of emission that may have some localised influence on climate change. Operation of mining equipment, vehicles and generators can also lead to greenhouse gases and various air contaminants, including sulphur oxides, nitrogen oxides, carbon monoxide and particulate matter. Releases of airborne particulate matter can result from various activities, including blasting, crushing, loading, hauling, and transferring by conveyor. Open pits, waste rock piles, tailings management facilities, and stockpiles are potential sources of wind-blown particulate matter.

Climatic components have a direct linkage to the air quality. The main aim of the air quality assessment of the likely impact of the project activities within and around the project activities area on the air quality is to determine the likely contaminant sources, possible pathways and targets as well as to maximise mitigation measures. Within the general area and surround environments and based on the regional climatic data it is likely that a significant proportion of windblown dust will be generated during the operations. This is likely to occur when the threshold wind speed of 4.5 m/s is exceeded. The threshold wind speed is dependent on the erosion potential of the exposed surface, which is expressed in terms of availability of erodible material per unit area. Any factor that binds the erodible material will significantly reduce the availability of erodible material on the surface, thus reducing the erosion potential of the surface.

Overall, the proposed project activities will have significant impact on the local air quality only around the proposed mining areas / processing plant area with little to no influence on the climate change. The energy that will be used to run the plant will be from electricity supplied by the national unitality company NamPower which includes a component of renewables. The impact assessment results of the Karibib Project mining, minerals processing, recovery, and exploration operations inclusive of all the supporting infrastructure activities on the receiving environment, covering the complete lifecycle of the proposed project are shown in Table 5.43.

Table 5.44: Impact assessment results related to the activities of mining, processing and minerals recovery impacts on Climate Change and air quality influences.

Overall likely impacts on climate change and air quality during mining and exploration operations including excavation, drilling, blasting as maybe required for all activities	*Status*	Negative
	Probability	Unlikely due to very limited scale of the proposed operations and remoteness of the surrounding
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Low

5.3.2.3.10 Mining, Processing and Minerals Recovery Impacts on Flora

The stripping of outcrops during mine construction and operation thereof, can have significant local effects on resident plant communities. These communities also represent wildlife habitat and destroying habitat can lead to the loss of local breeding grounds and wildlife movement corridors or other locally important features. Mining activity may also contaminate terrestrial plants. Metals may be transported into terrestrial ecosystems adjacent to mine sites because of releases of airborne particulate matter and seepage of groundwater or surface water. In some cases, the uptake of contaminants from the soil in mining areas can lead to stressed vegetation. In such cases, the vegetation could be stunted or dwarfed. Overall, the proposed mining project will have flora disturbance that will be localised. Table 5.45 indicates the potential/envisaged impacts expected regarding floral disturbance (which is obviously closely linked to habitat destruction. Detailed information about the type of flora found in and around the proposed mining area and the protection status are available in the Specialist Study Report (Annex 5).

Table 5.45: Summary of the potential/envisaged impacts expected regarding floral disturbance as a result of the proposed activities linked to habitat destruction.

Description	Floral disturbance will vary depending on the scale/intensity of the development operation and associated and inevitable infrastructure.
Extent	**1.** Access routes - Localised disruption/destruction of the habitat and thus consequently flora associated directly with the actual routes. This, however, would be a relatively small area(s) with localised implications. **2.** Mining/Prospecting sites - Localised disruption/destruction of the habitat and thus consequently flora associated directly with the actual sites. This, however, would be relatively small area(s) – depending on scale of operations – with localised implications. **3.** Infrastructure - Localised disruption/destruction of the habitat and thus consequently flora associated directly with the actual sites. This, however, would be relatively small area(s) – especially if the existing old Helikon and Rubicon infrastructure areas are used rather than affecting new sites – with localised implications.
Duration	**1.** Access route(s) - The duration of the impact is expected to be permanent along the route(s). This, however, would be relatively small area(s) with localised implications. **2.** Mining/Prospecting sites - The duration of the impact is expected to be permanent at the site(s). This, however, would be relatively small area(s) with localised implications. **3.** Infrastructure - The duration of the impact is expected to be permanent at the site(s). This, however, would be relatively small area(s) with localised implications.
Intensity	**1.** Access route(s) - The actual sites where construction of the route(s) would be located would be permanently altered. This, however, would be relatively small area(s) with localised implications. **2.** Mining/Prospecting - The actual mining/prospecting site(s) would be permanently altered. This, however, would be relatively small area(s) with localised implications. **3.** Infrastructure - The actual construction sites associated with the various mining infrastructures would be permanently altered. This, however, would be relatively small area(s) with localised implications. The areas adjacent the mining/prospecting site(s) and other associated infrastructure should not be significantly affected. This, however, would depend on control over the contractors during the road building, construction phase(s) & mining/prospecting phase(s), but should be limited to localised implications. Areas not directly affected by the mining/prospecting and associated infrastructure although within the immediate area would be affected minimally. This would include dust & other associated disturbances in the area but is limited to the mining/prospecting & construction periods.
Frequency of occurrence	Expected to be a "once off" issue affecting the selected site(s). Further prospecting & associated road construction (should this become necessary/evident during the mining operations) throughout the area would however increase the frequency of occurrence.
Probability	Definite (100%) negative impact on flora is expected in the actual mining/prospecting area(s) as well as the access route(s) and infrastructure development sites. This, however, would be much localised and cover only a small area and should avoid sensitive areas. Precautionary principle (e.g. avoid unique habitat features as well as adhering to the proposed mitigating measures would minimise this) would decrease the significance of these potential impacts. Highly Probable (75%) negative impact on flora is expected in the general areas especially with large scale extraction of groundwater for prospecting/mining activities. Probable (50%) negative impact on flora is expected from the infrastructure (roads/tracks/buildings, etc.). Precautionary principle (e.g. avoid unique habitat features as well as adhering to the proposed mitigating measures would minimise this) would decrease the significance of these potential impacts.
Significance	Before mitigation: **High** and After mitigation: **Medium** to **Low**
Status of the impact	Negative: Localised unique habitats (e.g. *Aloe litoralis* Hill – Helikon area. mountainous areas & drainage lines) with associated flora will be avoided and not disturbed through the proposed Project.
Legal requirements	Flora related: Forest Act No. 12 of 2001, Nature Conservation Ordinance No. 4 of 1975, CITES, IUCN
Degree of confidence in predictions	As an ecologist I am sure of the above-mentioned predictions made and would suggest that the mitigation measures be implemented to minimise potentially negative aspects regarding the local flora in the area.

5.3.2.3.11 Mining, Processing and Minerals Recovery Impacts on Fauna

Mining and exploration activities can affect fauna because of habitat loss and habitat degradation. For example, mining activity may affect migration routes, breeding grounds, or nesting areas. Conversely, some wildlife species may be attracted to mine sites, particularly if food wastes and other wastes that may attract wildlife are not properly managed. This may lead to increased interactions between humans

and wildlife and it could result in animals that pose a risk to persons on site having to be relocated or destroyed. Table 5.46 indicates the potential / envisaged impacts expected regarding fauna disturbance which is obviously closely linked to habitat destruction. Detailed information about the type of fauna found around the proposed mining area and the protection status are available in the Specialist Study Report (Annex 5).

Table 5.46: Summary of the potential/envisaged impacts expected regarding fauna disturbance because of the proposed mining project to habitat destruction.

Description	Faunal disturbance will vary depending on the scale/intensity of the development operation and associated and inevitable infrastructure.
Extent	**1.** Access routes - Localised disruption/destruction of the habitat and thus consequently fauna associated directly with the actual routes. This, however, would be a relatively small area with localised implications. **2.** Mining/Prospecting sites - Localised disruption/destruction of the habitat and thus consequently fauna associated directly with the actual sites. This, however, would be a relatively small area – depending on scale of operations – with localised implications. **3.** Infrastructure - Localised disruption/destruction of the habitat and thus consequently fauna associated directly with the actual sites. This, however, would be a relatively small area – especially if the existing old Helikon and Rubicon infrastructure areas are used rather than affecting new sites – with localised implications.
Duration	**1.** Access route(s) - The duration of the impact is expected to be permanent along the route(s). This, however, would be a relatively small area(s) with localised implications. **2.** Mining/Prospecting sites - The duration of the impact is expected to be permanent at the site. This, however, would be relatively small area(s) with localised implications. **3.** Infrastructure - The duration of the impact is expected to be permanent at the site(s). This, however, would be relatively small area(s) with localised implications.
Intensity	**1.** Access route(s) - The actual sites where construction of the route(s) would be located would be permanently altered. This, however, would be relatively small area(s) with localised implications. **2.** Mining/Prospecting - The actual prospecting/mining site(s) would be permanently altered. This, however, would be relatively small area(s) with localised implications. **3.** Infrastructure - The actual construction sites associated with the various mining infrastructures would be permanently altered. This, however, would be relatively small area(s) with localised implications. The areas adjacent the mining site(s) and other associated infrastructure should not be significantly affected. This, however, would depend on control over the contractors during the road building, construction phase(s) & prospecting/mining phase(s), but should be limited to localised implications. Areas not directly affected by the prospecting/mining and associated infrastructure although within the immediate area would be affected minimally. This would include dust, noise, light & other associated disturbances in the area, but be limited to the prospecting/mining & construction periods.
Frequency of occurrence	Expected to be a “once off” issue affecting the selected site(s). Further prospecting & associated road construction (should this become necessary/evident during the mining operations) throughout the area would however increase the frequency of occurrence.
Probability	Definite (100%) negative impact on fauna is expected in the actual mining areas as well as the access route(s) and infrastructure development sites. This, however, would be much localised and cover only a small area(s) and should avoid sensitive areas. Highly Probable (75%) negative impact on fauna is expected in the general areas especially during the construction and mining phase(s) because of noise, increased activities, etc. Probable (50%) negative impact on fauna is expected from the infrastructure (roads/tracks/buildings, etc.). Precautionary principle (e.g. avoid unique habitat features as well as adhering to the proposed mitigating measures would minimise this) would decrease the significance of these potential impacts.
Significance	Before mitigation: **High** and After mitigation: **Medium** to **Low**
Status of the impact	Negative: Localised unique habitats (e.g. hills, mountainous areas & drainage lines) with associated fauna will be avoided and not disturbed through the proposed Project.
Legal requirements	Fauna related: Nature Conservation Ordinance No. 4 of 1975, CITES, IUCN and SARDB Habitat – Flora related: Forest Act No. 12 of 2001, Nature Conservation Ordinance No. 4 of 1975, CITES
Degree of confidence in predictions	As an ecologist I am sure of the above-mentioned predictions made and would suggest that the mitigation measures be implemented to minimise potentially negative aspects regarding the local fauna in the area.

5.3.2.3.12 Mining, Processing and Minerals Recovery Impacts on Archaeology

The likely type of archaeological resources will comprise pre-colonial sites that are likely to be small and widely scattered, probably comprising the remains of hutted encampments, and including some burial sites (Annex 7). The impact assessment results of the proposed Karibib Project mining, minerals processing, recovery, and exploration operations inclusive of all the supporting infrastructure activities on the receiving archaeological resource, covering the complete lifecycle of the proposed project are shown in Table 5.47.

Table 5.47: Impact assessment results related to the activities of mining and exploration likely impacts on archaeology.

Likely impacts on archaeological resource covering the complete lifecycle	*Status*	Negative
	Probability	Probable (already disturbed areas)
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Low

5.3.2.3.13 Mining, Processing and Minerals Recovery Impacts on Socioeconomic

The proposed Karibib Project mining, minerals processing and recovery activities are likely to be associated with negative socioeconomic impacts including the increase in prevalence of HIV / AIDs, as detailed in Annex 6. The impact assessment results of the proposed Karibib Project mining, minerals processing, recovery and exploration operations inclusive of all the supporting infrastructure activities on the overall socioeconomic environment including any likely increase on the HIV / AIDs prevalence, covering the complete lifecycle of the proposed project are shown in Table 5.48.

Table 5.48: Impact assessment results related to the activities of mining and exploration likely negative socioeconomic impacts.

Likely impacts on socioeconomic environment including HIV/AIDs during the Karibib Project mining and exploration operations including excavation, drilling, blasting as maybe required for all activities	*Status*	Negative
	Probability	Unlikely due to the isolation of the project area from major urban centre. However, new settlements within the operational farm boundary must be monitored to avoid illegal settlers occupying land around the mine.
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Low

5.3.2.4 Progressive and Final Mine Closure

5.3.2.4.1 Progressive Mine Closure Activities During Mine Operations

In additional to the currently already disturbed land targeted for mining, minerals processing and exploration operations, additional areas are likely to be disturbed during the proposed Karibib Project mining and ongoing exploration activities. Disturbed areas that are not stabilised can be susceptible to erosion caused by both wind and water. Erosion can lead to problems with dust as well as water quality influences.

During the mine operational phase, it is important for the operator to start with ongoing landscape rehabilitation which may include the reshaping and restructuring of the landscape and erosion control measures. In addition to reshaping or recontouring, landscape restructuring activities can include the use of stockpiled soils to reconstruct soil structure in preparation for revegetation during the final restoration and closure stages. These activities are also associated with the air quality, risk of spills and

accidents, which could result in the release of contaminants such as chemicals, reagents and other substances into the receiving environment and results in harm including Occupational Health and Safety (OHS). Assessment of the overall likely negative impacts associated with the progressive mine closure activities during mine operations are shown in Table 5.50.

Table 5.49: Impact assessment results related to the activities of progressive mine closure activities during mine operations.

Assessment of likely negative impacts associated with the progressive mine closure activities during mine operations	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	Localised
	Duration	Medium term
	Intensity	Low
	Significance	Moderate - High

5.3.2.4.2 Final Mine Closure Activities

Table 5.50 provided a summary of components to be addressed in the final mine closure phase linked to the ongoing mine closure activities undertaken during mine operational stage. A detailed mine closure for the Karibib Project has been prepared and attached ESMP as Annex 1.

Table 5.50: Mine components to be addressed in the ongoing and final mine Closure Plan.

Components	Aspects to be Addressed
Rubicon and Helikon 1 Pit Areas	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
Ore Processing Facilities	o Removal of 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 Revegetation
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 o Prevention of groundwater contamination o Prevention of illegal dumping o Security and unauthorized access
Infrastructure	o Removal of power and water supply o Removal of haul and access roads o Reuse of transportation and supply depots

The objectives of final mine closure plan as detailed in the Annex 1 of the ESMP are to:

- ❖ Ensuring compliance with all legislative requirements with respect to mine closure.
- ❖ Forms the basis for consulting with a variety of stakeholders to derive a widely acceptable social, economic, and environmental closure outcome through the implementation of tools and practices to manage and minimise the impact of the mine closure on the environment and land.
- ❖ Describes a closure strategy based on envisaged final post-mining / aftercare ecosystem (Physical, Biological, Socioeconomic Environments) conditions, stakeholder expectations, future potential use of disturbed areas, closure risks and preferred sustainable Karibib Project closure business plan alternatives.
- ❖ Provide for all the necessary resources (financial and human) for the implementation and monitoring of a sustainable Karibib Project closure and aftercare business plan, and.
- ❖ Basis for formal relinquishment process in place releasing the mining company from future obligations when closure outcomes have been accepted and achieved.

The final closure of all the activities of the proposed Karibib Project mine operations will results in both negative socioeconomic impacts such as loss of jobs and positive impacts such as the effective rehabilitation and restoration of the current poorly abandoned Rubicon and Helikon old mines. Tables 5.51 – 5.53 summarises the impact assessment results associated with the final closure of the proposed Karibib Project.

Table 5.51: Impact assessment results related to the implementation of sustainable socioeconomic closure plan for mine closure.

Use of non-renewable resources, closure company operations and the termination of all contributions to the economy including taxes, employment, support to secondary industries	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	Regional
	Duration	Long-term
	Intensity	Moderate
	Significance	Medium to High

Table 5.52: Impact assessment results related to the activities of closure of mining and exploration operations and removal of all infrastructure.

Closure of mining and exploration operations and removal of all supporting infrastructure covering: 1. Closure of open pits 2. Closure of solid waste piles 3. Backfill waste dump sites 4. Closure of storage sites 5. Decommissioning of all the unwanted supporting infrastructure including water and electricity	*Status*	Positive
	Probability	Definite
	Confidence	High
	Extent	Regional
	Duration	Long-term
	Intensity	Moderate
	Significance	Medium

Table 5.53: Impact assessment results related to the activities of overall land reclamation and revegetation and aftercare as may be required.

Land reclamation and revegetation of mined out and disturbed areas as part of the implementation of the final mine closure and aftercare stage	*Status*	Negative
	Probability	Definite
	Confidence	High
	Extent	International
	Duration	Permanent
	Intensity	Very High (=Very Severe)
	Significance	High

5.3.2.5 Accidents and Emergencies

All the developmental activities of the proposed Karibib Project mine operations in the ML 204 covering the preconstruction, construction, operation, ongoing monitoring and rehabilitation and decommissioning, closure and aftercare stages are associated with the climate change, air quality, risk of spills and accidents, which could result in the release of contaminants such as chemicals, reagents and other substances into the receiving environment and results in harm including Occupational Health and Safety (OHS). Tables 6.35 – 6.39 summarises the impact assessment results associated with fire, hydraulic fluid spills, re-fuelling, accidents, and related operational emergencies.

Table 5.54: Impact assessment results related to the fire hazard.

Fire emergency associated with the mining, processing, minerals recovery, exploration or use of any supporting infrastructure such in any area	*Status*	Negative
	Probability	Improbable. based on standards and procedures implemented to be implemented by well trained and qualified personnel
	Confidence	Medium
	Extent	Site specific (<1 km)
	Duration	Very Short. fires likely to be rapidly extinguished
	Intensity	Mild
	Significance	Low

Table 5.55: Impact assessment results related to hydraulic fluid and other chemicals spills.

Leakage of hydraulic fluid spill due to rupture of pipes /failure of hydraulic sampling / mining equipment which cannot be contained easily	*Status*	Negative
	Probability	Improbable. based on standards and procedures to be implemented by well trained and qualified personnel
	Confidence	High
	Extent	Site specific (<1 km)
	Duration	Very Short. clean up recovery of low volume spills will be rapid
	Intensity	Mild
	Significance	Low

Table 5.56: Impact assessment results related to re-fuelling accidental spills.

Accidental spillage of fuel during refuelling operations due to rupture of pipes or valve failure	*Status*	Negative
	Probability	Improbable. based on standards and procedures to be implemented by well trained and qualified personnel
	Confidence	Medium
	Extent	Local
	Duration	Very Short to Short-term
	Intensity	Mild
	Significance	Low

Table 5.57: Impact assessment results related to mining, processing, minerals recovery, exploration or use of any supporting infrastructure emergencies including vehicle interaction.

Emergency caused by mining, processing, minerals recovery, exploration or use of any supporting infrastructure including car crush	*Status*	Negative
	Probability	Improbable, always based on strict operational standard and speed limits
	Confidence	High
	Extent	Local
	Duration	Very Short
	Intensity	Moderate
	Significance	Low

Table 5.58: Impact assessment results related to exposure to potential hazardous substances /materials.

Detrimental effects on the health of personnel/ workers / public as a result of exposure to potential hazardous substances /materials related to the proposed project activities	*Status*	Negative
	Probability	Improbable (There will be clear HSE Requirements and operational procedures to be implemented by well trained and qualified personnel).
	Confidence	High
	Extent	Site specific.
	Duration	Very Short
	Intensity	Very low
	Significance	Low

5.3.2.6 Human Rights Impact Assessment

Namibia is one of the 168 States that have ratified the International Covenant on Civil and Political Rights (ICCPR) and the country undergoes regular reviews on how it is implementing the Covenant and the reviews are conducted by the United Nations (UN) Committee. Namibia's Constitution has a strong emphasis on fundamental human rights and freedoms as described in Chapter 3 of the Constitution. The Constitution stresses, among others, equality, and freedom from discrimination (Article 10). Namibia is a constitutional multiparty democracy. According to the United States Department of State, (2017) Human Rights Report on Namibia, there were no reports of egregious human rights abuses. Rights to housing dues poverty and unemployment as well as slow judicially processes are among the other challenges heighted by Amnesty International 2017 /2018 Report on Namibia.

Human rights impact assessment (HRIA) can be defined as a process for identifying, understanding, assessing, and addressing the adverse effects of programmes, projects and activities on the human rights enjoyment of workers, communities, consumers or other rights-holders. The United Nations Guiding Principles on Business and Human Rights set the expectation that businesses should respect human rights by using a process of human rights due diligence.

In line with Lepidico' s requirements, the first step in the human rights assessment has been to determine how the company's proposed Karibib Project activities and business relationships may pose risks to human rights (Fig. 5.1). This involves considering the possible negative impacts of current and planned activities and business relationships on individuals and communities, and sets priorities for action to mitigate any such risks, similar to the approaches used in the socioeconomic assessment undertaken in 2017 and 2020 (Annex 6). Through the identifications of the most severe human rights impacts with which the company could be involved can help build internal understanding of human rights, set a strategic direction for the business on how to manage risks associated with its operations, and provide a focus for the company's mitigation efforts based on where the risk of harm to people is most acute.

As shown in Fig. 5.1, the human rights impact assessment for the proposed Karibib Project focused on the review of existing information and define broad human rights issues. All relevant human rights issues and legal protections that are likely to be associated with the proposed Karibib Project activities have been reviewed and assessed to be negligible. Namibia has human rights enshrined in the Constitutions with clear regulatory provisions addressing all key components human rights. Labour laws and trade unions are the additional support mechanism that protects the rights of the workers.

The following is the summary of the key human rights impact assessment considerations that have been included assessment process in line with the framework as outline in Fig. 5.1:

- Reviewed the national and international regulatory requirements.
- Reviewed specific functions/operations that may be connected to human rights risks: for example, recruitment, labour, security, procurement, human resources.

- ❖ Obtained expert input into impact assessment processes though consultation and key sub consultant/s inputs within the socioeconomic assessment framework.
- ❖ Interacted with external stakeholders including the local communities, and.
- ❖ Integrated human rights into existing risk management process of this ESIA and ESMP Reports.

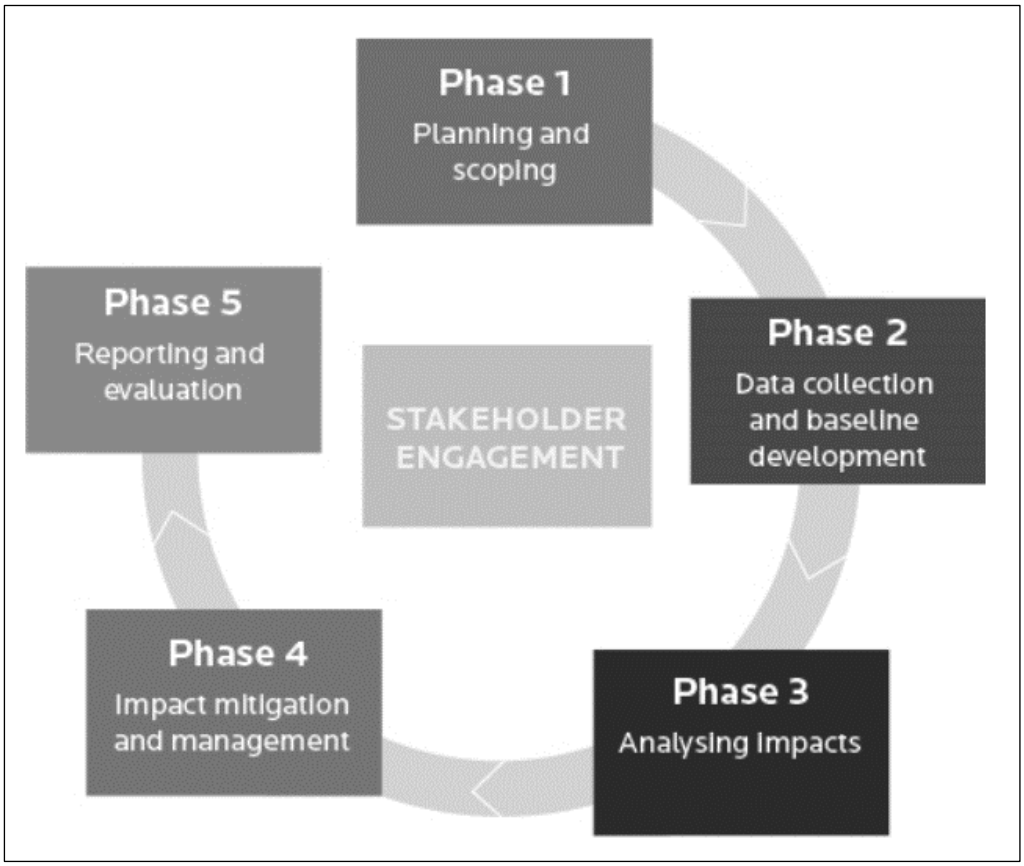

Figure 5.1: An outline of the human impact assessment process linked to the socioeconomic baseline studies as well as Stakeholder Engagement Plan (SEP) processes and outcomes process undertaken in 2017 and 2020 with the engagement process with the key stakeholders to be continued thought the proposed Karibib Project lifecycle (Source: https://www.business-humanrights.org).

Table 5.59: Impact assessment results related to human rights.

Detrimental effects on the proposed Karibib Project activities with respect to human rights issues inclusive of laws and operational activities such as labour, recruitment, security, procurement, human resources	*Status*	Negative
	Probability	Improbable (Namibia has human rights enshrined in the Constitutions with clear regulatory provisions addressing all key components human rights. Labour laws and trade unions are the additional support mechanism that protects the rights of the workers).
	Confidence	High
	Extent	Site specific.
	Duration	Very Short
	Intensity	Very low
	Significance	Negligible

5.3.2.7 Natural and Social Capital Assessment

The assessment of natural and social capital has been undertaken within the framework of the socioeconomic assessment and the impact assessment process utilised the best practices on Natural Capital Protocol: https://naturalcapitalcoalition.org/protocol/ and Social Capital Protocol: http://www.social-capital.org/ as well as the A4S Chief Financial Officer Leadership Network valuation recommendations.

The assessment approach adopted a three (3) step process in integrating natural and social capital into this ESIA and ESMP decisions for the Karibib Project operations. An illustration of the study approach and the key components of the proposed project natural, social, and human capitals assessed covering impacts, shareholders value, dependency, societal value and externalities is shown in Fig. 5.2. The overall approach and assessment leading to the embedment of natural and social capital into this ESIA Process decision and outcomes has been guided by six (6) overarching principles, processes and elements shown in Fig. 5.2 as may be applicable and as described for each of the three (3) steps to be undertake and shown in Fig. 5.3.

A three (3) step assessment approach was used to integrate the natural and social capitals into ESIA project decisions, using the boundaries, materiality, completeness, time, valuation, and confidence principles. The adoption of the three (3) steps will provided for consideration for the type of decision to be made, the types of evaluation methods that may be most useful and how to approach using the information derived from the data collection process and in particular the Socioeconomic baseline as well as outcomes of the Stakeholders Engagement Plan (SEP).

What they are and how they are used will depend upon the type of decision being made and what is material to the decision. As illustrated in Fig. 5.4, it is useful to think of two dimensions metrics that also incorporates the following components:

(i) The type of issue i.e. which natural or social capital impact or dependency. and,

(ii) The type of measure for each issue i.e. qualitative, quantitative, and / or monetary.

The assessment process has the consideration of value to whom. Whether you are interested in impacts to shareholder value, societal value, or both, will depend on the objective of the evaluation. As societal values become increasingly recognised, valued, and factored into new markets, regulations and company policies linked to profits will continue to grow.

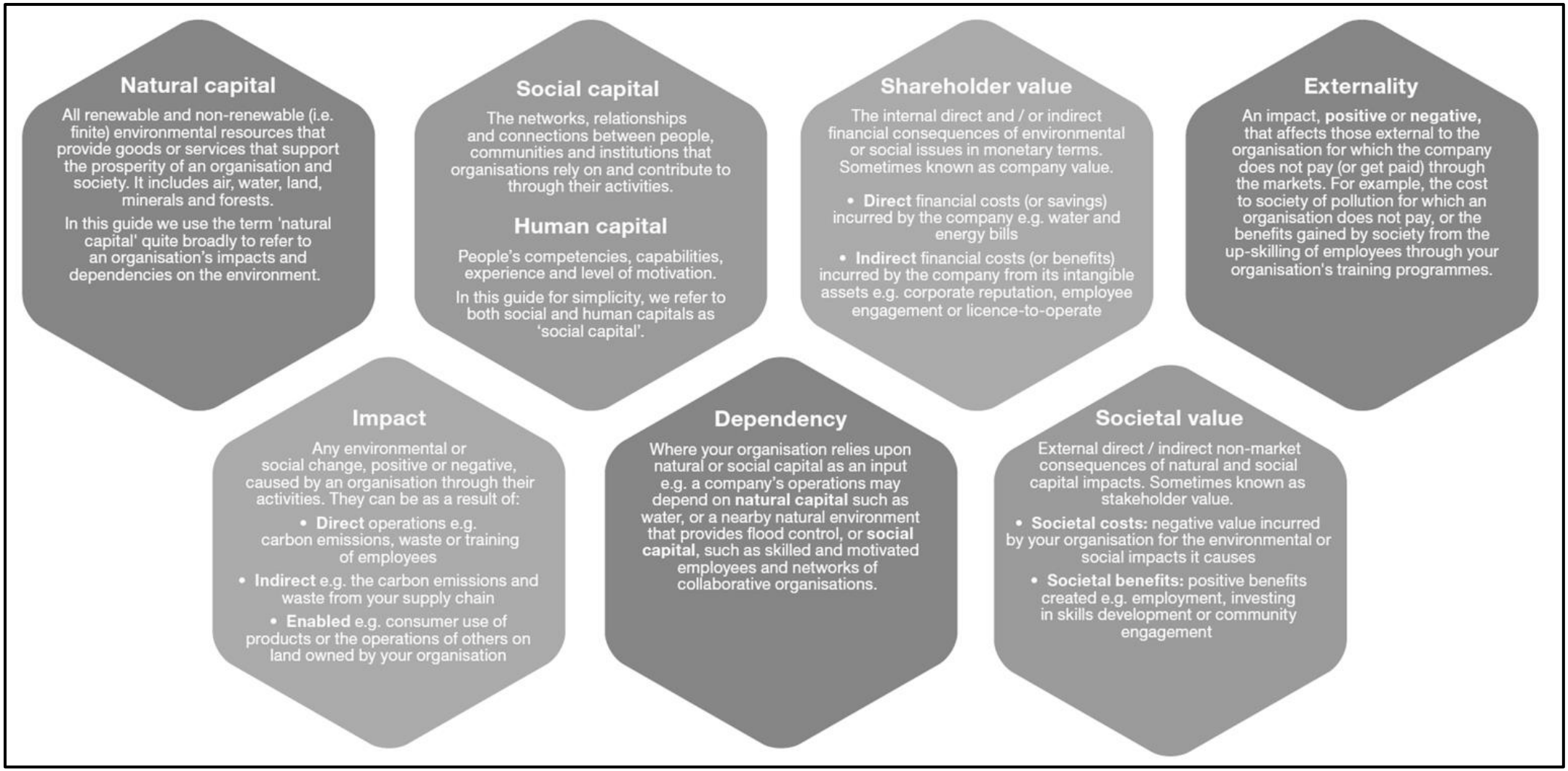

Figure 5.2: Illustration of the key components of the natural and social capital considerations that will be adopted for the proposed project (Source: https://www.accountingforsustainability.org).

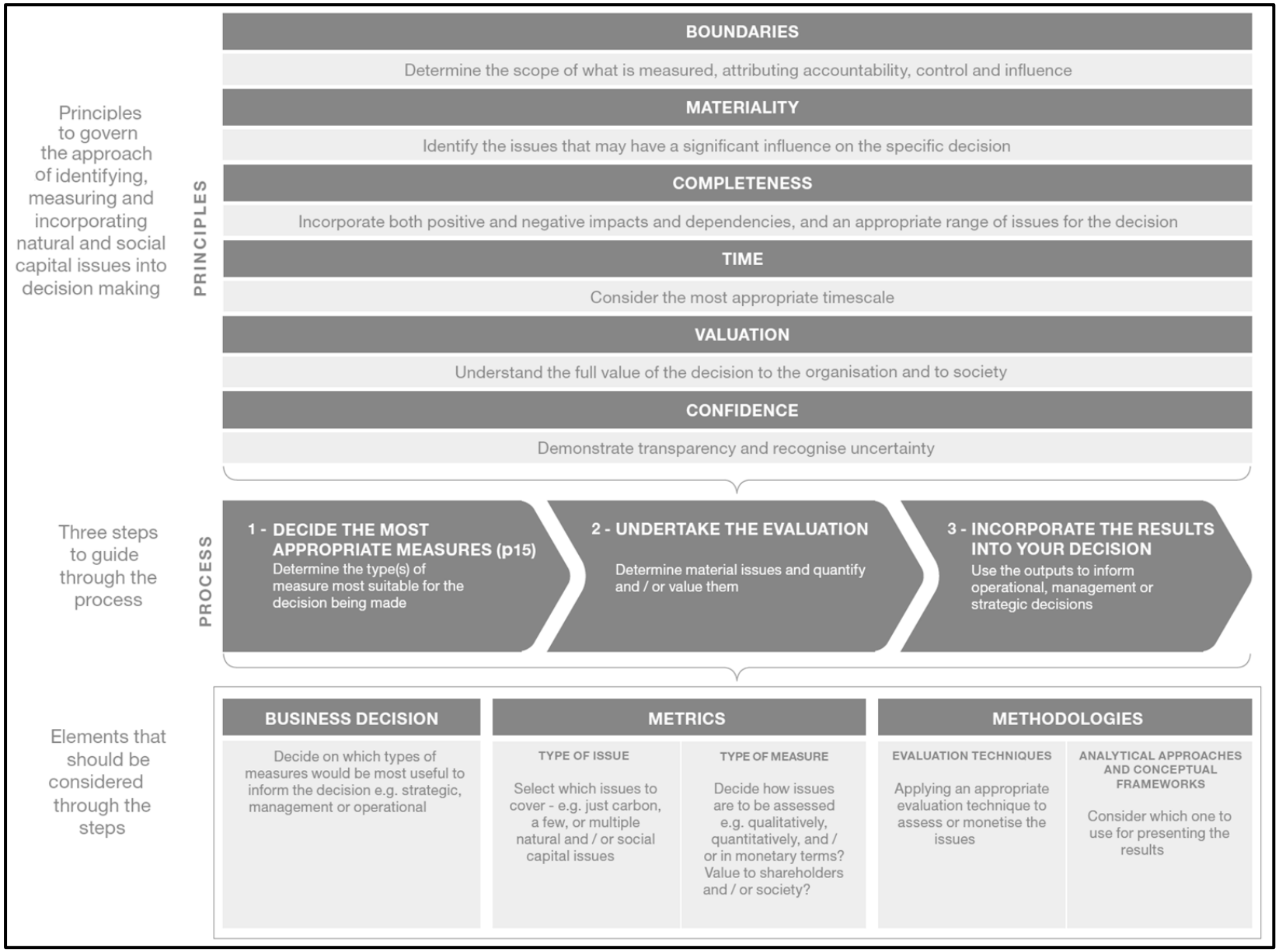

Figure 5.3: Principles, processes and key elements leading to the embedment of natural and social capital into ESIA Process decision and outcomes (Source: https://www.accountingforsustainability.org)

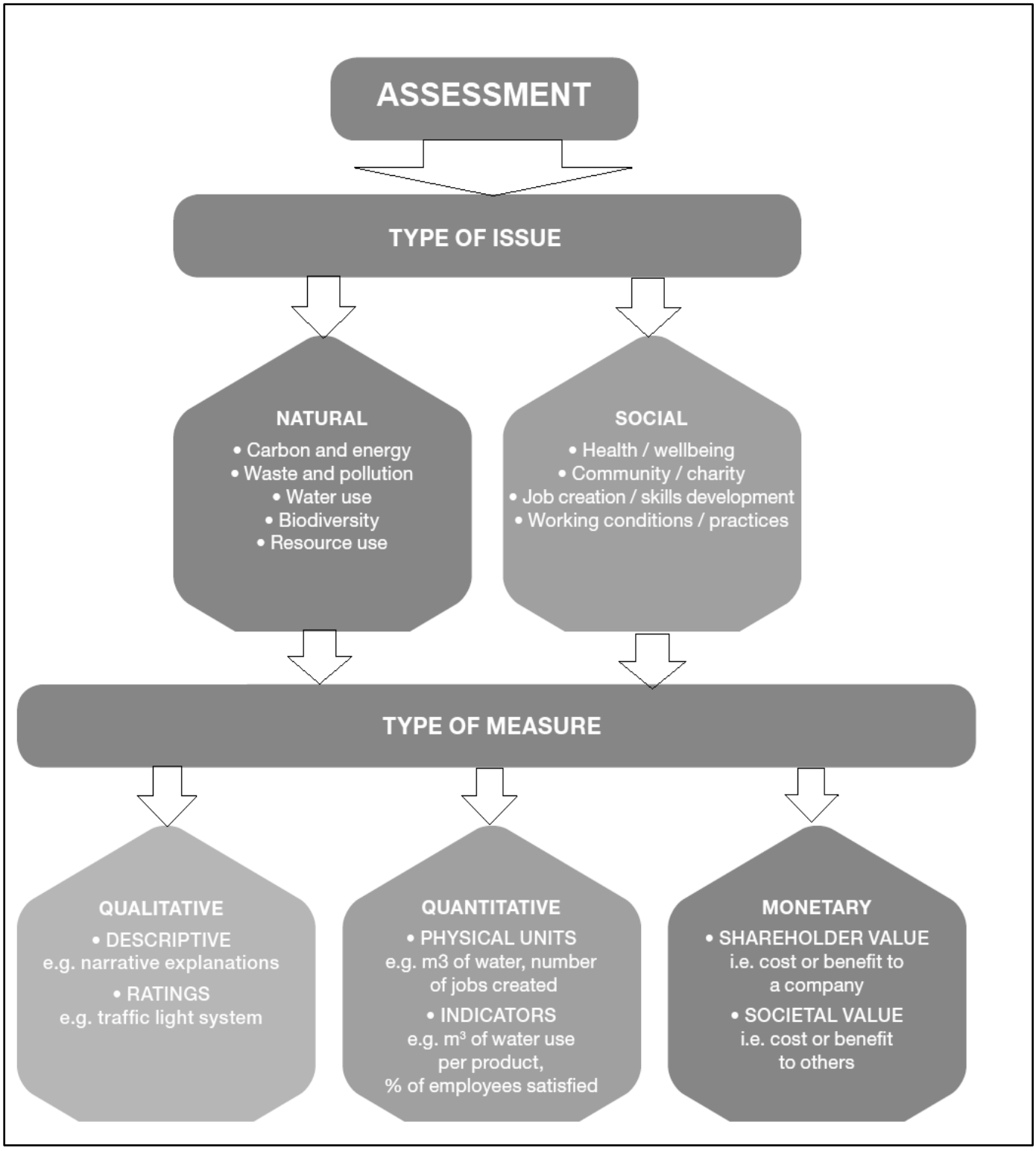

Figure 5.4: Natural and social capital assessment metrics tool that be applied to the assessment process for the proposed project (Source: https://www.accountingforsustainability.org).

The overall expected outcome of the natural and social capital assessment is to support the Environmental Clearance Certificate (ECC) and other associated permitting process. Through the SEP, baseline socioeconomic date sets as well as the results of the natural and social assessment, Lepidico will be able to develop and employ a strategy that involves engaging stakeholders, managing impacts and providing positive local benefits throughout the proposed Karibib Project lifecycle.

Indicators that will measure Lepidico' s relationship with communities near its operations mainly around the local Farm Okongava Ost No. 72, Town of Karibib and Otjimbingwe settlement will be developed based on the outcomes of the ongoing key stakeholder consultation and engagement processes. The indicators will also measure any identified or recommended contributions by Lepidico to the local communities through social corporate investment programmes and the procurement of local goods and services within the supply chain for the proposed Karibib Project.

As part of the key stakeholder consultation and engagement processes, a grievance mechanism shall be developed and incorporated in the natural and social capital management process as detailed in the ESMP. 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 Karibib Project operations.

This will enable Lepidico to capture and resolve concerns quickly and in a transparent and balanced manner and use the monitoring data to allocate resources to project activities that aim to benefit local communities over the long term, prioritising buying goods and services from local suppliers that meet its standards and support local businesses and skills development in Namibia.

Table 5.60: Impact assessment results related to natural and social capital.

Assessment of natural and social capital with respect to the proposed Karibib Project impact on the local societies and the local societies benefits / perspectives of the Karibib Project	*Status*	Positive
	Probability	Probable (Focused on long-term local communities' benefits, including prioritising buying goods and services from local suppliers and businesses coupled with skills development programme and mentorship support)
	Confidence	High
	Extent	Site specific.
	Duration	Long-term
	Intensity	Low
	Significance	Medium to High over long term.

5.4 Overall Impact Assessment Results

5.4.1 Overview

The overall impact assessment methodology for the Karibib Project adapted for this ESIA and ESMP Reports is in line with the ToR as detailed in the BID Annex 1. The overall matrix framework used in the impact assessment for this project is based on the Leopold matrix which is one of the internationally best-known matrix methodologies available for predicting the impact of a project on the receiving environment. The Leopold matrix is a two-dimensional matrix cross-referencing the following:

- The activities linked to the project that are supposed to have an impact on man and the environment, and.
- The existing environmental and socioeconomic conditions that could possibly be affected by the proposed project activities.

The activities linked to the proposed mine development are listed on one axis, while the environmental and socioeconomic conditions are listed on the other axis, and divided in physical, socioeconomic, and biological environments (Table 5.61).

The activities of the proposed Karibib Project development have the potential to affect the receiving physical, socioeconomic, and biological environments in both negative and positive impacts. The first step in the impact identification has been to identify the various types of activities associated with the proposed Karibib Project developmental stages and activities, together with their associated emissions

and land discharges where appropriate. At a high level, the main sources of impact of the proposed mine development are:

- Socioeconomic benefits at local regional and national levels.
- Physical disturbance to the local environment.
- Emissions, discharges and wastes at local level, and.
- Accidental events at local level.

Accidental events are clearly not a part of the intended activity and their potential occurrence has a low probability of occurrence associated with it. Such impacts have therefor been treated differently.

5.4.2 Assessment of the Proposed Activities and the Key Issues

The results of the overall impacts and key issues associated with the proposed Karibib Project activities / sources (mining, exploration and supporting infrastructure activities) of potential impacts with respect to the receiving environment that could potentially be affected, resulting in key positive or negative issues are presented in Table 5.61.

Table 5.61: Overall impact assessment matrix results of the proposed Karibib Project mining, exploration and supporting infrastructure activities.

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, Archaeological and Cultural Resources	Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION		1. General site clearing of the pit areas, administration block, waste rock, tailings, water and electricity other supporting infrastructure	3 (-)	1 (-)	3 (-) Recruitments and Jobs	3 (-)	3 (-)	3 (-)	3 (-)
			2. Access roads clearing / upgrading	3 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Topsoil removal and storage for all operations	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			4. Development of the temporary construction facilities	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			5. Installation of campsites, offices, workshops, storage.	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Processing plant infrastructure including foundation and the entire structures	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			3. Co-disposal Waste Management Area for tailing and waste rock	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			4. Waste rock and ore stockpiles	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			5. Water supply systems	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			6. Onsite power infrastructure, including power distribution and metering systems	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			7. Administration blocks and warehouses	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			8. Fuel supply and storage facilities	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			9. Workshop and equipment maintenance	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			10. Chemicals and explosives storage facility	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			11. Wastewater treatment systems	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			12. Municipal solid waste storage / transfer facilities	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			13. Storm water management around the plant, waste rock and tailings	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			14. Testing the mining and processing facilities	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
		MINE WORKINGS	1. Excavation, drilling and blasting to create access to the ore body	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Actual Pits excavation and stripping of the overburden to access the ore body	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Ore production for test mining operations	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			4. Test mining process	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)

Table 5.61: *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, Archaeological and Cultural 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. Mining operations (actual mining operations including excavation, drilling, blasting as maybe required)	3(-)	0(-)	3(-)	1(-)	2(-)	1(-)	1(-)
		2. Transportation of the mined materials from pit to the processing plant for sorting, two (2) stage crushing, screening and stockpile of concentrate	3(-)	1(-)	1(-)	1(-)	2(-)	1(-)	1(-)
		3. Transportation and storage of concentrate to be exported through the Port of Walvis Bay to Lepidolite Chemical Conversion Plant in Abu Dhabi	3(-)	1(-)	3(-)	1(-)	2(-)	1(-)	1(-)
		4. Management and disposal of the co-disposal facility comprising tailings and waste rock materials	3(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
		5. Management of industrial and domestic wastewater	2(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
		6. Storage and management of hazardous materials	2(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
		7. Ongoing exploration support	1(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
		8. Ongoing rehabilitation and maintenance	1(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	0(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		2. Closure / secure the open pits	3(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		3. Closure and secure the co-disposal Waste Management Area (WMA)	3(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		4. Backfill all excavated areas / sites except the pits	3(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		5. Closure of all storage sites (waste, rock, ore etc)	2(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		6. Decommissioning of onsite water and electricity infrastructure	2(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		7. Overall land reclamation around the ML area	2(+)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		8. Restoration of internal roads	2(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		9. Revegetation and aftercare as may be required	1(+)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)

5.4.3 Assessment of the Overall Significant Impacts

5.4.3.1 Overview

The determination of the significance of the negative impacts of the sources was undertaken based on the environmental baseline results and the intensity of the likely negative impact assessment results as shown in Table 5.61.

The assessment was depending upon the degree to which the proposed Karibib Project developmental activities are likely to results in unwanted consequences on the receptor covering the physical, socioeconomic, and biological environments. Overall, the assessment of significant impacts was focused on the physical, socioeconomic, and biological environments.

5.4.3.2 Summary of the Sources of Impacts

The main key sources of impacts that have been used to determine significant impact posed by the proposed Karibib Project comprised all the activities associated with the preconstruction, construction, operation, and decommissioning stages. Each of the main sources of impacts have been evaluated against the receiving physical, socioeconomic, and biological environments.

5.4.3.3 Determination of the Overall Likely Significant Impacts

To determine the overall significant impact of individual sources associated with the proposed Karibib Project development, an impact identification and assessment process was undertaken as part of this ESIA (Chapter 1 Methodology).

The ESIA impact identification and assessment processes focused on the receiving environment (Physical, Biological and Socioeconomic) interaction approach with respect to the proposed Karibib Project activities, the pathways through which the impact may reach the likely targets or receptors of concern within the receiving environment component. In this process, components of the project activities that are likely to impact the receiving environment were broken down into individual development stages and activities as shown Tables 5.61 and 5.62.

The results of the overall likely significant impacts and key issues associated with the proposed activities / sources (mining, exploration and supporting infrastructure related activities) of potential impacts with respect to the receiving environment (physical, socioeconomic, and biological environments) that could potentially be affected, resulting in key issues are presented in Table 5.62.

Table 5.62: Overall significant impact assessment matrix results for Karibib Project mining, exploration and supporting infrastructure activities.

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: 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, Archaeological and Cultural Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION	1. General site clearing of the pit areas, administration block, waste rock, tailings, water and electricity other supporting infrastructure			B4 (-)	A1(-)	D3 (+)	B3(-)	B3(-)	B3(-)	B3(-)
		2. Access roads clearing / upgrading			B4 (-)	A1(-)	D3 (+)	B3(-)	B3(-)	B3(-)	B3(-)
		3. Topsoil removal and storage for all operations			B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
		4. Development of the temporary construction facilities			B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		5. Installation of campsites, offices, workshops, storage.			B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1.	Transportation facilities, including access roads to the site and on-site roads	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			2.	Processing plant infrastructure including foundation and the entire structures	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			3.	Co-disposal Waste Management Area for tailing and waste rock	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			4.	Waste rock and ore stockpiles	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			5.	Water supply systems	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			6.	Onsite power infrastructure, including power distribution and metering systems	B4 (-)	A1(-)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			7.	Administration blocks and warehouses	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			8.	Fuel supply and storage facilities	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			9.	Workshop and equipment maintenance	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			10.	Chemicals and explosives storage facility	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			11.	Wastewater treatment systems	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			12.	Municipal solid waste storage / transfer facilities / station	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			13.	Storm water management around the plant, waste rock and tailings	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			14.	Testing the mining and processing facilities	B4 (-)	A1	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		MINE WORKINGS	1.	Excavation, drilling and blasting to create access to the ore body	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			2.	Actual Pits excavation and stripping of the overburden to access the ore body	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			3.	Ore production for test mining operations	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			4.	Test mining process	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			5.	Excavation, drilling and blasting to create access to the ore body	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)

Table 5.62: *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]

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	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic, Human Rights, Natural and Social Capital, Archaeological and Cultural Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations including excavation, drilling, blasting as required)	C3(-)	A1(-)	D3 (+)	A1(-)	B4 (-)	A1(-)	A1(-)
		2. Transportation of the mined materials from pit to the processing plant for sorting, two (2) stage crushing, screening, and stockpile of concentrate	C3(-)	A1(-)	A1(-)	A1(-)	B4 (-)	A1(-)	A1(-)
		3. Transportation and storage of concentrate to be exported through the Port of Walvis Bay to Lepidolite Chemical Conversion Plant in Abu Dhabi	C3(-)	A1(-)	D3 (+)	A1(-)	B4 (-)	A1(-)	A1(-)
		4. Management and disposal of the co-disposal facility comprising tailings and waste rock materials	C3(-)	A1(-)	A1(-)	A1(-)	B4 (-)	A1(-)	A1(-)
		5. Management of industrial and domestic wastewater	B2 (-)	A1(-)	A1(-)	A1(-)	B4 (-)	A1(-)	A1(-)
		6. Storage and management of hazardous materials	B2 (-)	A1(-)	A1(-)	A1(-)	B2 (-)	A1(-)	A1(-)
		7. Ongoing exploration support	A1(-)	A1(-)	A1(-)	A1(-)	B2 (-)	A1(-)	A1(-)
		8. Ongoing rehabilitation and maintenance	A1(-)	A1(-)	A1(-)	A1(-)	B2 (-)	A1(-)	A1(-)
	CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	A1(-)	A1(-)	D3 (+)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		2. Closure / secure the open pits	C3(-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		3. Closure and secure the co-disposal Waste Management Area (WMA)	C3(-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		4. Backfill all excavated areas / sites except the pits	C3(-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		5. Closure of all storage sites (waste, rock, ore etc)	B4 (-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		6. Decommissioning of onsite water and electricity infrastructure	B4 (-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		7. Overall land reclamation around the ML area	B4 (-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		8. Restoration of internal roads	B4 (-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		9. Revegetation and aftercare as may be required	A1(-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)

6. ESIA CONCLUSIONS AND RECOMMENDATIONS

6.1 Development Opportunities

This ESIA Report forms a part of the comprehensive feasibility work programme that has been implemented by Lepidico for the Karibib Project mining, minerals processing and ongoing exploration program. With high regard to good environmental performances, the overall objective of the proposed development is to develop a small to medium sized Project within the existing ML204 area. Based on all the data collected and analysed at different stages of this Environmental Assessment process, including all the findings and recommendations of the specialist studies, there are opportunities to implement the development of the proposed Karibib Project with higher considerations to good environmental performances in line with the national and international EPs requirements.

This ESIA report has been prepared in accordance with the national applicable regulations as well as the EPs 1-10 based on the International Finance Corporation (IFC) guidelines. All findings and recommendations of the key specialist studies with respect to the proposed Karibib Project development as undertaken in 2017 and some specialist studies such flora and fauna and socioeconomic baseline that have been updated in 2020, have all been incorporated and presented in this ESIA report with mitigation measures provided in the ESMP Reports. The proposed Karibib Project mining, minerals processing and ongoing exploration operations within ML 204 will greatly support and coexist with the other current and future land uses within the local and surrounding areas.

6.2 Summary of ESIA Conclusions

Table 6.1 summarises the impacts assessment results undertaken as part of the environmental assessment process for the proposed Karibib Project mining, minerals processing and ongoing exploration operations within ML 204. It is important to note that the development of proposed Karibib Project mining, minerals processing, and ongoing exploration operations in the ML 204 will address the current environmental damages created by the historical exploration and mining operations as well as final rehabilitation of new activities that will be undertaken.

Based on the outcomes of the impact assessment as undertaken in this report, the proposed Karibib Project development in the ML 204 poses localised negative impacts to the receiving environment with great offset /trade-offs/ benefits in form of socioeconomic and environmental reclamation of the currently abandoned mine sites (Table 6.1). The extent of the proposed mining and minerals processing and ongoing exploration operations are limited in area extent with respect to the ore body, the Rubicon and Helikon 1 pits and supporting infrastructures areas.

Due to the localised extent of the likely negative impacts, compared to the likely positive impacts, the Karibib Project is classified as a Category B project in terms of the Equator Principle 1: Review and Categorisation and Finance Corporation’s (IFC) environmental and social categorisation process.

It is hereby recommended that the proposed Karibib Project shall go ahead and be issued with the new Environmental Clearance Certificate (ECC) that must also be transferred from Desert Lion Energy (Pty) Ltd (Previous Proponent) to Lepidico Chemicals Namibia (Pty) Ltd (Current new Proponent) and that a detailed ESMP Report has been prepared to address all the identified impacts including the historical, current and future social and environmental.

Mitigation measures that will enhance the positive impacts and minimise the negative impacts have been developed and management strategies are provided in the Environmental Social Management Plan (ESMP) Report for implementation by the Proponent, Lepidico Chemicals Namibia (Pty) Ltd.

Table 6.1: Summary impact assessment results of the selected key potential environmental issues for the proposed Karibib Project.

ENVIRONMENTAL OR SOCIAL 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 impact
22. Regional (Erongo region) and National (Namibia) overall positive socioeconomic benefits	High (+) Medium term	High long-term 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

6.3 Summary of ESIA Recommendations

The development of the proposed Karibib Project mining, minerals processing and ongoing exploration operations within ML 204 shall always focus on utilising the already disturbed areas as much as its practicable and technically possible. Focusing on developing and utilising the already disturbed areas will greatly be beneficial to the future rehabilitation of the Project site.

Due to the localised extent of the likely negative impacts, compared to the likely positive impacts and that likely great environmental benefits that the proposed Karibib Project will bring in the area, it is hereby recommended that a detailed ESMP Report be prepared to address all the identified medium and high rated impacts.

Overall, it is hereby recommended that the proposed Karibib Project mining, minerals processing and ongoing exploration operations within ML 204 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 agreement to be concluded with the owner of Farm Okongava 72, the Ministry of Agriculture, Water and Land Reform, for the portion of the farm required to support the proposed Karibib Project.

(ii) The proponent will implement and adhere to all the provisions of the ESMP report.

(iii) Mitigation measures will be implemented as detailed in the ESMP report.

(iv) The Proponent will 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 will 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.

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All other specific References on air quality / dust and noise / sound study, hydrogeological, fauna and flora, socioeconomic and archaeology, please refer to Annexes 1 – 8 Reference / Bibliography Lists

8. ANNEXES

Annex 1 – BID 2020

Annex 2 – Legal Register 2020

Annexes 3-1 to 3-3 – Baseline Air Quality / Dust and Noise / Sound Study 2017 and Monitoring Reports 2020

Annex 4 –Hydrogeological Baseline Assessment 2017

Annex 5 – Updated Fauna and Flora Study 2020

Annex 6-1 and 6-2 – Baseline Socioeconomic Studies 2017 and 2020

Annex 7 – Archaeological Study 2017

Annex 8 – Public and Stakeholder Consultation Materials 2017