SHALI GROUP
STRATEGIC METAL DISCOVERY AND DEVELOPMENT

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REPORT:

ONGOMBO COPPER PROJECT – ESIA SCOPING REPORT

PROJECT NUMBER: ECC-127-374-REP-01-D

REPORT VERSION: REV 04

DATE: 29 NOVEMBER 2022

TITLE AND APPROVAL PAGE

Project Name:	Ongombo Copper Project – ESIA Scoping Report
Client Company Name:	Shali Group Holdings (Pty) Ltd
Client Name:	Mr Wilhelm Shali
Ministry Reference:	APP-003833
Authors:	Environmental Compliance Consultancy
Status of Report:	Final for Government submission
Project Number:	ECC-127-374-REP-01-D
Date of issue:	29 November 2022
Review Period	NA

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Environmental Compliance Consultancy (ECC) (Reg. No. CC 2013/11401) has prepared this scoping report and the preliminary EMP on behalf of the Proponent. This report has been authored by employees of ECC, who have no material interest in the outcome of this report, nor do any of the ECC team have any interest that could be reasonably regarded as being capable of affecting their independence in the preparation of this report. ECC is independent from the Proponent and has no vested or financial interest in the Project, except for fair remuneration for professional fees rendered based upon agreed commercial rates. Payment of these fees is in no way contingent on the results of this report or the assessment, or a record of decision issued by Government. No member or employee of ECC is, or is intending to be, a director, officer, or any other direct employee of the Proponent. No member or employee of ECC has, or has had, any shareholding in the Proponents company or project. Any personal views or opinions expressed by the writer may not necessarily reflect the views or opinions of Environmental Compliance Consultancy or its client.

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EXECUTIVE SUMMARY

Shali Group Holdings (Pty) Ltd (herein referred to as the Proponent), intends to undertake mining activities located on exclusive prospecting licence 5772 (EPL 5772) within mining licence 240 (ML 240), 40 km northeast of the capital city Windhoek, Khomas Region, Namibia and 15 km northeast of the Otjihase mine. The proposed Ongombo Copper Project will hereinafter be referred to as 'the Project'. The area under the licence covers an area of 12 093 ha. The Project will be an underground mine with copper extraction similar to existing copper mines in Namibia. Additionally conventional open pit mining is planned for the Central shoot.

The Environmental Management Act, No. 7 of 2007 and its associated 2012 regulations stipulate that an environmental clearance certificate is require before undertaking any of the listed activities in the act and its regulations. As part of the environmental clearance certificate application, an environmental and social impact assessment (ESIA) has already commenced in terms of the requirements with the environmental management act, 2007 and its regulations. The purpose of this report is to present the preliminary findings of the scoping study and the ESIA process and has been prepared as part of the mining licence application requirements.

A full environmental and social impact assessment (ESIA) is required for mining operations such as the proposed Project. The scoping phase has demonstrated that the following components should be included in the assessment phase.

The terms of reference (ToR) for the assessment phase are detailed below:

- Soil impact assessment
- Acid mine drainage impact assessment
- Groundwater study and surface water impact assessment
- Biodiversity impact assessment
- Noise impact assessment
- Air quality impact assessment
- Traffic impact assessment
- Visual impact assessment
- Socioeconomic impact assessment
- Mine blast vibration assessment
- Heritage impact assessment

The public participation phase for the scoping report was concluded on the 17 November 2022. The public, stakeholders, competent authorities, and government were provided with the opportunity to comment on the draft scoping report and supporting appendices for a 7 day period.

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TERMS AND ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
°	degree
°C	degree Celsius
%	percentage
AFP	African Pioneer PLC
Ag	silver
AIDS	acquired immune deficiency syndrome
amsl	above mean sea level
ASX	Australian Securities Exchange
Au	gold
Avanti	Avanti Resources Pty Ptd
BID	background information document
CIA	cumulative impact assessment
Co	cobalt
COVID	COVID-19 pandemic
Cu	copper
DEA	Directorate of Environmental Affairs
ECC	Environmental Compliance Consultancy
EIA	environmental impact assessment
EMP	environmental management plan
EPL	exclusive prospecting licence
ESIA	environmental and social impact assessment
g/t	gram per tonne

ABBREVIATIONS	DESCRIPTION
ha	hectare
HIV	human immunodeficiency virus
I&APs	interested and affected parties
IFC	International Finance Corporation
JV	joint venture
km^2	kilometre squared
km	kilometre
ktpm	thousand tonnes per month
kW	kilowatt
LDVs	light delivery / duty vehicles
LHD	long hole drill
LOM	life of mine
m	metre
mm	millimetre
m^3/s	metre cubed per second
Ma	mega annum
Manmar	Manmar Investments One Hundred and Twenty Nine (Pty) Ltd
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
ML	mining licence
MME	Ministry of Mines and Energy
mps	metre per second
MWT	Ministry of Works and Transport
NCO	Namibian Copper NL
NHC	National Heritage Council
NSA	National Statistics Agency
Ongombo	Ongombo Copper Project
Pb	lead
Practara	Practara Consulting
SEM	scanning electron microscope
Shali	Shali Group Holdings (Pty) Ltd
Starlight	Starlight Investments Pty Ltd
STH	STH pty Ltd
t	tonne
TB	tuberculosis
ToR	terms of reference
UG	underground
WHO	World Health Organization
Zn	zinc

1 INTRODUCTION

1.1 COMPANY BACKGROUND

Environmental Compliance Consultancy (ECC) has been retained by Shali Group Holdings (Pty) Ltd through a joint venture (JV) with African Pioneer PLC (AFP) on behalf of Manmar Investments One Hundred and Twenty Nine (Pty) Ltd referred to hereinafter as the Proponent. ECC is conducting an environmental and social impact assessment (ESIA) for mining of base metals, namely copper, within a proposed mining licence (ML) area (ML 240) located on exclusive prospecting licence 5772 (EPL 5772), near the capital city Windhoek, Khomas Region, Namibia.

The Proponent has focused on the development of potential copper projects in Namibia through extensive exploration programmes. The proposed Ongombo Copper Project will be an underground mine with a copper extraction process similar to existing copper mines in Namibia, for example the Otjihase and Matchless mines. The proposed Project will be referred to herein as the “Ongombo Project” or the “Project”. Additionally, a conventional open pit is planned to be mined from the Central shoot.

The proposed Project area is located 40 km northeast of Windhoek in the Khomas Region as shown in Figure 1.

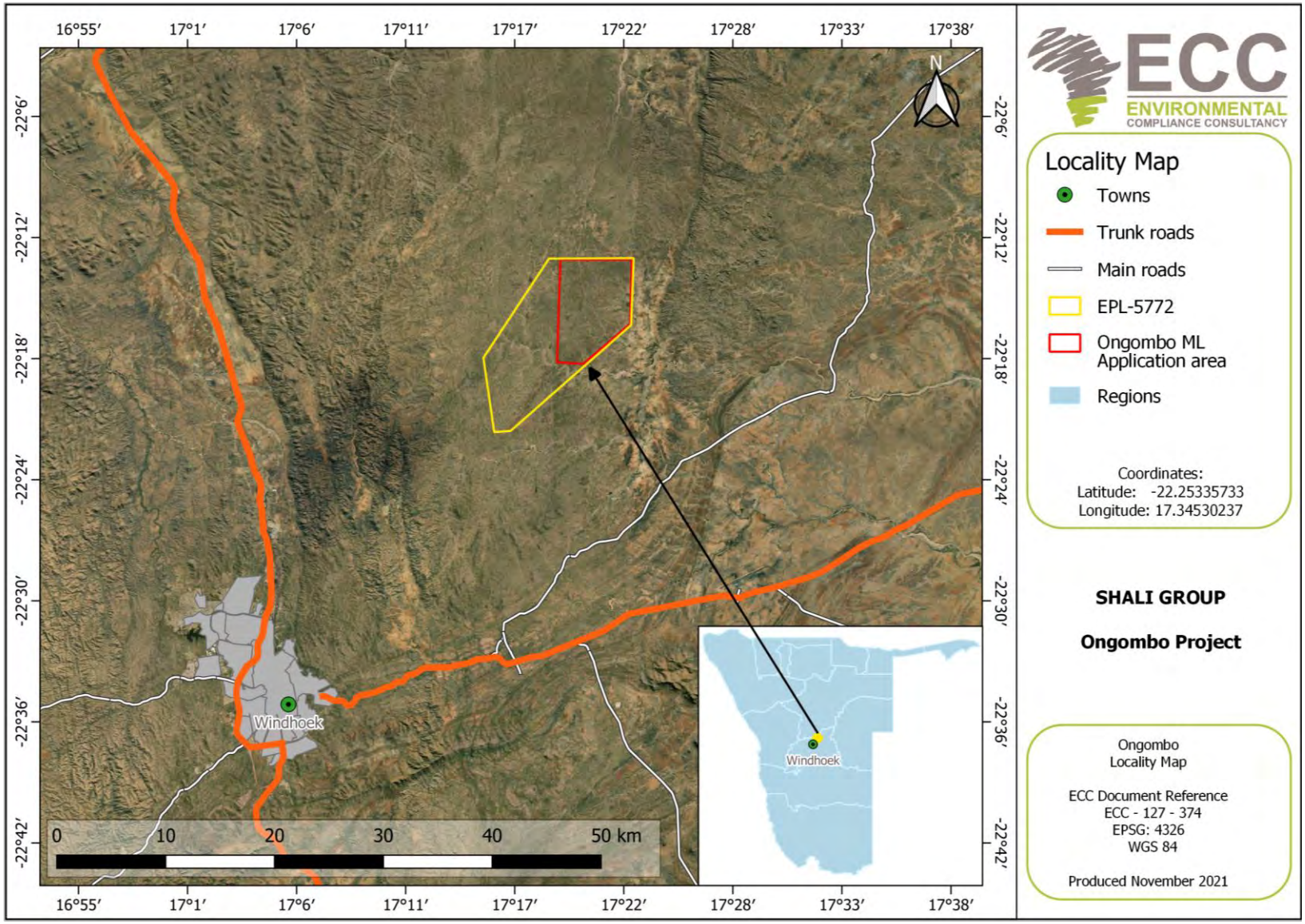

Figure 1 – Project location and regions

1.2 PURPOSE OF THE SCOPING REPORT

An environmental and social impact assessment (ESIA) has commenced in terms of the requirements of the Environmental Management Act, No. 7 of 2007, and its associated 2012 regulations. The purpose of this report is to present the findings of the scoping study phase that forms part of the larger ESIA process.

The scoping report summarises the prescribed ESIA process followed; provides information on the baseline biophysical and socio-economic environments, project description and details; outlines the terms of reference for the assessment phase; and presents a preliminary environmental management plan (EMP), which is provided as Appendix A.

The scoping report and appendices were submitted for public review from the period 10 to 17 November 2022. This provided an opportunity for interested and affected parties (I&APs) to provide input, comments, and suggestions on the proposed Project, and in so doing, guide the impact assessment phase. This final scoping report, inclusive of the public comments, will now be submitted to the Ministry of Mines and Energy (MME) as the competent authority for the Project. Thereafter, it will be submitted to the Ministry of Environment, Forestry and Tourism (MEFT) - Directorate of Environmental Affairs (DEA) for a record of decision.

1.3 THE PROPONENT OF THE PROPOSED PROJECT

Shali Group Holdings (Pty) Ltd is the proponent for the proposed project. The Proponent has a head office in Namibia's capital, Windhoek and the Proponents' details are provided in Table 1.

Table 1 – Proponents details

Company Representative:	Contact Details:
Mr Wilhelm Shali	Shali Group Holdings (Pty) Ltd: PO Box 40705, Ausspannplatz invest@shaligroup.com +264 (61) 239 515

1.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Environmental Compliance Consultancy (ECC) (Reg. No. CC 2013/11401) has prepared this scoping report and the preliminary EMP on behalf of the Proponent.

This report has been authored by employees of ECC, who have no material interest in the outcome of this report, nor do any of the ECC team have any interest that could be reasonably regarded as being capable of affecting their independence in the preparation of this report. ECC is independent from the proponent and has no vested or financial interest in the project, except for fair remuneration for professional fees rendered based upon agreed commercial rates. Payment of these fees is in no way contingent on the results of this report or the assessment, or a record of decision issued by Government. No member or employee of ECC is, or is intending to be, a director, officer, or any other direct employee of Shali Group Holdings. No member or employee of ECC has, or has had, any shareholding in Shali Group Holdings.

All compliance and regulatory requirements regarding this report should be forwarded by email or posted to the following address:

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PO Box 91193, Klein Windhoek, Namibia
Tel: +264 81 669 7608
Email: info@eccenvironmental.com

1.5 ENVIRONMENTAL REQUIREMENTS

The Environmental Management Act, No. 7 of 2007, and its associated 2012 regulations, stipulates that an environmental clearance certificate is required before undertaking any of the listed activities that are identified in the Act and its regulations. Potential listed activities triggered by the Project are provided in Table 2.

Table 2 – Listed activities potentially triggered by the Project

LISTED ACTIVITY	AS DEFINED BY THE ACT	RELEVANCE TO THE PROJECT
Energy generation, transmission, and storage activities	The construction of facilities for: (1a) The generation of electricity. (1b) The transmission and supply of electricity.	– The Ongombo Project will need to generate and or transmit electricity for its operations. – It is very likely that the proposed Project will connect to the national power grid supplied by NamPower. – Alternatively, the Proponent may possibly consider developing a renewable energy plant (i.e. solar) for the generation of supplementary power. – Power generated by renewals if any, will be used to supply the proposed Ongombo Project, and potential surplus could be redirected into the national grid.
Waste management, treatment, handling, and disposal activities	2.1 The construction of facilities for waste sites, and the treatment and disposal of waste. 2.2 Any activity entailing a scheduled process referred to in the Atmospheric Pollution Prevention Ordinance Act, 1976. 2.3 The importing, processing, use and recycling, temporary storage, transit, or exporting, of waste.	– The Project will require waste sites for the disposal of mineralised and non-mineralised waste. Hazardous waste may be generated by the operation. – Facilities for the disposal of waste will need to be constructed. – In terms of the Atmospheric Pollution Prevention Ordinance Act, the bulk storage and handling of mineralised or metallic ore on waste dumps designed to hold 100 000 metric tonnes or more, is defined as a scheduled process.
Mining and quarrying activities	3.1 The construction of facilities for any process or activities that require a license, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining) Act, 1992.	– This listed activity infers the provisions of the Minerals (Prospecting and Mining) Act 33 of 1992. The very nature of the Project is mining, which therefore triggers this listed activity.

LISTED ACTIVITY	AS DEFINED BY THE ACT	RELEVANCE TO THE PROJECT
	3.2 Other forms of mining or extraction of any natural resources, whether regulated by law or not. 3.3 Resource extraction, manipulation, conservation, and related activities.	
Forestry activities	4. The clearance of forest areas, deforestation, afforestation, timber harvesting, or any other related activity that requires authorisation in terms of the Forest Act, 2001 (No. 12 of 2001) or any other law.	– Vegetation clearing will be required for site construction and infrastructure establishment. – During operations, vegetation clearing will be required as the Project develops.
Water resource developments	8.1 The abstraction of ground or surface water for industrial or commercial purposes. 8.2 The abstraction of groundwater at a volume exceeding the threshold authorised in terms of the law relating to water resources. 8.4 Construction of canals and channels, including the diversion of the normal flow of water in a riverbed, and water transfer schemes between water catchments and impoundments. 8.5 Construction of dams, reservoirs, levees, and weirs. 8.6 Construction of industrial and domestic wastewater treatment plants and related pipeline systems. 8.8 Construction and other activities in watercourses within flood lines. 8.9 Construction and other activities within a catchment area.	– Ground and surface water may be abstracted to support the operation. – Dewatering underground workings will be required to ensure safe mining operations. – The sourced groundwater may likely exceed the threshold authorised in terms of the Water Act, and therefore permits for abstraction must be sourced. – A dam may be constructed to provide water for the process plant. – Pipeline systems will be used to transport water or slurry within the site.

LISTED ACTIVITY	AS DEFINED BY THE ACT	RELEVANCE TO THE PROJECT
Hazardous substance treatment, handling, and storage	9.1 The manufacturing, storage, handling, or processing of hazardous substance defined in the Hazardous Substances Ordinance, 1974. 9.2 Any process or activity that requires a permit, licence, or other form of authorisation, or the modification of, or changes to, existing facilities for any process or activity that requires amendment of an existing permit, licence or authorisation, or which requires a new permit, licence or authorisation in terms of governing the generation or release of emissions, pollution, effluent, or waste. 9.4 The storage and handling of dangerous goods, including petrol, diesel, liquid petroleum, gas, or paraffin, in containers with the combined capacity of more than 30 cubic meters at one location. 9.5 Construction of filling stations or any other facility for the underground and above ground storage of dangerous goods, including petrol, diesel, liquid, petroleum, gas, or paraffin.	– The mining operations and proposed process plant triggers this activity, as both fuel and hazardous substances are required for mining and processing. – Bulk fuel may be required for onsite generation of electricity, and for refuelling the mining fleet. – Consumer installation certificates are required for bulk fuel storage and dispensing. – Hazardous reagents will be used within the copper extraction and processing plant.
Infrastructure	10.1 The construction of: (j) masts of any material or type, and of any height, including those used for telecommunication broadcasting and radio transmission.	– Powerlines and telemetry for water and tailings pumping will be required. – Radio and telecommunication towers will be required for the site.

2 APPROACH TO THE ASSESSMENT

2.1 PURPOSE AND SCOPE OF THE ASSESSMENT

The aim of this assessment is to determine which impacts are likely to be significant; to scope the available data and identify any gaps that need to be filled; to determine the spatial and temporal scope; and to identify the assessment methodology.

The scope of the assessment was determined through undertaking a preliminary assessment of the proposed Project against the receiving environment, obtained through a desktop review, available site-specific literature.

2.2 THE ASSESSMENT PROCESS

The ESIA methodology applied to this assessment has been developed using the International Finance Corporation (IFC) standards and models, in particular Performance Standard 1: 'Assessment and management of environmental and social risks and impacts' (International Finance Corporation, 2012 and 2017); Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008); international and national best practice guidelines; and over 25 years of combined ESIA experience.

Furthermore, this assessment was undertaken for the Proponent in accordance with Namibian legal requirements.

This assessment is a formal process. The potential effects that the Project will have on the biophysical, social, and economic environments are identified, assessed, and reported, so that the significance of potential impacts can be taken into account when considering a record of decision for the proposed Project.

Final mitigation measures and recommendations are based on the cumulative experience of the consulting team and the client, taking into consideration the potential environmental and social impacts. The process followed, through the basic assessment, is illustrated in Figure 2 and is detailed further in the following sections.

1. Project screening

Complete

The first stages in the ESIA process are to undertake a screening exercise to determine whether the Project triggers listed activities under the Environmental Management Act, 2007, and its regulations.

The screening phase of the Project is a preliminary analysis, in order to determine ways in which the Project might interact with the biophysical, social, and economic environments.

Stakeholder engagement:
- Registration of the project
- Preparation of the BID

2. Establishing the assessment scope

Complete

Where an ESIA is required, the second stage is to scope the assessment. The main aim of this stage is to determine which impacts are likely to be significant; to scope the available data and any gaps that need to be filled; to determine the spatial and temporal scope; and to identify the assessment methodology.

The scope of this assessment was determined through undertaking a preliminary assessment of the proposed Project against the receiving environment.

Feedback obtained from consultation with the public and the Proponent informs this process.

Impacts that are identified as potentially significant during the screening and scoping phase are taken forward for further assessment in the ESIA process.

The following environmental and social topics were scoped into the assessment:

SOCIOECONOMIC ENVIRONMENT
- Employment
- Local businesses
- Visual impacts on sense of place
- Traffic management

BIOPHYSICAL ENVIRONMENT
- Noise and air quality, including dust emissions
- Surface and ground water
- Heritage and culture
- Topography and soil
- Biodiversity and
- Mine waste characterisation

The following topics were scoped out of the ESIA, and they are therefore not discussed further in this report.
- An assessment of safety impacts or risks associated with developing the mine are not included within the scope of this assessment, and will be addressed by the Proponent in a site-specific safety management plan.

3. Baseline studies

In Progress

A robust baseline is required, in order to provide a reference point against which any future changes associated with a Project can be assessed, and to allow suitable mitigation and monitoring to be identified.

The region and general area have been studied extensively for various projects and assessments, therefore there is a vast volume of literature available to be referenced. The Project site-specific area has no yet been studied as part of the ESIA process to date, but field studies will be conducted as part of this assessment and may include but are not limited to the following:
- Field surveys
- Desktop studies
- Consultation with stakeholders
- Specialist field visits, monitoring, and ongoing studies

The environmental and social baselines will be provided in the next update of the scoping study.

4. Draft scoping report and EMP

Complete

The scoping report documents the findings of the current assessment process and introduces the proposed project. An opportunity will be provided to stakeholders to proceed with public consultation and provide comments, which will form part of the full environmental assessment. The EMP provides measures to manage the environmental and social impacts of the proposed project, and outlines the specific roles and responsibilities required in order to fulfil the management plan.

This report will be issued to stakeholders and I&APs for consultation, for a period of 7 days, meeting the mandatory requirement as set out in the Environmental Management Act, 2007. The aim of this stage is to ensure that all stakeholders and I&APs have an opportunity to provide comments on the assessment process, and to register their concerns, if any.

5. Impact identification and evaluation

Future Stage

The key stage of the ESIA process is the impact identification and evaluation stage. This stage is the process of bringing together project characteristics with the baseline environmental characteristics, and ensuring that all potentially significant environmental and social impacts are identified and assessed. It is an iterative process that commences at project inception, and ends with the final design and project implementation. The impact identification and evaluation stages will be updated in the assessment phase.

The final design of the proposed Project will be assessed, along with alternatives that were considered during the design process in accordance with the Environmental Management Act, 2007. Section 6 in this report sets out the assessment methodology to be used to assess the Project against the environmental and social baselines that would be affected.

6. Final EIA and EMP

Future Stage

All comments received during the I&AP public review period will be collated in an addendum report, which will accompany this scoping report when submitted to the competent authorities and MEFT: DEA. All comments will be responded to, either through providing an explanation or further information in a response table, or by signposting where information exists, or where new information has been included in the ESIA report or appendices. Comments will be considered, and where they are deemed to be material to the decision-making, or might enhance the ESIA, they will be incorporated.

The final ESIA report, appendices, and the addendum report, will be available to all stakeholders, and all I&APs will be informed of its availability for review.

The ESIA report, appendices and addendum will be formally submitted to the competent authority and the MEFT: DEA as part of the application for an environmental clearance certificate.

7. Authority assessment and decision

Future Stage

The Environmental Commissioner, in consultation with other relevant authorities, will assess if the findings of the ESIA presented in the report are acceptable. If deemed acceptable, the Environmental Commissioner will revert to the Proponent with a record of decision and recommendations.

8. Monitoring and auditing

Future Phase

In addition to the EMP being implemented by the Proponent, a monitoring strategy and audit procedure will be determined by the Proponent and competent authority. This will ensure key environmental receptors are monitored over time to establish any significant changes from the baseline environmental conditions, caused by Project activities

Figure 2 – ESIA Process and stages complete

2.1 PROJECT LOCATION

The Ongombo C Project is located in central Namibia near the Windhoek District, 15 km northeast of the Otjihase Mine and 45 km from Windhoek in the Khomas Region of Namibia see Figure 3. The property can be accessed from Windhoek, towards Gobabis on the (B6), and then by gravel road (M53). The area under licence measures 15.7 km from north to south and 12.5 km from east to west and covered an area of 12 092 ha.

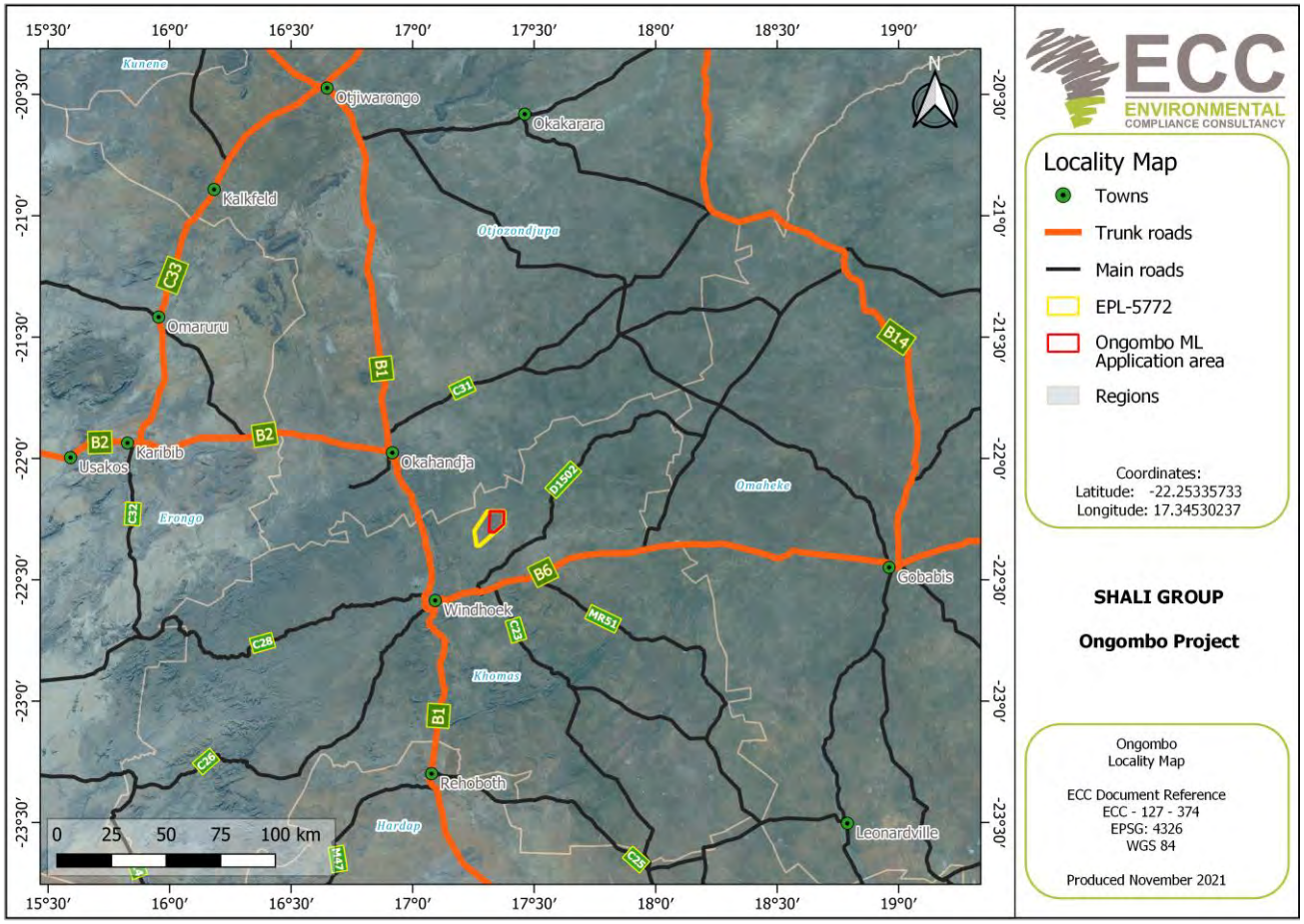

Figure 3 – Site locality map

2.2 STUDY AREA

This ESIA study area has been defined according to the geographic scope of the receiving environment, and potential impacts that could arise because of the proposed Project. The study area is presented in Figure 4.

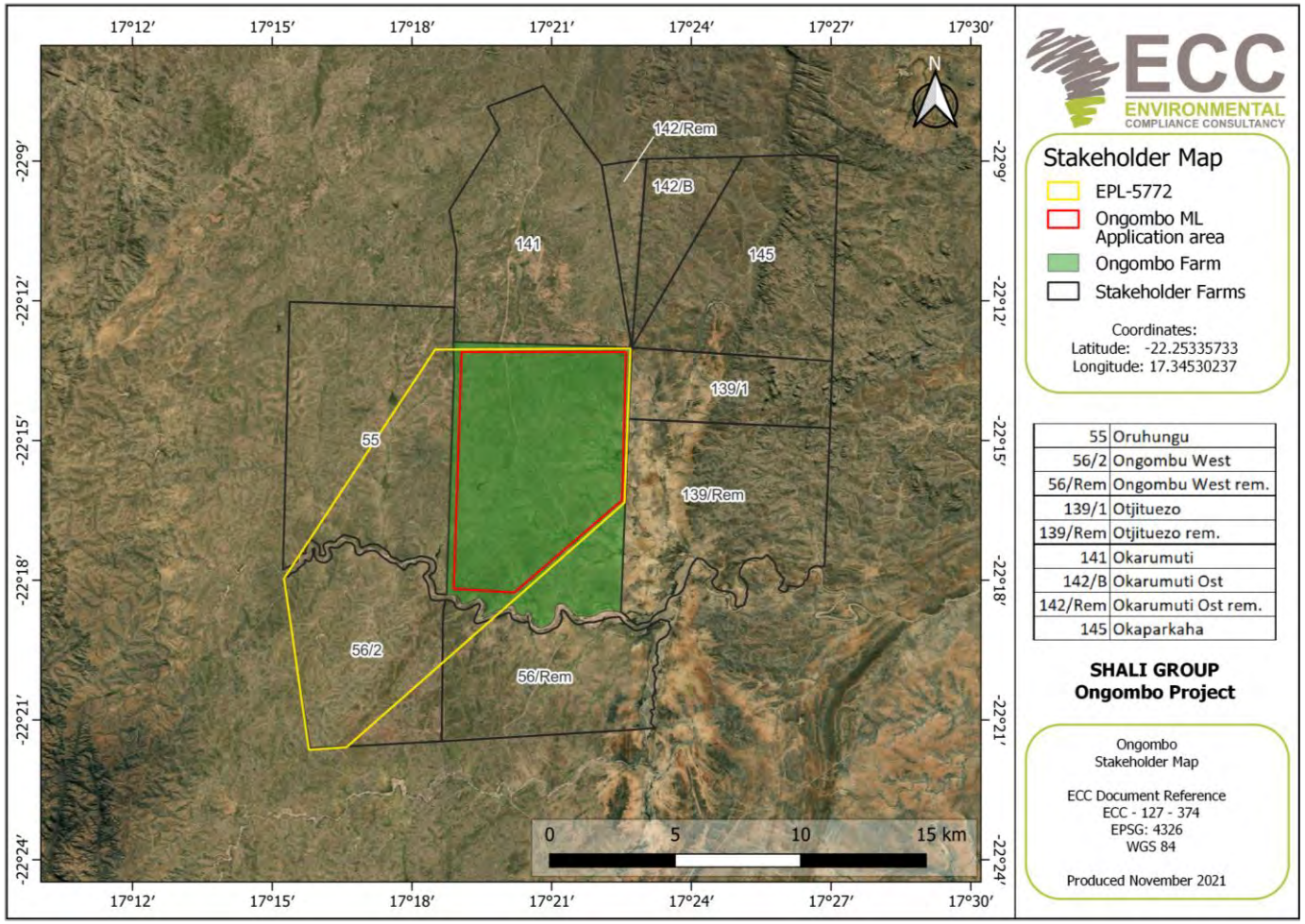

Figure 4 – ESIA study area, infrastructure, and surrounding neighbours

2.3 CONSULTATION

Public participation and consultation are a requirement stipulated in Section 21 of the Environmental Management Act, No. 7 of 2007, and its 2012 regulations, for a project that requires an environmental clearance certificate. Public consultation for this Project commenced on the 10 May 2022 when the background information document (BID) was made available to I&APs. Adverts informing the public of the ESIA process were placed in the local newspapers on the 16 and 23 May 2022, respectively. A public meeting was held in Windhoek on the 18 May 2022 to ensure that the public and key stakeholders are engaged in the early stages of the ESIA process. The objectives of the public participation and consultation process are to:

- Provide information on the Project, and introduce the overall Project concept and plan in the form of a background information document (BID);
- Determine the relevant government, regional and local regulating authorities;
- Listen to and understand community issues, record concerns, and questions; and
- Explain the process of the ESIA and timeframes involved and establish a platform for ongoing consultation

The public meeting and related feedback from I&APs during the pre-consultation process is located in Appendix B of this scoping report.

2.4 IDENTIFICATION OF KEY STAKEHOLDERS AND INTERESTED OR AFFECTED PARTIES

A stakeholder mapping exercise was undertaken to identify individual or groups of stakeholders, and the method in which they will be engaged, during the ESIA process. The stakeholders were issued with a formal pre-consultation letter on the 13 May 2022 via email. Stakeholders are approached either through direct communication (letters and phone calls), the national press, site notices, or directly by email. A summarised list of potential stakeholders for this Project is given below:

- Directly and indirectly affected landholders
- The general public with an interest in the Project
- Ministry of Environment, Forestry and Tourism (MEFT)
- Ministry of Agriculture, Water and Land Reform (MAWLR)
- Ministry of Mines and Energy (MME)
- National Heritage Council (NHC)
- Ministry of Works and Transport (MWT) and the Roads Authority
- Khomas Regional Council
- City of Windhoek Municipality
- Landowners and neighbouring establishments
- Town residents and business owners
- NamWater and NamPower

- Water users downstream or around the Project

A summary report (Appendix B) provides a list of interested and affected parties, evidence of consultation, including minutes of public meetings, advertisements in national newspapers, locations of the site notices and a summary of the comments or questions raised by the public. A summary of the key concerns raised during the consultation process is presented in Appendix B.

Matters that could or are likely to be raised typical for this scale of Project during the scoping phase by I&APs, may be as follows:

- Heritage impacts
- Power and water supply
- Water use, contamination, and management
- Waste management
- Waste resource management
- Visual impacts
- Biodiversity impacts
- Socio-economic and social impacts, such as job creation, staff housing and accommodation
- Traffic management
- Potential pollution impacts
- Mine closure

To ensure that interested and affected parties have the opportunity to comment and provide feedback on the assessment, the scoping report and associated appendices was circulated for a period of 7 days (10 to 17 November 2022) to all neighbouring landholders, interested and or affected parties and stakeholders of the Project. This feedback is addressed in Appendix D of this report.

Should stakeholders have comments or questions or areas that concern them, that they feel require further assessment, ECC will address these in the assessment phase.

3 REVIEW OF THE LEGAL ENVIRONMENT

As stated in Section 1, an environmental clearance is required for any activity listed in the Government Notice No. 29 of 2012 of the EMA. The Proponent holds a current and valid environmental clearance certificate for the exploration phase of this Project.

The Project area is located outside of any national parks, heritage listed areas, or areas of significance. It is to be determined if the Project is located within a groundwater-controlled area, as regulated under the Water Management Act of 1956, high level review indicates it is not within a groundwater control area.

A thorough review of relevant legislation has been conducted for the proposed Project. Table 3 below identifies relevant legal requirements specific to the Project. Table 4 provides the national policies and plan and Table 5 specific permits for the Project. This chapter outlines the regulatory framework applicable to the proposed Project.

3.1 RELEVANT NATIONAL LEGISLATION

Table 3 – Details of the regulatory framework as it applied to the proposed Project

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
Constitution of the Republic of Namibia (1990)	The constitution defines the country's position in relation to sustainable development and environmental management. The constitution refers that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at the following: "Maintenance of ecosystems, essential ecological processes and biological diversity of Namibia, and the utilisation of living, natural resources on a sustainable basis for the benefit of all Namibians, both present, and future."	The Proponent is committed to the sustainable use of the environment, and has aligned its corporate mission, vision, and objectives within the ambit of the Constitution of the Republic of Namibia (1990).
Minerals (Prospecting and Mining) Act No. 33 of 1992	The Act provides for the granting of various licences related to mining and exploration. Section 50 (i) requires: "An environmental impact assessment indicating the extent of any pollution of the environment before any prospecting operations or mining operations are being carried out, and an estimate of any pollution, if any, likely to be caused by such prospecting operations or mining operations."	The proposed mining activity requires an EIA to be carried out, as it triggers listed activities in the Environmental Management Act's regulations. Mining activities shall not commence until all conditions in the Act are met, which includes an agreement with the landowners and conditions of compensation, if applicable.

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
	The Act sets out the requirements associated with licence terms and conditions, such that the holder of a mineral licence shall comply with. The Act also contains relevant provisions for pollution control related to mining activities and land access agreements, and provides provisions that mineral licence holders are liable for any damage to land, water, plant, or animal life, caused by spilling or pollution, and must take all such steps as may be necessary to remedy such spilling, pollution, loss, or damage, at its own costs.	The Project shall be compliant with Section 76 of the Act with regard to records, maps, plans and financial statements, information, reports, and returns submitted. As the Proponent may need to access privately owned land, the Proponent will ensure Sections 50 and 52 are complied with.
Environmental Management Act, 2007 (Act No. 7 of 2007) and its regulations, including the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011)	The Act aims to promote sustainable management of the environment and use of natural resources. The Act requires certain activities to obtain an environmental clearance certificate prior to Project development. The Act states that an EIA should be undertaken and submitted as part of the environmental clearance certificate application process. The MEFT is responsible for the protection and management of Namibia's natural environment. The Department of Environmental Affairs, under the MEFT, is responsible for the administration of the EIA process.	This environmental scoping report documents the findings of the scoping phase of the environmental assessment undertaken for the proposed Project. The process will be undertaken in line with the requirements under the Act and its regulations.

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
Water Act, 1956 (Act No. 54 of 1956)	Although the Water Resources Management Act (No. 11 of 2013), has been billed, but not promulgated, it cannot be enacted, as the regulations have not been passed – therefore the Water Act of 1956 remains the current piece of legislation relating to water management in Namibia. This Act provides for the control, conservation and use of water for domestic, agricultural, urban, and industrial purposes; and to make provision for the control of certain activities on or in water. The Department of Water Affairs, within the Ministry of Agriculture, Water and Land Reform (MAWLR), is responsible for the administration of the Act.	The Act stipulates obligations to prevent the pollution of water. Measures to minimise potential surface and groundwater pollution are contained in the EMP. The Project is obliged to have all permits relevant to its operations under this Act. Abstraction of water from boreholes requires an abstraction permit to be obtained from the Ministry of Agriculture, Water and Land Reform.
Soil Conservation Act, No. 76 of 1969	This Act makes provision for the prevention and control of soil erosion, and for the protection, improvement, and conservation of soil and vegetation.	Land clearing is an unavoidable necessity for the proposed Project, as large areas will be cleared for mining infrastructure. Measures will be included in the EMP to conserve soil and vegetation that will be used as part of the rehabilitation phase of the Project.
The Forestry Act, No. 12 of 2001 as amended by the	Section 22 deals with the protection of natural vegetation that is not part of the surveyed erven of a local authority area as defined.	The Project activities will require vegetation clearing. The Proponent will ensure that all required permits are in place before vegetation removal commences.

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
Forest Amendment Act, No. 13 of 2005	Section 21 states that no person shall cut, destroy, or remove vegetation that is growing within 100 metres of a river, stream, or watercourse. Section 23 requires a permit from the Director for the clearance of vegetation on more than 15 hectares on any piece of land or several pieces of land situated in the same locality as that which has predominantly woody vegetation; or cut or remove more than 500 cubic metres of forest produce from any piece of land in a period of one year.	
National Heritage Act, No. 27 of 2004.	The Act provides provision for the protection and conservation of places and objects with heritage significance. Section 55 compels mining companies to report any archaeological findings to the National Heritage Council. Subsection 9 allows the NHC to issue a consent, subject to any conditions that the Council deems necessary.	There is the potential for heritage related objects to be found in the mining licence area. Therefore, the relevant stipulations in the Act will be taken into consideration and incorporated into the EMP. In cases where heritage sites are discovered, the 'chance find procedure' will be used.
Labour Act, No. 11 of 2007	The Labour Act, No. 11 of 2007 (Regulations relating to the Occupational Health & Safety provisions of Employees at Work, promulgated in terms of Section 101 of the Labour Act, No. 6 of 1992 - GN156, GG 1617 of 1 August 1997)	The Project shall adhere to all labour provisions and guidelines, as enshrined in the Labour Act. The Project shall also develop and implement a comprehensive occupational health and safety plan to ensure adequate protection for its personnel throughout the Project lifecycle.

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
Road Traffic and Transport Act, No. 22 of 1999	This Act makes provision for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, and the control and regulation of road transport users across Namibia.	The Project will involve transportation activities in support of mining activities. The employees and support business shall adhere to national road regulations on public roads.
Hazardous Substances Ordinance, No. 14 of 1974	This Ordinance provides for the control of toxic substances, and can be applied in conjunction with the Atmospheric Pollution Prevention Ordinance, No. 11 of 1976. This applies to the manufacture, sale, use, disposal, and dumping of hazardous substances, as well as their import and export.	The planned Project will involve the handling and storage of hazardous substances such as fuels, reagents, and industrial chemicals. The Proponent shall ensure safe handling, transfer, storage, and disposal protocols are developed, implemented, and audited throughout its operations. The Proponent is obliged to ensure that all permits under this Ordinance are obtained prior to Project commencement.
The Atmospheric Pollution Prevention Ordinance, No. 11 of 1976	The Ordinance pertains to the prevention of air pollution, with particular focus on public health, and contains detailed provisions on air pollution matters, including the control of noxious or offensive gases, atmospheric pollution by smoke, dust control, motor vehicle emissions, and other general provisions.	The nature of mining activities does generate dust. Activities within the mining operations and processing plant will generate gases, odours, and air pollution. The Proponent will ensure that all measures reasonably practicable will be implemented to reduce and mitigate impacts to air quality, and this will be included in the EMP.

3.2 RELEVANT NATIONAL POLICES AND PLANS

Table 4 – National polices and plans applicable to the proposed Project

Policy or plan	Description	Relevance to the Project
Vision 2030	Vision 2030 sets out the nation's development targets and strategies to achieve its national objectives. Vision 2030 states that the overall goal is to improve the quality of life of the Namibian people aligned with the developed world.	The proposed Project shall aim to meet the objectives of Vision 2030, and shall contribute to the overall development of the country through continued employment opportunities and ongoing contributions to the gross domestic product (GDP).
Fifth National Development Plan (NDP5)	The NDP5 is the fifth in a series of seven five-year national development plans that outline the objectives and aspiration of Namibia's long-term vision. The NDP5 pillars are economic progression, social transformation, environmental sustainability, and good governance.	The planned Project supports meeting the objectives of the NDP5 through creating opportunities for continued employment.
The Harambee Prosperity Plan ii (2021 – 2025)	Second Pillar: Economic advancement – ensuring increasing productivity of priority key sectors (including mining) and the development of additional engines of growth, such as new employment opportunities.	The Project will contribute to the continued advancement of the mining industry and create an additional employment generation engine within the regional and national landscape.
Minerals Policy	The Minerals Policy was adopted in 2002, and sets guiding principles and direction for the development of the Namibian mining sector, while communicating the values of the Namibian people. The policy strives to create an enabling environment for local and foreign investments in the mining sector, and seeks to	The planned Project conforms to the Policy, which has been considered through the ESIA process and the production of this report. The Proponent intends to continue to support local spending and procurement.

Policy or plan	Description	Relevance to the Project
	maximise the benefits for the Namibian people from the mining sector, while encouraging local participation. The objectives of the Minerals Policy are in line with the objectives of the Fifth National Development Plan that include reduction of poverty, employment creation, and economic empowerment in Namibia.	The Project will comply with the general guidelines of the Policy through the adoption of various legal mechanisms to manage all aspects of the environment effectively and sustainably from the start. The ESIA is one such mechanism to ensure environmental integrity throughout the planned Project's lifecycle.

Table 5 – Specific permits and licence requirements for the proposed Project

PERMIT OR LICENCE	ACT/REGULATION	RELATED ACTIVITIES REQUIRING PERMITS	RELEVANT AUTHORITY
Environmental clearance certificate	Environmental Management Act, No. 7 of 2007	Required for all listed activities shown in Table 2.	Ministry of Environment, Forestry and Tourism (MEFT)
Mining licence	Section 90 (2) (A) of the Minerals Act, No. 33 of 1992	Written permission from the mining commissioner.	Ministry of Mines and Energy (MME)
Surface rights agreements (mine, infrastructure corridors)	Section 52(1)(A) of the Minerals Act, No. 33 of 1992	Included in the mining license application. Also required in the permit application for accessory works areas.	Ministry of Mines and Energy (MME)
Exclusive prospecting licences	Section 68 (2) (A) of the Minerals Act, No. 33 of 1992	Written permission from the mining commissioner before prospecting can commence.	Ministry of Mines and Energy (MME)
Accessory work permit	Section 90(3) of the Minerals Act, No. 33 of 1992	Written permission from the mining commissioner before accessory works can be erected on an EMP or mining licence area.	Ministry of Mines and Energy (MME)
Heritage consent and approval	The Heritage Act, No. 27 of 2004	Written consent from the National Heritage Council to proceed with a project.	National Heritage Council (NHC)

PERMIT OR LICENCE	ACT/REGULATION	RELATED ACTIVITIES REQUIRING PERMITS	RELEVANT AUTHORITY
Permit for boreholes (exploration and water boreholes)	A permit is issued under the Water Act, No. 54 Of 1956 (enforced)	Required before the drilling of boreholes for exploration and the abstraction of water.	Ministry of Agriculture, Water and Land Reform (MAWLR)
Tailings waste disposal permit	A permit is issued under the Water Act, No. 54 of 1956 (enforced)	Required for the disposal of tailings.	Ministry of Agriculture, Water and Land Reform (MAWLR)
Wastewater discharge permit	A permit is issued under the Water Act, No. 54 of 1956 (enforced) but form types that fall under the Water Act, No. 24 of 2004 are used.	Required for discharge of sewage and/or excess industrial or mine wastewater.	Ministry of Agriculture, Water and Land Reform (MAWLR)
Permit for the clearing of land	The Forest Act, 2001 (Act No. 12 of 2001)	This Act governs the removal of vegetation within 100 m of a water course, or removal of more than 15 ha of woody vegetation, or the removal of any protected plant species.	Ministry of Agriculture, Water and Land Reform (MAWLR)
Permit for the destruction of heritage objects and artefacts	The Heritage Act, No. 27 of 2004.	This Act relates to interference with heritage artefacts during the Project life. Heritage sites could potentially be located within the proposed mining licence footprint, or along proposed pipeline or powerline routes.	National Heritage Council (NHC)
Consumer installation certificate for bulk fuel storage	Petroleum Products Regulations	A consumer installation certificate is required for bulk fuel storage and dispensing.	Ministry of Mines and Energy (MME)
Licence for explosives magazine	Minerals (Prospecting and Mining) Act, No. 33 of 1992; Mine Safety Regulations	This is also covered under the accessory works application.	Ministry of Mines and Energy (MME)

PERMIT OR LICENCE	ACT/REGULATION	RELATED ACTIVITIES REQUIRING PERMITS	RELEVANT AUTHORITY
	Section 22 of the Explosives Act, Act 26 of 1956 and Section 7.2.1 of the Explosives Regulations 1972		
Permit for the storage and use of explosives, and the burning of packaging	Minerals (Prospecting and Mining) Act, No. 33 of 1992; Mine Safety Regulations The Explosives Act, Act 26 of 1956 and Explosives Regulations 1972	Part (10), explosives and blasting.	Ministry of Mines and Energy (MME)

4 PROJECT DESCRIPTION

4.1 NEED FOR THE PROJECT

New mining activities could contribute to the national and local economies and may have a positive impact on the country's economy. Namibia's economy depends largely on mining. Should the Project prove economically viable, the Namibian economy can expect benefits from revenues during the construction phase, royalties and taxes during the life of mine (LOM), and a positive contribution towards employment.

Practara Consulting has prepared a scoping study to determine the feasibility of the proposed Project. The 2021 Practrata scoping study report has been used to gather project description information.

The design philosophy for the Project is based on the following:

- The project is a low grade and low tonnage operation therefore the mine must be a low-cost operation and designs should be directed at keeping operating and capital costs to a minimum.
- The target production rates to be evaluated was set for a 40 ktpm operation.
- The deposit is relatively small yet extended on strike and will have a short life compared to other Southern African projects and as such the infrastructure and cost base should be designed accordingly.

4.2 EMPLOYMENT

Between 20 and 80 people will be employed during construction. Approximately two mining crews of 14 personnel for the operational phase will be required with support staff and management it is expected that the total staff compliment will be between 50 and 80 people, providing jobs and livelihoods for them, and their families, for the anticipated life of mine between 12-14 years.

A complete mining crew of 14 personnel will comprise of a miner, a team leader, two blasting assistants, a drill rig operator, a drill rig assistant, one roof bolter operator, one roofbolter assistant, one LHD operator, two truck drivers, and three face preparation assistants

4.3 EXPLORATION HISTORY

Historically, parts of the project area were extensively explored by B&O Minerals (1971-1973), JCI Limited (1975), and Goldfields Namibia (1986-1994), just to mention a few and priory it is being explored by Starlight Investments Pty Ltd (Starlight). Starlight Investments Pty Ltd is a Namibian registered company. The company applied for the exclusive prospecting licence over the Ongombo copper prospect. Starlight Investments Pty Ltd application for EPL 3238 was approved on the 8 November 2007.

Starlight and Avanti Resources Pty Ltd (Avanti) signed an option agreement on the 19 of June 2007, whereby Avanti had the exclusive right to promote EPL 3238 over the Ongombo copper deposit to potential investing companies. Subsequent to the option agreement between Avanti and Starlight, Avanti prepared a technical review of the Ongombo Copper Deposit in Namibia (Marlow, 2007).

Avanti and STH Pty Ltd (STH) signed an Option Deed on the 13 September 2019, where STH would acquire the option held by Avanti over the Ongombo copper deposit with Starlight. After the Option Agreement, Starlight and Avanti and STH signed the Ongombo Farmin Join Venture Agreement.

The Ministry of Mines and Energy approved the Gazania Investments Thirty Two (Pty) Ltd Joint Venture Agreement between Starlight Investments Pty Ltd, and Avanti Recourses Pty Ltd, and STH Pty Ltd on the 27 November 2007. Subsequent to the Ministerial approval of the JV, the ASX listed company Namibian Copper NL (NCO) was formed to fund and manage the exploration on EPL 3238.

In 1995 Goldfields investigated the potential of mining the shallow portion of the Central shoot at Ongombo by open pit (Simon, 1995). Goldfields reviewed 30, 40 and 50 m pits. They estimated that a 50m pit contains 335,256 t at 1.035 Cu, with a stripping ratio of 12:1 and a 15 month mine plan. The 30 m, 40 m and 50 m deep open pit mining models proposed by Goldfields were based on limited drilling in the immediate area of the proposed open pit.

In 2016 the Shali Group were granted EPL 5772 in the name of Manmar Investments One Hundred and Twenty Nine (Pty) Ltd. The Shali Group was able to acquire the NCO boreholes form 2014 and some of the data. The collar positions were verified and assays data validated. In addition, the open pit potential near the gossan was tested with six short holes into the gossan and shallow mineralized layers over a strike length of 500 m. The results were disappointing returning insufficient volume with grades above 1 m%Cu to sustain a mining operation. The 14 sulphide samples analysed from the 5 holes which intercepted the sulphide ore zone reported a weighted average of all five intercepts as 0.29 g/t Au. Although the gold assay data was positive, it was concluded that a significant expansion of the open pit mining area of the Central shoot was not viable given copper prices at the time.

Further drilling was undertaken by the Shali Group in 2017 on the north-eastern margin of the proposed Goldfields pit (Marlow, 2017). The drilling program was designed to establish a potential northeast extension of the 1995 Goldfields 50 m deep pit. Two holes drilled by the Shali Group on Section 10,100E successfully intersected economic ore grades, and the drilling increased the width of the Central shoot on Section 10,100 by at least 150 m. These results demonstrate the potential to significantly increase the size of the existing Central shoot resources by drilling up-dip of the existing Goldfields holes (Practara technical report, 2021).

4.4 GEOLOGY AND MINERALISATION

The Ongombo project lies within the Matchless member of the Kuiseb Formation, a conspicuous assemblage of lenses of foliated amphibolite, chlorite-amphibolite schist, talc schist and metagabbro. This belt, up to 5 km wide in the Otjihase area, stretches 350 km east-north-eastwards in the Southern Zone of the Damara Orogen from the Gorob - Hope area towards Steinhausen, north of Omitara. There are general characteristics found in all deposits. The sulphide mineralization is found in “shoots” a few tens of meters up to 400 m wide and several kilometres in length. At least 13 deposits are known, the largest of these occur in three distinct clusters at Gorob/Hope in the south and Matchless and Otjihase/Ongombo/Ongeama in the north.

The Matchless member is thicker in the areas of sulphide mineralization than along the rest of the belt.

Sulphide mineralization is found associated with a thin band of magnetite-bearing quartzites interpreted to have been a ferruginous chert deposited on the seafloor as a result of submarine volcanic activity. Deposition of iron, copper and other metal sulphides, silver and gold accompanied the deposition of the chert. Mineralization has been modified during the metamorphic process, but the sulphide minerals have largely remained in the vicinity of original deposition.

The host magnetite-quartzite has been described as occurring in extensive bands and/or in discontinuous lenticular massive bodies’ boudinage. Isoclinal folding on a small scale can be seen in the borehole core. Sulphides may be remobilized into zones of brecciation, boudinage and fracturing, or along shears and contacts between different rock types.

Disseminated and stringer mineralization exists in all deposits. The sulphide masses are not continuous on a short to medium range but shoots carry distinct characteristics over longer ranges. Deposits have low to very low zinc (Zn) contents and almost no lead (Pb).

Three mineralized shoots are identified in the area, namely the West Shoot, the Central Shoot and the East/Ost Shoot. The shoots plunge at about 7° in a north easterly direction.

The mineralized zone is enveloped in staurolite-rich biotite schist, which contains fine to coarse disseminated sulphide grains. The mineralized zone consists of streaky, banded and locally semimassive granular sulphide aggregates within a quartzitic groundmass which is in places magnetite bearing (Pentzel, 1994).

The neighbouring property is the Otjihase Mine managed by Weatherly International PLC, and is a copper mine in care and maintenance which is 15 km southwest of the current Ongombo Project.

Like Ongombo, a gossan outcrop is the surface expression of the massive sulphide mineralization. Otjihase consists of four identified mineralized shoots, one large shoot more than 8 km in length, broken by faults, which forms the basis for the mine and three smaller ones. The tenor and style of mineralization at Ongombo is similar to that found at Otjihase.

4.5 OREBODY

The Ongombo deposit lies in quartz and quartz biotite schists and consists of "shoot" of massive and disseminated sulphides up to 350 m wide plunging at about 2° in the shallow Central Shoot and at about 6° in the deeper East Shoot. The deposit dips at about 15°- 20° to the Northwest. The mineralization thickness varies between 1 and 5 m with an average between 1 and 2 m in the Central Shoot and up to 5 m in the East Shoot.

The known mineralization stretches from near surface to depths of 500 m and may be divided into two or more compartments by faults. These faults, as experienced in the similar orebody at Otjihase mine are possibly water bearing and may have poor rock conditions making them difficult to traverse.

The shallower, Central Shoot compartment extends from the surface down to a depth of approximately 160 m below surface. The East Shoot area, lies between 300 m to around 500 m below surface.

The deposit is made up of competent massive sulphides and quartzitic schist. The hangingwall is quartz biotite schist with distinct schistosity which sometimes spalls. It should be competent if supported. The declines and other development will be excavated in competent quartz rich schists.

The mineral resource for the Project is made up of four areas, the central block, east block, east central block, and the east deeps block. The first three blocks are thin (<2 m thick) in nature, while the fourth block is wider potentially being more than 3 m but less than 5 m thick. A cover drilling programme is recommended by Practara with the aim of improving definition of economic mineralisation up-dip of existing drilling.

A mineral resource was estimated for the central and east shoots in September 2012. This mineral resource was based on the geology as encountered in the boreholes and did not account for specific mining parameters. Grades and mineralization thickness were estimated to define the deposit geometry. The mineral resource estimation described below forms the basis from which the current study follows.

Mineral resources declared are given in Table 6 and
Table 7. Further details of the proposed ore bodies and blocks provided in the Practara report, and therefore not repeated here.

Table 6 – Ongombo Mineral Resources (0.6 % Cu cut-off)

Resource Category	In situ tonnes and grade at 0.6% Cu cut-off					
	Tonnes (Millions)	Cu (%)	Ag (g/t)	Au (g/t)	Density (t/m 3)	Sulphur (%)
Measured*						
Central Shoot	1.17	1.83	9	0.32	3.1	7.49
Est/Ost Shoot	-	-				
Indicated*						
Central Shoot	0.57	1.92	10	0.32	3.07	8.3
Est/Ost Shoot	4.97	1.4	7	0.32	3.12	8.8
Total Measured and Indicated	6.71	1.52	8	0.32	3.11	8.5
Inferred						
Central Shoot	0.93	1.43	7	0.32	2.94	8.7
Est/Ost Shoot	2.82	1.79	9	0.32	3.1	11.9
Total	3.75	1.70	9	0.32	3.06	11.1
*Measured and Indicated Mineral Resource for Cu and Ag only. Au is Inferred.						

Table 7 – Ongombo Mineral Resources (1.0 % Cu cut-off)

Resource Category	In situ tonnes and grade at 1% Cu cut-off					
	Tonnes (Millions)	Cu (%)	Ag (g/t)	Au (g/t)	Density (t/m 3)	Sulphur (%)
Measured*						
Central Shoot	1.11	1.89	10	0.32	3.10	7.6
Est/Ost Shoot	-	-				
Indicated*						
Central Shoot	0.57	1.93	10	0.32	3.07	8.3
Est/Ost Shoot	3.8	1.57	8	0.32	3.14	9.6
Total Measured and Indicated	5.48	1.67	9	0.32	3.12	9.1
Inferred						
Central Shoot	0.66	1.69	9	0.32	2.94	8.8
Est/Ost Shoot	2.36	1.98	10	0.32	3.11	12.7
Total	3.02	1.92	10	0.32	3.07	11.9
*Measured and Indicated Mineral Resource for Cu and Ag only. Au is Inferred.						

4.6 SITE LAYOUT

An optimal site layout is based on designing the site around critical landform features such as topography and sensitive areas, while considering the efficiencies required for the mining operation. The proposed site layout is provided in Figure 6, Figure 6 and Figure 7 respectively. Figure 5 provides the overall site layout (excluding waste rock dumps) and the entrance to the pit decline. Figure 6 provides the layout of the underground mining activities. Figure 7 provides the layout of the open pit conceptual design on the Central shoot. The waste rock dumps are still in a design phase but it is estimated at a stripping ratio of 1:12 that there will be two dumps, each 600 m in length, 60 m in width and 30 m in height. Total disturbance footprint per stockpile estimated at 540 000 m^3.

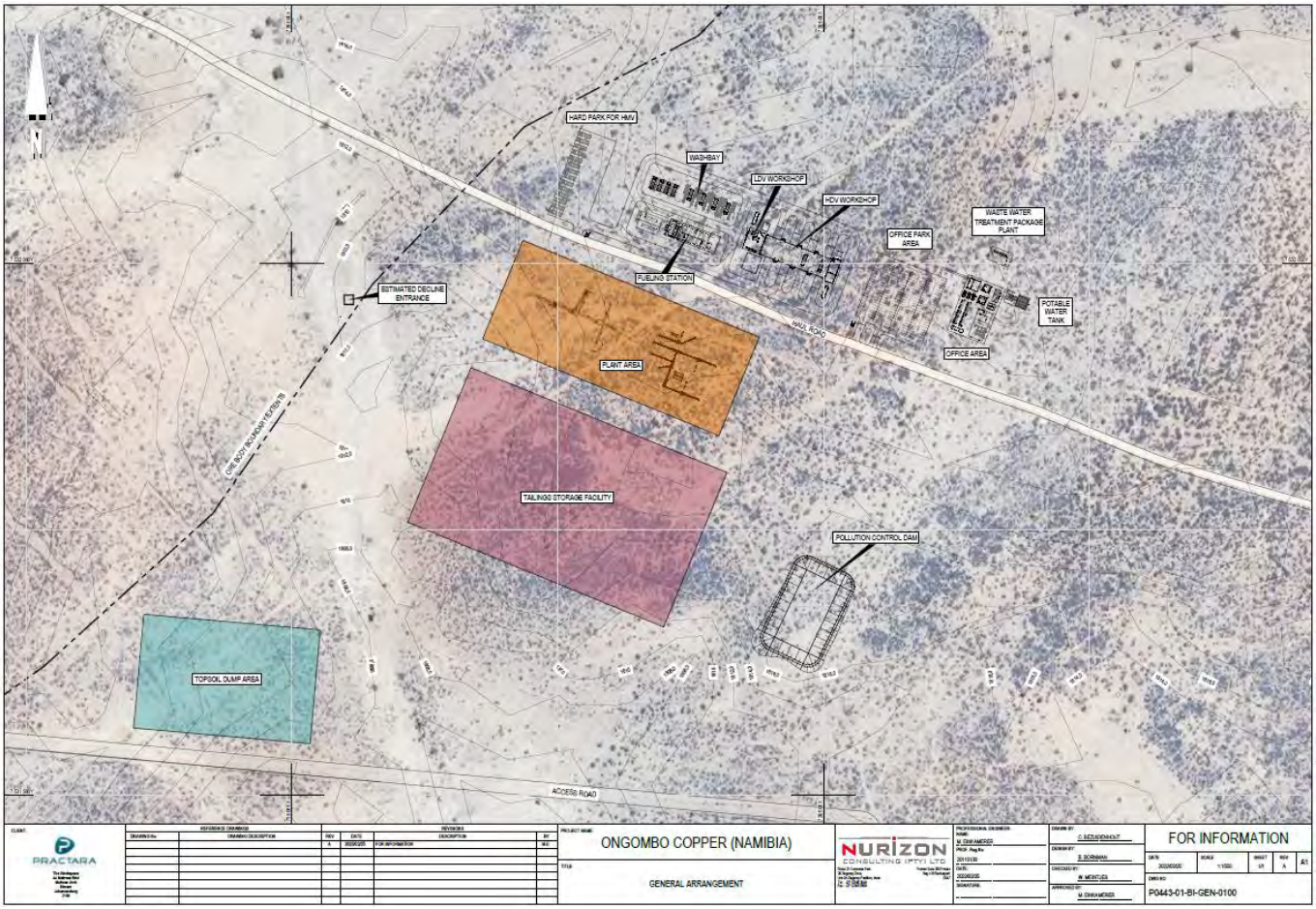

Figure 5 – Proposed site layout including underground mining areas (decline entrance)

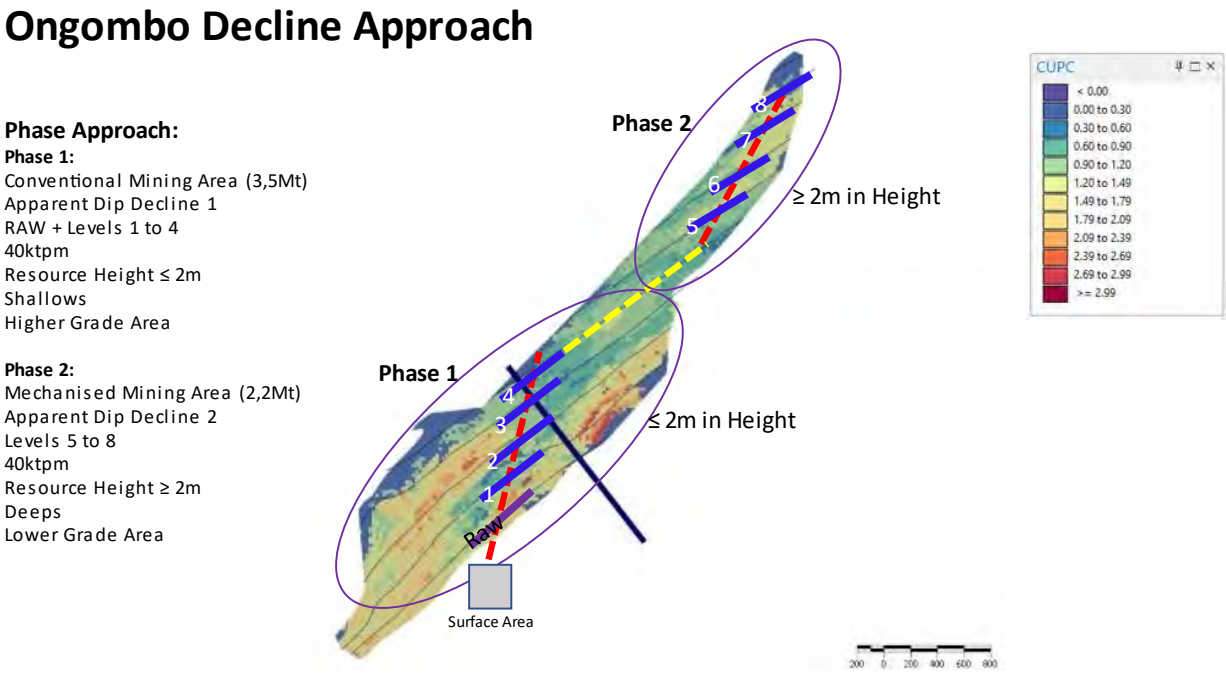

Figure 6 – Proposed site layout showing mining areas (decline approach)

Figure 7 – Proposed site layout showing mining areas (Central shoot open pit), with 40 m high walls and indicated mining cross sections (Source: Practara).

4.7 MINING METHODS, INFRASTRUCTURE, AND SERVICES

4.7.1 UNDERGROUND MINING

Due to the difference in the seam heights of the ore bodies, two mining methods are envisaged: conventional stoping using pneumatic rock drills and scrapers, and bord and pillar mining.

In the first three blocks (Central, East, and East Central) the deposit under consideration is a narrow, intermediate dipping (15° to 20°) tabular body and as such is amenable to a conventional mining approach common to South African narrow gold and platinum mining. Options of both breast and dip mining were considered for extraction of the three areas with breast mining being the preferred mining method as it is possible to establish mining quicker with less preproduction development.

Based on geotechnical inputs an extraction rate of 86 % has been used for all conventional stopes and a 71 % extraction for the bord and pillar section. The minimum mining cut selected for conventional mining is 105 cm and in some cases areas have been diluted to this cut.

The production rate planned from the mine is 40 ktpm. This production rate has been set by matching the production rate from stopes to the development rate and the consequent time taken to open up new raise lines for stoping. The main footwall development is planned on an advance rate of 60m per month. The raise spacing is 200 m, giving a total time of just over three months to complete sufficient footwall development to open up a new raise line. The average tonnage, which can be mined from a raise line, is calculated as follows:

200 m (raise spacing) x 200 m (typical back length) x 1.0 m (stope width) x 3.0 (specific density of rock) = 120 000 tonnes.

To match the production rate to the development rate the maximum production rate possible is 120 000 tons in three months, or 40 000 tons per month. Thus 1.5 development crews are required to support mining operations. For steady state mining utilising conventional mining methods the production target will be over three levels and when possible over two working areas. The application of trackless trucking/conveying and proximity to surface should facilitate the tonnage target.

4.7.2 OPEN PIT MINING

Additionally, conventional open pit mining is planned on the Central shoot. The open pit mining design is currently in a conceptual phase and therefore information provided in this section of the scoping report will be expanded on during the ESIA report. The Proponent is currently finalising geochemistry test work from a recent drilling programme in order for Practara to finalise the open pit mining design and methodology. Currently the conceptual open pit production profile is based on 40 m high walls at a stripping ratio of 1:12 at a production volume of 20 ktpm. It is predicted there will be a 30 % loss applied to in situ volumes for the open pit volumes that could be mined.

Values reported on in this section does not include this variable as this is still at conceptual phase. LOM for the open pit is determined at 20 months. Total ore tonnes to be mined are estimated at 380 000, total waste tonnes estimated at 4 560 000, total tonnes estimated at 4 940 000 and Cu content at 1% estimated at 3800 tonnes. Mining depth is currently shallow estimated to 100 m.

4.8 PORTALS AND DECLINE DEVELOPMENT

The initial development down through the soils and weathered surface zone can be considered as the portal and represents the interface between surface and underground. The support of this section will be designed as a temporarily supported box-cut down to a depth where the highwall can be undercut to go underground. It is envisaged that the ramp to surface will be protected by reinforced concrete culverts and the temporary box-cut then backfilled.

The support strategy for the portals will be devised to suit the ground conditions encountered at the chosen sites. The support elements involved will probably include:

- 4.5 m long by 38 t pre-tensioned full column grouted cable anchors into the bench face.
- 1.5 m long grouted roofbolts with the spacing of the support depending upon the ground conditions encountered.
- Steel fibre or mesh reinforced shotcrete.

Twin declines apparent dip will be developed from surface at the dip of 10° and positioned on reef. The declines will be 5 m by 5m and the hanging wall will be supported by a 1.5 m pattern of 2.4 m grouted rock bolts. It is possible, as at the Otjihase mine, the declines may have to traverse fault zones which may be water bearing with very poor rock conditions. If this occurs it may be necessary to support through such zones with arches and concrete lining or long anchors and shotcrete. Provision will need to be made for the costs of this. A provision of N$3.5 million has been made for supporting the traversing of fault zones. Once in the wider parts of the deeper East Shoot North the declines will be developed in the deposit.

4.9 CONVENTIONAL BREAST MINING

The stoping method employed will be conventional breast mining. Figure 8 shows a typical layout of a conventional breast stoping method.

The spacing between raises is planned at 200 m, resulting in a maximum scrape distance of 100 m in the strike gully. This is considered the maximum strike distance which permits acceptable cleaning time for the stope face.

Each raise will be serviced by footwall drive access and a short crosscut or travel way to the stope at the bottom of the raise. The stope extends on dip (back length) between 180 m and 230 m. This back length is determined by the dip of the physical extent of the mineralized area. Each raise will have between 9 and 11 panels on each side, depending on the back length.

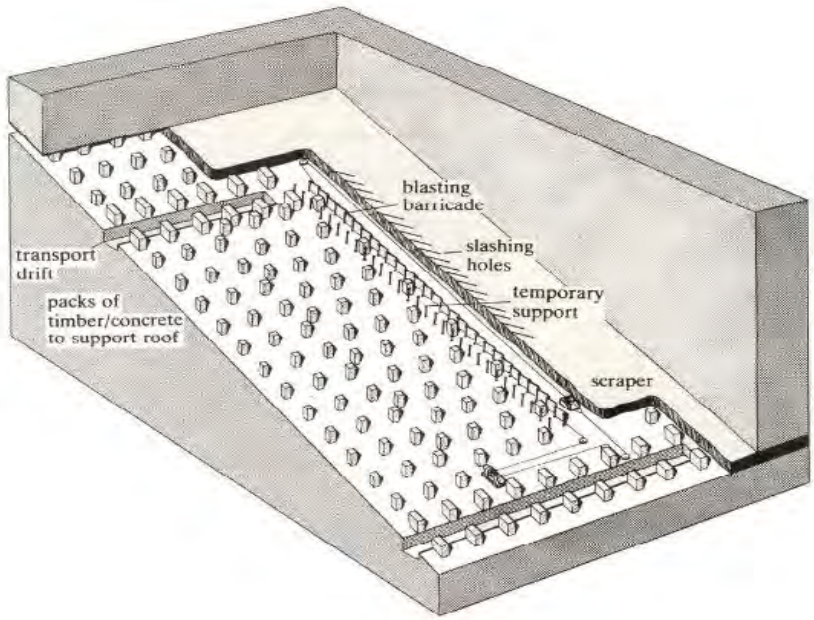

Figure 8 – Schematic view of conventional narrow vein mining method

Stope face length of 20 m per panel is planned at an advance on 12 m per month. This advance rate is considered a reasonable estimate of what is possible in shallow narrow vein operation.
Each raise will be serviced by an ore pass tipping into a crosscut of the footwall haulage. The minimum ore pass length will be approximately 15 m in length (this is dependent on the vertical distance placing of the haulage below the orebody).

4.10 Bord and Pillar mining

Bord and Pillar mining is planned for the deeper and wider sections of the eastern shoot utilising 6m wide bords to a height between 3 m and 5 m with 7 m pillars. Bord and Pillar mining is used in deposits dipping at maximum 15° and is ideally suited for thicknesses between 2 m and 5 m. Haulage ramps are mined diagonally against the dip of the deposit/orebody at shallow enough slopes to utilise trackless equipment. Figure 9 shows a typical stope layout of a Bord and Pillar mining method.

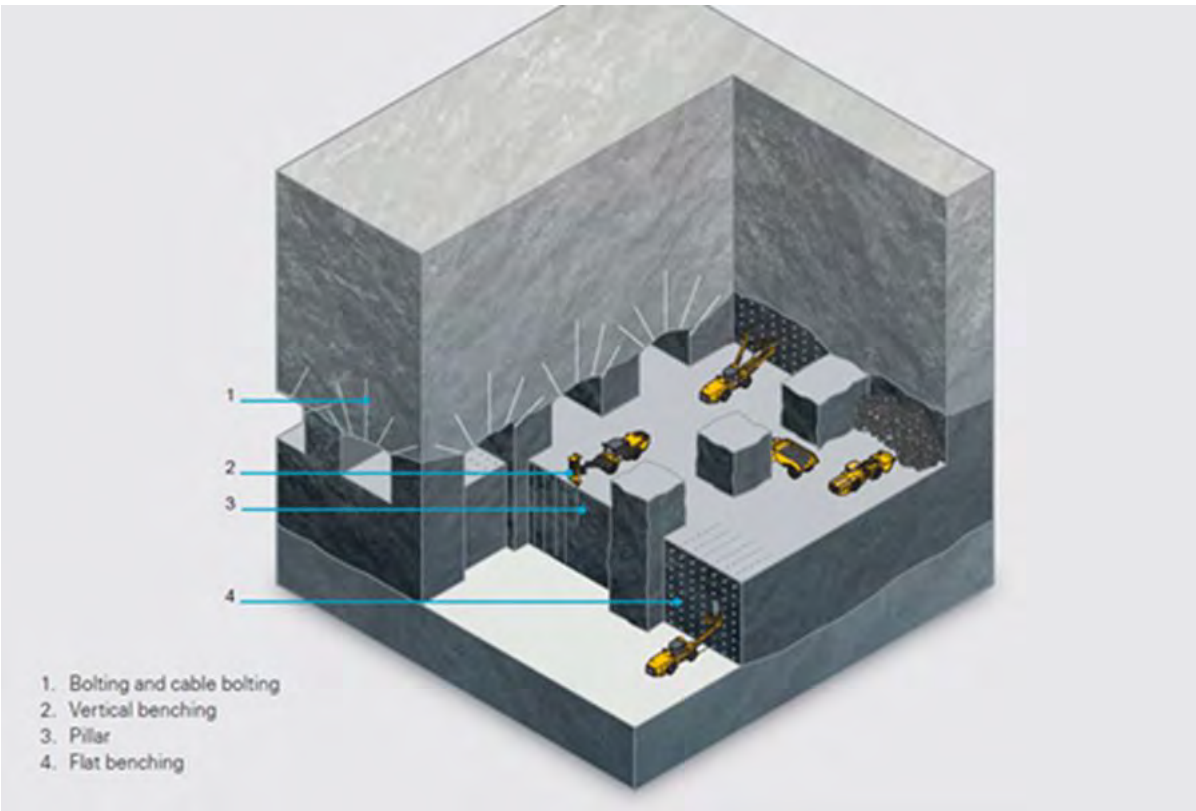

Figure 9 –Schematic View of a Bord and Pillar Mining Method

For the eastern deep area of Ongombo a decline will be developed down the plunge of the mineralised zone at approximately 7.5°. Bords are driven off this decline in an opposite direction and subsequent stopes can be mined out sideways down dip following the slope of the floor. Mining continues for 6 m (maximum span) and at this point the 7 m pillars are left in place for support.

4.11 EQUIPMENT

The most important criteria which influences the selection of mining equipment are the scheduled rates of mining and the geometry of the mining area, which are in most cases interrelated. Generally, the shape of the deposit dictates the stope size, which in turn determines the achievable stoping rate, the most appropriate equipment and finally the development sizes required to accommodate that equipment. The planned operation at Ongombo can be considered to be a typical small-scale hybrid operation, and will therefore use medium sized equipment.
The following are likely and typical equipment required for the operation:

- Jumbo drill/s, single or twin boom
- Haul trucks
- Light delivery/duty vehicles (LDVs)
- Charge up vehicles
- Long hole drills
- Loader or scoop

- Personnel carrier

4.12 VENTILATION

Ventilation is provided to supply fresh air for human respiration and to dilute and remove pollutants in the underground workings. In the case of Ongombo, the principal pollutants will be diesel exhaust fumes, and dust generated from mining. As the mine is shallow, all heat made in the workings as well as that generated by diesel equipment can be removed by adequate ventilation.

The basic principles in dealing with pollutants is to prevent or minimize as far as possible their emission at source and then use sufficient ventilation to dilute the remaining pollutants to a safe level and remove them from the mine. The ventilation design detailed in this report is conceptual and is meant to provide indicative ventilation requirements for costing purposes. Detailed ventilation design work will be required for the next level of the project study.

The twin 5 m x 5 m decline will be developed using a force-exhaust system. The air volume required has been determined from the rated diesel power of the major equipment and is based on two trucks and a loader utilising some 610 kW. For development purposes a figure of 0.06 $m^3/s/kW$ rated power at the point of application may be used. Thus 610 kW x 0.06 $m^3/s/kW$ = 36.6 m^3/s.

At this stage an exhaust ventilation shaft or intake is not planned.

4.13 MINERAL PROCESSING

Full understanding/methodology regarding the mineral processing to be established, plant options or other plant capacity to be established, dark terrain at this stage.
Ongombo is geologically similar to the Otjihase and Matchless deposits in respect of overall mineralogy and metallurgical processing of the sulphide material is expected to have similar requirements. No recent metallurgical test work has been undertaken on Otjihase mine ore, and no work has been completed on the Ongombo deposit.

A testwork programme will be established for any further project stage implemented. Samples of ¼ core from the 2017 Shali Group drilling campaign have been exported to Jubilee Mining in South Afica for SEM study.

Considering the resource estimate and lack of sampling test work completed, the objective of the preliminary plant design is to minimize capital and operating costs and propose a flow sheet that is simple and capable of recovering copper and pyrite from the Ongombo deposit. The flowsheet incorporates crushing and ball milling to liberate the minerals, and flotation plus concentrate and tailings handling and storage. Semi-autogenous milling with several potential advantages may have an application but capital cost and lack of test work precludes this form of comminution at this stage. Otjihase information was used to derive the preliminary plant design and layout.

The Otjihase concentrator is designed as a sequential flotation plant treating a base metal sulphide mineral deposit. The economic metals in the ore are copper and silver with pyrite and small amounts of gold. Historically, the flotation plant sequentially produced copper concentrate, and pyrite concentrate with silver being primarily contained in the copper concentrate. An overall recovery of 87 % is assumed from an average plant head grade of 1.40 % copper.

The flowsheet option proposed is based the flotation operation at Otjihase to derive a scoping study estimate of plant capital costs. The optimum process route may be established on completion of testwork and during the next study phase. The processing facility capital costed for the purpose of this exercise is somewhat simplified in both the comminution and recovery aspects. indicates a typical process flow for copper as shown in Figure 10.

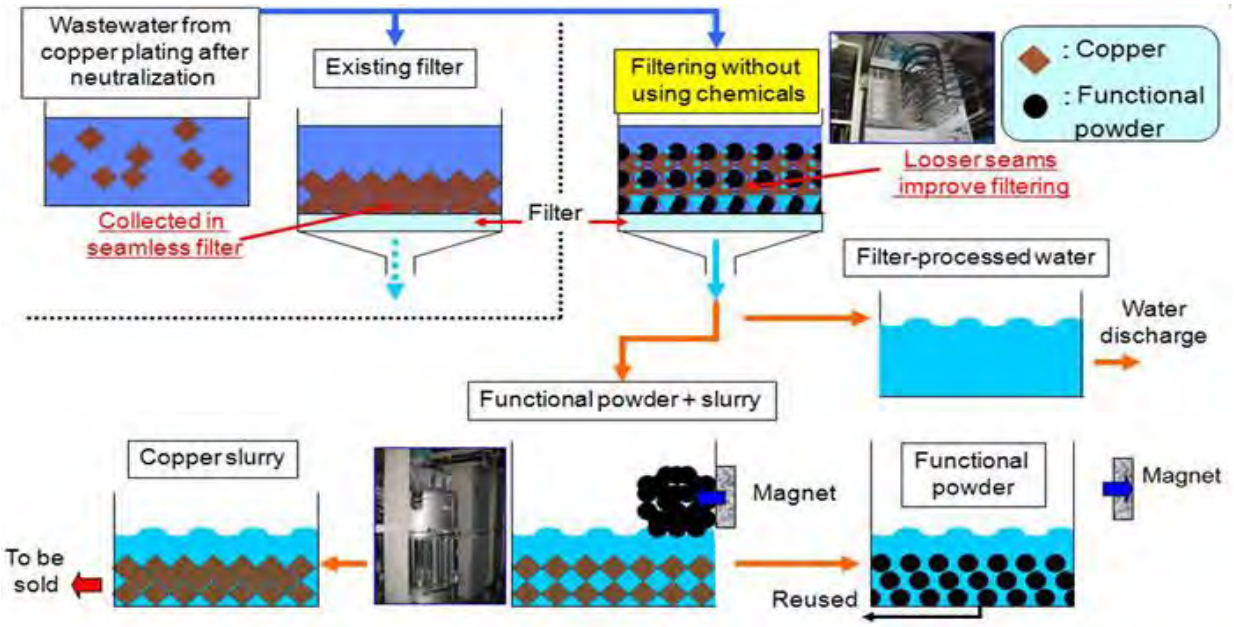

Figure 10 –Typical Copper Process Flow

4.14 MINERAL WASTE

The proposed Project will generate mine waste that will include waste rock and tailings from processing. The location, placement, handling, and storage of this mine waste will be determined based on the site alternatives being considered and the mine waste characterisation test work that will be completed as part of the impact assessment phase.

Rehabilitation requirements are considered in dump location and design, and all dumping areas will undergo an ore sterilisation campaign prior to waste dumping. The waste rock dumping strategy is to reduce the hauling distance and similarly enable progressive rehabilitation of the waste dumps wherever possible. In-pit dumping will also be deployed where possible.

4.15 General waste

Waste will be separated at source, stored in a manner that there can be no discharge of contamination to the environment, and either recycled or reused where possible. On-site facilities will be provided at a dedicated waste storage facility for sorting and temporary storage prior to removal and disposal to appropriate recycling or disposal facilities off-site (Windhoek for general waste and Walvis Bay for hazardous waste).

Industrial waste will be sorted on-site and disposed of at appropriate facilities. Hazardous waste includes, but is not limited to, the following: fuels, chemicals, lubricating oils, hydraulic and brake fluid, paints, solvents, acids, detergents, resins, brine, solids from sewage, and sludge. A waste specification will be developed and included in the assessment phase and incorporated into the EMP.

4.16 Effluent and wastewater

Sewage will be collected and will use gravity reticulation via buried sewer pipes to be transported to the treatment facility. Sewage will be treated in a purpose-built sewage treatment plant. The plant will have the capacity to treat the sewage generated on-site per day. The water output from the plant will be suitable for use in dust suppression, vehicle washing, irrigation, fire water, and process water.

4.17 Rehabilitation and closure

The Proponent will commit to establishing a rehabilitation plan as part of the mine closure plan. An environmental consultant, in conjunction with the Proponent and the specialist consultants working on the mine design, and those undertaking the environmental impact assessment, will draft a conceptual mine closure plan as part of the EMP requirements, and this will be updated into the assessment phase.

5 ENVIRONMENTAL AND SOCIAL BASELINE

5.1 BASELINE DATA COLLECTION

Initial desktop baseline studies relevant to the project formed part of the initial environmental assessments conducted for the exclusive prospecting licences on which the project is situated. As part of this assessment, the baseline was studied in detail, with inputs from specialist studies commissioned as part of the environmental and social impact assessment process.

5.2 DESKTOP AND FIELD SURVEYS

Initial desktop baseline studies were completed for the project by various consultants and groups between 2012 and 2020 for the EPLs assessments. Additional desktop and field-based baseline studies will be completed in 2022 and will build onto the dataset of site data.

This section sets out the biophysical and socioeconomic environments in which the project is situated. It is an important part of the scoping component of the assessment, as it determines if there are any knowledge gaps that require additional information prior to the assessment phase being completed.

5.3 SPECIALIST STUDIES

The following specialist studies should be considered as set out in Table 8, in order to determine the current state of the baseline environments to support the full ESIA for the mining project:

Table 8 - Specialist studies conducted for the ESIA

STUDY AREA	PURPOSE
Terrestrial ecology	– Biodiversity and habitat – Identification of species of concern and sensitive areas – Impacts of mining construction and operations on habitats and biodiversity
Hydrology	– Water supply – Storm protection and river diversion – Impact downstream users – Clean and dirty water management systems
Groundwater	– Assess the potential for contamination of aquifers – Provide a model to determine impacts of drawdown and plume mobility – Assess the sustainability of boreholes for water supply if required
Air quality	– Provide emission standards and dust suppression requirements – Assess prevailing wind directions and possible effects of emissions on the process and/or personnel – Model potential air quality impacts
Noise and sense of place	– Identification of possible receptors, and assess levels of noise to which they may be exposed during construction and operations

STUDY AREA	PURPOSE
Soils and land use	– Assess existing land use, and potential impacts on surrounding land users – A soil study informs the quality and quantity of material available for rehabilitation to a similar state on closure
Traffic	– The traffic impact assessment will study the potential traffic impacts and loading on routes associated with the mining activities – Assessing the capacity of infrastructure and safety aspects of the mine entrance – Assessing the need for an intersection upgrade at the mine entrance, and providing a concept layout plan if necessary
Heritage and culture	– A heritage assessment is required, in order to comply with Namibian national legislature
Visual and tourism	– Assessing the potential visual impacts of a proposed project on the receiving environment
Geochemical sampling and analysis	– The geochemical analysis of waste rock, tailings, and overburden will be undertaken to assess the mineralogical composition, acid mine drainage potential, and metal concentration of the leachate of waste rock and tailings
Blast vibration impact	– Assessing the impact of blasting on receptors in the area

5.4 LAND USE

The Project is situated in a commercial agricultural region and the land use is dominated by cattle, game and small stock farming. Figure 12 outlines the proposed mining licence area (ML 240) with surrounding farms.

The Project area is not part of any communal conservancy, although the SEEIS private conservancy borders the Project area (EPL 5772) and the Namatanga private conservancy are located south and south east of the site (Enviro Dynamics EA report, 2016). Refer to Figure 11. The proposed Project is in an area of relatively well-developed infrastructure on the farms Ongombo East and Ongombo West (Figure 12).

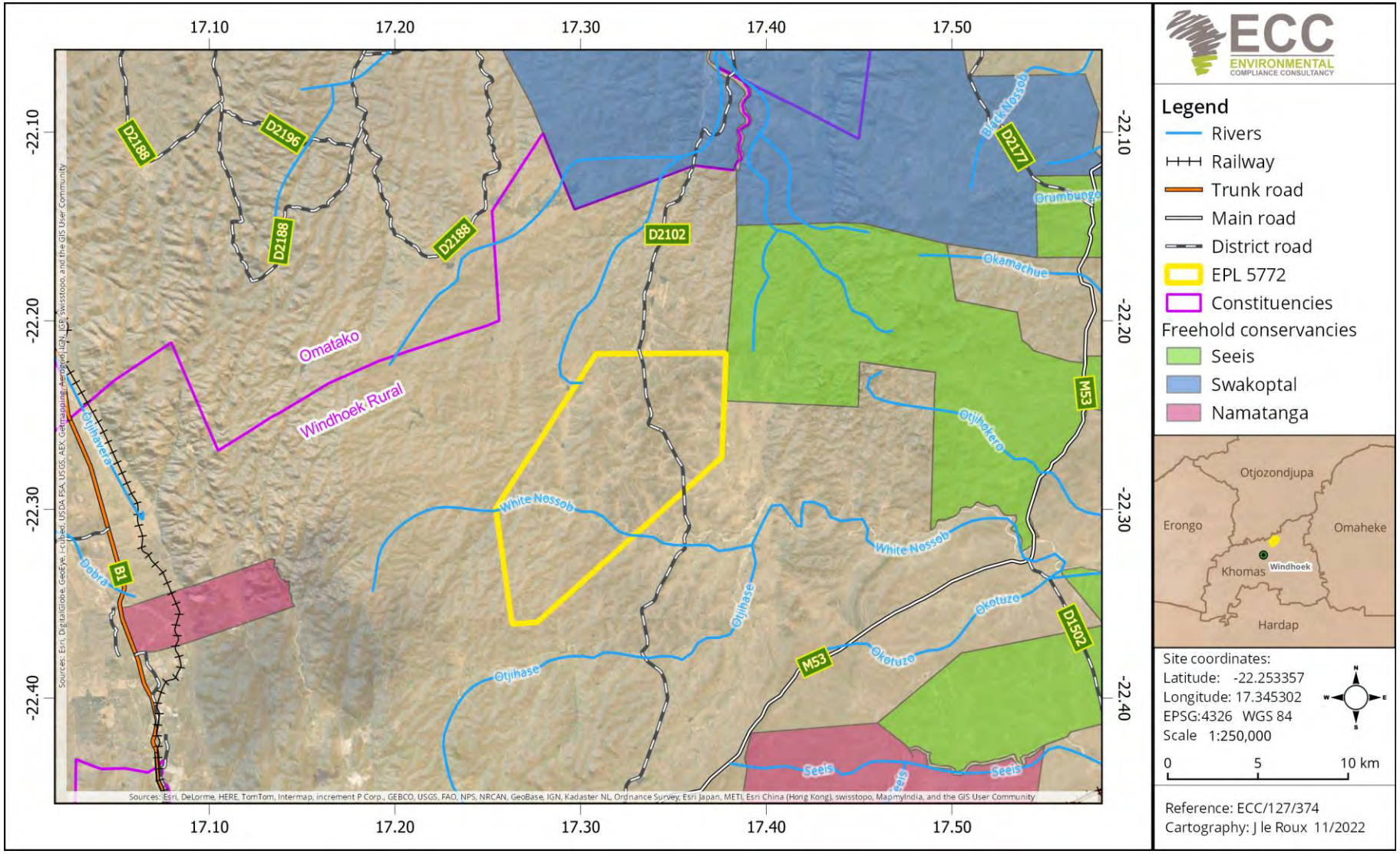

Figure 11 – Constituencies and conservancies in relation to the Ongombo Copper Project (EPL 5772)

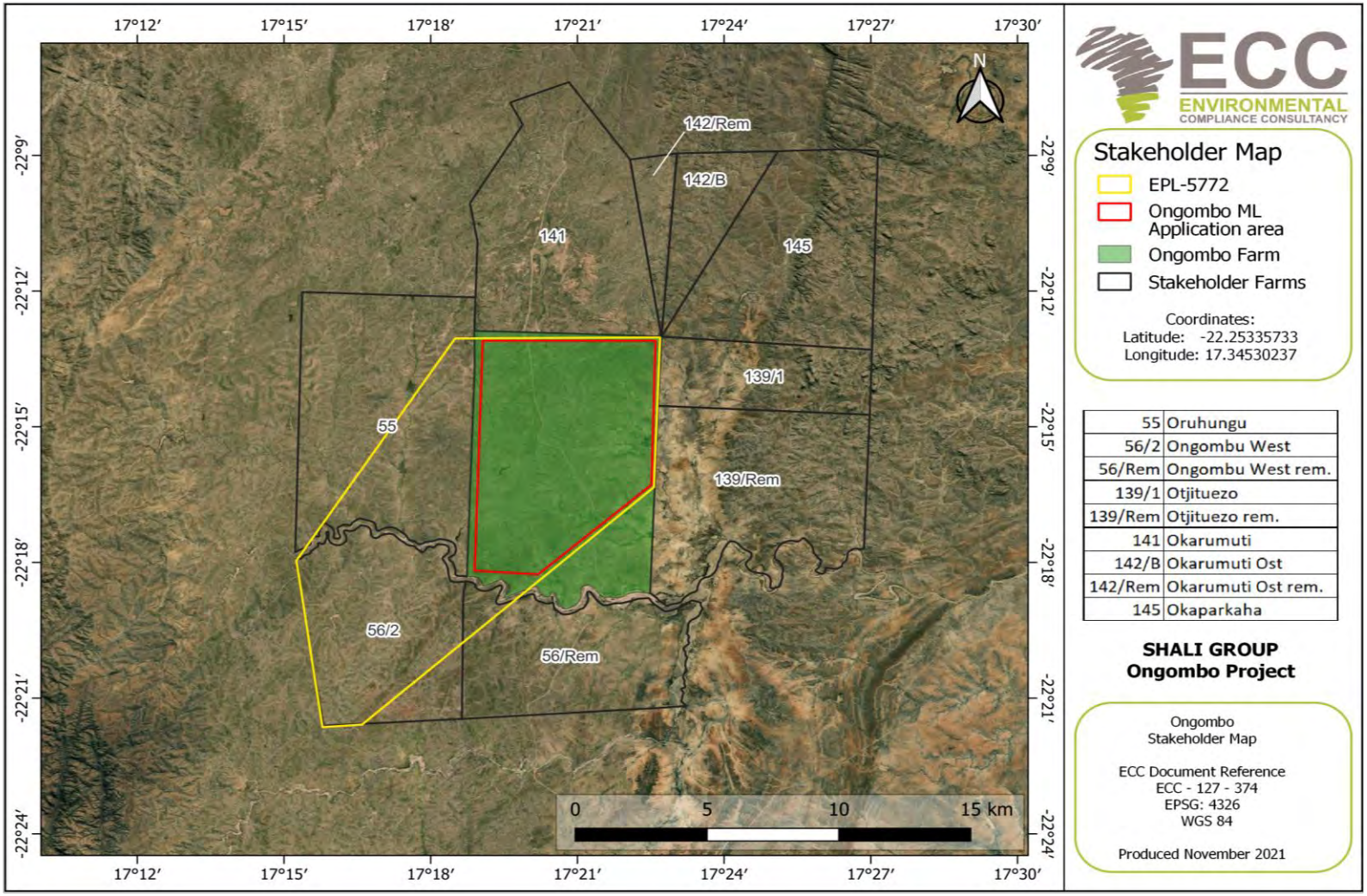

Figure 12 - Project location in proximity to farms

5.5 INFRASTRUCTURE AND BULK SERVICES

The Project is in vicinity to adequate services and well-developed infrastructure. The City of Windhoek is the nearest major town with a large population centre that hosts all modern amenities and public services.

The Project is outside of the settlement areas and has no municipal services other than the fixed line telephone service which parallels the gravel road to Midgard, passing through the licence area. The main access road to Ongombo East will be from the trunk road, which joins the main gravel road just north of the White Nossib River.

5.6 BASELINE BIOPHYSICAL ENVIRONMENT

Namibia's climate is generally characterized as arid, with approximately 90 % of the overall landmass being hyper-arid, semi-arid or arid. The coastal regions are characterized by the Namib Desert whilst the eastern parts of the country are dominated by the Kalahari Desert. The only permanent flowing rivers in the country lie near or form part of the country's international borders to the north and the south. Low and highly variable rainfall leads to corresponding variability in run-off, stream flow and groundwater aquifer recharge.

Water demand has continued to grow with the county's development and this has become a evolving challenge for urban areas located far from perennial water sources. The countires main water consumer are the agriculture and mining sectors. The county is investigating expanding new water sources as part of a long-term plan for water security and supply, this may include desalination. Currently, groundwater extraction remains the cheapest available source of water in Namibia.

The central Namibia area where the Project is located receives between 350 – 400 mm of rain per annum. The average annual temperature is approximately 20°C. The approximate elevation for the site is 1800 metres above sea level.

It is likely that the soil types vary from Eutric Regosols and Leptosols to Ferraic Arenosols, which do have the potential to support moderate levels of agricultural. Vegetation types around the site area are limited to scattered shrubs with frequent patches of bare soil typical of the Acacia tree and shrub Savannah. There are no perennial rivers in the immediate vicinity of the project area, however there is the presence of occasional non-perennial drainage lines.

5.7 CLIMATE

5.8 TEMPERATURE

The area has a hot and dry climate with mean temperatures of 31°C and 15°C for summer and winter respectively. Summer rainfall varies between 350 – 450 mm per annum.

5.9 WIND TEMPERATURE

Predominant wind direction is from the east, with an average wind speed of 2.6 mps (metres per second), and a calm of 6.0% as shown in the centre of the windrose. Calm is a period when there is limited to no activity recorded on the windrose. Calm is expressed as a percentage of the mean value over the period from 2010 – 2021 as shown in Figure 13. (Iowa State University, 2021).

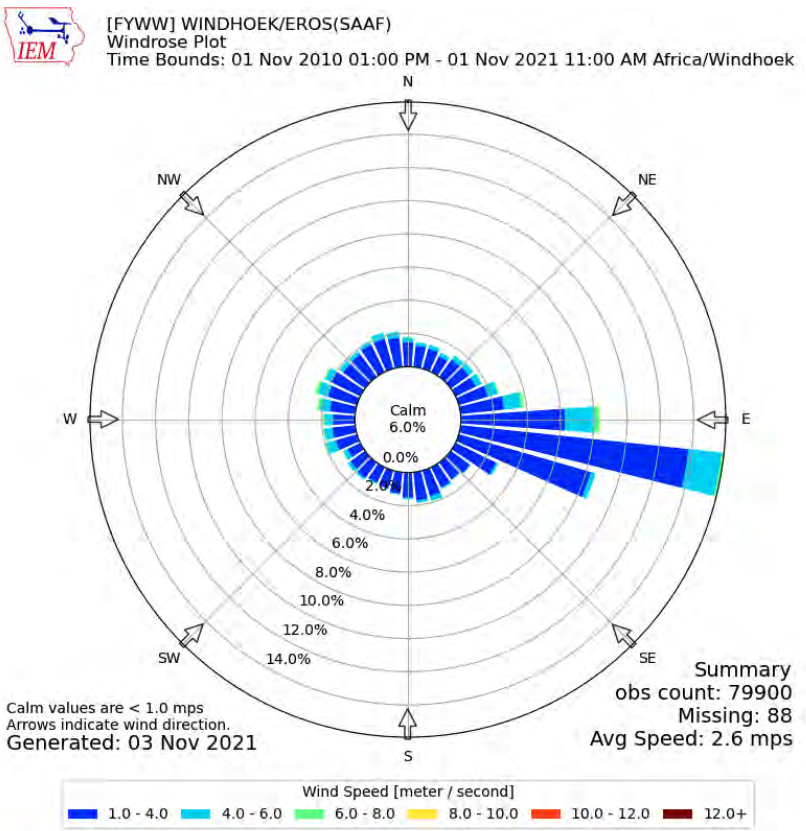

Figure 13 - Prevailing wind direction and wind speed in the area of the proposed Project (Source: Iowa State University, 2021).

5.10 Rainfall and evaporation

The average annual rainfall for the region is 366 mm, 86 % of which falls during the summer months. March is the wettest month of the year with an average rainfall of 79 mm. The evaporation rate is in the region of 3 200 mm a year (Mendelsohn et al, 2009). Rainfall is highly erratic and unpredictable over the entire Khomas Hochland region, with the highest rainfall months being January to March. According to the Department of Water Affairs as much as 83% of the rainfall evaporates before it reaches the ground, 2 % enters drainage systems and only 1% recharges the ground water sources.

5.11 Geology and geomorphology

The local geology is summarised from a collection of reports compiled by the Proponent during exploration activities. The Ongombo Project is situated within the Matchless Belt, which is an important geology component of the area. The Matchless belt extends for 400 km through the intracratonic branch of the late Proterozoic Damaran orogenic belt (Figure 14). It hosts several volcanogenic-exhalative, stratiform and strata- bound cupriferous pyrite deposits containing subordinate and variable amounts of zinc, lead, silver and gold. The average grade of the ten most important deposits is 2.3 % Cu, with a range of 1.3-3.9 % Cu. There is a total of 18 individual ore bodies that have been recognized including the Gorob, Matchless, Otjihase, Ongeama and Ongombo deposits. Iron sulphides generally dominate the sulphide mineralogy of the deposits, pyrite being dominant. Chalcopyrite is the most important sulphide economically, although bornite, galena, sphalerite, and marcasite have been historically reported (Enviro Dynamics EA report, 2016).

5.12 Regional geology

The Matchless Belt is hosted by the Kuiseb Formation of the Damara Sequence, which consists of a monotonous sequence of quartz-biotite schist. Minor calc-silicate rock and carbonaceous schist within the Kuiseb Formation indicate the sequence has a metapelitic origin. There is no significant compositional difference in the schists across the quartz-biotite schist sequence, although the relative abundance of individual schist units varies considerably (Practara technical report, 2021).

The Matchless belt can be traced over a strike length of about 400 km from a point 100 km southeast of Walvis Bay, through Windhoek, to the vicinity of Steinhausen in the east-northeast, before being lost under the Kalahari sand cover. The belt varies in width between about 1.5 km in the extreme southwest to about 3 km in the northeast, and is characterised by the presence of amphibolitic rocks incorporated within the Kuiseb schists. Geochemical, mineralogical, and textural studies have led to the conclusion that the amphibolites of the Matchless Belt represent an intercalation of subsequently metamorphosed basic to intermediate submarine tholeiitic volcanic rocks. Textures also indicate the presence of

metamorphosed gabbroic and ultramafic intrusive rocks (Killick, 1982). An age of emplacement of 765 Ma for the amphibolites has been suggested by Kroner (1980).

The proportion of extrusive to intrusive material varies along the length of the Matchless Belt. In the Gorob area in the southwest, a discrete zone about 1.5 km thick contains only two major amphibolites, which are predominantly extrusive in origin. By contrast, towards the northeast, the ultramafic schists become more conspicuous, and around Ongombo in the northeast, metamorphosed intrusive rocks are reported to predominate. Mineralogical investigations undertaken by Gold Fields Namibia Limited indicate that at least some of the amphibolites at Ongombo were originally lavas (Lauenstein, 1990). Refer to the Ongombo Copper Project Technical Scoping by Practara, 2021, for a detailed geology and mineralization of the proposed Project.

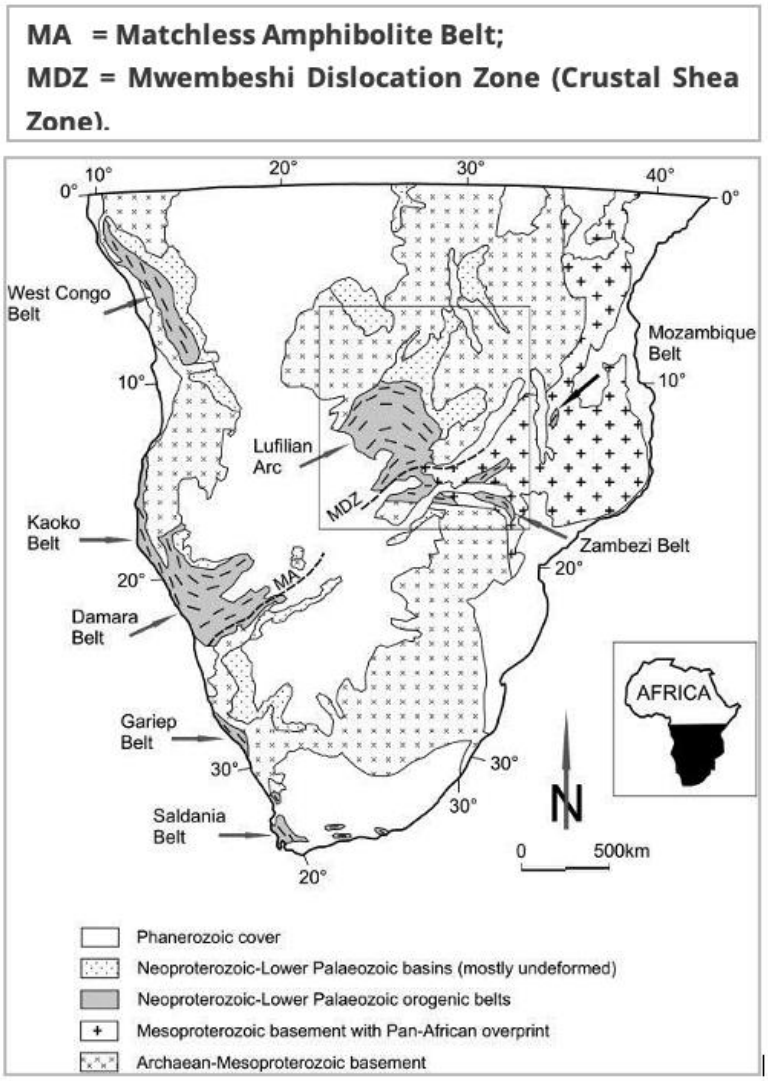

Figure 14 - Location of the neoproterozoic orogenic belts and basins in the precambrian tectonic framework of Southern Africa (Cailteux et al, 2015)

5.13 LOCAL GEOLOGY

The Ongombo Project lies within the Matchless Member of the Kuiseb Formation and Khomas Group, a conspicuous assemblage of lenses of foliated amphibolite, chlorite-amphibolite schist, talc schist and metagabbro. The Matchless Belt (Figure 15) is up to 5 km wide in the Otjihase area, stretches 350 km east-north-eastwards in the Southern Zone of the Damara Orogen from the Gorob - Hope (Figure 14) area towards Steinhausen, north of Omitara (Practara technical report, 2021).

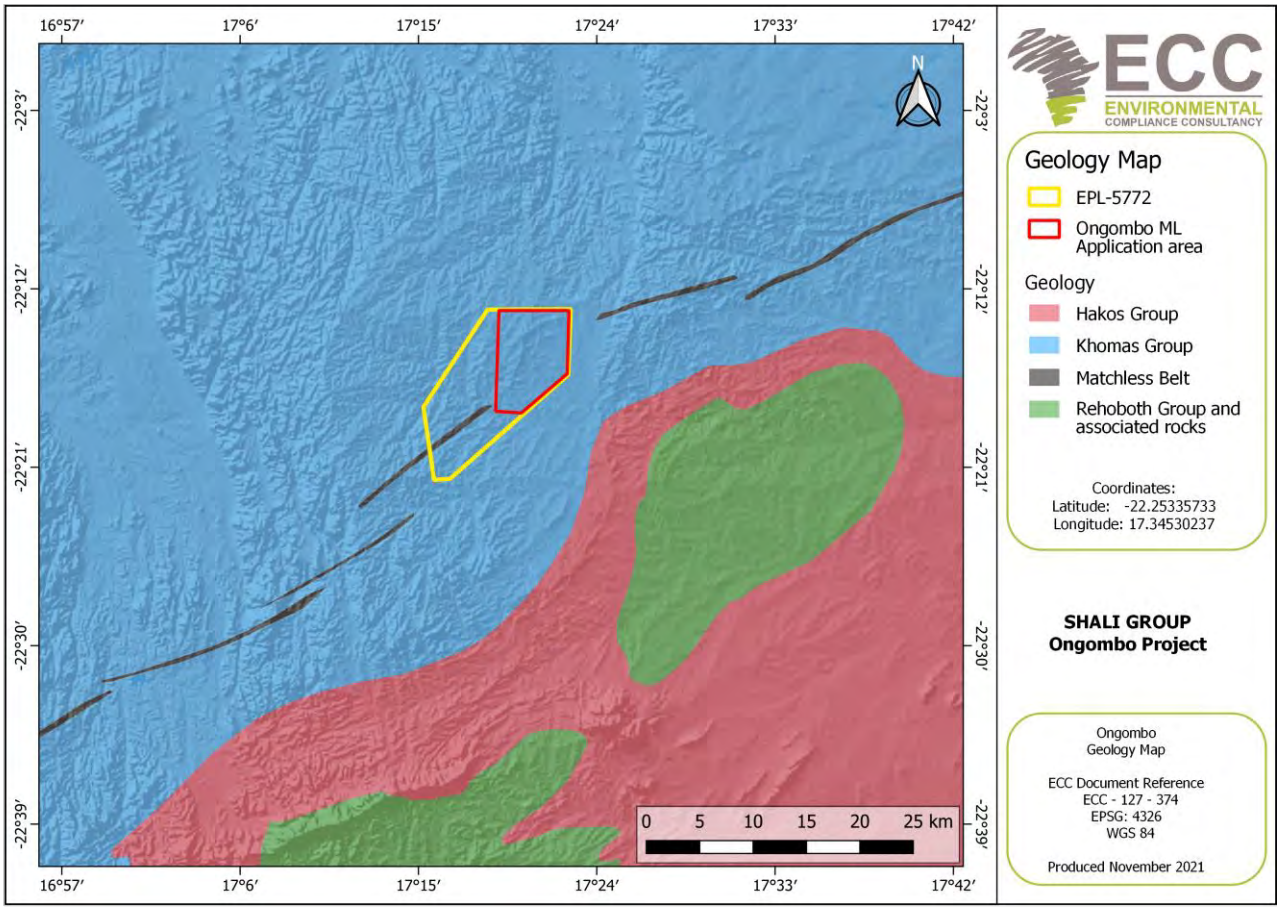

Figure 15 - Local geology of the proposed site

The Matchless Belt hosts several volcanogenic-exhalative, stratiform and strata-bound cupriferous pyrite deposits containing subordinate and variable amounts of zinc, lead, silver and gold. The deposits range in size from 0.3 to 16 million tonnes averaging 2 % Cu, and are generally attributed to a Besshi-type genetic model (Moroni 1990, Slack 1993). The deposits occur in close association with the amphibolites and lie near the southern edge of the Matchless belt throughout its exposed strike length. However, the detailed position of the deposits relative to the amphibolite varies considerably (Killick, 1982).

A total of 18 individual ore bodies have been recognized within the Matchless Belt and the most important are the Hope, Gorob, Matchless, Otjihase, and Ongombo deposits (Figure 16) There are close similarities between the mineralization at the individual deposits (Practara technical report, 2021).

Four main clusters have been recognized which may correlate spatially with palaeovolcanic centres (Killick, 1982). The Gorob cluster in the southwest consists of eight sulphide lenses distributed about a large synformal fold. The Niedersachsen cluster consists of three separate gossanous magnetite-quartzite occurrences associated with quartz-sericite schist. The largest occurrence at Niedersachsen, comprises three lenses with a total strike length of about 1.8 km, and the other two occurrences each have a strike length of about 1 km. The Matchless cluster consists of the Matchless Mine deposit which has been previously worked as well as three additional sulphide bodies. The Otjihase cluster in the northeast consists of the Otjihase deposit, which is the largest known occurrence on the Matchless belt, as well as the Ongeama and Ongombo deposits.

The most striking characteristic of these sulphide deposits is their intimate and invariable association with one or more magnetite-quartzite horizons, which can be barren or mineralised. Although the magnetite-quartzites are characteristically discontinuous, they are generally laterally more extensive than the associated sulphide mineralisation. The magnetite-quartzites are massive or banded, and generally contain 5 to 40 percent magnetite by volume. With increasing mica content, the magnetite quartzites grade through sericite-quartzite into quartz-sericite schists containing little to no magnetite. The schists adjacent to the magnetite-quartzite, quartz-sericite schist, and sulphide mineralisation are commonly aluminous and may contain significant amounts of sericite, cordierite, sillimanite, staurolite, kyanite, garnet, clay and prehnite (Killick, 1982). Chlorite is a common constituent of the aluminous schists, the magnetite-quartzites, and quartz-sericite schists.

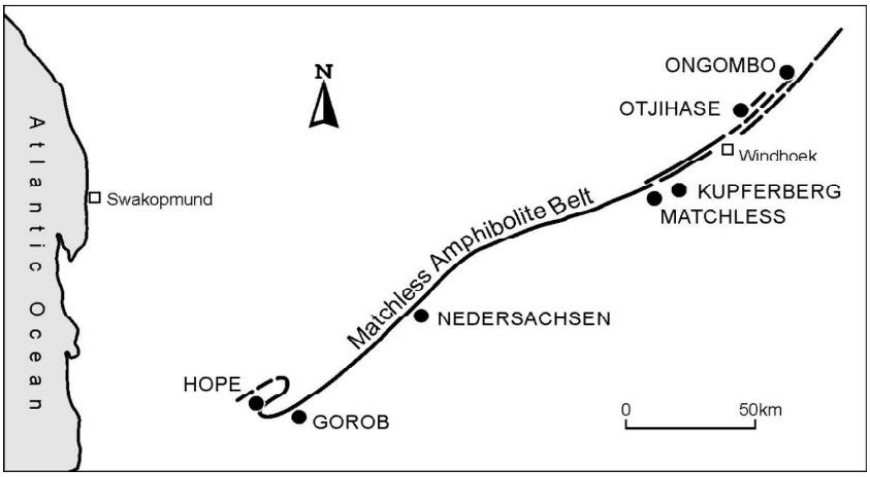

Figure 16 - Matchless belt with major sulphide deposits (Breitkoft and Maiden 1988)

Amphibolites and amphibole-schists may also be directly associated with the sulphide mineralization. At the Matchless mine most of the copper mineralisation is hosted by the hanging wall amphibolite or underlying amphibolite schist. The shape of the Matchless deposits varies from tabular to ribbon-like but all are stratiform. Non-metamorphosed stratiform massive sulphide orebodies are generally circular in plan, and the present shapes of the Matchless deposits are considered to be influenced largely by Damaran orogenic crustal shortening. The stratabound ores are considered by Hartnady (1979) to be of Besshi type, forming initially on the sea floor and afterwards emplaced into continental margin sediments. Killick (1983) however, considers the deposition to be syngenetic, and to have developed within the four volcanic centres spread out along the Matchess Belt.

The surface expression of the sulphide deposits varies from true gossans with box work structures after sulphides to limonite-stained quartzite's and mica schists. Secondary copper minerals, although present are generally inconspicuous. Chrysocolla and atacamite have been reported in outcrop at Gorob, and cuprite, chrysocolla, native copper, bornite, covellite, chalcocite, and tenorite have been reported from the upper levels of the Matchless Mine. Native copper has also been reported from the interface between the oxide and sulphide zones in the Otjihase Mine. The oxidation depth for the deposits of the Otjihase cluster is generally 20 to 25 m vertically below surface. The deposits comprising the Gorob cluster are generally oxidized to a depth of 35 to 40 m vertically below surface, the top 5m being leached of copper minerals. This variable depth of oxidation can be related to the different geomorphological domains occurring over the considerable length of the Matchless Member (Killick, 1982). Goldfields defined a linear Pb-Co soil anomaly at Ongombo which extends along strike to the northeast beyond the gossan outcrops (Practara technical report, 2021).

5.14 Topography and soil

The terrain in the project area is gently undulating with elevations in the range of 1700 m – 2000 m above mean sea level (amsl) (Figure 17). The landscape is flat with some sharp topographical contrasts. Generally there is a rise in elevation from west to east and from north to south, with the highest readings to the northwest of the proposed project area. (Mendelsohn et al, 2002).

Ongombo is located by the Khomas Hochland Plateau, which is the large ridge of higher ground in the centre of the country. Although the Hochland is generally characterised by rolling hills, the proposed itself falls within an area of rugged and heavily dissected terrain with some rocky outcrops.

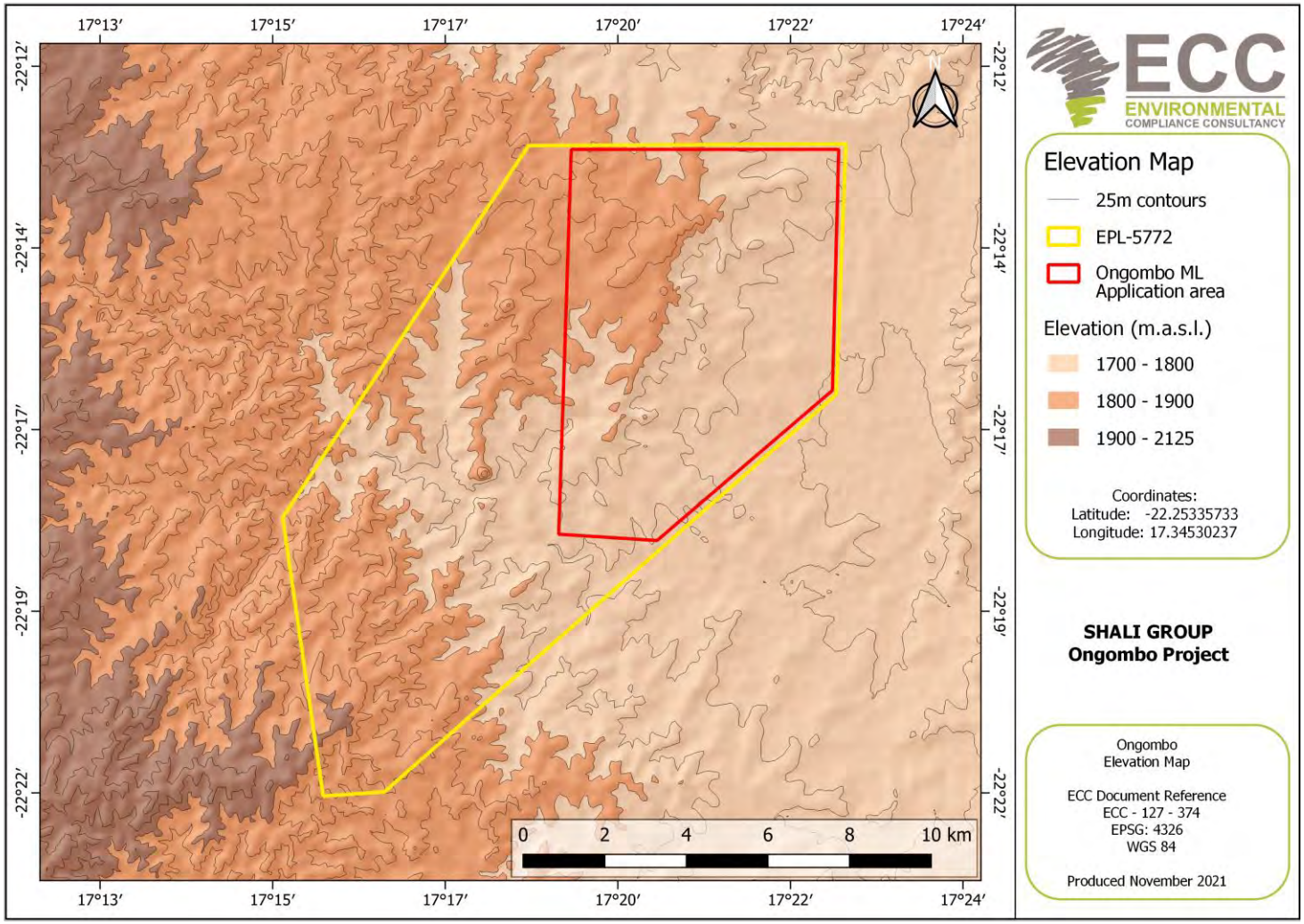

Figure 17 - Elevation profile along the proposed Project site

The landscape is dominated by rolling hills and covered by scrub and grassland. The Swakop River runs through the proposed project area. Photos of the landscape and the Swakop River are shown in (Figure 18). The main economic activity in the area is stock farming, game hunting and eco-tourism.

Figure 18 - Ongombo landscape (left); the swakop river divides the proposed Project area (right)

The soil fertility is relatively low to medium, dominated by chromic cambisol soil type, and red soils, characterised by good holding capacity and internal drainage. These soils are not particularly fertile and have limited agricultural potential. The primary land use in the area surrounding the proposed project area is livestock and game farming.

Ongombo is largely covered by the Regosol soil group (Figure 19). Regosols typically form in actively eroding landscapes, especially in the hilly or undulating areas that cover much of the southern and north-western Namibia. These coarse-texured soils are characterised by the presence of a continuous hard-rock. Regosols are therefore shallow and often contain much gravel. As a result the water holding capacity is low and the vegetation occurrence is often subject to drought. Vegetation cover on these thin soils is generally sparse because they cannot provide most plants with sufficient water or nutrients, however it can support low-density stock farming or wildlife (Mendelsohn et al, 2002).

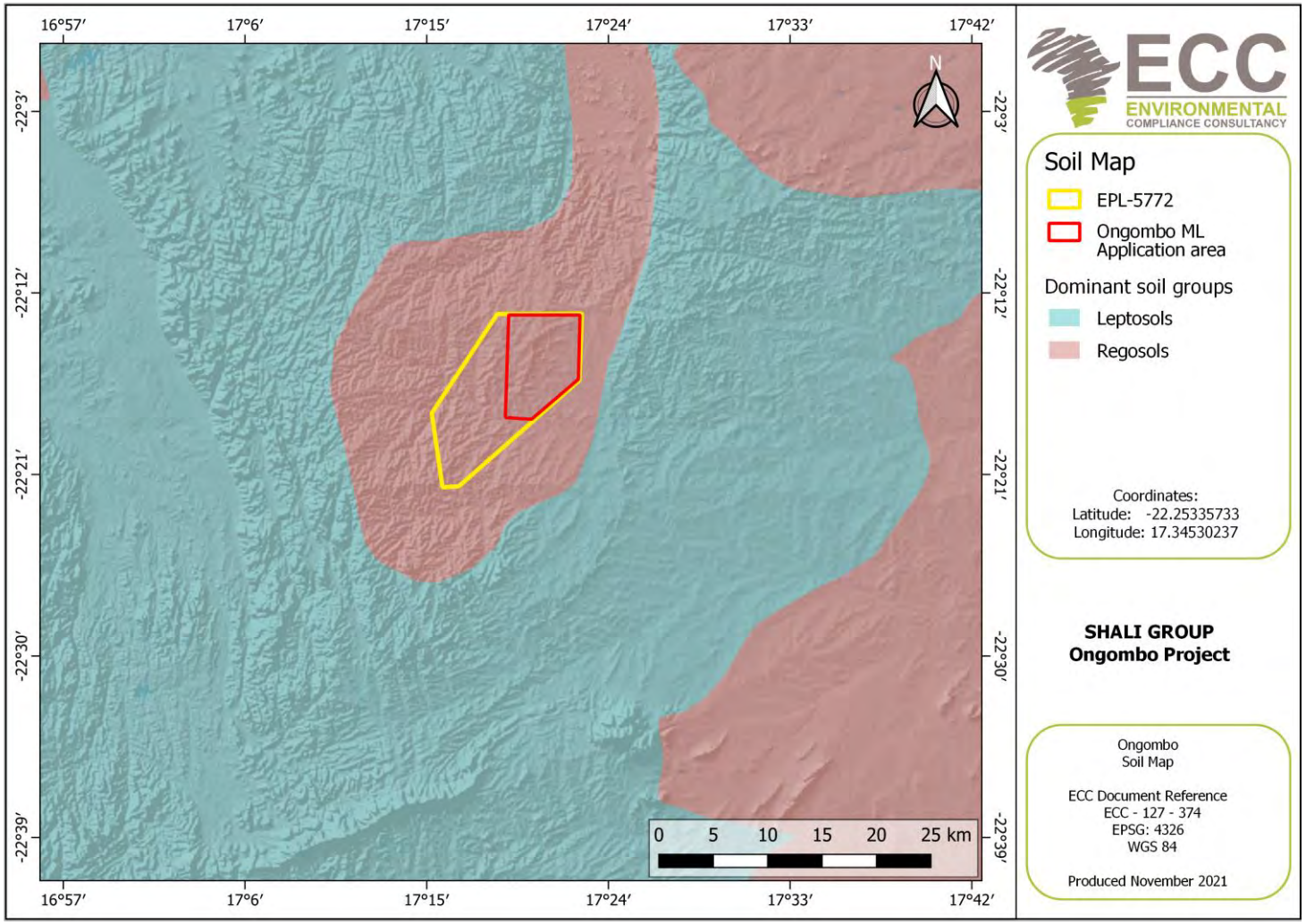

Figure 19 - Regional and local soil map of the proposed Project

5.15 HYDROGEOLOGY

Namibia's varied geology encompasses rocks of Archaean to Cenozoic age, thus covering more than 2600 million years (Ma) of Earth history. Nearly half of the country's surface area is bedrock exposure, while the remainder is covered by young surficial deposits of the Kalahari and Namib Deserts. Metamorphic inliers consisting of highly deformed gneisses, amphibolites, meta-sediments and associated intrusive rocks occur in the central and northern parts of the country, and represent some of the oldest rocks of Palaeoproterozoic age (ca. 2200 to 1800 Ma) in Namibia (Christelis, et al., 2011).

Based on their hydrogeological characteristics, the extremely varied lithology's occurring in Namibia were grouped into 12 main units for the Hydrogeological Map. While stratigraphic positions and spatial distribution were taken into consideration, the main focus was placed on the groundwater potential of the rocks. The resulting sub-division is therefore quite different from the lithological units shown on the Geological Map of Namibia (Figure 20).

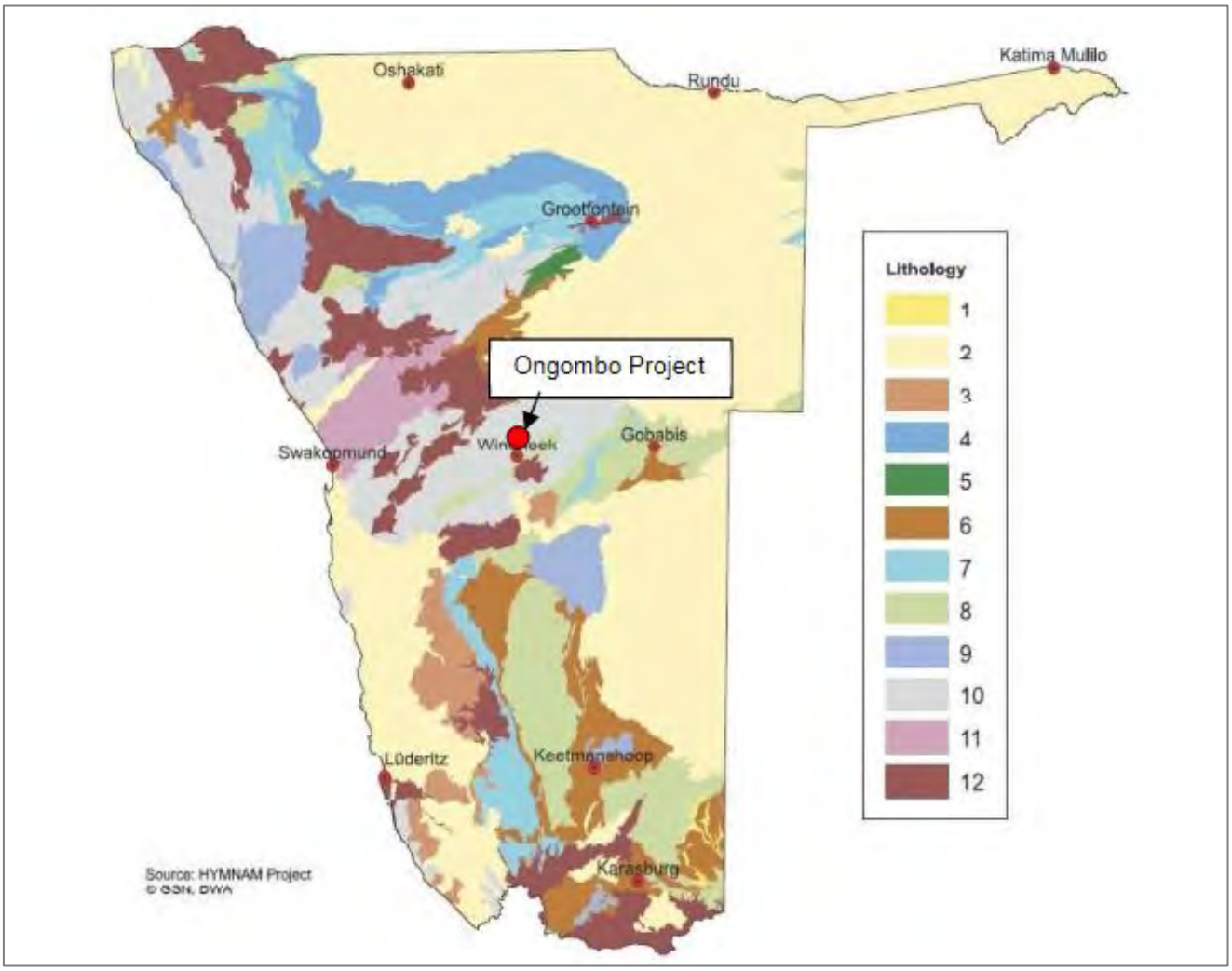

Figure 20 - Simplified lithological map of Namibia (Christelis, et al., 2011)

The following units were established:

1. Sand and gravel, valley deposits (alluvium).
2. Unconsolidated to semi-consolidated sand and gravel, locally calcrete.
3. Unconsolidated to semi-consolidated sand and gravel, locally calcrete; with scattered bedrock outcrops.
4. Calcrete.
5. Sandstone.
6. Shale, mudstone, siltstone.
7. Limestone, dolomite, marble.
8. Non-porous sandstone, conglomerate, quartzite.
9. Volcanic rocks (Karoo and younger).
10. Metamorphic rocks, including quartzite and marble bands.
11. Metamorphic rocks, including quartzite and marble bands; with granitic intrusions.
12. Granite, gneiss, old volcanic rocks.

The Ongombo Project area falls within sub-division 10 and many different, highly folded rock types of Mokolian and Namibian ages are included in this unit. These extend from the Gobabis area to the Gamsberg region and then southwards to Helmeringhausen. The 1800 million year old Rehoboth Sequence is thought to have formed in the back-arc basin of a magmatic arc and comprises schist, phyllite, amphibolite and quartzite. Rocks of the Sinclair Sequence accumulated within an intra-continental drift. Deposition of quartzites took place in narrow fault-bounded troughs in today's Helme- Ringhausen-Solitaire area after a cycle of magmatic activity. Damaran rocks present in this unit include schists of the basal Nosib Group, marbles of the Ugab and Kudis Subgroups, schist, phyllite and amphibolite of the Chuos Formation and marble, schists and amphibolites of the Karibib and Kuiseb Formations, including the Matchless Amphibolite Belt (Christelis, et al., 2011).

5.16 GROUNDWATER BASIN

The country has been divided into twelve hydrogeological regions based mainly on geological structure and groundwater flow (Figure 21). Their boundaries were chosen to encompass areas of similar geology and hydrogeology (Christelis, et al., 2011). The Ongombo project area is situated on the western side of the Hochfeld-Dordabis-Gobabis groundwater area which stretches from east of Windhoek to the eastern border of Namibia. It mainly includes sandveld between the Kalahari basins of northern Omaheke-Epukiro and the Stampriet artesian basin.

The eastern Khomas Region, up to the Hosea Kutako International Airport, is mountainous, drained in an easterly and south-easterly direction by the ephemeral Seeis, White Nossob and Black Nossob rivers that originate in the highlands to the east of Windhoek and Okahandja. The area is characterized by tree savanna and rich grasslands, which support a thriving cattle industry (Christelis, et al., 2011).

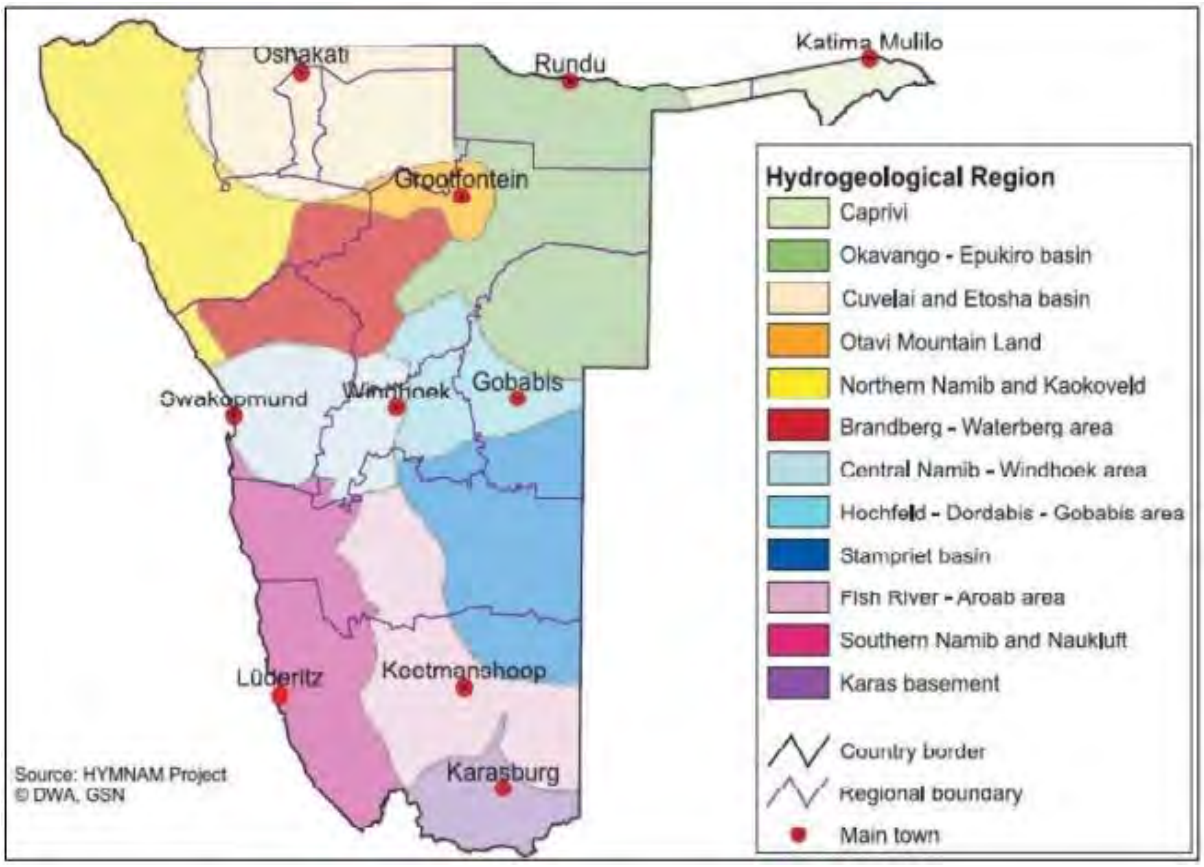

Figure 21 - Groundwater basins and hydrogeological regions in Namibia (Christelis, et al., 2011)

5.17 GROUNDWATER FLOW GRADIENT

There is generally a relationship between groundwater elevation and topographic elevation. This relationship is known as the Bayesian relationship and was tested by plotting the borehole collar elevation against the measured groundwater elevation. If a linear correlation of 75 % or more exists it can be assumed that the groundwater table would mimic the topography. Figure 22 shows the draining systems flowing downstream the proposed site towards the White Nossib River.

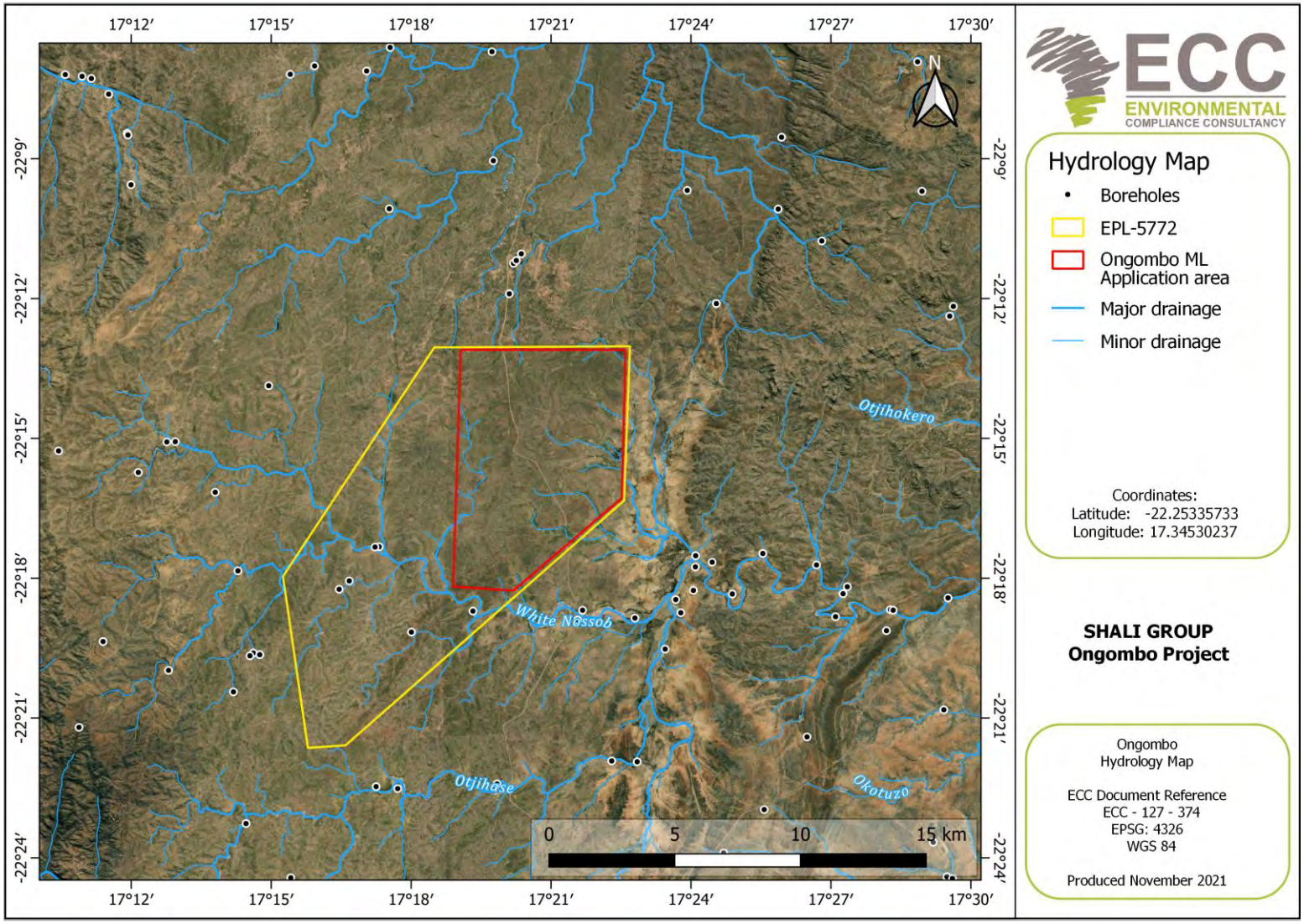

Figure 22 - Hydrology map of the proposed Project

5.18 Biodiversity

5.19 Vegetation

The proposed project area is covered by the tree and shrub savanna vegetation type (Figure 23). It is broadly classified as a dense shrubland vegetation structure, with vegetation dominated by relatively dense stands of woody shrubs and trees. The grass cover ranges between 51 – 75 %, in some places plant growth becomes progressively shrubby, especially where the soils are shallower, slopes are steeper and where it is more hilly and rocky. Most of the woody vegetation varies between one and three metres in height. Thorny Acacia species dominate but a number of species are closely associated with the higher elevations only. Thornbush thickets dominate on the sandy parts and calcrete-rocky parts (Mendelsohn et al, 2002).

A variety of savanna type vegetation covers most of the Namibian lands, of which the thornbush and mountain savannas are the most dominant ones to occur in the central highlands. Less water infiltrates during the growing season when vegetation cover is denser and plants take up water for growth and transpiration Christelis and Struckmeier, 2001). Grazing resources are made up of a wide variety of grass species, which vary widely in palatability and in their abundance. Large parts of the farmland on and around Ongombo Project area are marked by bush encroachment, mainly as a result of long continuous periods of selective grazing by livestock. The encroachment has led to a decreased carrying capacity on many farms and the invader bush is managed in several ways as a result, one of which is the production of charcoal for export.

Plant diversity is estimated at >500 species (Mendelsohn et al, 2002), although local differentiation as a result of topography and the availability of water is possible. One of the identified potentially, growing important plant specie in the surrounding area is the Mopane (*Colephospemum mopane*). Biophysical baseline information does not accentuate the uniqueness of mountain vegetation suggesting the diversity of plant species may be restricted to relatively small areas in which there are several habitats and niches offered by micro-climate, elevation and sheltered spaces.

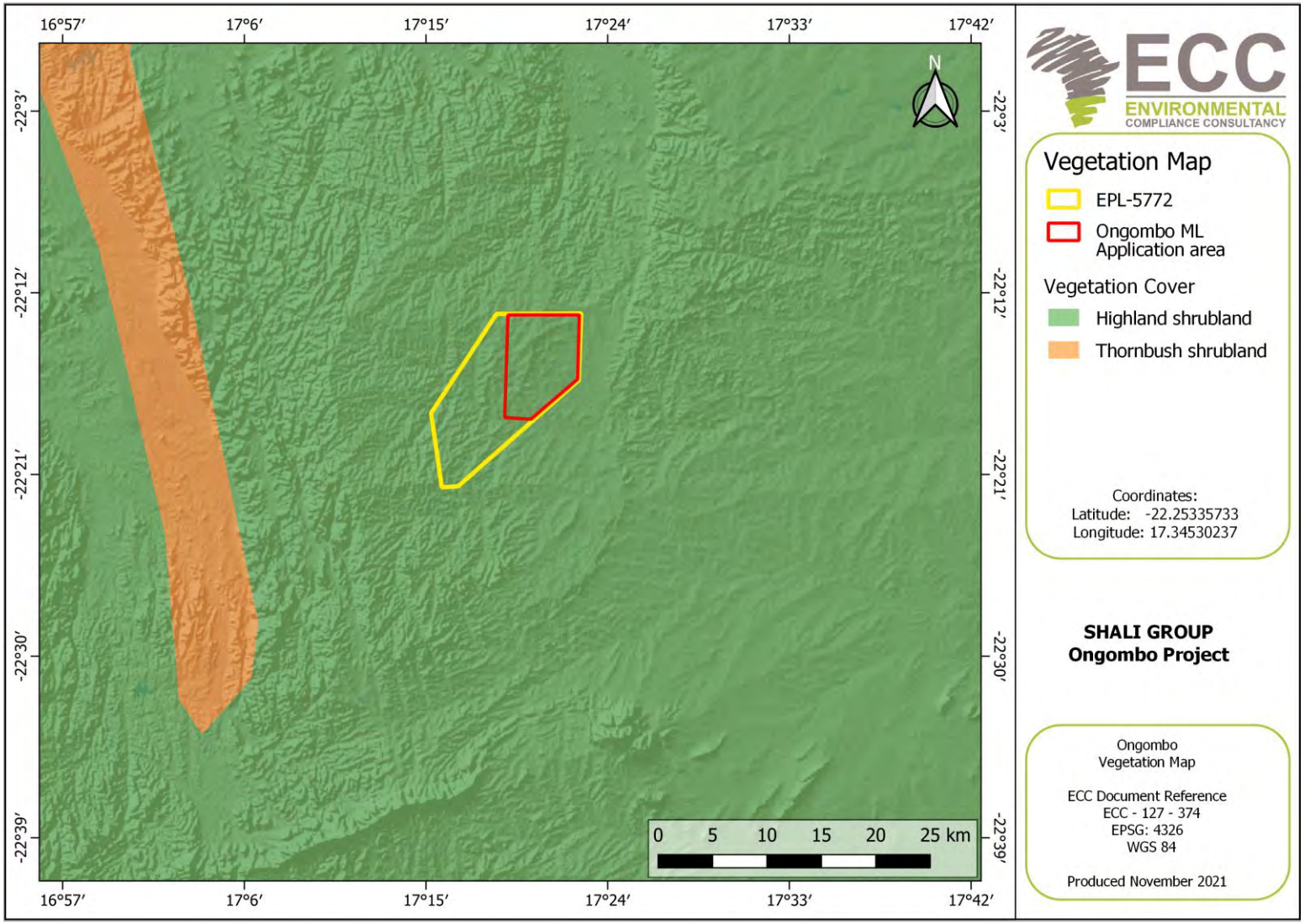

Figure 23 - Vegetation map of the proposed Project site

5.20 FAUNA SPECIES

Overall terrestrial biodiversity of the project area ranges from medium to high. The number of mammal species ranges between 61 and 75, the number of bird species is between 201 and 230, with 71 – 80 reptile species, 12 – 15 frog species and 10 – 11 scorpion species that could be expected (Mendelsohn et al, 2002). High bird diversity reflects the presence of a greater range of habitats compared with surrounding areas. The vegetation of the proposed project area in combination with the higher elevation support many birds that are absent from the surroundings.

On a local scale it is expected that diversity increases with the increase in habitats, which is closely coupled to shelter, food and water availability and migration routes. The micro-climate associated with an increase in elevation plays a prominent role in this regard and is directly related to the increase in terrestrial diversity, and the relative abundance of water in the area.

The dominant land use within and on the surroundings of the proposed project area is extensive agriculture, in particular large livestock farming and to a lesser and limited degree crop production. For crop production some farmers apply irrigation, mainly to produce fresh vegetables.

5.21 SOCIO-ECONOMIC BASELINE

The economy of Namibia is driven heavily by its primary and tertiary sectors, these include mining, fishing, livestock farming and wholesale and retail services. The majority of the population are directly or indirectly dependent of the agricultural sector, being the largest employer in Namibia.

Future projected economic growth is expected to come from the mining industry, increased tourism activities, and the agriculture sector through additional irrigation projects.

Current socio-economic limitations include:

- A high dependence on natural resources.
- Population growth and settlement patterns - the country is sparsely populated with only certain areas supporting high human settlement density.
- Health care - access to adequate health care between urban and rural areas remains a problem.
- Poverty and inequality - Namibia has one of the greatest skewed income distributions globally with the poor relying heavily on subsistence activities for survival.

The primary socio-economic issue related to mining projects is the potential relocation of either indigenous or settled populations as this aspect is often expensive and timeous.

5.22 SOCIO-ECONOMIC BACKGROUND

The Khomas Region is the central region of Namibia and is named after the Khomas Hochland, the prominent highland that surrounds Namibia's capital. In the west and northwest, the region is bordered by the Erongo Region, by the Otjozondjupa Region to the northeast, the Omaheke Region to the east and the Hardap Region to the south. Although the Khomas Region only occupies 4.5 % of the land area of Namibia, it accommodates the largest percentage (18 %) of the national population total (NSA, 2017).

Namibia is one of the least densely populated countries in the world (2.8 people per km^2). Vast areas of Namibia are without people, in contrast to some dense concentrations, such as the central-north and along the Kavango River.

The population density in the Khomas Region is 4.2 times higher (12 persons per km^2) than the national figure; the projected total population for the Khomas Region was 415,780 by 2016. In the Khomas Region, 95 % of the people live in urban areas, with Oshiwambo being the most spoken language (41 % households), the average household size is 3.5 people and the literacy rate is 97 % for people older than 15.

Living in an urban environment implies better living conditions. At least 99 % of all households have access to safe water, only 25 % have no toilet facility, 64 % have electricity for lighting and only 7 % of the population depend on open fires to prepare food (NSA, 2017).

The urban population pyramid for Namibia shows a very clear dominance of the age group 20 – 35 as well as for infants (0 – 4 years of age). As the majority of people in the Khomas Region are living in an urban area, the dominance of Windhoek is further apparent. The population of the Khomas Region is young, most of them within the child-bearing age range. The urban population pyramid for Namibia contrasts sharply with the one for the rural population. The base of the pyramid reflects people younger than 25 and forms the majority of the total population, meaning that most people are young Namibians (NSA, 2017).

Namibia is divided into 14 regions, subdivided into 121 constituencies. Khomas Region is divided into ten constituencies. Each region has a regional council, elected during regional elections per constituency. Towns are governed through local authorities, in the form of municipalities. Windhoek is the national capital city and as such hosts many of the national head offices as well as the head offices of the Khomas Regional Council. Windhoek is governed by a local authority in the form of a city council.

The dominance of Windhoek as a place of residence in the Khomas Region is apparent, all other urban places in the Khomas Region are classified as settlements, the lowest order of governed populated places in Namibia. Places such as Baumgartsbrunn, Groot Aub, Seeis and Dordabis are managed directly by the central authority.

5.23 DEMOGRAPHIC PROFILE

Namibia is one of the least densely populated countries in the world (2.8 persons per km^2). Vast areas of Namibia are without people, in contrast to some fairly dense concentrations, such as the central-north and along the Kavango River. Windhoek, the capital, functions as a primate city, not only is it the urban area with the biggest population, but the concentration of private and public head offices attracts Namibians from all parts of the country in search for a better life. National population growth rate is estimated at less than 2 %, lower than most African countries.

Namibia's population is young, although 57 % falls in the age group 15 – 59, 37 % of the total population is younger than 15 (NSA, 2017). Since 2005 there has been a steady improvement in life expectancy, currently estimated at 65 years. In 2018 it was estimated that 50 % of all Namibians are urbanized, in other words living in an urban settlement (retrieved from www.worldpopulationreview.com). The last national census was conducted in 2011 and counted 2.1 million Namibians. An inter-censal demographic survey was conducted in 2016 and estimated the total population at 2.3 million (NSA, 2017).

5.24 GOVERNANCE

Since independence in 1990, Namibia is led by a democratically elected and stable government to date. The country ranked top 5 out of 54 African countries in the Ibrahim Index of African Governance in 2015 for the indicators including the quality of governance and the government's ability to support human development; sustainable economic opportunity; rule of law and human rights; and development of smart information and communication technology to access information for socio-economic growth (National Planning Commission, 2017).

As a result of sound governance and stable macroeconomic management, Namibia has experienced rapid socio-economic development. Namibia has achieved the level of 'medium human development and ranks 125th on the Human Development Index out of 188 countries (National Planning Commission, 2017).

The Namibian constitution provides for the establishment of Local authorities by law under the Municipal Ordinance, 1963 (Ordinance 13 of 1963) and the Local Authorities Act, No. 23 of 1992. As such the Local Authorities have the power to pass by-laws for the effective administration of their Municipalities and Communities.

5.25 INFECTIOUS DISEASES

Since independence in 1990, the health status of Namibia has increased steadily with a remarkable improvement in access to primary health facilities and medical infrastructure. Despite the progress, the World Health Organization (WHO) in 2015 recommended strategic priorities of the health system in Namibia which include improved governance, an improved health information system, emergency preparedness, risk reduction and response, preventative health care and the combating of HIV/AIDS and TB (WHO, 2016).

HIV/AIDS remains a major reason for low life expectancy and is one of the leading causes of death in Namibia. There is a high HIV prevalence among the whole population, but since the peak in 2002 (15 000 new cases of HIV per year, and 10 000 yearly deaths due to AIDS) the epidemic started to stabilise (UNICEF, 2011). Although new infections, as well as fatalities, halved during the next decade, life expectancy for females returned to pre-independence levels but for males, it did not reach pre-independence levels yet. HIV/AIDS remains the leading cause of death and premature mortality for all ages, killing up to half of all males and females aged 40 - 44 years in 2013 (IHME, 2016).

Tuberculosis (TB) is a leading killer of people infected by HIV/AIDS, and Namibia has a high burden – in 2018, 35 % of people notified with TB were infected with HIV. The country is included among the top 30 high-burden TB countries in the world, with an estimated incidence rate of 423 per 100,000 people and 60 fatalities per 100,000 people in 2018 (retrieved from www.mhss.gov.na).

Over the period 2000 – 2013 significant rises were observed for stroke, ischemic heart diseases, diabetes, and depressive disorders, but HIV/AIDS remained the top cause of premature mortality. Over the same period, significant decreases were observed for diarrheal diseases, neonatal conditions, and malaria. Risk factors are key drivers of premature mortality, and social ills were identified as the leading factor for death – particularly unsafe sex and alcohol and drug abuse. TB and malaria are compounded by the AIDS epidemic, and the risk of contracting malaria and TB is 15% greater if a person is also infected with HIV, with a risk of 50 % higher to die as a result (IHME, 2016).

As of the beginning of 2020 the coronavirus disease (COVID-19), a communicable respiratory disease, causes illness in humans at a pandemic scale and has resulted in an increasing number of deaths worldwide. The viral outbreak is adversely affecting various socio-economic activities globally, and with reports of the increasing number of people testing positive, it is anticipated that this may have significant impacts on the operations of various economic sectors in Namibia too. The disease caused many countries to enter a state of emergency and lockdown mode, with dire economic consequences.

According to the socio-economic impact assessment of COVID-19 in Namibia by the United Nations Namibia (2020), 96.5 % of tourism businesses have been affected by COVID-19 in 2020, there was a 2 % to 3 % decline in net export, an estimated increase in unemployment from 33.4 % to 34.5 % and through a best-case scenario it is also estimated that poverty will increase from 17.2 % to 19.5 %, COVID-19 have resulted in a loss of learning and socialising and there has been a 6 % increase in health workers.

5.26 Employment

In 2018, 53.4 % of all working Namibians were employed in the private sector and 21.5 % by the state. State-owned enterprises employ 7.6 % Namibians and private individuals 16.6 %. Wages

and salaries represented the main income source of 47.4 % of households in Namibia. Agriculture (combined with forestry and fishing) is the economic sector with the most employees – 23 % of all employed persons in Namibia work in this sector. Agriculture is also the sector that employs the most informal workers in Namibia, calculated at 87.6 %. Wages of employees in the agriculture sector are lower than all other sectors except for workers in accommodation and food services and domestic work in private households (NSA, 2019).

Low education levels affect employability and prevent many households to earn a decent income. Of all people employed in Namibia, 63.5 % are not higher qualified than junior secondary level (Grade 10 and lower). In total 11.8 % of all people employed had no formal education. In total 29.1% of all people employed fall in the category "elementary occupation" and 15.2 % in the category "skilled agriculture" (NSA, 2019).

Overall, the rate for unemployment is estimated at 33.4 % for Namibia, using the broad definition of unemployment. More than 60 % of the population is over 15 years of age and about one-third of the total population can be regarded as part of the labour force. The unemployment rate in rural and urban areas is almost the same – 33.4 % in urban areas and 33.5 % in rural areas. The highest unemployment rates are found amongst persons with education levels lower than junior secondary. The unemployment rate of persons with no formal education is 28.6 %, with primary education 34.6 % and with junior secondary education 32.7 % (NSA, 2019).

5.27 Economic activities

In the Khomas Region, 74.5 % of all households depend on salaries and wages as their main income source, only 0.2 % of households depend on subsistence farming as the main income and 9.7 % of all households get their main income from non-farming business activities (NSA, 2019).

In contrast to most of Namibia's other regions, agriculture is less prominent in the Khomas Region where the majority of people are urbanized. The figure for informal-employed people is also lower (55.6 %) as people are employed in a wider range of secondary and tertiary economic sectors such as administration, services and manufacturing (NSA, 2019).

Since 2016, Namibia has recorded slow economic growth, registering an estimated growth of only 1.1 % in 2016. The primary and secondary industries contracted by 2.0 and 7.8 % respectively. During 2017 the economy contracted by 1.7, 0.7 and 1.9 % in the first, second and third quarters respectively (NSA, 2019). Despite the more positive expectations, the economy retracted to average growth of not more than 1 % annually since 2017.

5.28 Cultural heritage

In Namibia several mountains are closely coupled to heritage values. A review of the National Heritage Council database was conducted, and no known heritage sites were identified on the proposed project site area, moreover no heritage sites were encountered during the exploration

phase of the Project. In cases where heritage sites are discovered the "Chance Find" procedure will be used.

If any historical or heritage sites(s) of importance on or around the project area are encountered during construction and operational activities these shall be reported to the Monument's Council in Windhoek. Moreover, as per the environmental assessment procedures, it is further required that heritage assessments be conducted for mining operations.

5.29 Noise and vibrations

The proposed location is in a rural area outside of Windhoek and there might be onsite increase in the noise levels generated during the construction and operational activities. However, the noise levels as permissible in the city would not be altered from the project's site operations. Noise impacts can be managed according to best practise and the recommended mitigation measures provided in the EMP, it is further recommended that a noise assessment should be conducted for the ESIA.

6 IMPACT IDENTIFICATION AND EVALUATION METHODOLOGY

6.1 INTRODUCTION

Chapter 2 provides an overview of the approach used in this ESIA process, and details each of the steps undertaken to date. Predication and evaluation of impacts is a key step in the ESIA process. This chapters outlines the methods that will be followed, in order to identify and evaluate the impacts arising from the proposed Project. The findings of the assessment will be presented in the full assessment report.

This chapter provides comprehensive details of the following:

- The assessment guidance that will be used to assess impacts.
- The limitations, uncertainties, and assumptions with regards to the assessment methodology.
- How impacts will be identified and evaluated, and how the level of significance will be derived.
- How mitigation will be applied in the assessment, and how additional mitigation will be identified.
- The cumulative impact assessment (CIA) method that will be used.

The aims of this assessment will be to determine which impacts are likely to be significant; to scope the available data and identify any gaps that need to be filled; to determine the spatial and temporal scope; and to identify the assessment methodology.

The scope of the assessment was determined through undertaking a preliminary assessment of the proposed Project against the receiving environment, and was obtained through a desktop review, available site-specific literature, monitoring data, and site reports, as set out in this scoping report.

6.2 ASSESSMENT GUIDANCE

The following principal documents will be used to inform the assessment method:

- International Finance Corporation standards and models, in particular performance standard 1: 'Assessment and management of environmental and social risks and impacts' (International Finance Corporation, 2012 and 2017).
- International Finance Corporation Cumulative Impact Assessment (CIA) and Management Good Practice Handbook (International Finance Corporation, 2013).
- Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008).

6.3 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS

The following limitations and uncertainties associated with the assessment methodology will be considered in the assessment phase:

- Topic specific assessment guidance has not been developed in Namibia. A generic assessment methodology will be applied to all topics using IFC guidance and professional judgement.
- Guidance for CIA has not been developed in Namibia, but a single accepted state of global practice has been established. The IFC's guidance document (International Finance Corporation, 2013) will be used for the CIA.

6.4 ASSESSMENT METHODOLOGY

The ESIA methodology applied to this assessment has been developed by ECC using the International Finance Corporation (IFC) standards and models, in particular performance standard 1: 'Assessment and management of environmental and social risks and impacts' (International Finance Corporation, 2017); Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008); international and national best practice; and over 25 years of combined ESIA experience. The methodology is set out in Figure 24 and Figure 25.

The evaluation and identification of the environmental and social impacts require the assessment of the Project characteristics against the baseline characteristics, ensuring that all potentially significant impacts are identified and assessed. The significance of an impact is determined by taking into consideration the combination of the sensitivity and importance/value of environmental and social receptors that may be affected by the proposed Project, the nature and characteristics of the impact, and the magnitude of any potential change. The magnitude of change (the impact) is the identifiable changes to the existing environment that may be negligible, low, minor, moderate, high, or very high; temporary/short-term, long-term or permanent; and either beneficial or adverse.

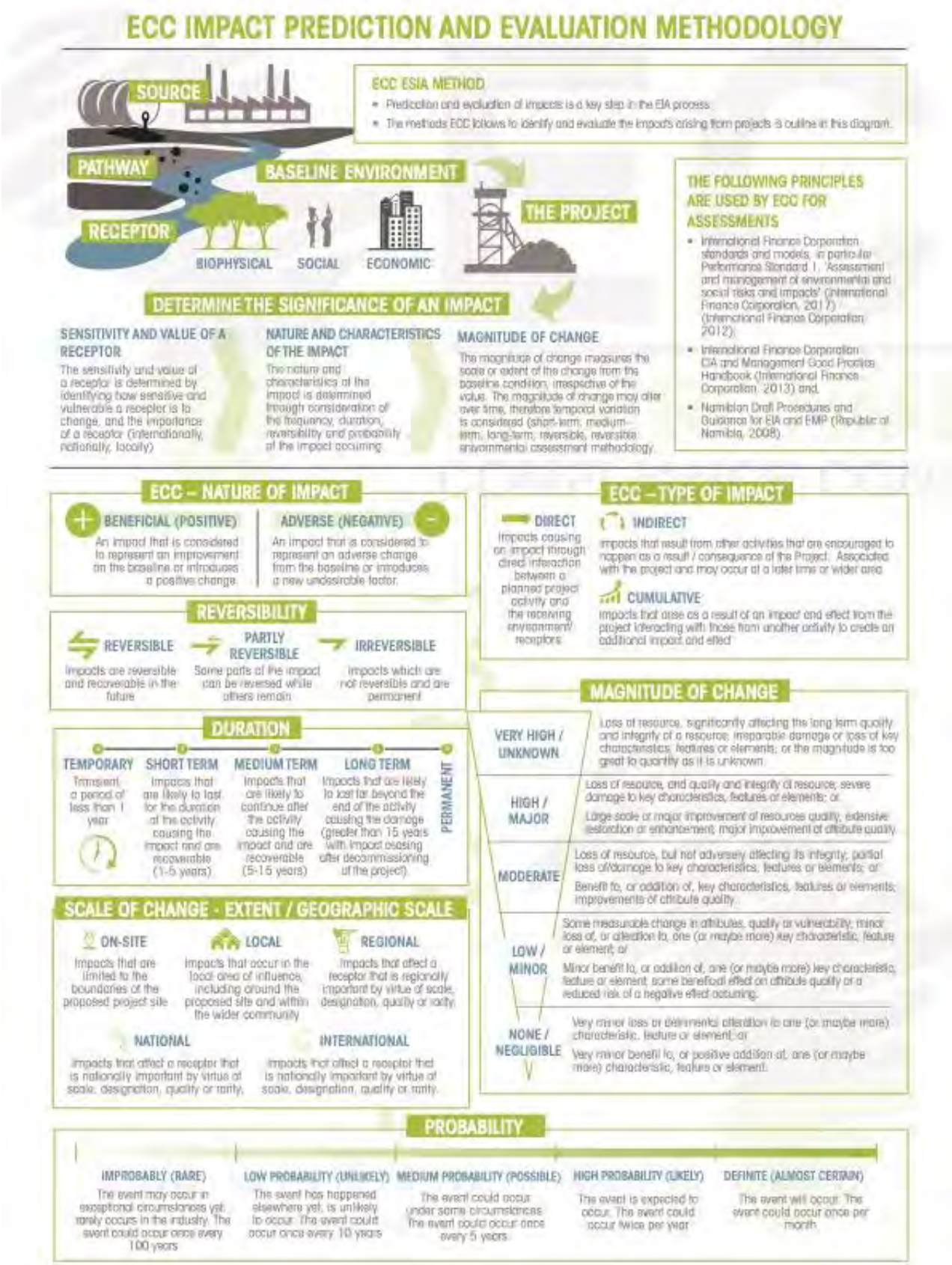

Figure 24 – ECC ESIA methodology based on IFC standards

- The significance of impacts has been derived by applying the identified thresholds for receptor sensitivity and magnitude of changes, as well as the definition of significance. Moderate and major adverse impacts are considered as significant.
- The following thresholds were therefore used to double check the assessment of significance that been applied appropriately: a significant impact would meet at least one of the following criteria:
- If exceeds widely recognized levels of acceptable change;
- It threatens or enhances the viability or integrity of a receptor or receptor group of concern; and
- It is likely to be material to the ultimate decision about whether or not the environmental clearance certificate is granted.

				SIGNIFICANCE OF IMPACT			
			Significance of Impact	Impacts are considered to be local factors that are unlikely to be critical to decision-making	Impacts are considered to be important factors but are unlikely to be key decision-making factors. The impact will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value. Impacts are considered to be short-term, reversible and/or localized in extent	Impacts are considered within acceptable limits and standards. Impacts are long-term, but reversible and/ or have regional significance. These are generally (but not exclusively) associated with sites and features of national importance and resources/ features that are unique and which, if lost, cannot be replaced or relocated.	Impacts are considered to be key factors in the decision-making process that may have an impact of major significance, or large magnitude impacts occur to highly valued/sensitive resources/receptors. Impacts are expected to be permanent and non-reversible on a national scale and/ or have international significance or result in a legislative non-compliance.
	Biophysical	Social		Low	Minor (2)	Moderate (3)	Major (4)
SENSITIVITY	A biophysical receptor that is protected under legislation or international convention (CITES) listed as rare, threatened or endangered IUCN species. Highly valued/ sensitive resource/ receptors	These affected people/ communities will not be able to adapt to changes or continue to maintain pre-impact livelihoods.	High (3)	Minor (3)	Moderate (6)	Major (9)	Major (12)
	Of value, importance/ rarity on a regional scale and with limited potential for substitution; and/or not protected or listed (globally) but may be a rare or threatened species in the country; with little resilience to ecosystem changes, important to ecosystem functions, or one under threat or population decline	Able to adapt with some difficulty and maintain pre-impact status but only with a degree of support	Medium (2)	Low (2)	Minor (4)	Moderate (6)	Major (8)
	Not protected or listed as common/abundant, or not critical to other ecosystems functions.	These affected are able to adapt with relative ease and maintain pre-impact status. There is no perceptible change to people's livelihood.	Low (1)	Low (1)	Low (2)	Minor (3)	Moderate (4)

SENSITIVITY AND VALUE

Low
Of value, importance or rarity on a local scale and/or not particularly sensitive to change or has considerable capacity to accommodate a change.

Medium
Of value, importance or rarity on a regional scale, and with limited potential for substitution; and/or moderate sensitivity to change, or moderate capacity to accommodate a change.

High
Of value, importance or rarity on an international and national scale, and with very limited potential for substitution; and/or very sensitive to change or has little capacity to accommodate a change.

MITIGATION

Mitigation comprises a hierarchy of measures ranging from preventative environmental impacts by avoidance, to measures that provide opportunities for environmental enhancement. The mitigation hierarchy is avoidance; reduction at source; reduction at receptor level; recycling and correcting; compensation; remediation; and enhancement.

Mitigation measures can be split into three distinct categories, broadly defined as:

- Standard practices and other best practice measures for avoiding and minimizing environmental impacts. These are considered as good practice measures.
- Actions undertaken by the EIA process, that influence the design process, through implementing design measures that would entirely avoid or eliminate an impact or modifying the design through the inclusion of environmental features to reduce the magnitude of change. These are considered as embedded mitigation.
- Specified additional measures or follow-up action to be implemented to further reduce adverse impacts that remain after the incorporation of embedded mitigation. These are considered as additional mitigation.

The EIA is an iterative process whereby the outcomes of the environmental and social assessments inform the project.

The EMP provides the good practice mitigation measures and specified additional measures or follow-up action ECC has recommended for the project.

SIGNIFICANCE DESCRIPTION

Low - Major Beneficial (All Scores)
Impacts are considered to be beneficial to the environment and society.

Low (negative) 0 - 25
Impacts are considered to be local factors that are unlikely to be critical to decision-making.

Minor (negative) 25 - 50
Impacts are considered to be important factors but are unlikely to be key decision-making factors. The impact will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value. Impacts are considered to be short-term, reversible and/or localized in extent.

Moderate (negative) 50 - 75
Impacts are considered within acceptable limits and standards. Impacts are long-term, but reversible and/ or have regional significance. These are generally (but not exclusively) associated with sites and features of national importance and resources/ features that are unique and which, if lost, cannot be replaced or relocated.

Major (negative) 75 - 100
Impacts are considered to be key factors in the decision-making process that may have an impact of major significance, or large magnitude impacts occur to highly valued/sensitive resource/receptors. Impacts are expected to be permanent and non-reversible on a national scale and/or have international significance or result in a legislative non-compliance.

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Figure 25 – ECC ESIA methodology based on IFC standards

6.5 CUMULATIVE IMPACTS

CUMULATIVE IMPACT ASSESSMENT METHOD

Cumulative impacts may arise as a result of other Project activities, or the combination of two or more projects in the Project area. A cumulative impact assessment (CIA) will be undertaken by applying the IFC CIA Good Practice Handbook (International Finance Corporation, 2013), which recommends that a rapid CIA is undertaken. A rapid CIA takes into consideration the challenges associated with a good CIA process, which includes a lack of basic baseline data, uncertainty associated with anticipated development, limited government capacity, and the absence of strategic regional, sectoral, or integrated resource planning schemes.

The following five-step rapid CIA process will be followed:

Step 1: Scoping - Determine spatial and temporal boundaries
Step 2: Scoping - Identify valued environmental and social receptors, and identify reasonably foreseeable developments
Step 3: Determine the present condition of valued environmental and social receptors (the baseline)
Step 4: Evaluate the significance of the cumulative impacts
Step 5: Identify mitigation measures to avoid or reduce cumulative impacts

The following information will be applied to the assessment in line with the above steps and IFC guidance:

- The spatial and temporal boundaries of the CIA are the extent of the ML boundaries and the duration of the construction and operation phases of the proposed Project.
- Valued environmental and social receptors that may be affected.
- A review of existing and reasonable, anticipated and/or planned developments has been undertaken, which is based on the information presented in section 4.
- The predicted future conditions of sensitive and common environmental and social receptors have been taken into consideration in the assessment.
- The assessment findings will be presented in the assessment report, and will have had the CIA applied in combination with professional judgment and published environmental assessment reports.
- A review of mitigation and monitoring measures will be undertaken, with any additional ones identified.

7 ASSESSMENT TERMS OF REFERENCE

A full impact assessment will be completed with input from stakeholders during the public participation phase. Specialist studies will be conducted and will be based on the findings and input from the public participation phase. A final draft EMP will be produced to manage residual impacts that cannot be mitigated through the Project evolution process.

A full environmental and social impact assessment (ESIA) is required for mining operations such as the proposed Project. The scoping phase progress to date has demonstrated that the following components should be included in the assessment phase.

These terms of reference (ToR) for the assessment phase are listed below:

- Soil impact assessment
- Acid mine drainage impact assessment
- Groundwater study and surface water impact assessment
- Biodiversity impact assessment
- Noise impact assessment
- Air quality impact assessment
- Traffic impact assessment
- Visual impact assessment
- Socioeconomic impact assessment
- Mine blast vibration assessment
- Heritage impact assessment

The public participation phase for the scoping report was concluded on the 17 November 2022. The public, stakeholders, competent authorities, and government were provided with the opportunity to comment on the draft scoping report and supporting appendices for a 7 day period.

8 CONCLUSION

This final scoping report provides the baseline data for the assessment phase of the ESIA. ECC will carry out an in-depth environmental and social impact an assessment to ensure that all potential significant impacts that may occur during project are identified.

These potential impacts will then be further analysed to establish mitigation and best practice methods to ensure the environment is protected and unforeseen effects and environmental disturbances are avoided. These mitigation and best practice managing methods which will then be outlined in a detailed environmental management plan.

The likely studies to be completed for the assessment for the proposed Project may include those set out in Table 9.

Table 9 - Specialist studies to be conducted for the ESIA

STUDY AREA	PURPOSE
Terrestrial ecology	– Biodiversity and habitat – Identification of species of concern and sensitive areas – Impacts of mining construction and operations on habitats and biodiversity
Hydrology	– Water supply – Storm protection and river diversion – Impact on downstream users – Clean and dirty water management systems
Groundwater	– Assess the potential for contamination of aquifers – Provide a model to determine impacts of drawdown and plume mobility – Assess the sustainability of boreholes for water supply if required
Air quality	– Provide emission standards and dust suppression requirements – Assess prevailing wind directions and possible effects of emissions on the process and/or personnel – Model potential air quality impacts
Noise and sense of place	– Identification of possible receptors, and assess levels of noise to which they may be exposed during construction and operations
Soils and land use	– Assess existing land use, and potential impacts on surrounding land users – A soil study informs the quality and quantity of material available for rehabilitation to a similar state on closure
Traffic	– The traffic impact assessment will study the potential traffic impacts and loading on routes associated with the mining activities – Assessing the capacity of infrastructure and safety aspects of the mine entrance – Assessing the need for an intersection upgrade at the mine entrance, and providing a concept layout plan if necessary
Heritage and culture	– A heritage assessment is required, in order to comply with Namibian national legislature
Visual and tourism	– Assessing the potential visual impacts of a proposed project on the receiving environment

STUDY AREA	PURPOSE
Geochemical sampling and analysis	– The geochemical analysis of waste rock, tailings, and overburden will be undertaken to assess the mineralogical composition, acid mine drainage potential, and metal concentration of the leachate of waste rock and tailings
Blast vibration impact	– Assessing the impact of blasting on receptors in the area

Findings from the ESIA process will be clearly reported in the updated scoping report, ESIA and EMP ready for public, stakeholders, competent authorities, and government review for a record of decision.

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APPENDIX A – DRAFT ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX B – PUBLIC MEETING AND RELATED FEEDBACK

APPENDIX C – ENVIRONMENTAL ASSESSMENT PRACTITIONER CVS

APPENDIX D – ADDENDUM REPORT