ENVIRONMENTAL SCOPING REPORT: FOR THE PROPOSED 44KV LINE FROM ROSSING MOUNTAIN TO ARANDIS, ERONGO REGION-NAMIBIA.

DATE: NOVEMBER 2020

D&P ENGINEERS
AND ENVIRONMENTAL CONSULTANTS
"Purpose with Passion"

ERONGO red
power to the people

The Proposed 44kv Line from Rossing Mountain to Arandis, Erongo Region-Namibia: Environmental Scoping Report (ESR)

Environmental Scoping Report Prepared for
Erongo Regional Electricity Distributor Company (Pty) Ltd

(ErongoRed)
91 Hage Geingob Street
Walvis Bay,
Namibia

By
D&P Engineers and Environmental Consultants (Pty) Ltd.

20 Joseph Mukwayo Ithana Street
Ludwigsdorf,
Windhoek-Namibia
PO Box 8401, Bachbrecht,
Telephone: +264 (61) 302 672/ 081299 8444
Facsimile: +264 (61) 255 207
Email: tdavid@dpe.com.na
https://www.facebook.com/DP-Engineers-and-Environmental-Consultants-193970370936785/

Project Number APP-002150

November 2020
Compiled by:

D&P Engineers and Environmental
Consultants (Pty) Ltd
Email: tkasinganeti@dpe.com.na
EAP:
Tendai E. Kasinganeti

Contents

List of Figures

List of Tables

Acronyms

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Plan Report
GHG	Greenhouse Gasses
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
OHL	Overhead Line
MEFT: DEA	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

i. Purpose of This Environmental Impact Assessment Report

This Environmental Scoping Report (ESR) follows on the Scope of Work delineated by **Erongored**. Existing information and input from commenting authorities, Interested and Affected Parties (I&APs) was used to identify and evaluate potential environmental impacts (both social and biophysical) associated with the proposed project.

Environmental flaws associated with the proposed powerline project were identified through the Environmental Scoping exercise. A conscious decision was made based on the recommendations and guidelines by the Directorate of Environmental Affairs EIA guidelines in order to assess both significant and less significant environmental impacts proposed by the development. The developed Environmental Management Plan (EMP) for this proposed activity will have to be effectively implemented by the client, to ensure that adverse environmental impacts are not considered.

The detailed assessment of the anticipated impacts was undertaken with the purpose of highlighting any areas of concern regarding to the proposed project during its construction, and operation. In addition, an independent sensitivity mapping analysis was undertaken. This analysis characterised the development site on the significant environmental aspects in order to reflect the sites suitable and unsuitable (no-go) development footprint areas. This action guided the final footprint of the power transmission line.

This ESR will also be used to motivate and define the previously identified, project alternatives (i.e. site, technology and layout) based on the findings of the environmental baseline study and the suitability of the site to the type of development. This ESR has been compiled in accordance with the regulatory requirements stipulated in the EIA Regulations (2012), promulgated in terms of the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007))

The ESR aims to:

- Provide an overall assessment of the social, physical and biophysical environments of the area affected by the proposed project development;
- Undertake a detailed environmental assessment, in terms of environmental criteria and impacts (direct, indirect and cumulative), and recommend a preferred location for the proposed plant (based on environmental sensitivity);
- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts; and
- Undertake a fully inclusive Public Participation Process (PPP)
- GIS sensitivity mapping was conducted to identify potential impacts, propose mitigation and inform the sensitivity analysis.

A systematic approach was adopted for the successful completion of the EIA in line with the regulated process. The diagram in Figure 1 below indicates the sequential process that will be followed for this study.

ii. Assumptions And Limitations

The following assumptions and limitations underpin the approach to this EIA study:

- The information received from the stakeholders, desktop surveys and baseline assessments are current and valid at the time of the study;
- A precautionary approach was adopted in instances where baseline information was insufficient or unavailable;
- Mandatory timeframes will apply to the review and adjudication of the reports by the competent authority and other government departments; and
- No land claims have been registered for the proposed site at the onset and registration of the study.

NB: The EAP does not accept any responsibility in the event that additional information comes to light at a later stage of the process. All data from unpublished research utilised for the purposed of this project is valid and accurate. The scope of this investigation is limited to assessing the potential biophysical, social and cultural impacts associated with the proposed project.

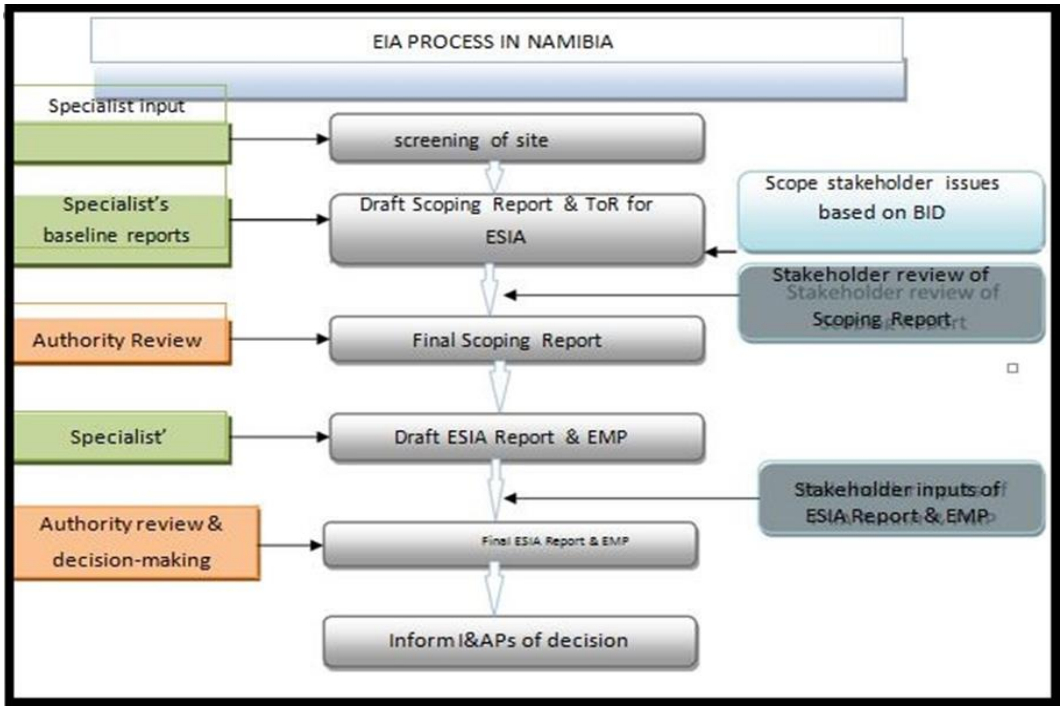

Figure 1: Schematic representation of the EIA Process followed in this study

1. CHAPTER ONE: BACKGROUND

1.1. Introduction

The proponent, Erongo Regional Electricity Distributor Company (Erongo RED) (Pty) Ltd is a dynamic and efficient commercialized electricity distributor for the Erongo Region, Namibia. In this respect and as part of Erongo RED's mandate to supply electricity in Erongo Region, the proponent intends to upgrade the existing 22KV powerline to 44 KV Overhead Line (OHL) connected from Rossing Mountain T-Off to Arandis including a T-Off to Nampower, Lithops Sub-Station.

This development is envisaged, because the existing 22kv OHL is nearing its life-span and old since it is over 45 years, which has already passed its life expectancy, making it unreliable and inefficient, with high operating costs. The upgrade is also meant to ensure that Arandis has its power requirements catered for, since the town has been growing and developing lately.

In terms of the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007)), an EIA is required to obtain an Environmental Clearance Certificate from the Ministry of Environment and Tourism (MET) before the project can proceed. Furthermore, as per the requirements of the Environmental Management Act No. 7 of 2007, Erongo Red has appointed **D&P Engineering and Environmental Consultants** to conduct an Environmental Assessment (EA) and develop an Environmental Management Plan (EMP) for the proposed project.

This has been followed by an application for Environmental Clearance Certificate (ECC) to the Ministry of Environment, Forestry and Tourism (MEFT): Directorate of Environmental Affairs (DEA).

In this respect, this document forms part of the application to be made to the DEA's office for an Environmental Clearance certificate for the proposed upgrade of the existing 22KV powerline to 44 KV Overhead Line (OHL) connecting from Rossing Mountain T-Off to Arandis town, including a T-Off to Nampower Lithops Sub-Station, in accordance with the guidelines an statutes of the Environmental Management Act No.7 of 2007 and the environmental impacts regulations (GN 30 in GG 4878 of 6 February 2012).

1.2. Project Location

The OHL will be connected from a point at the base of Rossing Mountain, following an existing servitude parallel to the B2 highway until Arandis town sub-station. A T off will be connected near the Husab Mine T junction to connect to Lithops Substation. Please refer to the map below (Fig 1) giving a locality layout of the site:

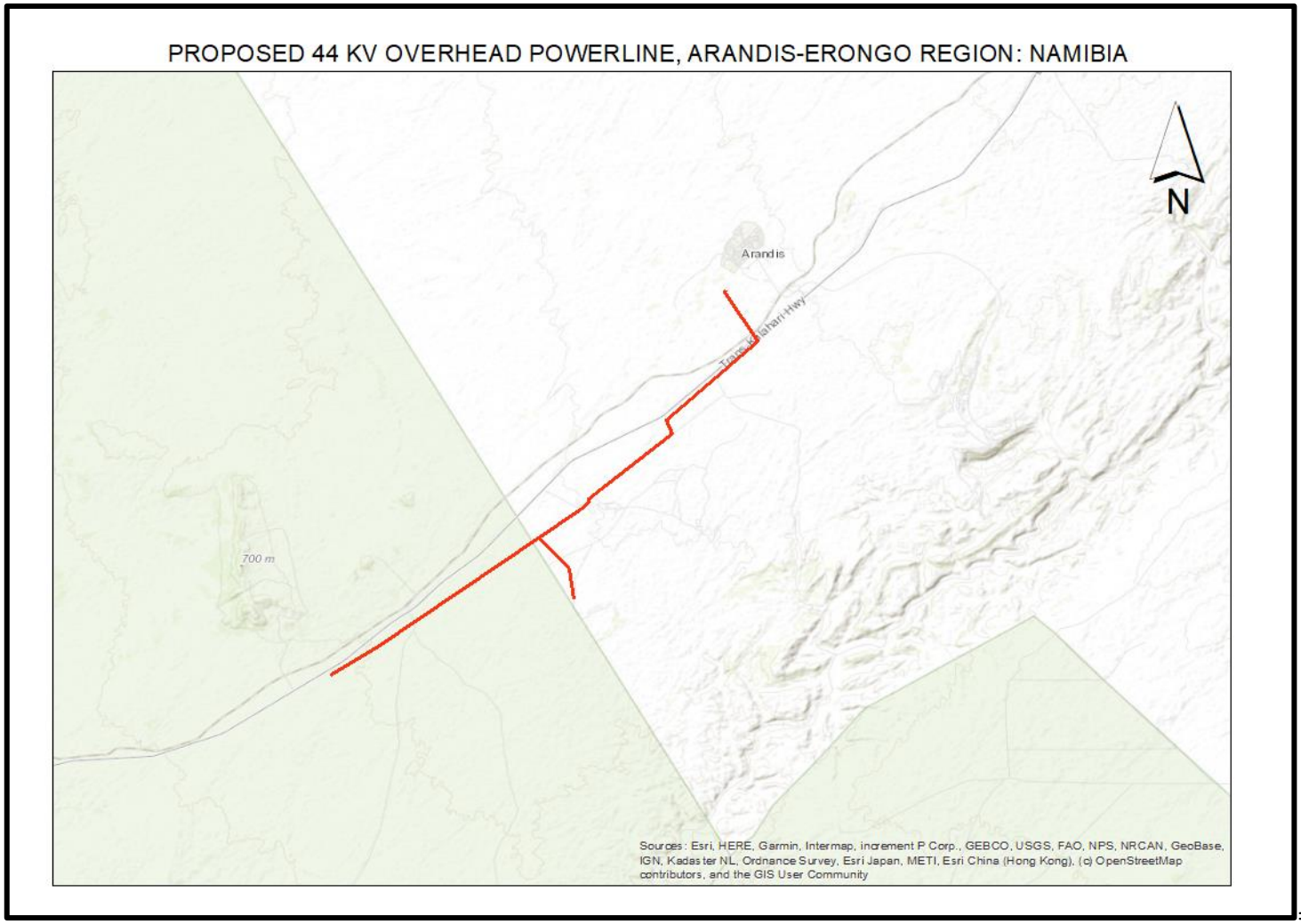

Figure 2: Proposed Project Site.

1.3. Project Overview

Erongo RED proposes the design, construction and operation of a 44 KV Overhead Powerline from Rossing Mountain T-off up to Arandis Town (22km), including a T-off up to the NamPower Lithops substation(4km) in Arandis, Erongo Region- Namibia. The construction and operations of the OHL will be conducted with a high degree of safety for employees, equipment and neighbouring land uses. The proposed infrastructure will have minimal impacts on the natural resources, i.e. water, fauna and flora.

1.4. Proposed project infrastructure

There is an existing 22kV OHL which is over 45 years old, and has which has already passed its life expectancy, making it unreliable and inefficient, with high operating costs. Once the new 44kV designed, but 33kV operated OHL is constructed, the existing 22kV OHL will be de-commissioned, uninstalled and removed.

The upgrade will all be a phased approach, in order to connect to the new 33kV NamPower supply point at Lithops substation. The higher voltage level allows for larger loads to be supplied, with less volt drop problems with an entire new electrical network, making it more reliable, with less down time and a reduction in electrical losses occurring.

1.4.1. Accessibility

The site OHL is running parallel to the B2 National highway and can be easily access during construction and for maintenance once it is operational.

1.4.2. Infrastructure and Services

Water: Water for construction purposes will be obtained from Arandis Town Council
Ablution: During construction phase, temporary mobile toilets will be used, but upon completion, there are no permanent toilets needed on site
Communication: The site is well serviced with TN and MTC communication networks.

1.5. Project Environs

The proposed 44KV OHL upgrade will be installed on the existing servitude within which the existing 22 KV OHL is currently running, and the servitude is wide enough to allow for an additional line to run next to it. This means that the proposed upgrade will not result in new land clearances because the servitude is already cleared and always maintained for accessibility during powerline maintenance and fault fixing. From Rossing Mountain substation there are several powerlines branching from the substation, and it crosses the B2 highway to run on the Southern side of the road. The proposed T-OFF to Lithops substation is already going to follow the access road to Rossing Uranium, hence the proponent clearly planned the project to follow on existing servitude right of ways.

Figure 3: Arandis Sub Station and existing Servitude connecting to B2 Highway.

Figure 4: Existing 22KV OHL and cleared servitude

Figure 5: OHL Pylons connecting to Lithops Sub Station

Figure 6: Existing Lithops Substation and access road to be used for OHL ROW

2. CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. Introduction

An important part of the EIA is identifying and reviewing the administrative, policy and legislative frameworks concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in undertaking the proposed project. This section looks at the legislative framework within which the proposed development will conform to; the focus is on the compliance with the legislation during the planning, construction and operational phases. All relevant legislations, policies and international statutes applying to the project are highlighted in the table below as specified in the Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012).

Table 1:Policies, legal and Administrative regulations

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
The Constitution of the Republic of Namibia (1990)	The articles 91(c) and 95(i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalizing policies to accomplish the sustainable objectives which include: - Guarding against overutilization of biological natural resources, - Limiting over-exploitation of non-renewable resources, - Ensuring ecosystem functionality, - Maintain biological diversity.	Through implementation of the environmental management plan the proposed development will be in conformant to the constitution in terms of environmental management and sustainability, through bringing development in an environmentally sensitive way.
Vision 2030 and National Development Plans	Namibia's overall Development ambitions are articulated in the Nations Vision 2030. At the operational level, five-yearly national development plans (NDP's) are prepared in extensive consultations led by the National Planning Commission in the Office of the President. Currently the Government has so far launched a 4th NDP which pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.	The proposed powerline project, is an important element in the industrialisation of the country as well as FDIs in Namibia.
Environmental Assessment Policy of Namibia 1994	The Environmental Assessment Policy of Namibia requires that all projects, policies, Programmes, and plans that have detrimental effect on the environment must be accompanied by an EIA. The policy provides a definition	The construction and operation of the transmission line will only commence after being awarded an environmental clearance certificate, thus by abiding to the requirements of the Environmental Assessment

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	to the term "Environment" broadly interpreted to include biophysical, social, economic, cultural, historical and political components and provides reference to the inclusion of alternatives in all projects, policies, programmes and plans.	Policy of Namibia. The EIA and EMP will cater for the sustainable management of biophysical environment.
Environmental Management Act No. 07 of 2007	The Act aims at ▪ Promoting the sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment; ▪ To provide for a process of assessment and control of projects which may have significant effects on the environment; The Act gives legislative effect to the Environmental Impact Assessment Policy. Moreover, the act also provides procedure for adequate public participation during the environmental assessment process.	This document is compiled in a nature that project implementation is in line with the objectives of the EMA. EIA guiding procedures developed by MET were also used in the course of this project.
Electricity Act 4 of 2007	Requires that any generation and or distribution complies with laws relating to health, safety and environmental standards (s 18(4)(b)	Obliges Erongo RED to comply with all relevant provisions of the EMA and its regulations.

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	In the event that exemption from acquiring a license is granted, the Minister may impose conditions relating to public health safety or the protection of the environment.	
The Atomic Energy and Radiation Protection Act, Act 5 of 2005:	Provides for the adequate protection of the environment and of people against the harmful effects of radiation by controlling and regulating the production, processing, handling, use, holding, storage, transport and disposal of radiation sources and radioactive materials, and controlling and regulating prescribed non-ionising radiation sources according to the standards set out by the ICNIRP.	Justifies the need for assessing the impact of electromagnetic radiation from the power line, on the nearby residents.
"Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300GHz)" (April 1998 developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP))	Provides international standards and guidelines for limiting the adverse effects of non-ionising radiation on human health and well-being, and, where appropriate, provides scientifically based advice on non-ionising radiation protection including the provision of guidelines on limiting exposure.	Justifies the need for assessing the impact of electromagnetic radiation from the power line, on the nearby residents and or animals
Public Health Act (No. 36 of 1919)	Under this act, in section 119: "No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	The project proponent will ensure that all legal requirements of the project in relation to protection of the health of their employees and surrounding residents is protected.

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
		-Personal protective equipment shall be provided for employees in construction. -The development shall follow requirements and specification in relation to water supply and sewerage handling so as not to threaten public health of future residents on this piece of land.
Soil Conservation Act 76 of 1969	The objectives of this Act are to: ▪ Make provisions for the combating and prevention of soil erosion, ▪ Promote the conservation, protection and improvement of the soil, vegetation, sources and resources of the Republic.	The project will have a rather localized impact on soils and on the soil through clearance for powerline pylons. Soil protection measures will be employed and preservation of flora as much as possible.
Nature Conservation Ordinance 1996	To consolidate and amend the laws relating to the conservation of nature; the establishment of game parks and nature reserves; the control of problem animals; and to provide for matters incidental thereto.	The proposed project implementation of the powerline will pass through a known or demarcated conservation area, however there are no new land disturbances within the area, as an existing servitude will be used. The project site was selected with this ordinance in mind to ensure that Namibian nature is conserved.
Protected Areas and Wildlife Management Bill	This bill, when it comes into force, will replace the Nature Conservation Ordinance 4 of 1975. The bill recognizes that biological diversity must be maintained, and where necessary, rehabilitated and that essential ecological processes and life support systems be maintained. It	Environmental recommendations and considerations on this project has ensured that the proposed activities that fall within the boundaries of any protected area and that the project will not affect heavily endangered vegetation and animals on its site.

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	protects all indigenous species and control the exploitation of all plants and wildlife.	
Forest Act, 2001 (Act No. 12 of 2001)	The Act gives provision for the protection of various plant species through the Ministry of Agriculture, Water and Forestry (MAWF), Directorate of Forestry).	-Land clearing of an extensive piece of land will be done upon approval from the Directorate of Forestry. -The proponent will also have to ensure that there is no indiscriminate cutting down of trees during construction and operation -The proposed site is not vegetated with any protected desert fauna species, as the powerline Right of Way was cleared before and any protected flora was relocated accordingly.
National Rangeland Policy and Strategy, 2012	The policy aims at enabling resource users (farmers and managers) to manage their rangeland resources in a sustainable manner and sustainable in that they are economically viable, socially acceptable, environmentally friendly and politically conducive.	-This proposed project will ensure that the local community benefits both economically and socially from the project, this in line with the recently declared Harambee Prosperity Plan and NDP 4&5.
National Biodiversity Strategy and Action Plan (NBSAP2)	The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia putting together management of matters to do with ecosystems protection, biosafety, biosystematics protection on both terrestrial and aquatic systems.	The project proponent has been advised by the D&P Engineers and Environmental Consultants and recognises the need for ecosystems protection to manage the changing climatic environment.

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
Wetland Policy, 2004	The policy provides a platform for the conservation and wise use of wetlands, thus promoting inter-generational equity regarding wetland resource utilization. Furthermore, it facilitates the Nation's efforts to meet its commitments as a signatory to the International Convention on Wetlands (Ramsar) and other Multinational Environmental Agreements (MEA's).	In compliance to this Policy, the development will ensure a standard environmental planning such that it does not affect any wetlands within its locale through recognition of wetlands to promote the conservation and wise utilization of wetlands resources. There are no existing wetlands/peatlands within the proposed project site.
Water Resources Management Act, 2013 (Act No. 11 of 2013)	This Act provides for the management, protection, development, use and conservation of water resources. This also forms the regulation and monitoring of water resources.	The nearby watercourse is 10km to the southern side of the powerline and the project activities are not anticipated to affect the watercourse in any way.
National Heritage Act 27 of 2004	Heritage resources to be conserved in development. (National Heritage	During the project implementation as soon as objects of cultural and heritage interests are observed such as graves, artefacts and any other object believed to be order than 50 years, all measures will be taken protect these objects until the National Heritage Council of Namibia have been informed, and approval to proceed with the operations granted accordingly by the Council.
National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979	"No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: (a) any meteorite or fossil; or (b) any drawing or painting on stone or a petroglyph known or commonly believed to have been	The proposed site of development is not within any known monument site both movable or immovable as specified in the Act, however in such an instance that any material or sites or archeologic importance are identified, it will be the responsibility of the developer

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	executed by any people who inhabited or visited Namibia before the year 1900 AD; or (c) any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph (b); or (d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or (e) any other archaeological or palaeontological finds, material or object; except under the authority of and in accordance with a permit issued under this section.	to take the required route and notify the relevant commission.
Pollution Control and Waste Management Bill	This bill has not come into force. Amongst others, the bill aims to "prevent and regulate the discharge of pollutants to the air, water and land" Of particular reference to the Project is: Section 21 "(1) Subject to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse." Section 55 "(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment."	To control air, water and land pollution as agitated by the Act the project proponent will ensure that all solid waste during construction is managed with an integrated waste management strategy following the EMP provided herein.

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
Convection on Biological Diversity (CBD)	Namibia is a signatory of the Convention on Biological Diversity and thus is obliged to conserve its biodiversity.	The project will preserve tree species on as part of their plans for greed and sustainable development.
United Nations Convection to combat Desertification	Namibia is bound to prevent excessive land degradation that may threaten livelihoods.	It will be the responsibility of the proponent to conserve vegetation on and around the area, to avoid encroachment of the desert environs in the area.

3. CHAPTER THREE: RECEIVING ENVIRONMENT

3.1. Introduction

The findings in this chapter are based on baseline surveys, public consultation and desk reviews undertaken by the EIA team. The findings relate mainly to aspects of ecology, ambient air, soil, water and noise levels for the entire operation. Existing specialist studies conducted for the existing 22KV powerline were used during this study. Also, the economic and social environment was considered for this study.

3.2. Socio-Economic Status

The proposed 44 KV OH is intended to supply Arandis town and to connect to Lithops substation located in the Erongo Region of western central Namibia. Arandis is a growing mining town and has been termed the Uranium Capital of the World as it is located just 15 km outside the world's largest open-pit uranium mine, the Rössing Uranium Mine. Arandis has well above 7,600 inhabitants, most of whom are somehow connected to Rossing Uranium, Husab and Trekkopje uranium mines. Arandis is also home to a mining tertiary institution, the Namibian Institute of Mining and Technology, a technical institute focusing on training skilled industrial workers. Arandis is well serviced with social amenities, commercial institutions and it is growing as there are town expansion projects currently being implemented by the council. All this for smooth functioning, would require uninterrupted power supply, hence the proposal by Erongo RED to upgrade electricity supply to the town.

3.3. Climate

Table 2: Climatic Environment

Aspect	Description
Classification of climate	Arandis is considered to have a desert climate. In Arandis, there is virtually no rainfall during the year. Arandis climate is classified as BWh by Köppen and Geiger.
Average rainfall:	44 mm per year
Average Evaporation	Evaporation in the area is averaged 3000 to 3200 mm.
Precipitation	Sporadic and unpredictable, about 44mm per annum.
Temperature	Maximum temperatures vary between 19 and 24°C with the average minimum temperature between 13 and 19°C
Humidity	The relative humidity during the least humid months of the year (i.e. September and October) is around 10-20% and the most humid month is March with 70-80% humidity. Namibia has a low humidity in general, and the

	lack of moisture in the air has a major impact on its climate by reducing cloud cover and rain and increases the rate of evaporation.
Wind direction	Predominantly westerly wind. The area experience strong winds during August/Sep with an average wind of 8-10mph. Due to absence of obstacles in Arandis, wind can travel longer distances carrying sand particles.

3.4. Topography

The western part of the proposed 44 kV Powerline development lies within the Dorob National Park (Figure 4.1). The eastern part lies within the ≠Gainqu Communal Conservancy. The area also lies adjacent to the Namib Naukluft Park in the south. The nearest large town to the proposed power line development in central-western Namibia is Swakopmund in the west, with the smaller town of Arandis in the north-east.

A major topographical feature in the greater area is the deeply incised, ephemeral Swakop River and its tributaries, running from the east to reach the Atlantic Ocean in the west. Its main tributary, the Khan River flows from the north-east to join the Swakop River about 20 km east of Walmund Substation. The river is largely dry, but there are a few perennial pools that attract birds at the crossing of the C28 road about 2 km south-east of the NamWaterBase.

The altitude for the study area ranges from 564 m above sea level at Arandis Substation to 670 at the Rössing Mountain, surrounded by extensive gravel plains that characterise the study area. Numerous drainage lines are a feature of these plains, where the relative increase in moisture enables vegetation growth. Well-defined dolerite ridges are also found in the area, running mainly from the north-east to the south-west.

The predominant land uses in the greater study area are conservation and nature-based tourism; commerce and industrial development in the municipal areas; and mining on a large scale. A large road development, including a freeway/flyover, is planned at the Swakop River C28/B2 road crossing.

3.5. Geology, Hydrogeology, Pedology

The study area falls within the Namib Desert biome, and Central Desert sub-biome (Mendelsohn et al. 2002). The vegetation type is classed as Central Desert, with Petric Gypsisols and Petric Calcisols the dominant soil types; sparse shrubs and grasses the dominant vegetation structure; and mainly Central-western Plains the dominant landscape. Large sections of the routes are already disturbed due to previous activities associated with the construction of telephone lines and power lines; the B2 main road; the Rössing pipeline and the associated access road; as well as some small scale quarrying activities.

There are no large rivers transect the study area, the Kahn River located to the south of Arandis being the most prominent river to the south of Arandis. The town of Arandis therefore falls within the catchment area of the Kahn River which in turn is part of the greater Swakop River catchment area. Further, north of the town the catchment area of the Omaruru River

3.6. Visual Baseline

The visual landscape is determined by considering: landscape character, sense of place, aesthetic value, sensitivity of the visual resource and sensitive views. In this regard, the study area is considered to have a significant visual landscape.

The landscape character of the area under discussion is defined by plains and shallow washes, drainage lines and the existing infrastructure within close proximity to the area. With reference to the above mentioned and the existing infrastructure, the visual resource of the area has already been disturbed. Infrastructure in the area includes an existing 22kV powerline network, Telephone line, the B2 main road with already disturbed servitude, the Rössing pipeline with service road, NamPower booster stations, and access roads.

3.7. Terrestrial ecology

The project area is situated in the central Namib Desert, in the Erongo Region of Namibia, approximately 80 km east of Swakopmund. The central Namib lies between the ephemeral Ugab and Kuiseb rivers, and is bounded by the Atlantic Ocean in the west and the escarpment in the east. It falls into the Desert Biome of southern Africa (Rutherford & Westfall 1986) and the Desert Biome of Irish (1994), who described and mapped the biomes of Namibia utilising an objective approach based on plant life forms and climatic factors rather than species ranges.

Based on a previously commissioned fauna and flora specialist study for the existing 22KV OHL, while approximately 17% of the Namibian flora as a whole is thought to consist of endemic species (i.e. species restricted to within the political boundaries of Namibia) (Barnard 1998), over 30% of plants that occur in the Namib Desert in Namibia are believed to be endemic to that area. This is a remarkably high figure, but in the context of this project it is important to note that the areas of highest plant endemicity in the Namib are the Kaokoveld and the southern Namib, both regarded as major centres of endemicity Maggs et al. 1998). The central Namib is not generally regarded as a ‘hotspot’ of endemics. Most of the plants have not been evaluated for IUCN status and are only categorized according to the three main habitat categories.

Namibian endemic species are generally regarded as conservation priorities and may, inter alia, be used to determine habitat sensitivity. However, many of these are reasonably widespread, occurring well beyond the central Namib and are thus of less concern than species that have a more limited extent of occurrence. Endemic and near-endemic species that are restricted to specific, and often limited, habitats or have a fragmented distribution across their range are of additional concern, the latter because they are often taxonomic uncertainties and may be distinct species not yet described.

The endemic, near-endemic and protected species regarded as issues that will necessitate mitigation measures in this study are separately listed and discussed in Table 4.1 below. Of these the species of most concern is Lithops ruschiorum, because it is has been impacted by mining activities at Rössing Uranium and in addition, field assessment reveled that in the powerline servitude it is not occurring because the right of way has been cleared already on previous servitude openings. It is not a true Red Data species because it is categorized as 'Least Concern' in the Namibian Red Data list but, nevertheless, loss of a population of such a limited species would be highly undesirable.

This project area, where average annual fog precipitation usually exceeds rainfall, is dominated by fog-dependent chamaephytes, specifically Arthraerua leubnitziae (pencil bush) and Zygophyllum spp. (the Dollar Bush genus); with the occurrence of annuals limited by extremely low rainfall. Further east chamaephytes are extremely sparse and therophytes dominate, although they grow only in the rainy season and are otherwise present as seed. As a result vegetation in the dry season is very sparse indeed. The easternmost zone exhibits chamaephytic-therophytic co-dominance, with perennial shrubs sharing dominance with annuals in the rainy season. The project area exhibits characteristics of the latter two zones, with vast gravel plains dominated by therophytes and areas of modified topography, such as rugged mountains, canyons and outcrops showing chamaephytic-therophytic codominance.

Figures below demonstrates vegetation types that might be found within the project area, and not necessarily along the OHL right of way because it is an open servitude that has been under clearance maintenance by ErongoRED.

Table 3: Vegetative species of importance occurring in the general area

LC = least concern; NT = near threatened; VU = vulnerable; NA = not assessed (Loots 2002, 2005).

SPECIE	CONSERVATION STATUS	NOTES
Aloe namibensis (Namib Aloe)	Protected LC Cites ll	Occurs as far east as the escarpment zone. Potentially impacted by several uranium developments. Not directly affected by the OHL ROW.
Lithops gracilidelineata subsp. gracilidelineata	Protected LC	The plant is occurring in the general area and not on the powerline ROW
Lithops ruschiorum	Protected LC	Occurring in the general area and widespread.
Commiphora saxicola (Rock Corkwood)	LC	Potentially impacted by construction developments but reasonably widespread.
Commiphora virgata (Slender Corkwood)	LC	Common on the general escarpment. Not directly impacted by the proposed development.

SPECIE	CONSERVATION STATUS	NOTES
Acacia erioloba (Camel Thorn Tree)	Protected	Not observed on the project ROW but occurring in the general area with water occurrences.
Aloe dichotoma	Protected	Not occurring in the powerline right of way, and contractors should be encouraged not to collect this specie for health purposes as it is under threat from over-utilisation and medicinal collection.
Commiphora glaucescens	LC	Not affected by the ROW and occurring in widespread in Namibia.
Euclea pseudebenus (Wild Ebony)	LC	Not affected by the ROW and occurring in widespread in Namibia.
Hoodia currorii	LC	Not affected by the ROW and occurring in widespread in Namibia.
Larryleachia marlothi	LC	Not affected by the ROW and occurring in widespread in Namibia.
Maerua schinzii (Lammerdrol)	Protected	Not affected by the ROW and occurring in widespread in Namibia.
Sterculia africana (Tick Tree)	Protected	Not affected by the ROW and occurring in widespread in Namibia.

Figure 7: Lithops rusciorum found in the central Namib.

Figure 8: The pencil bush (Arthraerua leubritziae) occuring rampant around the project area

Figure 9: White thorn shrub occurring along waterways

Figure 10: Project area ROW is an already cleared Servitude.

No major vegetation will be impacted.

3.8. Reptile Biogeography

Reptile diversity is high in the Namib Desert and the central Namib in particular has a surprisingly high diversity of lizards, especially geckos. The State Museum work, together with more recent literature (Griffin 2002 and Griffin 2007), lists a total of 33 lizard species recorded or having a high probability of occurrence in the study area. This comprises 15 Geckos, 2 Agamas, the Namaqua Chameleon, 7 Skinks, 7 Sand Lizards and one Plated Lizard. Of these 33 species, 8 are endemic to the Namib and one, the Husab Sand Lizard, has a particularly small geographic distribution.

The official status is 'Data Deficient' (Griffin 2007). The reason for this is that the potential effect of powerlines on the species is not yet known. Cumulative impacts from powerline installation and the developmental activities in the region on *Pedioplanis husabensis*, the Husab Sand Lizard has not yet been evaluated. Therefore, on the basis of the precautionary principle the Husab Sand Lizard is classified as Threatened – Data deficient.

The fauna and flora study commissioned for the 22KV powerline established that a further species of Meroles is categorized as Not Evaluated. On the basis of the precautionary principle, it is classified as Threatened – Data Deficient. With the exception of the Meroles species and the Husab Sand Lizard, all the above lizard species are categorized as Least Concern (Griffin 2007). Apart from lizards, one other reptile is red-listed, namely Leopard Tortoise (Vulnerable). Occurrence of Leopard Tortoise in the study area is possible but very unlikely, as this species generally prefers moister habitats. It might very be found in the Swakop River and rare in the Khan River.

The area has a high occurrence of reptiles, snakes. This includes cobras, puff adders (inhabit grasslands and bush ecosystems) and the black and green mamba (inhabiting the riverine ecosystems). The area is a habitat of a wide number of lizard species and tortoises. The baseline study further revealed existence of snails, centipedes, spiders and scorpions. However, there is no evidence of existence of endemic species of this kind in the project area. All construction activities should be reptile and animal conscious, to ensure that no unnecessary impacts to habitat and directly on species is not realised.

3.9. Avifauna

One of the most crucial aspects of this EIAR, is in relation to avifauna in the project environment because of the proposed 44kv transmission line. Power lines worldwide kill thousands of birds each year (Bevanger 1998, Lehman et al. 2007) either by electrocution or by direct collision. The NamPower/Namibia Nature Foundation Strategic Partnership (http://www.nnf.org.na/project/nampowernnf-partnership/13/5/5.html) has documented wildlife and power line incidents from 2006 to the end of 2016, involving some 630 animals, mostly birds. Due to the difficulty of obtaining records in bushy areas (especially in the northern and north-eastern parts of the country), low reporting rates and the high scavenging rates in general, it is likely that the incidents observed are an under-estimate.

Examples of power line incidents (mainly collisions, but also electrocutions) recorded in the vicinity of the study area to date are shown in Figure 27 (NamPower/NNF Strategic Partnership database, EIS 2017). Obviously, many more incidents have been recorded throughout the country. Most of the incidents have involved flamingos (39%) and bustards/korhaans (32%; Figure 28). A further 10% have involved raptors, mainly vultures as well as eagles, snake-eagles and owls; and 9% have involved waterbirds.

On the Khan-Lithops-Walmund 220 kV line south of the proposed power line route, collisions of 18 Ludwig's Bustards, four korhaans and one flamingo have been recorded; on the Lithops-Walmund line south of the Swakop River, collisions of six Ludwig's Bustards, 11 flamingos and one White Pelican are on record; on the Trekkopje Bypass north of the study area, collisions of 27 Ludwig's Bustards, 18 flamingos and eight korhaans have been recorded. A group collision of six Greater Flamingos was recorded on a low voltage power line crossing the Swakop River at the River Plots in November 2016. A number of electrocutions have also been recorded at Husab Mine on the low voltage distribution structures, including a Martial Eagle.

Bustards are susceptible to collisions due to their nomadic habits, a large body size with low manoeuvrability, and a visual "blind spot" when flying forwards (Martin & Shaw 2010). This proneness to collision is believed to be shared by korhaans, and has also been demonstrated in vultures, storks, snake-eagles and other groups. In desert habitats bustards and korhaans are often associated with drainage lines, where they find food (locusts and other insects) and shelter amongst the sparse vegetation. High mobility of bird species, e.g. among ephemeral food sources, may also render them more prone to power line interactions. Flamingos are particularly prone to collisions due to their habit of flying at night or under conditions of poor light, in groups. Apart from movements up and down the coast, collision records on power lines indicate that flamingos appear to use rivers and drainage lines as flightpaths at times. Dolerite ridges may also be used as flight paths, e.g. during windy conditions.

A mortality register of all birds from large and small power lines in South Africa and Namibia suggest that, most individuals die from direct impacts (271 birds y−1) rather than electrocution (122 birds y−1; van Rooyen and Ledger 1999). Furthermore, birds succumb by striking the narrow ‘earth-wire’ set above the heavier transmission lines (Alonso and Alonso 1999, Jenkins and Smallie 2009). Many other species, particularly raptors (Falconiformes), die from electrocutions. Electrocutions are seemingly higher in this group (particularly the larger species) because they live around the pylons supporting the power lines, using them as perch and nesting sites, and thus spend large proportions of their lives around potentially dangerous conductors.

However, given the amount of time that raptors spend chasing prey or displaying around such lines their mortality rates appear relatively low (or under-recorded) and one presumes some sort of learning and avoidance, at least of collision with the transmission lines, is evident. Direct observations of wild birds affecting lines are very rare.

Rossing Mountain-Arandis Avifauna and Transmission Lines Risk:

Baseline data collected from Bird Information Systems layers, generated for Namibia by Environmental Information Systems revealed that the proposed transmission line has a relative risk, as about 13km is not threatening major bird species as summarised below;

Table 4: Bird Sensitivity and Risks

E = Critically Endangered, E = Endangered; V = vulnerable; NT = Near threatened

Potential impacts:
Collision: Cape Eagle-Owl(NT), Great White Pelican(E), Lappet-faced Vulture(V), Martial Eagle(E), Peregrine Falcon(NT), Verreauxs' Eagle(NT) **Electrocution:** Cape Eagle-Owl(NT), Lappet-faced Vulture(V), Martial Eagle(E), Peregrine Falcon(NT), Verreauxs' Eagle(NT)
HLPCD or Pole with S/O insulator: Lappet-faced Vulture(V)
Habitat damage: Lappet-faced Vulture(V), Martial Eagle(E)
Transformers: Lappet-faced Vulture(V), Martial Eagle(E), Verreauxs' Eagle(NT)
Faults caused by nests: Cape Crow, Pied Crow, Sociable Weaver
Other non-Red listed species potentially affected by power lines **Raptors:** African Hawk-Eagle, Barn Owl, Black-chested Snake-Eagle, Southern Pale Chanting Goshawk, Spotted Eagle-Owl **Wetland species:** Abdim's Stork, African Spoonbill, Cape Teal, Cattle Egret, Egyptian Goose, Pied Avocet, Red-billed Teal, South African Shelduck, White-breasted Cormorant **Korhaans and bustards:** Ruppell's Korhaan **Others:** Struthio camelus)
Key: CE = Critically Endangered, E = Endangered; V = Vulnerable; NT = Near Threatened NB: Species highlighted in red are common in the Rietoog/Hardap Region area.

As mentioned above, assessment and mitigation efforts are directed towards the identified species that have a high biological significance, i.e. primarily Red Data species and/or species endemic or near-endemic to Namibia, as well as Red Data migrant species. Risk likelihood of these species to

impacts is based further to a great extent on relative abundance in the study area in the form of SABAP reporting rates: mainly SABAP1, but with confirmation by SABAP2 data where available; and to behaviour and representation in terms of existing power line incidents reported in the area.
Twenty-four species are considered potentially at risk from the proposed development, while a further four species have the potential to impact upon power line structures through their nesting activities.

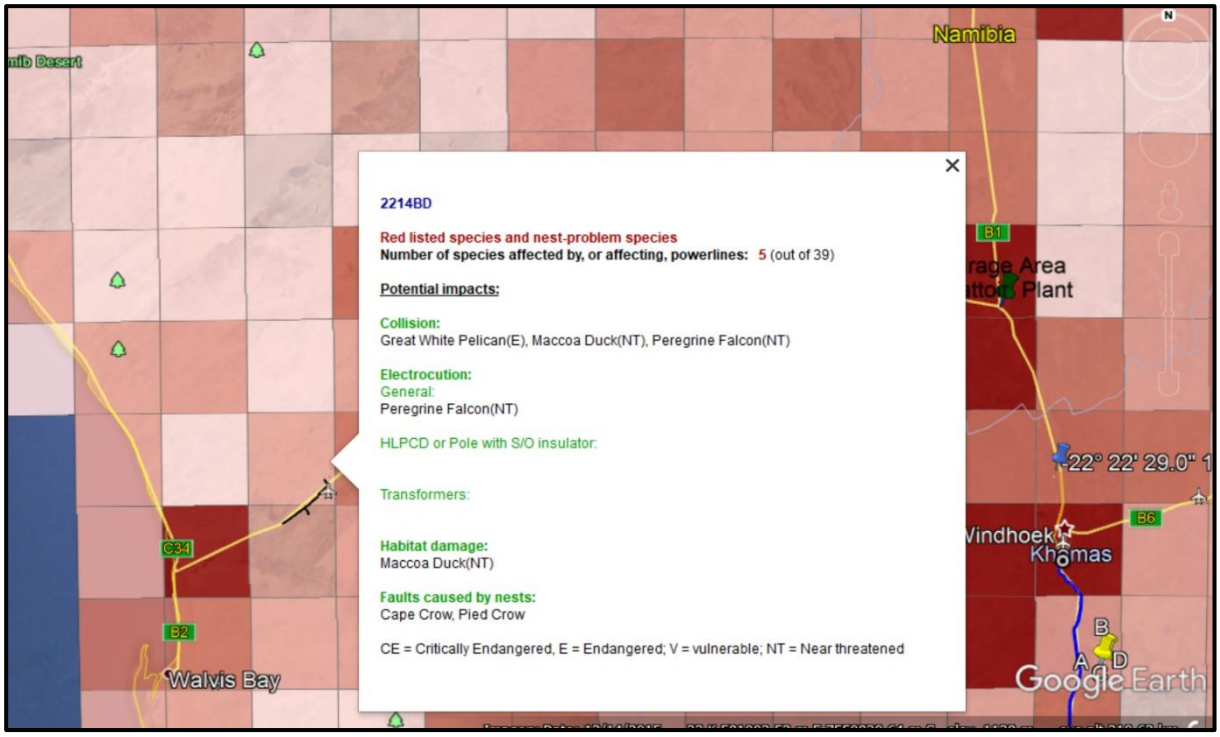

Table 5: Red Species and Nesting Problems in the area

3.10. Bird Flight Diverters

Bird flight diverters (BDs) have been used in Europe and the United States since the early 1970s (APLIC, 1994). BDs are a preformed high impact plastic spiral, which wraps around the shield wire to make the wire more visible (Figure 9). BDs increase the apparent shield wire diameter to 2.5 to 5.5 inches (6.4 to 13.9 cm) making the line more visible to birds. BDs are normally installed at a 49 foot (15 m) spacing. Reductions in bird collisions of 65 to 74 percent have been experienced using BDs. Bird diverters will be installed on the proposed transmission line.

Figure 11: Bird diverters for use on transmission lines, must be frequently replaced during the project operation phase.

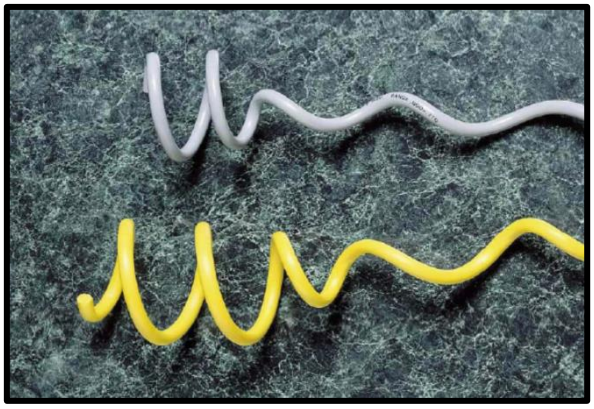

Figure 12: Local Fauna and Flora

Figure 13: Current Vegetation composition

The project servitude is already cleared, however within the surroundings and nearby ephemeral waterways pencil bush and aloeas perifolia can be observed. On the hilly areas, some occurrences of white thorn bushes were observed, although this is mostly in the mountain regions.

4. CHAPER FOUR: PUBLIC CONSULTATION

Public and Stakeholder involvement, is a key component of the EA process. The public consultation process, as set out in Section 21 of Regulation No 30 of EMA, has been followed during this assessment and the details thereof documented below.

4.1. Printed Media

4.1.1. Background Information Document

A Background Information Document (BID) was drafted at the onset of the EA process to act as a useful information handout about the proposed powerline upgrade. In addition, the BID provided details on the public consultation process with contact details for further information. This document was advertised for availability through various means of newspaper articles, Public meeting and electronic mail; see Appendix B of this document.

4.1.2. Newspaper Advertisements & Articles

Newspaper notices about the proposed project and related EA processes was circulated in two newspapers for two weeks. These notices appeared in the “Confidante” and “Windhoek Observer” newspapers, shown in Appendix B.

4.1.3. Site Notices

A site notice was placed at the project site, Ncaute Secondary School Notice Board and Ncaute Village Meeting place. These provided information about the project and related EA while providing contact details of the project team.

Figure 14(top & Centre): Site Notices

Figure 15(bottom): Arandis Town Council Notice

4.1.4. Building a Stakeholder Database

A stakeholder database for the project collected through a variety of means. During the advertisement of the project (though public notices in local newspapers and site-notices) the list was augmented as Interested & Affected Parties (I&AP) registered and contact information of stakeholders updated, please refer to Appendix B.

4.1.5. Stakeholder Meetings & Key Conversations

A public meeting was conducted on 25 September 2020 at Arandis Town Council Hall and the consultant administered facilitated the meeting with all members who attended.

4.1.6. Comments and review period

From the onset of the public consultation process and the initial information sharing through the BID, newspaper and site notices, various stakeholders have registered and provided comments. All of the immediate neighbours are not in support of the initiative due to several reasons. The Scoping Report and Environmental Management Plan was made available to the public and stakeholders for comment and review. Questionnaires and proof of stakeholder's engagement are attached in appendix B of this EAR.

Identified stakeholders for Consultation are as follows:

1) Arandis Town Council
2) Rossing Uranium
3) NIMT
4) Husab Mine

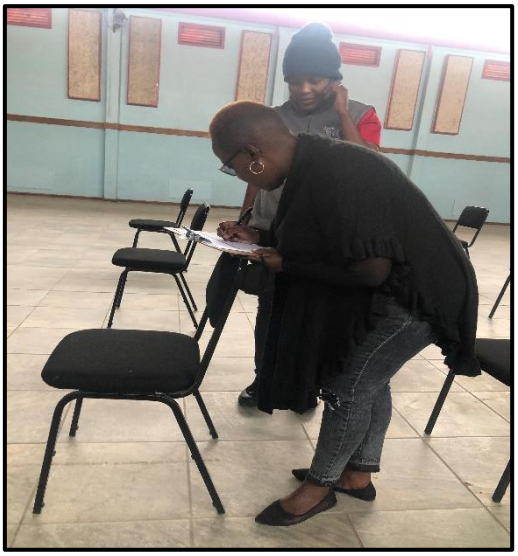

Figure 16: Public consultation proceedings at Arandis Town Council Hall

There was poor attendance to the consultative meeting, however the main stakeholders such as Arandis Town Council, Rossing Uranium, Husab Mine and NIMT managed to send their comments through email as evidenced in the appendix. The administered consultation register is also annexed.

5. CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1. Overview

Erongored has committed to sustainability and environmental compliance through coming up with a corrective action plan for all anticipated environmental impacts associated with the project. This is also in line with the Namibian Environmental Management legislation and International best practices on infrastructure development. The proponent will implement an Environmental Management Plan (EMP) in order to prevent, minimise and mitigate negative impacts. The environmental management plan is being developed to address all the identified expected impacts, the plan will be monitored and updated on a continuous basis with aim for continuous improvement to addressing impacts.

5.2. Assessment Of Impacts

This section sets out the overall approach that was adopted to assess the potential environmental and social impacts associated with the project. To fully understand the significance of each of the potential impacts each impact must be evaluated and assessed. The definitions and explanations for each criterion are set out below in Table 6: Assessment Criteria and

Table 6: Assessment Criteria

Duration – What is the length of the negative impact?	
None	No Effect
Short	Less than one year
Moderate	One to ten years
Permanent	Irreversible
Magnitude – What is the effect on the resource within the study area?	
None	No Effect
Small	Affecting less than 1% of the resource
Moderate	Affecting 1-10% of the resource
Great	Affecting greater than 10% of the resource
Spatial Extent – what is the scale of the impact in terms of area, considering cumulative impacts and international importance?	
Local	In the immediate area of the impact
Regional / National	Having large scale impacts
International	Having international importance
Type – What is the impact	
Direct	Caused by the project and occur simultaneously with project activities
Indirect	Associated with the project and may occur at a later time or wider area

Cumulative	Combined effects of the project with other existing / planned activities
Probability	
Low	<25%
Medium	25-75%
High	>75%

Table 7: Impact Significance

Class	Significance	Descriptions
1	Major Impact	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.
2	Moderate Impact	Impacts are long term, but reversible and/or have regional significance.
3	Minor	Impacts are considered short term, reversible and/or localized in extent.
4	Insignificant	No impact is expected.
5	Unknown	There are insufficient data on which to assess significance.
6	Positive	Impacts are beneficial

Table 8: Environmental Impacts and Aspects Assessment

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Source
TOPOGRAPHY	Landscape Scenery	Visual aesthetic impact	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Moderate	OHL
SOIL	Soil	Contamination to soil from waste disposal	Construction and Operations	Moderate	Small	Local	Direct	Low <25%	Minor	OHL
	Soil	Spillages of fuel, oil and lubricants.	Construction	Short	Small	Local	Direct	Low <25%	Minor	Construction Vehicles and Equipment
	Soil	Erosion	Operations	Moderate	Small	Local	Direct	Low <25%	Minor	OHL, Construction Vehicles and equipment
LAND CAPABILITY	Terrestrial ecology and aquatic ecosystems	Change in land use	Construction and Operations	Permanent	Great	Local	Direct	Low <25%	Moderate	OHL
	Carrying capacity	Increase in human activities in the environment	Construction and Operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate	OHL
WATER	Surface water quality	Water pollution from oils and lubricants from vehicles and machinery.	Construction and Operations	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Moderate	OHL, Construction Vehicles and equipment
	Surface water quality	Turbidity and high sediment load	Construction	Moderate	Small	Local	Direct	Low <25%	Moderate	OHL, Construction Vehicles and equipment

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Source
AIR QUALITY	Air Quality	Construction phase dust	Construction	Short	Small	Local	Direct	Low <25%	Minor	OHL, Construction Vehicles and equipment
WASTE	Groundwater quality	Hazardous waste such as waste oil and lubricants.	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	OHL, Construction Vehicles and equipment
	Surface water quality	Threatened from plant stormwater discharge into the river.	Construction and operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate	OHL, Construction Vehicles and equipment
	Topography and Landscape	Visual impacts due to use of unsustainable disposal methods	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	OHL, Construction Vehicles and equipment
FAUNA	Terrestrial ecology and biodiversity	Loss of habitat and driving away of local animals and desert reptile species	Construction and Operations	Moderate	Moderate	Local	Direct	High >75%	Minor	OHL, Construction Vehicles and equipment
	Avifauna	Bird electrocution, and physical crashes	Operations	Moderate	Small	Local	Direct	Low <25%	Minor	OHL
	Avifauna	Habitat destruction on pylons during maintenance	Operations	Moderate	Small	Local	Direct	Low <25%	Minor	OHL
	Aquatic life	Antifouling paints	Operations	Moderate	Small	local	Direct	Low <25%	Minor	OHL, Construction

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Source
										Vehicles and equipment
	Terrestrial ecology and biodiversity	Destruction of vertebrate fauna (e.g. road kills; fence and powerline mortalities)	Construction and Operations	Long	Moderate	Local	Direct	Low <25%	Minor	OHL, Construction Vehicles and equipment
FLORA	Terrestrial ecology and biodiversity	Proliferation of invasive species inland	Construction and Operations	Long	Moderate	Local	Direct	High >75%	Moderate	OHL, Construction Vehicles and equipment
	Terrestrial ecology and biodiversity	Habitat destruction through disturbances.	Construction and Operations	Long	Moderate	Local	Direct	Low <25%	Minor	OHL, Construction Vehicles and equipment
	Terrestrial ecology and biodiversity	Loss of unique flora and special habitats in the local environment because of general nuisance and animal migrate.	Construction and operations	None	Moderate	Regional	Direct	Low <25%	Moderate	OHL, Construction Vehicles and equipment
SOCIAL	Noise Pollution	Increased noise levels	Construction and operations	Moderate	Small	Local	Direct	Low <25%	Minor	OHL, Construction Vehicles and equipment
	Power Supply Interruptions	Industrial stoppages and security threats	Operation	Short	Small	Local	Direct	Low <25%	Minor	OHL

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Source
	Improved Power Supply	Industrial and Business improvement through opportunities	Construction	Long	Moderate	Regional / National	Direct	High >75%	Positive	OHL
	Socio Economic Activities	Temporary and permanent employment prospects.	Construction and operations	Long	Moderate	Regional	Direct	Medium 25 – 75%	Positive	OHL
	Socio Economic Activities	Climate change impacts through promotion of solar powered projects to feed into the grid.	Operations	Long	Moderate	Regional / National	Direct	High >75%	Positive	OHL
	Contribution to National Economy	Employment, local procurement, duties and taxes.	Construction and Operations	Short	None	Regional / National	Direct	Low <25%	Positive	OHL
Heritage/Archaeology	Artefacts, archaeological high value components	Destruction or affecting paleontological and archaeological artefacts	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 – 75%	Moderate	OHL, Construction Vehicles and equipment
HEALTH AND SAFETY	Health Sanitation	Poor ablution and waste management facilities may be detrimental to human health.	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 – 75%	Moderate	OHL, Construction Vehicles and equipment
	Property and human life	Electrocution, fires resulting in fatalities, damage to properties, veldt fires and power surges.	Construction and Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	OHL, Construction Vehicles and equipment

References

Directorate of Environmental Affairs. (2002) Ministry of Environment and Tourism, Atlas of Namibia Project.

Ministry of Environment and Tourism. (1994) National Environmental Assessment Policy.

Ministry of Environment and Tourism. (2002) National Environmental Management Bill.

Ruppel and Ruppel schlichting (eds) (2011). Environmental Law and Policy in Namibia

Simmons, R.E (1998a). Important Bird Areas in Namibia. In: Barnard,P. (ed). Biological Diversity in Namibia: a country study. Windhoek: Namibia Biodiversity Task Force.

GRN(MME). (2016). Electricity Supply Industry, National Policy for Indpendent Power Producers (IPPs) in Namibia. Windhoek, Namibia: GRN.

Nmaibia Rangelands. (2018, March 09). Nmaibia Rangelands. Retrieved from Products: http://www.namibiarangelands.com/products/

UNEP. (2002). Tools and Approaches for policy making in Environmental Management and public Health: Retrieved 9 April 2009 from

http://www.whoafro.unep.Inte/heag2008/docsenNew%20and%20emerging%threats.pdf.