

**ENVIRONMENTAL SCOPING REPORT: THE PROPOSED TELECOMMUNICATION BASE TRANSCIVER STATION (BTS) TOWER AT /AIS-/AIS RICHTERSVELD RESORT, //KHARAS REGION-NAMIBIA.**



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



**PowerCom  
(PTY) LTD**

# **Proposed Construction & Operation of a Telecommunication Base Transceiver Station (BTS) Tower at /Ais-/Ais Richtersveld Resort, //Kharas Region-Namibia**

## **Environmental Scoping Report (ESR)**

### **Environmental Scoping Report Prepared for Powercom (Pty) Ltd**

P.O.Box 40799  
Ausspannplatz  
Windhoek  
Namibia

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

20 Joseph Ithana Mukwayu street  
Ludwigsdorf  
Windhoek-Namibia  
PO Box 8401, Bachbrecht,  
Telephone: +264 (61) 302 672/ 081299 8444  
Facsimile: +264 (61) 255 207  
tdavid@dpe.com.na



<https://www.facebook.com/DP-Engineers-and-Environmental-Consultants-193970370936785/>

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### **Compiled by:**

D&P Engineers and Environmental  
Consultants (Pty) Ltd  
Email: [tkasinganeti@dpe.com.na](mailto:tkasinganeti@dpe.com.na)  
[ekasinganetie@gmail.com](mailto:ekasinganetie@gmail.com)

### **Authors:**

Tendai E. Kasinganeti

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## Definitions

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
MET: DEA	Ministry of Environment 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 Powercom Pty Ltd. 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 project were identified through the ESR. 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 proposed project development and operation.

This report 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 EIAR 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 establishment of the base transceiver station tower (BTS);
- 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.*

# 1. CHAPTER ONE: BACKGROUND

## 1.1. Introduction

Powercom (PTY) LTD as subsidiary of Telecom Namibia herein referred to as the proponent has been approached by Namibia Wildlife Resorts (NWR) to roll out telecommunication towers on their sites that are not connected to mobile network. In this respect Powercom identified NWR sites that requires improved communication alternatives due to projected growth in the tourism sector and crucial importance of connectivity within parks and resorts

To achieve the objective of improved telecommunication connectivity, Powercom intends to establish telecommunication towers across identified NWR sites. One of the identified areas that needs improved voice and data connectivity through the erection of a telecommunication mast is Ais Ais Richtersveld Resort located at the |Ai-|Ais/Richtersveld Trans-frontier Park.

In terms of the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007)) and the Environmental Assessment Regulations of 2012; 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, Powercom has appointed D&P Engineers and Environmental Consultants (DPEE) to conduct an Environmental Assessment (EA) and develop an Environmental Management Plan (EMP) for the proposed tower establishment. This has been followed by an application for Environmental Clearance Certificate (ECC) to the Ministry of Environment and Tourism (MET): 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 telecommunication tower at |Ais |Ais Richtersveld Resort, in accordance with the guidelines and 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 proposed tower is proposed at the entrance to the NWR Ais Ais Richtersveld Resort, at an open area that was previously used as a camping area. Next to the project area to the south is a tennis court, to the west is the access road, to the east lies an open area extending further to the Fish River canyon and the Northern area has an open piece of land that is reserved for any future development. In this respect, the project site is already disturbed and cleared



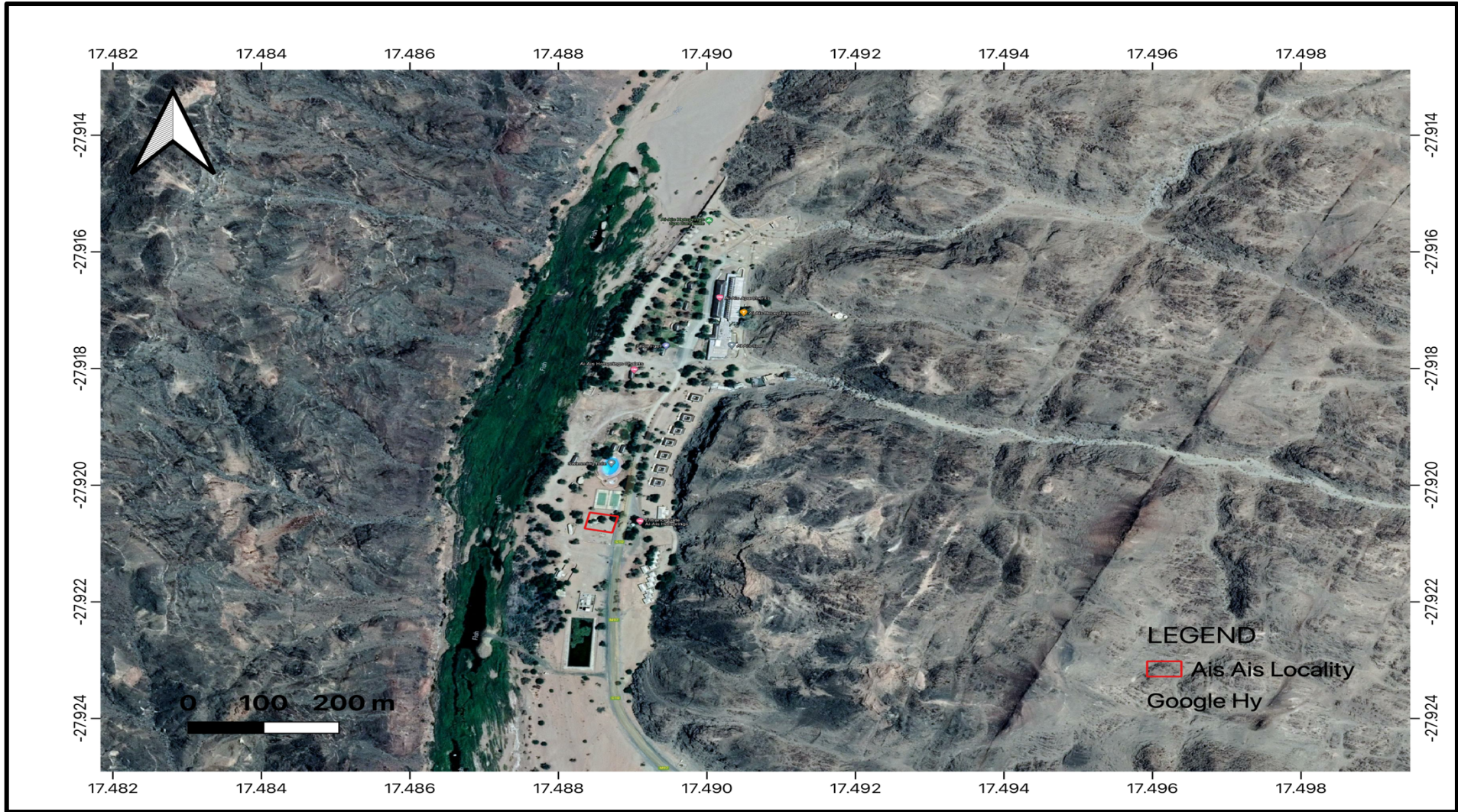


Figure 1: Proposed Project Site.



### 1.3. Project Overview

TELECOM Namibia's information and technology infrastructure development subsidiary, Powercom (Pty) Ltd is on a drive of construction network towers across the country. Powercom targets that, other than improving internet and voice connectivity in the regions, there is also a need to increase the company's footprint and asset base to best service ICT stakeholders and offer better connectivity in all regions of the country.

Powercom aims at providing different telecommunication service providers in Namibia with ready to use infrastructure as well as expand TN Mobile's network coverage into the different areas where there is weak or no network connectivity at all.

Behind this backdrop, Telecom was approached by Namibia Wildlife Resorts to help and facilitate internet connectivity on their sites that are currently not serviced with telecom network. One of the sites identified is |Ais Ais Richtersveld resort, and Powercom Pty Ltd intends to install a telecommunication tower at the Resort. The development will include the following:

- The construction of a 30m Palm tree tower within the footprint size of a 20m x 20m
- A storage and communication structure for equipment

The structure will be fenced to limit public access to it. The base station will be a secured building and sufficient precaution will be made to prevent access to the antenna support structure. Access to the area will be strictly controlled through a locked gate as illustrated below;

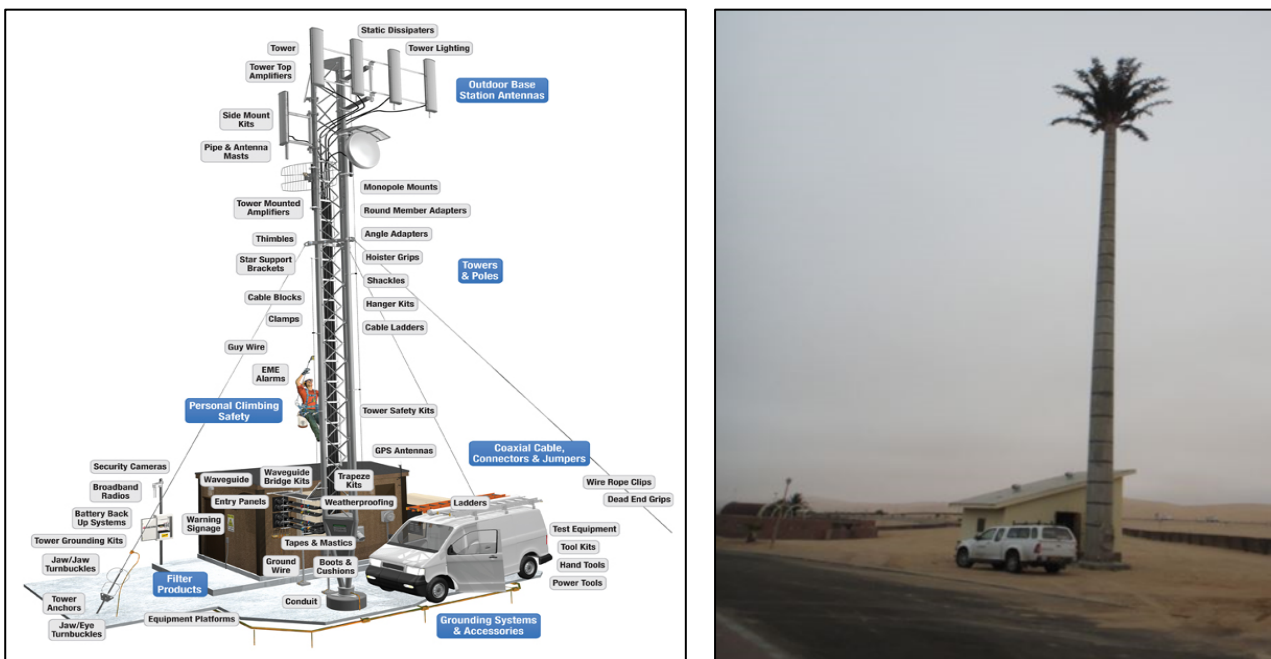


Figure 2: Typical Telecommunication tower (Left) Proposed tower (right).

The proposed telecommunication tower is designed to blend into the game park, through installation of a Palm tree tower. This is aimed to also minimize visual aesthetics impacts and the design is below:

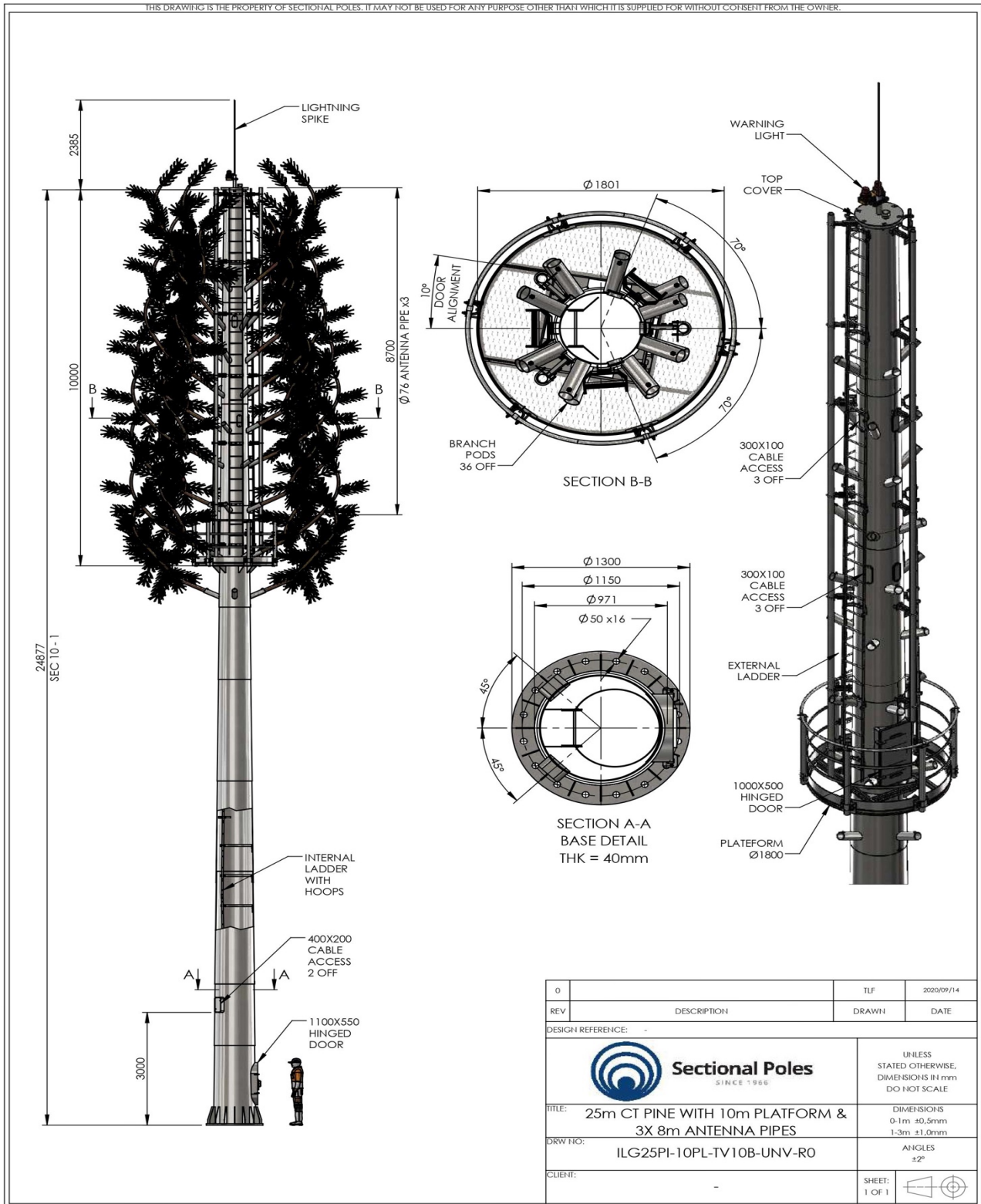


Figure 3: Proposed Palm tree design tower

### 1.3.1. Accessibility

The site is easily accessible from the resort’s access road.

### 1.3.2. Infrastructure and Services

**Water:** Water for construction will be obtained from existing boreholes.

**Ablution:** Construction contractor will use the existing toilets in proximity to the site.

**Electricity:** There is an existing electricity connection on site

**Communication:** The proposed project will provide for communication in the area.

## 1.4. The project Environs

The project site is located at the Ais Ais Richtersveld resort at an open area previously used as a camp area, and more recently as a contractors camp when the resort’s accommodation was getting upgraded. The site is already cleared and there is no vegetation on the project area.



**Figure 4: Project site environs**

Left: Old braai areas that will be removed.

Right: Tennis court and entrance to the resort area

## 1.5. Need and Desirability

The economic and social development goals of Namibia are embodied in (i) Vision 2030 and (ii) the National Development Plan 5 (NDP 5) 2017/2018 – 2021/2022 as well as NDPs 1, 2, 3, and 4. In addition, the Government has developed the Harambee Prosperity Plan (HPP) 2016/2017 – 2019/2020, which complements the Vision 2030 and NDP 5. All of the three plans set the goals, targets, and strategy for Namibia to move on a path to economic prosperity through a concerted strategy for the development of Namibia’s economic growth. These Plans also include specific growth targets milestones and strategies for the sustainable deployment of Namibia’s resources to achieve the stated economic and social development goals. Communication is one of the major targets aimed in the NDP5 and to stimulate development of any aspect, internet and voice connectivity is a pre-requisite.

This project, is a major step in addressing the objectives of the developmental plans and targets of the Namibian government and the development will ensure that there is connectivity for tourists who will need to keep connected to their business and family, whilst they are on holiday.

## **1.6. Project Alternatives**

### **1.6.1. Site Location Alternatives**

An integrated site selection study was done in order to identify a suitable site for the proposed tower. The proposed site is considered highly desirable due to the following considerations:

- Elevation: The project location is strategic because it can allow the covering of a wider radius within the game reserve.
- Land suitability:

-The site is easily accessible by road and near electrical connection to power the tower components. It is thus, the consideration of the above criteria resulted in the selection of the preferred site.

No further site location alternatives are considered in the EIA process.

### **1.6.2. Tower Infrastructure Alternatives**

There are several types of telecommunication towers designs and form. In this respect, to cater for a 30m height so as to cover further into surrounding farms and mines, the proponent will invest in a palm tree tower that also caters for green and sustainable development and minimising visual intrusion in the surrounding environs.

### **1.6.3. Conclusion**

Based on the preceding alternative analysis and options, the project will go ahead and will ensure maximum environmental and safety performance systems are in place

## **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**

<b>LEGISLATION/POLICY/GUIDING DOCUMENT</b>	<b>PROVISION</b>	<b>PROJECT IMPLICATION</b>
<b>The Constitution of the Republic of Namibia (1990)</b>	<p>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:</p> <ul style="list-style-type: none"> <li>- Guarding against overutilization of biological natural resources,</li> <li>- Limiting over-exploitation of non-renewable resources,</li> <li>- Ensuring ecosystem functionality,</li> <li>- Maintain biological diversity.</li> </ul>	<p>-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.</p>
<b>Vision 2030 and National Development Plans</b>	<p>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.</p>	<p>-The proposed project is an important element in the propelling and connectivity in the country.</p>
<b>Environmental Assessment Policy of Namibia 1994</b>	<p>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 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.</p>	<p>-The construction and operation of the tower will only commence after being awarded an environmental clearance certificate, thus by abiding to the requirements of the Environmental Assessment Policy of Namibia. The EIA and EMP will cater for the sustainable management of biophysical environment.</p>

<p><b>Environmental Management Act No. 07 of 2007</b></p>	<p>The Act aims at</p> <ul style="list-style-type: none"> <li>▪ Promoting the sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment;</li> <li>▪ To provide for a process of assessment and control of projects which may have significant effects on the environment;</li> <li>▪ 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.</li> </ul>	<p>-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.</p>
<p><b>Electricity Act 4 of 2007</b></p>	<ul style="list-style-type: none"> <li>▪ Requires that any generation and or distribution complies with laws relating to health, safety and environmental standards (s 18(4)(b))</li> <li>▪ 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.</li> </ul>	<p>-Obliges Powercom to comply with all relevant provisions of the EMA and its regulations when installing electrical connections to the tower.</p>
<p><b>The Atomic Energy and Radiation Protection Act, Act 5 of 2005:</b></p>	<p>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.</p>	<p>- Cell phone towers and other antenna installations are usually located on rooftops, towers and utility poles. Cell phone towers operate at a higher power than cell phones but the radiofrequency EMF they emit is much further away from your body. This means your exposure from such antennas is usually much lower than exposure level from using a cell phone.</p>

		-Installation of the network transmitter will be done in accordance to safety protocols required for non-ionizing radiation protection.
<b>Hazardous Substances Ordinance 14 of 1974 Regulations Made In Terms Of Hazardous Substances Ordinance 14 of 1974 sections 3 and 27</b>	To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the division of such substances into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances; and to provide for matters connected therewith.	Powercom will have to conform to this Act and its regulations through application for relevant licences with the relevant bodies highlighted thereto.
<b>“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))</b>	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.	- Cell phone towers and other antenna installations are usually located on rooftops, towers and utility poles. Cell phone towers operate at a higher power than cell phones but the radiofrequency EMF they emit is much further away from your body. -This means exposure from such antennas is usually much lower than exposure level from using a cell phone. However, Namibia regulations on non/ionizing radiation will be followed.
<b>Soil Conservation Act 76 of 1969</b>	The objectives of this Act are to: <ul style="list-style-type: none"> <li>✓ Make provisions for the combating and prevention of soil erosion,</li> <li>✓ Promote the conservation, protection and improvement of the soil, vegetation, sources and resources of the Republic.</li> </ul>	-The project will have a rather localized impact on soils and on the soil through clearance for tower platform. Soil protection measures will be employed and preservation of trees as much as possible.

<p><b>Nature Conservation Ordinance 1996</b></p>	<p>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.</p>	<p>The proposed project implementation is located within a national park, however it is at an area designated for development on an already disturbed piece of land that was previously used as a construction campsite. The project site was selected with this ordinance in mind to ensure that Namibian nature is conserved.</p>
<p><b>Protected Areas and Wildlife Management Bill</b></p>	<p>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 protects all indigenous species and control the exploitation of all plants and wildlife.</p>	<p>Environmental recommendations and considerations on this project have ensured that the proposed activities will not fall within the boundaries of any protected area and that the project will not affect heavily endangered vegetation and animals on its site.</p>
<p><b>Forest Act, 2001 (Act No. 12 of 2001)</b></p>	<p>The Act gives provision for the protection of various plant species through the Ministry of Agriculture, Water and Forestry (MAWF), Directorate of Forestry).</p>	<p>-The site has a few palm trees which will not be removed to pave way for development.</p>
<p><b>National Rangeland Policy and Strategy, 2012</b></p>	<p>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.</p>	<p>-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&amp;5.</p>
<p><b>National Biodiversity Strategy and Action Plan (NBSAP2)</b></p>	<p>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.</p>	<p>-The project proponent has been advised by DPEE and recognises the need for ecosystems protection to manage the changing climatic environment. -This project is one of the drivers to reduce the rate of global environmental change given its contribution, to decreased use of burning fossil fuels for energy generation.</p>

<b>Wetland Policy, 2004</b>	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 5km radius of the proposed project site.
<b>Water Resources Management Act, 2013 (Act No. 11 of 2013)</b>	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 proposed development will get water from the existing borehole.
<b>National Heritage Act 27 of 2004</b>	Heritage resources to be conserved in development.	-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 older 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.
<b>National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979</b>	“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 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	-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 to take the required route and notify the relevant commission.



	<p>(d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or</p> <p>(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.</p>	
<b>Pollution Control and Waste Management Bill</b>	<p>-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.”</p> <p>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.”</p>	-To control air, water and land pollution as agitated by the Act the project proponent will ensure that the development will prevent pollution in all forms during construction and operation phases.
<b>Communications Act, 2009 (Act No. 8 of 2009)</b>	<ul style="list-style-type: none"> <li>✓ (10) The Authority may impose specific obligations and requirements on a licensee regarding to masts, towers or other facilities including requirements relating to the environmental or aesthetic impact of such facilities;</li> <li>✓</li> </ul>	-As a pre requisite, telecommunication towers would require environmental clearance certificates and, in this respect, Powercom authorised this EIA to obtain such.
<b>Communication Bill 2009</b>	<ul style="list-style-type: none"> <li>✓ Provide for the regulation of telecommunication activities. The bill provides licencing and enforcement of conditions, and the approval or equipment and technical standards to ensure public health and safety.</li> </ul>	-As per relevant spectrum, network equipment should be as per licenses.
<b>Convention on Biological Diversity (CBD)</b>	<ul style="list-style-type: none"> <li>✓ Namibia is a signatory of the Convention on Biological Diversity and thus is obliged to conserve its biodiversity.</li> </ul>	The project will preserve tree species on as part of their plans for greed and sustainable development.

<b>United Nations Convention to combat Desertification</b>	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.
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## 3. CHAPTER THREE: RECEIVING ENVIRONMENT

### 3.1. Introduction

In this chapter, the findings of the EIA Team on baseline surveys, public consultation and desk reviews undertaken are in respect to the ecology, society, economy and geo-political set up of the proposed project area. The geological make up and meteorology of the project site will also be discussed in this chapter to give an in-depth understanding of the project area in question.

### 3.2. Climate

**Classification of climate:** Ais Ais Richterveld Park has a desert climate (BWk, according to the Köppen climate classification), with pleasant temperatures throughout the year.

**Average rainfall:** 50mm - 100mm per year

**Average Evaporation:** Evaporation in the area is averaged 2600-2800mm.

**Precipitation:** Sporadic and unpredictable, high intensity, highly localised storm events between December and March.

**Temperature:** During the hottest month of the year, which is mainly November, the average maximum temperature is about 30 - 37 °C. During July which is the coldest month the average minimum temperature is 8 - 10 °C.

**Wind direction:** Winds and weather in the region are controlled by the interaction of the south Atlantic anticyclone, the northward-flowing and cold Benguela Current (with associated upwelling), eastward moving mid latitude cyclones and the atmosphere pressure field over the subcontinent (Kamstra, 1985).

### 3.3. Topography

The topography rises from the sea level in the western part of the region towards the east and north eastern parts of the region. The study in proximity to the Fish River basin which is characterized by mountainous inselbergs forming high altitudes.

### 3.4. Geology and soils

The park is characterised by extremely rugged and largely inaccessible terrain in the majority of the area. The impressive Namus- and Huns mountains rise up to about 1250 m (amsl) and dominate the western section of the park. The Huib Hoch Plateau, the southern-most extension of the Namibian Great Western Escarpment, reaches into the northern portion of the park.

Some of the oldest rocks in Namibia can be found in the southern section of the park. The area is underlain by the Namaqua Metamorphic Complex (1400-1050 million years old). The remainder of the area is composed of limestone, sandstone and shale of the Nama Group (600-543 million years).

These form typical table mountains where harder layers on top have protected these rocks from erosion, such as in the south-east of the par. Geomorphologic processes in the past have created a wonderland for observing landform features such as landslides and the deeply incised canyons of the rivers expose different rock strata which tell a story of the geological history of the area. Different soil types have developed based on the underlying rock types and prevailing climatic conditions. Due to the arid climate, most are poorly developed regosols, except in rivers and drainage lines where sandy and loamy soils accumulate.

### **3.5. Terrestrial Ecology**

#### **3.5.1. Biodiversity study findings**

This study is site specific but will be supported by relevant literature of the studies done in the surrounding areas especially on the Succulent karroo biome of North –west South Africa which stretches into south western Namibia where our study area lies.

The Succulent Karoo biome is believed to support over 6, 000 plant species, 250 species of birds, 78 species of mammals, 132 species of reptiles and amphibians, and an unknown number of insects, it is extremely diverse and yet it is the world’s most arid environment. Most impressive, however, is that over 40 % of these species found here are found nowhere else on earth, (Farmer, 2003 - 2004).

The study area lies in the /Ai /Ais Hotsprings Game Park, a site of national and global significance. It is considered to be a Biodiversity Hotspot being part of the Succulent Karroo Biome. A biodiversity hotspot is a biogeographic region that is both a significant reservoir of biodiversity and is threatened with destruction. The term biodiversity hotspot specifically refers to 25 biologically rich areas around the world that have lost at least 70 percent of their original habitat. The remaining natural habitat in these biodiversity hotspots amounts to just 1.4 percent of the land surface of the planet, yet supports nearly 60 percent of the world's plant, bird, mammal, reptile, and amphibian species.

Plant diversity is the biological basis for hotspot designation. Plants have been used as qualifiers for Hotspots because they are the basis for diversity in other taxonomic groups and are well-known to researchers.

The hotspot concept targets regions where the threat is greatest to the greatest number of species and allows conservationists to focus cost-effective conservation efforts there. The world’s 25 biodiversity hotspots contain 44 percent of all plant species and 35 percent of all terrestrial vertebrate species in only 1.4 percent of the planet’s land area, (Farmer, 2003 - 2004; Daily, 2015).

The project site however is already disturbed and does not threaten biodiversity conservation within the park.

### **3.6. Fauna in the study area**

#### **3.6.1. Insects of the Richtersveld Area**

Semi-arid areas of the world are surprisingly rich in insects and the Richtersveld ecoregion which covers our study area, the project site is no exception. It is a centre of diversity for solitary bees, certain wasps, monkey beetles, grasshoppers, flies and lacewings.

In contrast butterflies and moths are poorly represented here. They emerge for a very short period of time in spring and summer. These insects are ecologically important as pollination agents in the plants reproduction cycle e.g. the tangle-veined fly pollinates over 20 different species of iris and pelargonium. The bees and wasps are vital pollinators of wild flowers.

### 3.6.2. Reptiles of the Richtersveld eco-region

At least 22% or 55 species of Namibian lizards are classified as endemic. The occurrence of reptiles of “conservation concern” includes about 67% of Namibian reptiles (Griffin 1998b). The diversity and uniqueness of the reptiles found in the study area make it a herpetological paradise, more than 50 reptile species have been recorded including 3 species of tortoise and one terrapin. Over grazing and mining in critical habitats are some of the biggest problems facing reptiles in Namibia (Griffin 1998b).

The Angulate tortoise and the Namaqua Speckled Padloper are common in the study area. Although not studied in the /Ai /Ais Hotsprings Game Park per se, tortoises are found in high densities and their biomass measured as the weight of tortoises per hectare can exceed that of many antelope species. In the Addo Elephant National Park, their weight was only exceeded by that of the elephants. They have poor digestion and eat large quantities of plants and as a result their faecal matter are full of undamaged seeds like elephant dung but theirs have a chance of germination since they are deposited in bushes as opposed to the open. This makes them very important ecosystem members for seed dispersal, (Branch, 2008).

### 3.6.3. Avian Diversity

Namibia with approximately 658 species of birds is considered very small as compared to other areas in Africa especially the equatorial regions with high rainfall and characterized by thick evergreen forests. The avian diversity expected to occur in the study area is indicted in the table below.

**Table 2: Bird expected and / or known to occur in the Study Area.**

Common Name	Scientific Name
Common ostrich	<i>Struthio camelus</i>
Southern black korhaan	<i>Eupodotis afra</i>
Cape spurfowl	<i>Francolinus eapensis</i>
Pied crow	<i>Corvus albus</i>
Blacksmith lapwing	<i>Vanellus armatus</i>
Namaqua sandgrouse	<i>Pteroctes namaqua</i>
Jackal buzzard	<i>Buteo rufofuscus</i>
Southern pale chanting goshawk	<i>Melierax canorus</i>
Rock kastered	<i>Falco rupicolus</i>
Bokmakierie Telophorus zeylonus	<i>Telophorus zeylonus</i>
Pale- neinged starlingn	<i>Onychognathus nabouroup</i>
White backed mousebird	<i>Colius colius</i>
Namaqua done	<i>Oena capensis</i>
Ant- eating chat	<i>Myrmecocichla formicivora</i>



Cape weaver	<i>Ploceus capensis</i>
Cape sparrow	<i>Passer melanurus</i>
Yellow canary	<i>Crithagra flavi ventris</i>

### 3.6.4. Mammal diversity in the Richtersveld area

Namibia harbours about 75 % of the Southern Africa’s species richness represented by 250 mammal faunal species (Griffin, 1998), 83 % of generic richness and 98 % of familial richness. 14 % are recognized as endemic mammals. The endemic mammals are characterized by the monotypic Petromurodae and the rodent genera Gerbillurus and Petromyscus. Currently 94 species (38 %) are classified as under or probable threat, 19 species (8 %) are classified as under definite threat. Major threats to mammals are invasive aliens, risk of genetic pollution, habitat alteration etc, (Griffin, 1998).

Winter rains falling in the study area used to attract annual migrations of herds of grazer and browsers from further inland such as springbok, hartebeest, wildebeest, eland and zebra but most of them are now restricted to conservation areas of Botswana, (Manning, 2008). The area’s resident mammals comprise mostly of smaller species of rats, mice, gerbils and other rodents.

**Table 3: Larger mammals expected and / or known to occur in the study area.**

Common Name	Scientific Name
Steenbok	<i>Raphiceras campestris</i>
Gemsbok	<i>Oryx Gazelle</i>
Rock Dassie, Hyrax	<i>Procavia capensis</i>
Suricate	<i>Suricatta suricatta</i>
Bat-eard fox	<i>Otocyon megalotis</i>
Whistling Rat	<i>Parotomys spp.</i>
Hare	<i>Lepus spp.</i>
Harmann’s Mountain Zebra	<i>Equus zebra hartmannae</i>
Klipspringer	<i>Oreotragus oreotragus</i>
Leopard	<i>Panthera pardus</i>
Chacma baboon	<i>Papio ursinus</i>

### 3.6.5. Plant or Flora Diversity

The Ais Ais Richterveld parkis mainly composed of deserts, savannas and woodlands. These are made up of 15 vegetation types, 5 of which fall under deserts, 8 under savannas and 2 under woodlands.

Vegetation population and diversity is influenced by climatic factors such as rainfall and temperature as well as substrate / soil and topography. The project area being largely arid, rainfall limits the distribution of plant species.

The project area has sparse and short vegetation in the project environment identified around. Furthermore, human encroachment has affected the project environs, as this area is designated for park infrastructure, accommodation, employee housing, restaurant and any other facilities for the

park and resort management. In this respect, the project siting is in line with the Parks management plan and will not result in disturbance of sensitive ecological areas.



**Figure 5: Currently cleared site area with existing buildings in its vicinity**



**Figure 6: Ais Ais Resort areas that will be serviced by the BTS tower**



**Figure 7: Left-The Fish River in proximity to the site**

**Figure 8: Right-Nearby sewer oxidation ponds servicing the resort area**



## 4. CHAPTER 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 project development. 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 Environmental Assessment processes was circulated in two newspapers for two weeks. These notices appeared in the "Confidante" and "New Era" newspapers, shown in Appendix B.



#### 4.1.3. Site Notices

A site notice was placed at the project site, Game Park entrance and NWR reception area. These provided information about the project and related EA while providing contact details of the project team.

**Figure 9: Ais Ais Resort Reception Notice**

**Figure 10: Site 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 (through 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 scheduled on Saturday 11 September 2021 at Ais Ais Resort and the meeting was well attended by all stakeholders. Appendix b has detailed list of the attendance register. The consultant administered questionnaires through email to all members who attended the meeting as well as other members who were recommended by the public that they should be consulted.



**Figure 11: A public meeting and a site investigation was conducted with stakeholders.**

#### 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.

## 5. CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

### 5.1. Overview

Powercom 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 telecommunication infrastructure. 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 4: Assessment Criteria and

**Table 4: Assessment Criteria**

<b>Duration – What is the length of the negative impact?</b>	
None	No Effect
Short	Less than one year
Moderate	One to ten years
Permanent	Irreversible
<b>Magnitude – What is the effect on the resource within the study area?</b>	
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
<b>Spatial Extent – what is the scale of the impact in terms of area, considering cumulative impacts and international importance?</b>	
Local	In the immediate area of the impact
Regional / National	Having large scale impacts
International	Having international importance
<b>Type – What is the impact</b>	
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
<b>Probability</b>	
Low	<25%
Medium	25-75%
High	>75%

*(Adopted from ECC-Namiba, 2017)*

**Table 5: 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

*(Adopted from ECC-Namiba, 2017)*

**Table 6: Environmental Impacts and Aspects Assessment**

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure / Activity
<b>TOPOGRAPHY</b>	Landscape Scenery	Visual aesthetic impact	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Minor	Tower construction
<b>SOIL</b>	Soil	Contamination to soil from paints and other potentially hazardous substances	Construction and Operations	Moderate	Small	Local	Direct	Low <25%	Minor	Tower
	Soil	Spillages of fuel, oil and lubricants.	Construction	Short	Small	Local	Direct	Low <25%	Minor	Tower and Access Road construction
	Soil	Erosion	Construction	Moderate	Small	Local	Direct	Low <25%	Minor	Tower and Access Road construction
<b>LAND CAPABILITY</b>	Terrestrial ecology	Change in land use	Construction and Operations	Permanent	Great	Local	Direct	Low <25%	Moderate	Tower
	Carrying capacity	Increase in human activities in the environment	Construction and Operations	Moderate	Moderate	Regional	Direct	Low <25%	Minor	Tower
<b>WATER</b>	Surface water quality	Water pollution from oils, lubricants and chemicals spillages.	Construction and Operations	Moderate	Small	Local	Direct	Medium 25 - 75%	Moderate	Construction hydrocarbons
	Surface water quality	Turbidity and high sediment load	Construction	Moderate	Small	Local	Direct	Low <25%	Moderate	Construction hydrocarbons
<b>AIR QUALITY</b>	Air Quality	Construction phase dust	Construction	Short	Small	Local	Direct	Low <25%	Minor	Tower and Access Road construction
<b>WASTE</b>	Groundwater quality	Hazardous waste such as waste lubricants and stored chemicals may be release into the environment.	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	Tower and Access Road construction
	Surface water quality	Threatened from chemicals being washed into nearby rivers	Construction and operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate	Tower and Access Road construction
	Surface water quality	Construction and Operational solid waste	Construction and operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate	Tower and Access Road



Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure / Activity
										construction and maintenance
<b>FAUNA</b>	Terrestrial ecology and biodiversity	Loss of habitat and driving away of local animals	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	Tower and Access Road construction
	Terrestrial ecology and biodiversity	Destruction of vertebrate fauna (e.g. road kills; fence and powerline mortalities)	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	Tower and Access Road
<b>SOCIAL</b>	Noise Pollution	Increased noise levels	Construction	Moderate	Small	Local	Direct	Low <25%	Minor	Tower and Access Road
	Socio Economic Activities	Temporary and permanent employment prospects.	Construction and operations	Long	Moderate	Regional	Direct	Medium 25 – 75%	Positive	Tower and Access Road
	Socio Economic Activities	Climate change impacts	Operations	Long	Moderate	Regional / National	Direct	High >75%	Positive	Tower and Access Road
	Contribution to National Economy	Employment, local procurement, duties and taxes.	Construction and Operations	Short	None	Regional / National	Direct	Low <25%	Positive	Tower and Access Road
<b>HERITAGE</b>	Artefacts, archaeological high value components	Destruction or affecting paleontological and archaeological artefacts	Construction and Operation	Moderate	Small	Local	Direct	Low <25%	Minor	Tower and Access Road
<b>HEALTH AND SAFETY</b>	Health Sanitation	Poor ablution and waste management facilities may be detrimental to human health.	Construction	Moderate	Moderate	Local	Direct	Medium 25 – 75%	Moderate	Tower and Access Road
	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	Warehouse
	Natural Environment	Spillage/ release of chemicals into the environment	Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	Tower and Access Road
	Humans, Vegetation, Animals	Potential impacts from non-ionizing radiation propagated by masts.	Operation	Moderate	Small	Local	Direct	Low <25%	Minor	Tower

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure / Activity
<b>AVIAN IMPACTS</b>	Air traffic	Air Traffic disturbances	Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	Tower
	<b>Avifauna</b>	<b>Bird fatalities</b>	<b>Operation</b>	<b>Moderate</b>	<b>Moderate</b>	<b>Local</b>	<b>Direct</b>	<b>Medium 25 – 75%</b>	<b>Moderate</b>	<b>Tower</b>
<b>TRAFFIC</b>	Access road	Vehicular accidents	Construction and Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	Tower

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