

**ENVIRONMENTAL IMPACT ASSESSMENT
FOR THE PROPOSED CONSTRUCTION AND
OPERATION OF A TELECOMMUNICATION LATTICE
TOWER AT KUPFERQUELLE RESORT IN TSUMEB,
OSHIKOTO REGION-NAMIBIA.**



**ENVIRONMENTAL SCOPING REPORT
FINAL**

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Acronyms

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
GHG	Greenhouse Gasses
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
JBIC	Junior Baiano Industrial Consultants
MET: DEA	Ministry of Environment and Tourism's Directorate of Environmental Affairs

EXECUTIVE SUMMARY

Junior Baiano Industrial Consultants (JBIC) cc has been engaged by **Powercom (PTY) LTD** to conduct an Environmental Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the Construction and Operation of a Telecommunication Lattice Tower at Kupferquelle Resort in Tsumeb, Oshikoto Region-Namibia and to apply for an Environmental Clearance Certificate for the proposed project.




The proposed establishment triggered the application for an environmental clearance certificate as the following listed activity will be triggered by the proposed communication infrastructure project.

INFRASTRUCTURE

10.1 The construction of-

(g) communication networks including towers, telecommunication and marine telecommunication lines and cables;

Anticipated Environmental Impacts

-  Low potential environmental impacts because the proposed site is already disturbed from human encroachment.
-  Adding on a management plan has been developed to mitigate any anticipated possible impacts of the project to the environment.
-  Relative or moderate social impact (positive)

Social Impact

The project is generally expected to improve telecommunication connectivity in Tsumeb and surrounding areas. Interested and Affected Parties were notified of the project through Site notices and newspaper adverts and all relevant information on consultation is covered in Chapter 4 of this document and Appendix A of the document.

Recommendations

It is concluded that most of the impacts identified during this Environmental Assessment can be addressed through the recommended mitigation and management actions for both the construction and operation phases of the tower. An Environmental Management Plan has been developed for the development.

Should the recommendations included in this report and the EMP be implemented the significance of the impacts can be reduced to reasonably acceptable standards and durations. All developments could proceed provided that general mitigation measures as set out are implemented as a minimum.

It is therefore recommended that the proposed telecommunication lattice tower receive Environmental Clearance, provided that the recommendations described above and the EMP are implemented.

1. CHAPTER ONE: BACKGROUND

1.1. INTRODUCTION

Powercom (PTY) LTD herein referred to as the proponent has identified different areas in the Northern regions of Namibia that needs improved communication alternatives due to growth in population and economic activities. To achieve the objective of improved telecommunication connectivity, Powercom intends to establish telecommunication towers across the identified different locations. One of the identified areas that needs a telecommunication mast is Tsumeb Town and a site at Kupferquelle Resort was identified.

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 JBIC 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 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 Kupferquelle Resort telecommunication lattice tower, 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 project site is at Kupferquelle Resort in Tsumeb, Oshikoto Region-Namibia. The Locality Map Fig 1) gives a local layout view of the project site:

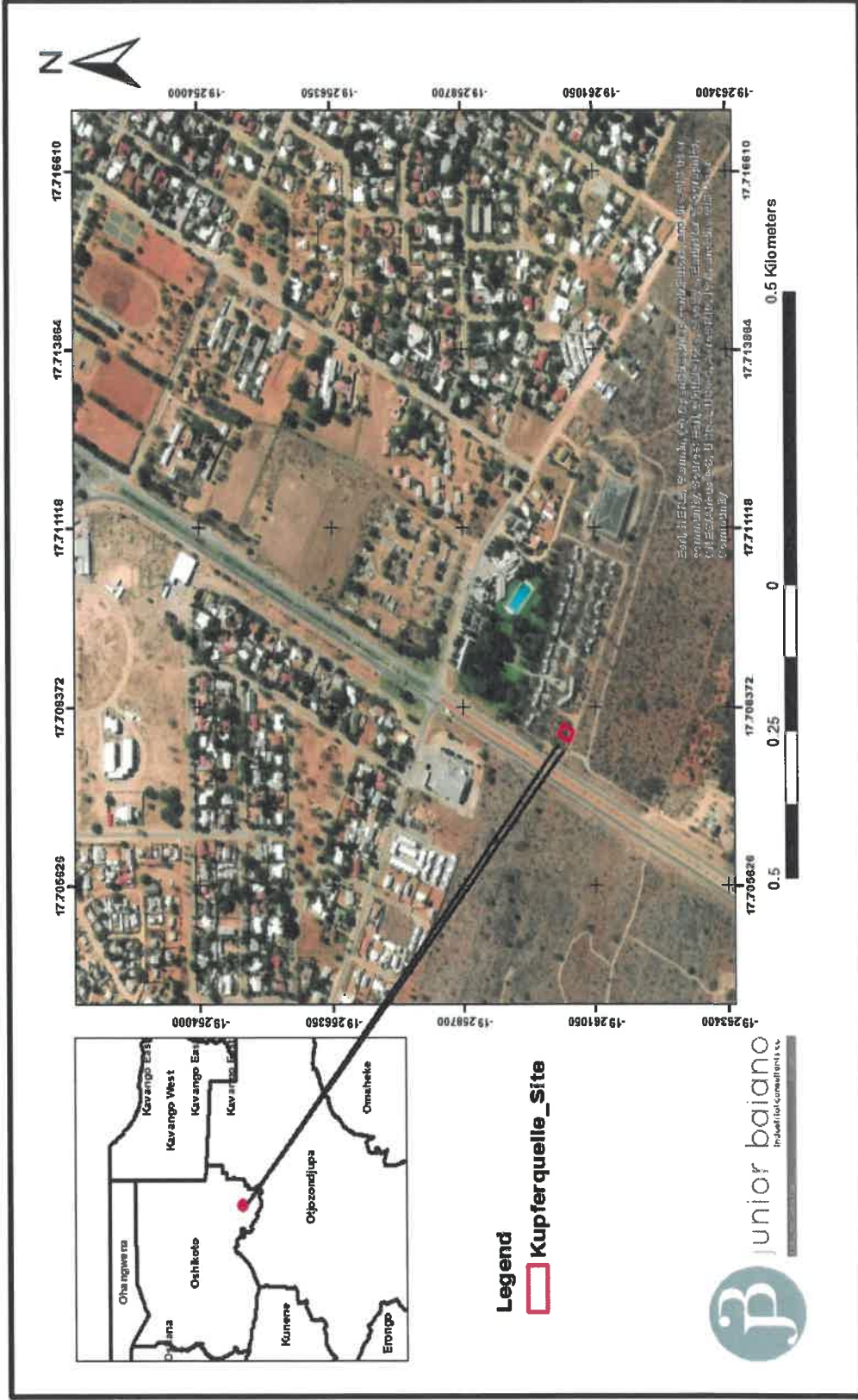


Figure 1: Proposed Project Site

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, the applicant, Powercom Pty Ltd intends to develop a telecommunication tower in Tsumeb at Kupferquelle resort. The development will include the following:

- The construction of an 60m Guyed mast 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.

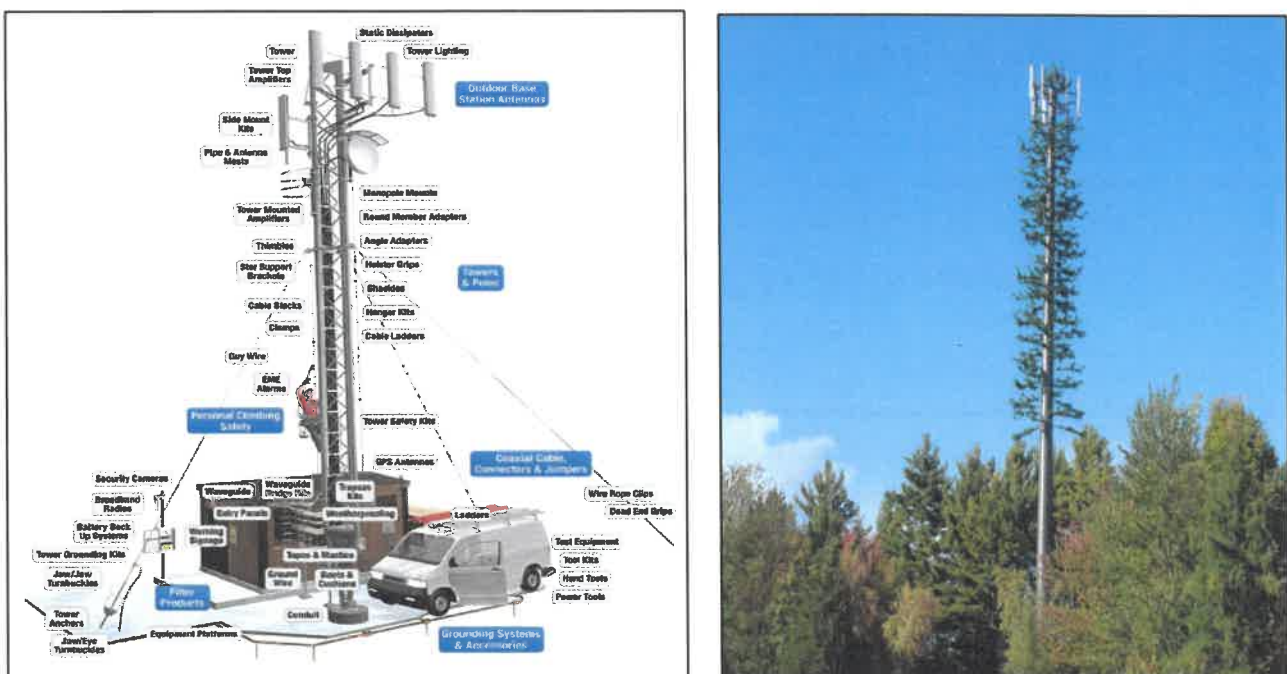


Figure 2: Typical Telecommunication tower (Left) Proposed eco-friendly tower (right).

Accessibility

The site is easily accessible from access road to Kupferquelle resort from the B1 national highway.

Infrastructure and Services

Water: There is already existing water supply from Tsumeb Town Council

Ablution: During construction, employees will use ablution at Kupferquelle resort, and during operation there is no need for on-site ablution.

1.4. THE PROJECT ENVIRONS

The project site is located to the South-Eastern corner of the Kupferquelle resort area, within this locality lies Kupferquelle accommodation houses at about 300m to the North. The proposed tower does not come into conflict with any existing land-uses.

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.

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 Tsumeb townlands as well as other surrounding farms.
- Land suitability:

-Sites that facilitate easy construction conditions (relatively flat land with few rock outcrops or water-bodies) were favoured during site selection.

-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 be compatible with Kupferquelle resort, the proponent will invest in an eco-friendly telecommunication mast that will blend with the surrounding vegetation.

1.6.3. NO-GO ALTERNATIVE

The current low environmental impact associated with current land use will be maintained and no change in land use or zoning would be required. The status quo needs to be measured against the proposed facility to determine whether the environmental and socio-economic benefits warrant the approval thereof or whether the status quo should be maintained.

This development alternative entails that the proposed tower will not be constructed on the project site, thus result in the site being left as is. With the current needs in voice and internet connectivity within Tsumeb and its surrounding farms, it is imperative that the tower should be constructed. The non-development of the proposed tower will furthermore impede economic development and socio-economic progress for Tsumeb Town.

Due to the numerous socio economic and economic benefits, the environmental advancement and the fact that the identified environmental impacts can be suitably mitigated it has been determined that the No Go option can be eliminated. Should the Competent Authorities (CA) refuse the authorisation of the proposed telecommunication tower, the 'No Go' option will be "implemented" and the status quo of the site will remain intact - leaving the site in its present state.

1.6.4. CONCLUSION

Based on the preceding alternative analysis and option, 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 situation concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in undertaking the construction and land servicing activities. This section looks at the legislative framework within which the proposed project will operate under. 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 Table 1: Legal Compliance 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).

The pursuit of sustainability is guided by a sound legislative framework. In this section, relevant legal instruments as well as their relevant provisions have been surveyed. An explanation is provided regarding how these provisions apply to this project.

Table 1: Legal Compliance

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
<p>The Constitution of the Republic of Namibia (1990)</p>	<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"> - Guarding against overutilization of biological natural resources, - Limiting over-exploitation of non-renewable resources, - Ensuring ecosystem functionality, - Maintain biological diversity. 	<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>
<p>Vision 2030 and National Development Plans</p>	<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</p>	<p>-The proposed project is an important element in the propelling and connectivity in the country.</p>

	<p>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>Environmental Assessment Policy of Namibia 1994</p>	<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>Environmental Management Act No. 07 of 2007</p>	<p>The Act aims at</p> <ul style="list-style-type: none"> - 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. 	<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>Electricity Act 4 of 2007</p>	<ul style="list-style-type: none"> - Requires that any generation and or distribution complies with laws relating to health, safety and environmental standards (s 18(4)(b) - 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. 	<p>-Obliges Powercom to comply with all relevant provisions of the EMA and its regulations when installing electrical connections to the tower.</p>
<p>The Atomic Energy and Radiation Protection Act, Act 5 of 2005:</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,</p>	<p>-Justifies the need for assessing the impact of electromagnetic radiation from the power line, on the nearby residents.</p>

	<p>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>Hazardous Substances Ordinance 14 of 1974 Regulations Made In Terms Of Hazardous Substances Ordinance 14 of 1974 sections 3 and 27</p>	<p>- 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.</p>	<p>- Powercom will have to conform to this Act and its regulations through application for relevant licences with the relevant bodies highlighted thereto.</p>
<p>“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))</p>	<p>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.</p>	<p>-Justifies the need for assessing the impact of ionising and non-ionising radiation from the operation of the network technologies to be installed on site.</p>

<p>Soil Conservation Act 76 of 1969</p>	<p>The objectives of this Act are to:</p> <ul style="list-style-type: none"> - 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. 	<p>-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>
<p>Nature Conservation Ordinance 1996</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 not located in any known or demarcated conservation area, national park or unique environments. The project site was selected with this ordinance in mind to ensure that Namibian nature is conserved.</p>
<p>Protected Areas and Wildlife Management Bill</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 has 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>Forest Act, 2001 (Act No. 12 of 2001)</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>-Land clearing of an extensive piece of land will be done upon approval from the Directorate of Forestry.</p>

		<p>-The proponent will also have to ensure that there is no indiscriminate cutting down of trees during construction and operation</p> <p>-The proposed site is sparsely vegetated with white shrubs and grasses, which are not threatened or protected.</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&5.</p>
<p>National Rangeland Policy and Strategy, 2012</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>National Biodiversity Strategy and Action Plan (NBSAP2)</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 JBIC and recognises the need for ecosystems protection to manage the changing climatic environment.</p> <p>-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>
<p>National Policy on Climate Change for Namibia, 2010</p>	<p>In harmony with the findings of the IPCC over time and the Earth Summits held annually, the policy seeks to outline a coherent, transparent and inclusive framework on climate risk management in</p>	<p>-Chemical storage, transportation and usage have considerable negative impacts on release of GHGs. There is need to ensure appropriate</p>

	accordance with Namibia's national development agenda, legal framework, and in recognition of environmental constraints and vulnerability. Furthermore, the policy pursues the strengthening of national capacities to reduce climate change risk and build resilience for any climate change shocks.	handling and storage is done on GHGs contributing chemicals.
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 2km radius of 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 proposed development will not have any interference with surface and groundwater sources during construction and operation, apart from water requirements for construction which will be supplied through Tsumeb water reticulation system
National Heritage Act 27 of 2004	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 order than 50 years,

		<p>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.</p>
<p>National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979</p>	<p>"No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia:</p> <ul style="list-style-type: none"> (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 (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. 	<p>-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>

<p>Pollution Control and Waste Management Bill</p>	<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." 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>	<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.</p>
<p>Communications Act, 2009 (Act No. 8 of 2009)</p>	<ul style="list-style-type: none"> - (10) The Authority may impose specific obligations and requirements on a licensee regarding to masts, towers or other facilities including requirements relating to the <ul style="list-style-type: none"> - environmental or aesthetic impact of such facilities; - 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. 	<p>-As a pre requisite, telecommunication towers would require environmental clearance certificates and, in this respect, Powercom authorised this EIA to obtain such.</p>
<p>Communication Bill 2009</p>	<p>- 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.</p>	<p>-As per relevant spectrum, network equipment should be as per licenses.</p>

<p>Convention on Biological Diversity (CBD)</p>	<p>- Namibia is a signatory of the Convention on Biological Diversity and thus is obliged to conserve its biodiversity.</p>	<p>The project will preserve tree species on as part of their plans for greed and sustainable development.</p>
<p>United Nations Convection to combat Desertification</p>	<p>Namibia is bound to prevent excessive land degradation that may threaten livelihoods.</p>	<p>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.</p>

3. CHAPTER THREE: RECEIVING ENVIRONMENT

3.1. CLIMATE

Table 2: Climatic environment

Aspect	Description
Classification of climate	Tsumeb has a hot semi-arid climate (Köppen: BSh), with hot summers and mild winters (with warm days and chilly nights).
Average rainfall:	600 mm per year
Temperature	The temperatures are highest on average in October, at around 25.9 °C. In June, the average temperature is 16.2 °C. It is the lowest average temperature of the whole year.
Humidity	The relative humidity during the least humid months of the year (i.e. September and October) is around 20-30% 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 winds are experienced in Tsumeb. General wind speed is at an average 2.3 m/s, based on data collected from Tsumeb Weather station.

3.2. TOPOGRAPHY

The site area is gently sloping to the North-east. The town of Tsumeb is located in the northern section of the central Namibian Plateau on the northern edge of the Otavi Mountain land which is characterised by a typical karst landscape. The town is relatively flat (1 300 meters above mean sea level and flanked to the south and east by the Otavi Mountains. An east-west ridge separates the town from the smelter complex (1 257 mamsl) which is located at the base of a valley to the north of the town. The terrain of the area is characterised by gentle undulating relief around the smelter complex. The Waterberg plateau is located approximately 12 km to the south-west of the smelter complex.

3.3. GEOLOGY

The Tsumeb area which is part of the colonial times Damara province is part of an orogenic belt which forms part of the upper Proterozoic Pan African system. The underlying Damara Sequence was deposited on a foundation of granitoid basement and infolded supracrustal formations of pre-Irumide (1.5 to pre 2.0 Ga), and Irumide (0.9 to 1.4 Ga) ages.

It is made up of a 400 km wide north east trending intracontinental arm and two 150 km wide coastal arms meeting at a triple juncture centred off the coastal town of Swakopmund, It evolved as an aulacogen by thinning of sialic crust causing the separation of the Kalahari, Congo and proto-South American cratons, and the deposition of a geosynclinal sequence 900 to 650 Ma ago. The northern coastal arm developed into what is known as the Kaoko Belt and the southern arm into the Gariep Belt which overlies the Northern Cape sub-province of the Namaqua Metamorphic Complex

3.4. GROUNDWATER

The town of Tsumeb falls within the Etosha Basin Hydrogeological Region. Groundwater occurs in the Tsumeb Dolomitic Aquifer with the Mulden Sandstones acting as an aquiclude. The Smelter site is located on the Elandshoek and Hüttenberg Formation lithozones in an ESE-WNW sloping valley formed as part of an anticlinal structure.

Tsumeb is highly dependent on groundwater resources (WSP Walmsley, 2004). Groundwater use in the area is as follows:

- The Tsumeb Municipality has a network of 39 boreholes which are used for domestic and industrial water supply.
- Several of the industries located to the north of the town have their own boreholes for water supply.
- Extensive agricultural activities occur immediately north of Tsumeb carrying out irrigation using groundwater resources.
- Agriculture to the south east of Tsumeb is also dependent on groundwater resources.

In 2002, the agricultural, industrial and domestic demand for groundwater from the Tsumeb Aquifer was estimated at 12 million m³ per annum (Mm³/a)(GKW Consult/Bicon, 2002). It is estimated that a surplus of 31 Mm³ flows to the north. Currently the main groundwater abstraction in the Tsumeb area includes: 1.83 Mm³/a to the DPMT Smelter, 1.67 Mm³/a for municipal public water supply, 2.03 Mm³/a for use by irrigation farms and 0.15 Mm³/a for use by other farms.

The proposed project will not threaten groundwater quality and quantity in Tsumeb in any way.

3.5. SURFACE WATER

Tsumeb is located on the eastern side of the Etosha Basin catchment, which is an inland drainage system where runoff flows into the Etosha Pan from where it then evaporates. The area around Tsumeb is predominantly karstic, which means that it is formed from the dissolution of soluble base rock (mainly dolomite and limestone in this area) which is characterised by underground drainage systems with sink holes and caves. Due to the geology of the area, there is no well-defined drainage pattern in the Tsumeb-Grootfontein area, but rather many small individual drainage systems, dependant on the local geology.

The local catchment can be divided up into an upper section (which included the old Mine Tailings Storage Facility (TSF) dam) covering an area of approximately 2.85 km² and the lower catchment below the TSF dam, which includes the main smelter and current western TSF areas, covering an area of 6.88 km², giving a total catchment area at the outlet on the border of the DPMT site boundary of 9.73 km².

To the west of the town is a drainage line (locally known as the Jordan River), which has its catchment area in the townlands of Tsumeb, flowing in a northerly direction along the western boundary of the site and then continuing off to the north where it reportedly disappears into the ground. The Jordan River is not a natural water course, relying on runoff from the central business area and the north eastern part of Tsumeb, but typically has only a low flow or is temporarily dry if there is no rainfall.

The proposed project, does not in any way threaten surface water quality within its immediate environs.

3.6. TERRESTRIAL ECOLOGY

3.6.1. VEGETATION

Tsumeb falls within the arid Savanna Biome (Harrison et al., 1997) and the vegetation in the Tsumeb area can broadly be classified as Dolomite Karstveld (Burke et al, in press). Due to the comparatively high rainfall and unique dolomite lithology of the area, it is recognised as a centre of plant species diversity in Namibia (Maggs et al, 1998).

A biodiversity assessment completed in December 2016 (Van Zyl, et al., 2016) identified four habitat types. These include dolomite hills, sandy plains, alien infested plain and drainage line.

The dolomite ridges comprise the largest unmodified/natural habitat within Tsumeb area and similarly on and around the project site and are highly diverse. It forms part of the Otavi mountain land, which is known to contain endemic and protected species. The sandy plain is more modified than the dolomite ridges due to its accessibility. A considerable degree of bush encroachment has taken place in the sandy plain areas. The alien-infested plain and drainage line habitat is located to the west of the plant facilities and originally probably also consisted of a sandy valley. Currently it has a highly modified species composition due to human influences, including high numbers of invasive alien plant species.

The project site falls within Kupferquelle resort project environment, which is already affected and the earmarked area for development is devoid of vegetation. Thus, there are no protected and or endemic tree species on the project site and construction activities will not result in massive vegetation disturbances.

3.7. FAUNA

The area of Tsumeb is disturbed as a result of urban development, but it can be expected that the surrounding areas which support natural vegetation will support species of conservation concern including damara dik-dik, eland, Namibian dwarf python, leopard tortoise and possibly endemic birds such as Carp's black tit and Ruppel's parrot. Wildlife surrounding the smelter is not abundant. Kudu, steenbok, squirrels, flamingos and other birds have, however, occasionally been spotted near or on the two main slimes dams.

Natural aquatic communities are largely absent from the region as a result of the absence of surface water flow due to the high infiltration rates. Stygobiotic (living in groundwater) amphipods are characteristic of karst landscapes and are known from the areas to the north east of Tsumeb.



Figure 3: Current vegetation cover on proposed site

Figure 4: Right-Existing site access to Kupferquelle Resort

4. CHAPER FOUR: PUBLIC CONSULTATION

4.1. OVERVIEW

The public consultation process forms an important component of the Environmental Assessment process. It is defined in the EIA Regulations (2012), as a “*process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters*” (S1). Section 21 of the Regulations details steps to be taken during a given public consultation process and these have been used in guiding our process.

Formal public involvement has taken place via public consultations and focal meetings, newspaper announcements to inform the public that the development is under consideration. The public consultation process has been guided by the requirements of Environmental Management Act (EMA) No. 7 of 2007 and the process has been conducted in terms of regulation 7(1) as well as in terms of the EMA Regulations of GN 30 of 6 February 2012 and the World Bank EIA standards and project ToR.

Its overriding goals have been to ensure transparency in decision making and to.

- Ensure stakeholder concerns are incorporated in project design and planning;
- Increase public awareness and understanding of the project and
- Enhance positive development initiatives through the direct involvement of affected people.

The objectives of the public participation are to build credibility through instilling integrity and of conducting the EIA, Educate the stakeholders on the process to be undertaken and opportunities for their involvement and build stakeholders by establishing an agreed framework accordingly. This requires accessible, fair, transparent and constructive participation at every stage of process. Inform stakeholders on the proposed project and associate issues, impacts and mitigation and using the most effective manner to disseminate information.

In this section of the report, the results of consultations with various classes of stakeholders are summarized. The results of consultations with other stakeholders and community members who took part in this EIA are attached as Appendices.

The consultation was facilitated through the following means:

- A Background Information Document (BID) containing the project description, the EIA process and an invitation to participate was shared with stakeholders and community members.
- Invitation to participate notices were published in the local newspapers (New Era and Confidante) as shown in Table 7 below and Appendix A of this document.
- Announcement of EIA process verbally in the common public meeting points.
- Placement of a public notice at the project site and town centre.

Table 3: Details of public notification of the EIA study

Method	Area of Distribution	Language	Date Placed
The Confidante	Country Wide	English	12 June 2020 19 June 2020
New Era	Country Wide	English	12 June 2020 19 June 2020
Site notices	Project site	English	05 June 2020
	Town Council Notice Board	English	05 June 2020
Public Meeting	Arandis Town Hall	English, Afrikaans	03 July 2020 @ 09:00 HRS

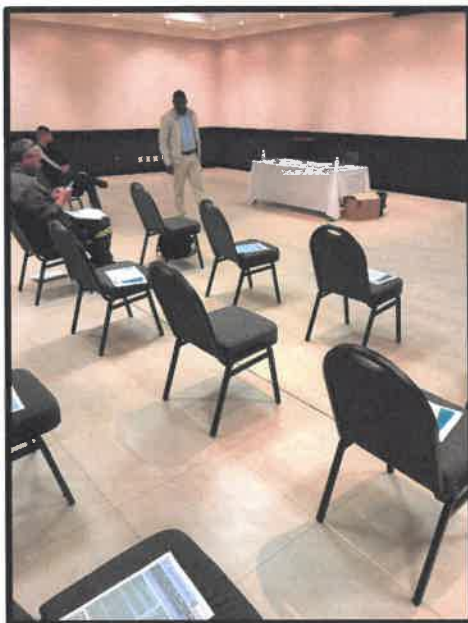


Figure 5:EIA Public meeting consultation.



Figure 6: Public Notification Site Notices

✓ *Key Stakeholder Engagement Meeting*

A public meeting was organised on 04 July 2020 at Kupferquelle Resort and only a handful of people attended the meeting. Surrounding properties were consulted and informed of the development. Proof of public consultation is given in Appendix A of this document as well the attendance register explaining the project and the EIA study. Given below are the details of the meeting which was held:

✓ *Identification of Interested and Affected Parties (I&APs)*

The EIA team identified and consulted the following I&APs & key stakeholders for the proposed project:

- Tsumeb Town Council,
- Community Members.

Other I&APs were allowed to register to the EIA team and compiled a database containing their names and correspondence details. The registration was accomplished over a period of 14 days.

✓ *Consultation with Stakeholders*

Experts in relevant fields, leaders of thought in environmental matters, Organs of the State, local communities have been consulted for their opinions on issues relating to the potential ecological and socio-economic impacts of the proposed project. This provided an opportunity for stakeholders and the public at large to engage in the process and to make comments or express their concerns regarding the proposed development.

Table 4: Key findings of the public consultation process:

SUMMARY OF ISSUES	
THEME	ISSUE
Health and Safety	<ul style="list-style-type: none"> ▪ The safety of the towers in light of 5G networks causing corona virus was asked, however it was addressed that the technology proposed is not 5G
Infrastructure sharing	<ul style="list-style-type: none"> ▪ Security companies were inquiring if they would be allowed to install transmitters on the towers to cover surrounding properties in Tsumeb.

5. CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1. OVERVIEW

Powercom Pty Ltd has committed to sustainable 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 energy generation, transmission and linear 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 5: Assessment Criteria.

Table 5: 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%

(Adopted from ECC-Namiba, 2017)

Table 6: 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 7: Environmental Impacts and Aspects Assessment

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure / Activity
TOPOGRAPHY	Landscape Scenery	Visual aesthetic impact	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Minor	Tower and Access road
	Soil	Contamination to soil from paints and other potentially hazardous substances	Construction and Operations	Moderate	Small	Local	Direct	Low <25%	Minor	Tower
SOIL	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
LAND CAPABILITY	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
WATER	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

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure / Activity
AIR QUALITY	Air Quality	Construction phase dust	Construction	Short	Small	Local	Direct	Low <25%	Minor	Tower Access Road construction
	WASTE	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
FAUNA		Surface water quality	Threatened chemicals being washed into nearby rivers	Construction and operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate
	SOCIAL	Surface water quality	Construction and Operational solid waste	Construction and operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate
FAUNA		Terrestrial ecology and biodiversity	Loss of habitat and driving away of local animals	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor
	SOCIAL	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
SOCIAL		Noise Pollution	Increased noise levels	Construction	Moderate	Small	Local	Direct	Low <25%	Minor

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure / Activity
	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
HERITAGE	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
HEALTH AND SAFETY	Health Sanitation	Poor ablation 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,	Construction and Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	Warehouse

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure / Activity
		veldt fires and power surges.								
	Natural Environment	Spillage/ release of chemicals into the environment	Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	Tower and Access Road
TRAFFIC	Air traffic	Air Traffic disturbances	Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	Tower
	Access road	Vehicular accidents	Construction and Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	Tower

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