ENVIRONMENTAL IMPACT ASSESSMENT

FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A 600 KWP SOLAR PV PLANT AT THE UNAM NEUDAMM CAMPUS, KHOMAS REGION, NAMIBIA

ENVIRONMENTAL SCOPING REPORT

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Acronyms

TERMS	DEFINITION
BID	Background Information Document
CA	Competent Authorities
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
GDP	Gross Domestic Product
GHG	Greenhouse Gasses
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
JBIC	Junior Baiano Industrial Consultants
MEFT: DEA	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs
PPE	Personal Protective Equipment

EXECUTIVE SUMMARY

Inceptus Energy (PTY) Ltd has engaged **Junior Baiano Industrial Consultants (JBIC)** cc to undertake an Environmental Impact Assessment (EIA) and create an Environmental Management Plan (EMP) and apply for an Environmental Clearance Certificate for the Environmental Impact Assessment for the proposed construction and operation of a 600 kWp Solar PV Plant at the UNAM Neudamm Campus, Khomas Region, Namibia.

The following activities promoted the planned project to require an application for an environmental clearance certificate under the Environmental Impact Assessment Regulations 2012:

Environmental Impacts

- Generation of waste during construction and operation.
- Impacts on vegetation and biodiversity through clearing of land during construction.
- Health and safety impacts during construction and operation.
- Surface and groundwater impacts during construction.

Social and Economic Impacts

- Improved energy supply.
- Creation of much needed employment opportunities
- Facilitation of local and national economic growth
- Utilization of an energy source (solar) is renewable and low emission. This contrasts with conventional fossil fuels that contribute to pollution and climate change.
- Reduction in foreign energy expenditures.
- An EMP has been developed to mitigate any anticipated possible impacts of the project to the environment.

Public Participation Process

Interested and Affected Parties were notified of the project through site notices and newspaper adverts. All relevant information regarding consultation is covered in Chapter 4 of this document and attached in Appendix A.

Recommendation

Based on the Environmental Assessment it is concluded that most of the impacts identified can be addressed through the recommended mitigation and management actions for both the construction and operation phases of the solar plant. 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 duration. All developments could proceed provided that general mitigation measures as set out are implemented at a minimum.

In this respect it is recommended that the proposed solar plant receives an Environmental Clearance Certificate, provided that the recommendations described in this report and the EMP are implemented.

1 CHAPTER ONE: BACKGROUND

1.1 INTRODUCTION

The University of Namibia (UNAM) intends to install a 600 kWp solar plant at its Neudamm Campus. This is part of the university's sustainable development initiative to green its operations. This undertaking is not only being done in the Neudamm but the university's other campuses such as Ogongo, Rundu and the Main Campus.

UNAM aims to play its part in supporting the country in meeting its renewable energy target. Namibia is poised to tackle climate change, by establishing a green economy that will drive economic recovery as envisioned for African countries in the African Union Continental Green Recovery Action Plan. In this context, the country has ambitious plans to develop green and blue economies as articulated under the economic advancement pillar of the Harambee Prosperity Plan (HPPII).

The feasibility of these plans is underscored by the abundant availability of sunlight throughout the year and proximity to billions of cubic meters of seawater and vast marine resources in the Atlantic Ocean. Namibia has the potential to capture around 10 hours of strong sunlight per day for 300 days per year. As a result, Namibia has some of the highest solar irradiance potential of any country in Africa, which is sufficient to provide power for the nation and its neigbours (WFC, 2021).

UNAM has engaged Inceptus Energy (Pty) Ltd to undertake the building work of the 600 PV solar plant at the Neudamm campus. 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) echoes the need of an Environmental Impact Assessment (EIA) for new projects (such as the proposed development) that are specified by the Act.

Non-compliance to legal obligations presents liabilities and it is in the wake of the need to attain sustainability that Inceptus Energy (Pty) Ltd has opted to undertake an EIA for the UNAM Neudamm campus proposed solar power plant. EIA is required to obtain an Environmental Clearance Certificate (ECC) from the Ministry of Environment and Tourism (MET) before the project can proceed. In this context the company has set out to conduct the Environmental Impact Assessment (EIA) for its upgrade activities.

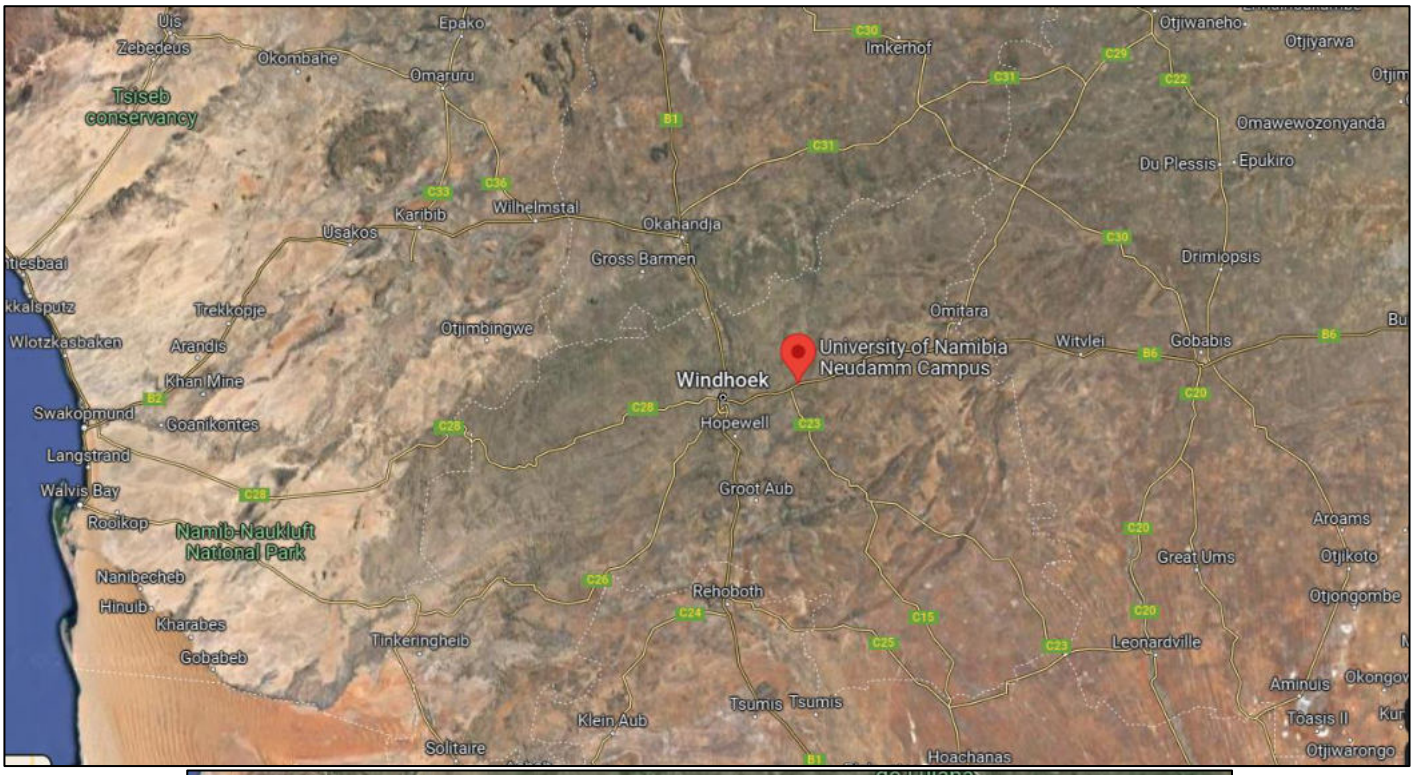
The EIA is the official appraisal process to identify, predict, evaluate and justify the ecological, social and related biophysical impacts of the project on both the environment and, affected and interested stakeholders. It provides insight on alternatives and measures to be adopted to prevent or mitigate any impacts/risks that may ensue from the project and its associated activities.

As per the requirements of the Environmental Management Act No. 7 of 2007, Inceptus Energy (Pty) Ltd has appointed JBIC to conduct the EIA and develop an Environmental Management Plan (EMP) for the proposed project. In this respect, this document forms part of the application to be made to the DEA's office for an ECC for the proposed project, in accordance with the guidelines an statutes of the Environmental Management Act No.7 of 2007 and the environmental impacts regulations (GN 30 in GG 4878 of 6 February 2012).

1.2 PROJECT LOCATION

The project site is located on UNAM Neudamm Campus and Farm spreads over 10 187 hectares and is ± 30 kilometers east from Windhoek on the Hosea Kutako International Airport and Gobabis Road. The GPS coordinates and locality map are shown below.

-17.901651025388936
19.800322893753822


Uis
Zebedeus
Epako
Okombahe
Omaruru
Tsiseb conservancy
Imkerhof
Otjiwaneho
Otjiyarwa
Omawewozonyanda
Du Plessis
Epukiro
Karibib
Wilhelmstal
Usakos
Okahandja
Gross Barmen
Drimiopsis
Trekkopje
Otjimbingwe
Omitara
Wlotzkasbaken
Arandis
University of Namibia Neudamm Campus
Witvlei
Gobabis
Khan Mine
Windhoek
Swakopmund
Goanikontes
Hopewell
Langstrand
Walvis Bay
Groot Aub
Rooikop
Namib-Naukluft National Park
Aroams
Great Ums
Otjikoto
Nanibecheb
Rehoboth
Otjongombe
Hinuib
Kharabes
Leonardville
Tinkeringheib
Gobabeb
Aminuis
Okongov
Tsumis
Klein Aub
Toasis II
Solitaire
Hoachanas
Otjiwarongo


Outapi
Oshakati
Katima Mulilo
Kasane
Opuwo
Ondangwa
Rundu
Divundu
Victoria
Shakawe
Etosha National Park
Tsumeb
Gumare
Otavi
Grootfontein
Skeleton Coast National Park
Outjo
Maun
Otjiwarongo
Omaruru
Ghanzi
Karibib
Hentiesbaai
University of Namibia Neudamm Campus
Botswana
Swakopmund
Walvis Bay
Rehoboth
Sesriem
Mariental
Gabor
Kgalagadi Transfrontier Park
Luderitz
Aus
Keetmanshoop
Sperrgebiet
Rosh Pinah
Upington
Oranjemund
Vioolsdrif
Kakamas
Kimberley
Pofadder
Bloem
Port Nolloth

Figure 1-1:Locality map and project layout

1.3 PROJECT OVERVIEW

This project entails clearing of about 9600m^2 of land to accommodate the proposed Solar Power plant, associated infrastructure and services. The proponent intends to install a 600 kWp Solar Plant including a Single Axis Tracker system. It is anticipated that this solar plant will produce approximately 600 kWp which will augment the UNAM Neudamm campus electrical energy needs. Approximately, 336 x 1.2-meter-deep holes will be drilled and they are to be filled with concrete for the foundation work of the tracker system. Trench work is to be done for cables and a security will also be put in place.

The project works involve the construction and operation of a solar PV plant which includes:

- Planning and Design of Project Work – this compasses preliminary site investigations e.g. geotechnical assessments and topographical surveys; permit applications; preparation of site plans/drawings and application of the appropriate approvals from the relevant regulatory authorities; assessment of baseline conditions to determine supply and demand for required project services; carry out EIA and obtain the appropriate approvals; etc.
- Site Preparation – this entails grading, landscaping, building roads and siding of project areas in order to make the sites free of obstruction prior to construction. It may also involve utilization of heavy machinery/equipment to fully prepare the landscape. This includes physically removing vegetation, any pre-existing concrete foundations, etc. By doing this, the sites are prepared for new concrete foundations and other needed site work.
- Building Foundation - once the site landscaping is fully prepared, getting the project areas mapped out for the foundation is the next critical phase before items can be delivered. The breakdown of the foundation process encompasses location of conduits into concrete shelters, placing rock in foundation bed to provide a firm surface for concrete, placing of rebar in framed areas to add extra strength for poured concrete; etc.
- Transportation, Logistics and Construction - site preparation complete and foundation in place, the next important step is preparing for transportation, logistics and construction of the solar plant, transmission lines and other associated infrastructure. This takes into account evaluating all site conditions to make sure they are conducive for the weight of cranes and trucks; planning for transporting very heavy pieces of

equipment; execution and control of the procurement; movement and stationing of personnel, material and other resources; etc.

- Electrical and Grounding - it is necessary to determine and install all necessary electrical and grounding materials needed to power the project areas.
- Operation of the solar power plant.

1.4 ACCESSIBILITY

The site is served by a well-developed road network as shown in the figure below.

Figure 1-2: Road network in and around the project site

1.5 INFRASTRUCTURE AND SERVICES

The project will make the use of the university's existing domestic water and sewer facilities.

1.6 NEED AND DESIRABILITY

With an average of ten hours of sunshine per day, Namibia is one of the world's sunniest countries. As shown in the graph below, it has enormous potential for solar energy yet, 60%

of the country's energy is imported from neighboring countries and 40% of its population is disconnected from the grid (Climate Partner, 2022).

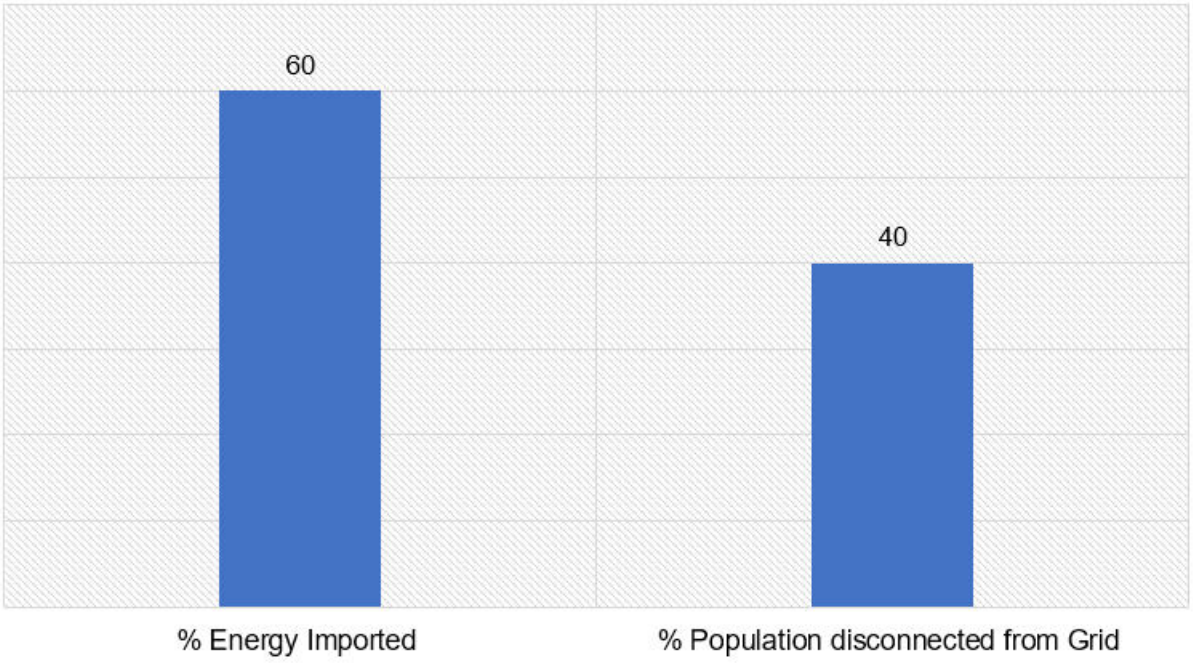


Figure 1-3: % of Energy Import and Disconnected Population

Nonetheless, Namibia has ambitious goals. The Harambee Prosperity Plan (HPPII) articulates ambitious plans to develop green and blue economies in the country. Namibia is uniquely positioned to become the renewable energy hub of the continent and is determined to play a leading role in illustrating how environmentally sustainable business practices can be profitable and transformative undertakings. By 2030, Namibia aims to produce 70% of its energy from renewable energy sources, with independent energy producers feeding renewable energy into its national grid (WEF, 2021).

The Solar PV Plant, is thus a major step in addressing the objectives of the developmental plans and targets of the Namibian government. The project will helping increase the proportion of renewable energy sources in Namibia's energy mix and improve regional and national supply.

1.7 PROJECT ALTERNATIVES

The project will not be implemented if the No-Go option is selected. The no-project alternative would mean that the various potential impacts/risks emanating from the proposed project

would not be experienced. Thus the current uses and value and other potential land uses of the site are likely to be retained.

In addition there would no increased pressure on resources such as water which are already under strain. There also would be no increased chances of pollution and other potential negative impacts that would emanate from project activities.

If the project is implemented, it is anticipated that the project will have the following benefits

- Improved energy supply
- Creation of much needed employment opportunities
- Facilitation of local and national economic growth
- Utilization of an energy source (solar) is renewable and low emission. This contrasts with conventional fossil fuels that contribute to pollution and climate change.
- Reduction in foreign energy expenditures.

These benefits will not be realised if the project does not take place. With the current needs in green energy in the region and nation, it is imperative that the solar plant be established. The non-development of the proposed project will furthermore impede economic development and socio-economic progress.

Due to the project's numerous environmental and socio-economic benefits, and 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 project, the 'No Go' option will be "implemented" and the status quo of the site will remain intact - leaving the site in its present state.

Table 1-1: Other Alternative Considerations

Item	Description	Alternatives	Comments
1.	Siting	• Current site	The only area accessible and authorized for the project is at the UNAM Neudamm Campus.
2.	Transportation	• Road • Rail	Given the location of the project road is the most cost-effective means of transport.
3.	Solid Waste Disposal	• Construction of a solid waste disposal site at the project site • Use of waste disposal site that is being by the university.	The project will make use of the waste disposal site that is being used by the university.

Item	Description	Alternatives	Comments
4.	Water and Sanitation	• University facilities • Drilling a Borehole on site • Soak away system	The project will be connected to the campus domestic water and sewer system.
5.	Energy	• Electricity • Solar	Considering investment costs it is cost effective to use electrical energy as an energy source in the initial stages of the project. Solar energy will be used when the project is in its operational phase.

1.7.1 Conclusion

It is recommended that the project goes ahead, with the construction and operation of a 410 kWp Solar PV Plant at the UNAM Neudamm Campus, Khomas Region, Namibia as a viable option as it is a cost effective and sustainable land use option.

2 CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 INTRODUCTION

This EIA Report for the solar plant has been prepared in reference to identified Namibian laws and regulations that impinge on the project throughout all its phases. Legislation is one of the most important instruments of government that ensures the following:

- Acceptable pollution control and waste management
- Conservation and utilisation of resources
- Sustainable land-use planning and regulation
- Safe and healthy workplace environments
- Determination amongst others things of the rights and responsibilities of individuals and authorities to whom the legislation applies.

The international and national laws, agreements and treaties that govern the social and environmental issues of the project are outlined in the following sub-section. The sub-section take into account brief summarises of selected legislation; it do not seek to provide comprehensive details of all legal obligations that apply to the project but rather an overview.

2.2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

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 2-1: Legal Compliance

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
The Constitution of the Republic of Namibia (1990)	The articles 91(c) and 95(i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalizing policies to accomplish the sustainable objectives which include: • Guarding against overutilization of biological natural resources, • Limiting over-exploitation of non-renewable resources, • Ensuring ecosystem functionality, • Maintain biological diversity.	Through implementation of the environmental management plan the proposed development will be in conformant to the constitution in terms of environmental management and sustainability, through bringing development in an environmentally sensitive way.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
Vision 2030 and National Development Plans	Namibia's overall Development ambitions are articulated in the Nations Vision 2030. At the operational level, five-yearly national development plans (NDP's) are prepared in extensive consultations led by the National Planning Commission in the Office of the President. Currently the Government has so far launched a 4th NDP which pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.	The proposed energy generation project, is an important element in the industrialisation of the country as well as FDIs in Namibia.
Environmental Assessment Policy of Namibia 1994	The Environmental Assessment Policy of Namibia requires that all projects, policies, Programmes, and plans that have detrimental effect on the environment must be accompanied by an EIA. The policy provides a definition to the term "Environment" broadly interpreted to include biophysical, social, economic, cultural, historical and political components and provides reference to the	The construction and operation of the solar farm and transmission line 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

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

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	In the event that exemption from acquiring a license is granted, the Minister may impose conditions relating to public health safety or the protection of the environment.	provisions of the EMA and its regulations.
The Atomic Energy and Radiation Protection Act, Act 5 of 2005:	Provides for the adequate protection of the environment and of people against the harmful effects of radiation by controlling and regulating the production, processing, handling, use, holding, storage, transport and disposal of radiation sources and radioactive materials, and controlling and regulating prescribed non-ionising radiation sources according to the standards set out by the ICNIRP.	Justifies the need for assessing the impact of electromagnetic radiation from the power line, on the nearby settlements.
"Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300GHz)" (April 1998 developed by the	Provides international standards and guidelines for limiting the adverse effects of non-ionising radiation on human health and well-being, and, where appropriate, provides scientifically based advice on non-ionising radiation protection including the provision of guidelines on limiting exposure.	Justifies the need for assessing the impact of electromagnetic radiation from the power line, on the nearby residents.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
International Commission on Non-Ionizing Radiation Protection (ICNIRP))		
Public Health Act (No. 36 of 1919)	Under this act, in section 119: "No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	• The project proponent will ensure that all legal requirements of the project in relation to protection of the health of their employees and surrounding residents is protected. • Personal protective equipment shall be provided for employees in construction. • The development shall follow requirements and specification in relation to water supply and sewerage handling so as not to threaten public health of future residents on this piece of land.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
Soil Conservation Act 76 of 1969	The objectives of this Act are to: • Make provisions for the combating and prevention of soil erosion, • Promote the conservation, protection and improvement of the soil, vegetation, sources and resources of the Republic.	The project will have a rather localized impact on soils and on the soil through clearance for PV panel stands and powerline poles. Soil protection measures will be employed and preservation of trees as much as possible.
Nature Conservation Ordinance 1996	To consolidate and amend the laws relating to the conservation of nature; the establishment of game parks and nature reserves; the control of problem animals; and to provide for matters incidental thereto.	The proposed project implementation 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.
Protected Areas and Wildlife Management Bill	This bill, when it comes into force, will replace the Nature Conservation Ordinance 4 of 1975. The bill recognizes that biological diversity must be maintained, and where	Environmental recommendations and considerations on this project has ensured that the proposed activities will

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	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.	not fall within the boundaries of any protected area and that the project will not affect heavily endangered vegetation and animals on its site.
Forest Act, 2001 (Act No. 12 of 2001)	The Act gives provision for the protection of various plant species through the Ministry of Agriculture, Water and Forestry (MAWF), Directorate of Forestry).	• Land clearing of an extensive piece of land will be done upon approval from the Directorate of Forestry. • The proponent will also have to ensure that there is no indiscriminate cutting down of trees during construction and operation • The proposed site is sparsely vegetated with white thorn tree species, which are not threatened or protected.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
National Rangeland Policy and Strategy, 2012	The policy aims at enabling resource users (farmers and managers) to manage their rangeland resources in a sustainable manner and sustainable in that they are economically viable, socially acceptable, environmentally friendly and politically conducive.	This proposed project will ensure that the local community benefits both economically and socially from the project, this in line with the recently declared Harambee Prosperity Plan and NDP 4&5.
National Biodiversity Strategy and Action Plan (NBSAP2)	The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia putting together management of matters to do with ecosystems protection, biosafety, biosystematics protection on both terrestrial and aquatic systems.	• The project proponent has been advised by JBIC 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.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
National Policy on Climate Change for Namibia, 2010	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 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.	Solar energy harnessing technologies are a positive impact to fighting climate change, thus this development is a positive step towards climate smart energy generation and environmental sustainability.
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

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
		conservation and wise utilization of wetlands resources. • Runoff from the project site is to be controlled so as to prevent pollution of surrounding water bodies.
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.	Water supply will be obtained from either boreholes or the nearby . Appropriate water abstraction permits are to be obtained before is drawn from either of the two water sources.
National Heritage Act 27 of 2004	Heritage resources to be conserved in development.	• Any graves or areas of natural/cultural heritage significance that are close to the project site are to be fenced off so that they are not disturbed by the project operations.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
		• During the project implementation as soon as objects of cultural and heritage interests are observed such as graves, artefacts and any other object believed to be order than 50 years, all measures will be taken protect these objects until the National Heritage Council of Namibia have been informed, and approval to proceed with the operations granted accordingly by the Council.
National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979	"No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: (a) any meteorite or fossil; or (b) any drawing or painting on stone or a petroglyph known or commonly believed to have been	The proposed site of development is not within any known monument site both movable or immovable as specified in the Act, however in such an instance that any material or sites or archeologic

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	executed by any people who inhabited or visited Namibia before the year 1900 AD; or (c) any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph (b); or (d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or (e) any other archaeological or palaeontological finds, material or object; except under the authority of and in accordance with a permit issued under this section.	importance are identified, it will be the responsibility of the developer to take the required route and notify the relevant commission.
Pollution Control and Waste Management Bill	This bill has not come into force. Amongst others, the bill aims to "prevent and regulate the discharge of pollutants to the air, water and land" Of particular reference to the Project is: Section 21 "(1) Subject to sub-section (4) and	To control air, water and land pollution as agitated by the Act the proponent will ensure that the project site will have approved drainage on site as well as standard conservancy tanks that do not

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	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."	threaten public health, adding on an integrated pollution management strategy following the EMP provided herein.
Convection on Biological Diversity (CBD)	Namibia is a signatory of the Convention on Biological Diversity and thus is obliged to conserve its biodiversity.	The project will preserve flora and fauna species as part of the project plans.
United Nations Convection to combat Desertification	Namibia is bound to prevent excessive land degradation that may threaten livelihoods.	It will be the responsibility of the proponent to conserve vegetation on and around the area, to avoid encroachment of the desert environs in the area.

3 CHAPTER THREE: RECEIVING ENVIRONMENT

3.1 SOCIO-ECONOMIC

The project is located in Khomas region (see Figure below). According to Namibia Statistics Agency (2011), the population of the region has a population of approximately 250,262 (123,613 females and 126,648 males or 102 males for every 100 females) growing at an annual rate of 4%. It is located in the central highlands of the country and is bordered by the Erongo region to the west and the northwest and by the Otjozondjupa region to the north. To the east is the Omaheke region, while in the south is the Hardap region. The region is characterized by its hilly country size and many valleys.

Figure 3-1: Khomas Region

The region is well-developed economic, financial, and trade sectors. Khomas Region occupies 4.5% of the land area of Namibia but has the highest population of any of its regions (16.2%). Khomas is one of only three Namibian regions to have neither shoreline nor a foreign border. Khomas has 100 schools with a total of 73,302 pupils.

Households in Khomas earn by far the highest average annual income at N$47,407, well more than the national average of N$17,198. There is very limited subsistence farming in the region, with only 0.4 percent of the population engaged in farming, 0.3 percent of households are rearing animals, and 0.1 percent are earning income from cash cropping. Windhoek accommodates most of Namibia's light industry and manufacturing. Some of the most important are meat processing, bottling and canning, beer brewing, plastics, and refrigeration. The city is also Namibia's educational, commercial, and tourism capital. In 2001 the employment rate for the labor force (46% of those 15+) was 71% employed and 29% unemployed. For those 15+ years old and not in the labor force (50%), 55% were students, 25% homemakers, and 20% retired, too old, etc.

Among households, 98% had safe water, 20% no toilet facility, 69% electricity for lighting, 83% access to radio, and 9% had wood or charcoal for cooking. In terms of households' main sources of income, 1% derived it from farming, 74% from wages and salaries, 7% cash remittances, 11% from business or non-farming, and 4% from pension.

According to the 2012 Namibia Labour Force Survey, unemployment in the Khomas Region stood at 26.5%. Extrapolating from the national unemployment statistics, the constituency has an unemployment rate of 33.40% and youth unemployment rate of 46.10% (Namibia Central Bureau of Statistics, 2019). This shown in the figure below.

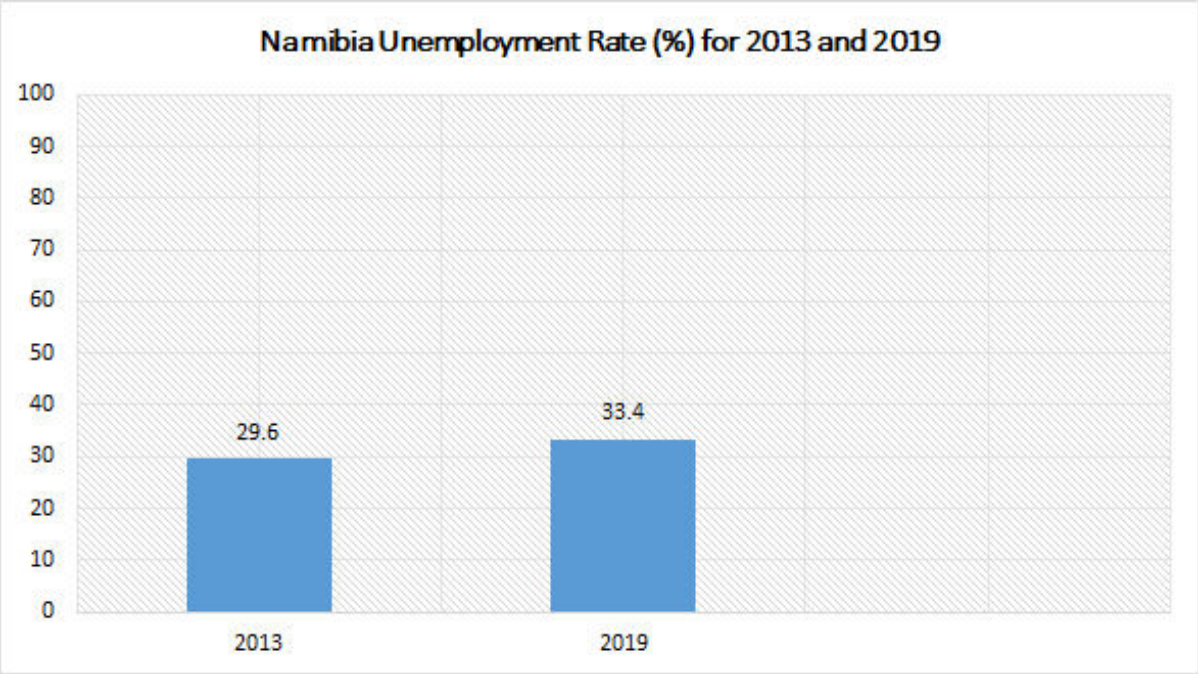


Figure 3-2: Namibia Unemployment Rate and Youth Unemployment Rate

The project will support the district's need for employment as well as the expansion of the local economy. Numerous employment opportunities are to be created for work personnel throughout the project phases. In addition, other forms of employment are likely to result from spillover effects, through indirect services such as supply of raw materials, equipment, machinery, etc.

3.2 CLIMATE

The Khomas Region is described as sub-tropical arid, tempered by altitude, with a hot, rainy season from December to March and a dry season from May to October, within which there is a cool period from May to August. In the latter, at night the temperature can drop a few degrees below freezing. During the day, it can get very hot from September to March. During the hottest month of the year, which is mainly December, the average maximum temperature is about 30- 32 °C. During July which is the coldest month the average minimum temperature is 4-6 °C.

Precipitation is sporadic and unpredictable, high intensity, highly localised storm events between October and April. The average rainfall is 300-350 mm per year. predominantly south easterly. Southerly, easterly and northerly airflow is common. The area is subject to erratic winds and considerable discrepancies in spite of short distances, due to the hilly terrain (Holm, 1996).

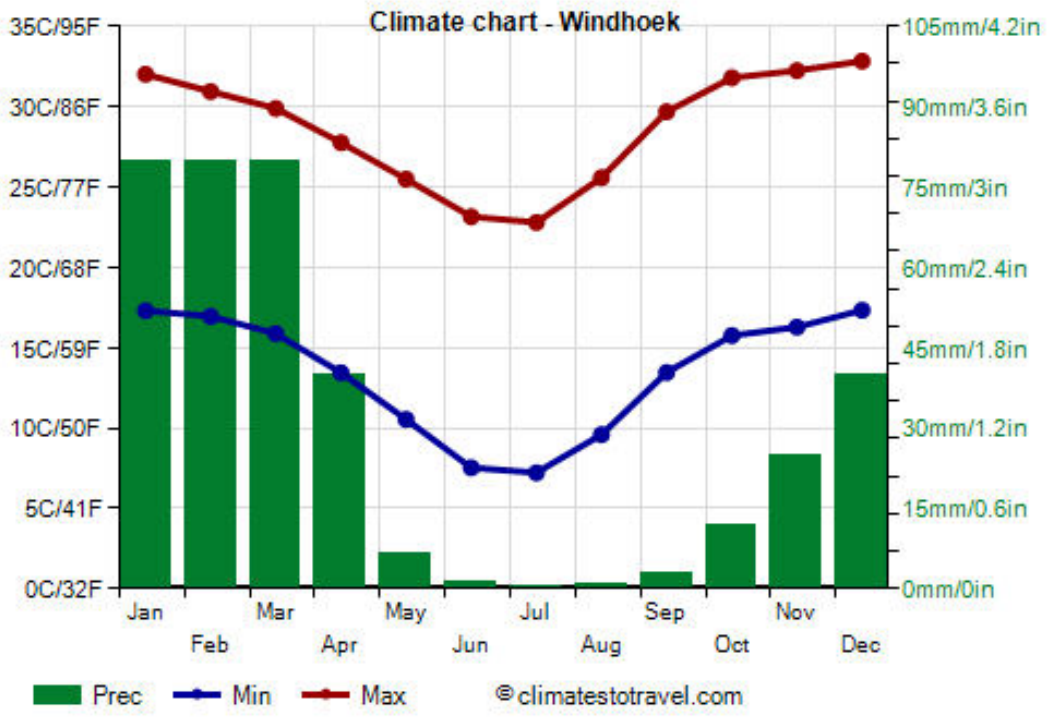


Figure 3-3: Khomas Climate Data

Source: Climate-data.org, 2022

3.3 FLORA AND FAUNA

In the central highlands the vegetation is classified as highland savanna and comprises a number of Acacia species and numerous species of perennial thorn trees in the valleys and shrubs and grass on the steep slopes (Lawrence, 1971). According to Giess (1971), highland savanna vegetation type, is mainly characterised by trees such as Combretum apiculatum and Acacia species (such as *Acacia reficiens, A. hereroensis*, and *A. erubenscens*). The grass in this vegetation type mainly comprises of the climax grasses such as *Anthephora pubescens, Brachiaria nigropedata, Digitaria eriantha* and many other species.

There is at least 250 species of mammals in Namibia. Currently 14 mammal species are considered endemic to Namibia of which 11 species are rodents and small carnivores of which very little is known. The most common endemic mammals include the rodent family *Petromuridae* (Dassie rat) and the rodent genera *Gerbillurus* and *Petromyscus*. Fauna species one may encounter in the project include *Lepus saxatilis, Vulpes chama, Antidorcas marsupialis, Raphicerus campestris*, etc.

Namibia has about 658 species of birds (Barnard, 1998). High diversity of bird species in the study are is expected to occur in river courses. The highland savanna in which the study area is, have relatively high diversity of birds. This is probably because of the fact that the highland savanna vegetation type is at the interface of the Kalahari to the east, Karoo to the south, thorn bush savanna to the north and escarpment to the west. Birds from all these biomes and vegetation types occur around the highland savanna. More than 230 species of birds are expected to occur in the study area (Barnard, 1998). Bird species of conservation importance expected to occur in the area include the following species which are endemic to Namibia: *Pternistis hartlaubi (Hartlaub's Spurfowl), Tockus monteiri (Monteiro's Hornbill), Tockus damarensis (Damara Hornbil), Phoeniculus damarensis (Violet Wood-Hoopoe), Poicephalus rueppellii (Rüppell's Parrot), Agapornis roseicollis (Rosy-faced Lovebird), Eupodotis rueppellii (Rüppell's Korhaan), Lanioturdus torquatus (White-tailed Shrike), Parus carpi (Carp's Tit)* and *Achaetps pycnopygius (Rockrunner).*

According to Griffin (1998) only anuran amphibians (frogs and toads) are found in Namibia. Namibia has about 50 frog species on record. The dependence of frogs to surface water for breeding limits most species of frog in Namibia to the five perennial rivers and more reliable seasonal sources. Despite this many species in Namibia are arid-adapted and occur

throughout the country. About 9- 12 species of frogs is expected to occur in the study area (Griffin, 1998).

3.4 GEOLOGY AND HYDROLOGY

3.4.1 Topography and Drainage

The landscape in the area is classified as being in the Khomas Hochland Plateau, which is characterized by rolling hills. Proper drainage systems should be developed at the site to control the flow of surface water, in order to avoid flooding. Storm water management should form part of the engineering.

3.4.2 Geology and Soils

The geology of the central Namibian region is dominated by the Damara Sequence. The site is underlain by pre-Cambrian aged meta-sedimentary strata of the Kuiseb Formation of the Damara Sequence. The Kuiseb Formation comprises of a more than 6000m thick succession of mica schist, graphitic schist, marble and quartzite. The main rock type is identified as biotite schist, but with minor strata of micaceous quartzite, feldspathic schist and amphibole schist (Labuschagne, 2004, and Mendelsohn, et al, 2002). The soil cover in the study area is largely shallow and has been derived from the underlying lithologies and is classified as ‘leptosol’ (Mendelsohn, et al 2002) referring to shallow soil cover over hard rocks. ‘Leptosol’ dominate the entire project area. Along the larger drainages, such as the ephemeral Gammas and Aretaragas rivers, alluvial deposits have developed.

3.4.3 Groundwater potential

The country has been divided into twelve hydrogeological regions based mainly on geological structure and groundwater flow and according to the national hydrogeological map, the project area is part of the Cuvelai-Etosha groundwater Basin. According to the hydrogeological map of Namibia (Christelis and Struckmeier, 2011), the regional groundwater potential is moderate. The Kalahari aquifers are subdivided into five major units and named after the region or locality where they occur or where they were first described. The Discontinuous Perched Aquifer (KDP) represents a series of shallow, only locally occurring aquifers of limited extent. This aquifer type is present mainly in the Niipele Sub-Basin where recent dune sand covers the underlying sediments of the Kalahari Sequence. The KDP is recharged by direct infiltration of rainwater and exploited by means of traditional funnel-shaped hand dug wells called omifima (perched aquifer). Although the yield is generally limited by the size of the aquifers, they provide easily accessible and good quality drinking water to the scattered villages in the northern regions.

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 the process.

Formal public involvement has taken place via public consultations and focal meetings, newspaper announcements to inform the public that such a large-scale project 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.

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 objective of the public participation is 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.

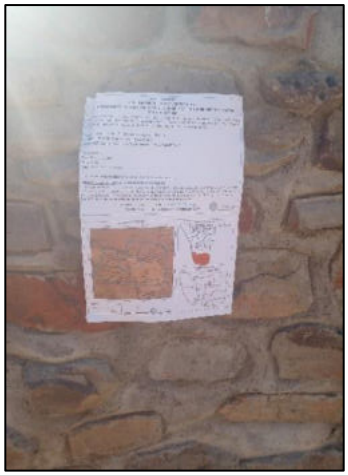
- Invitation to participate notices were published in the local newspapers (e.g. Confidante) as shown in Table 4.1 below and Appendix A of this document.
- Announcement of EIA process verbally in the common public meeting points.
- Placement of a public notice at the project site and surrounding areas.

Table 4-1: Details of public notification of the EIA study

Method	Area of Distribution	Language	Date Placed
The Confidante	Country Wide	English	24th February and 3rd of March 2023
Windhoek Observer	Country Wide	English	24th February and 3rd of March 2023
Site notices	Neudamm and surrounding areas	English	6th – 10th March 2023
Public Meeting	Neudamm Campus	English,	17th March 2023

The photos below show the public consultation notice that was placed for project. Also shown are photos that were taken during the site visits as well as the public meeting.





✓ *Key Stakeholder Engagement Meeting*

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:

- ❖ NAMPOWER
- ❖ CENORED
- ❖ 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 4-2: Key findings of the public consultation process

SUMMARY OF ISSUES	
THEME	**ISSUE**
Economic	Employment of general labour must consider employing local people from the local area. The company must take the social responsibility in local area. Improve the life being of the local residents.
Health and Safety	Waste management concerns including both solid waste and wastewater. Potential air, noise and water pollution due to development. The company must provide enough health care to employees
Ecological	Concerns regarding impacts on and conservation of natural vegetation.

SUMMARY OF ISSUES	
	▪ Limited cutting down of trees should be observed by the construction company ▪ Resources such as air and water should not be polluted during operations because communities, wild animals and livestock rely on these resources.
Communication	▪ Clear communication needs to be promoted between relevant authorities and the local community.

5 CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1 OVERVIEW

The proponent recognizes the importance of undertaking the project operation in line with sustainable development objectives and applicable legal requirements. To this end an Environmental Management Plan (EMP) for the project is being developed in order to address negative environmental impacts and enhance positive impacts. The EMP takes into account identification of potential impacts, assessment of the significance of the risks associated with these impacts and the establishment of preventive actions as well as mitigation measures. The EMP will be monitored, reviewed, and updated as necessary with the aim of continuous improvement, taking into account various changes in project operations, the biophysical environment and socio-economic circumstances.

5.2 ASSESSMENT OF IMPACTS

This section outlines how the overall methodology to assessing the project's possible environmental and social impacts. Each potential impact must be assessed in order to properly evaluate its significance. The definitions and explanations for each criterion are set out below in Table 5-1.

Table 5-1: 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-Namibia, 2017)***

Table 5-2: 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-Namibia, 2017)

Table 5-3: Environmental Impacts and Aspects Assessment

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

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure
	Soil, Vegetation, Infrastructure	Flooding	Construction& Operation	Permanent	Moderate	Local	Direct	Medium 25 - 75%	Moderate	PV Plant
AIR QUALITY	Air Quality	Construction phase dust	Construction	Short	Small	Local	Direct	Low <25%	Minor	PV Plant
WASTE	Groundwater quality	Hazardous waste such as waste oil and lubricants.	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	PV Plant
	Surface water quality	Threatened from plant stormwater discharge into the river.	Construction and operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate	PV Plant
	Topography and Landscape	Visual impacts due to use of unsustainable disposal methods	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	PV Plant
FAUNA	Terrestrial ecology and biodiversity	Loss of habitat and driving away of local animals and aquatic animal species	Construction and Operations	Moderate	Moderate	Local	Direct	High >75%	Minor	PV Plant
	Avifauna	Bird electrocution, and physical crashes	Operations	Moderate	Small	Local	Direct	Low <25%	Minor	PV Plant

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure
	Aquatic life	Antifouling paints	Operations	Moderate	Small	local	Direct	Low <25%	Minor	PV Plant
	Terrestrial ecology and biodiversity	Destruction of vertebrate fauna (e.g. road kills; fence and powerline mortalities)	Construction and Operations	Long	Moderate	Local	Direct	Low <25%	Minor	PV Plant
FLORA	Terrestrial ecology and biodiversity	Proliferation of invasive species inland	Construction and Operations	Long	Moderate	Local	Direct	High >75%	Moderate	PV Plant
	Terrestrial ecology and biodiversity	Illegal collection of firewood	Construction and Operations	Long	Moderate	Local	Direct	Low <25%	Minor	PV Plant
	Terrestrial ecology and biodiversity	Loss of unique flora and special habitats in the local environment because of general nuisance and animal migrate.	Construction and operations	None	Small	Local	Direct	Low <25%	Moderate	PV Plant

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure
	Terrestrial ecology and biodiversity	Uncontrolled fires	Construction	Long	Great	Regional / National	Direct	Low <25%	Major	PV Plant
SOCIAL	Noise Pollution	Increased noise levels	Construction and operations	Moderate	Small	Local	Direct	Low <25%	Minor	PV Plant
	Socio Economic Activities	Temporary and permanent employment prospects.	Construction and operations	Long	Moderate	Regional	Direct	Medium 25 – 75%	Positive	PV Plant
	Socio Economic Activities	Climate change impacts	Operations	Long	Moderate	Regional / National	Direct	High >75%	Positive	PV Plant
	Contribution to National Economy	Employment, local procurement, duties and taxes.	Construction and Operations	Short	None	Regional / National	Direct	Low <25%	Positive	PV Plant
Heritage/Archaeology	Graves, artefacts, archaeological high value components	Destruction or affecting heritage, paleontological and archaeological artefacts	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 – 75%	Moderate	PV Plant

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure
HEALTH AND SAFETY	Health Sanitation	Poor ablution and waste management facilities may be detrimental to human health.	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 – 75%	Moderate	PV Plant
	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	PV Plant