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ENVIRONMENTAL AND SOCIAL SCOPING ASSESSMENT FOR THE PROPOSED CONSTRUCTION AND OPERATION OF THE 20 MEGAWATTS (MW) OF THE SHANKARA SOLAR PLANT & ASSOCIATED INFRASTRUCTURE LOCATED IN SHANKARA VILLAGE, NDONGA LINENA CONSTITUENCY, KAVANGO EAST REGION, NAMIBIA

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EXECUTIVE SUMMARY

The programme forms part of the Government's 2024 Ministerial Determination and Namibia's Integrated Resource Plan (NIRP 2022), aimed at strengthening security of supply, reducing imports, and expanding least-cost renewable generation across the country This project is proposed in support of Namibia's Renewable Energy Feed-in Tariff (REFIT) Programme, which is jointly implemented by NamPower and the Electricity Control Board of Namibia (ECB). The programme forms part of the Government's 2024 Ministerial Determination and Namibia's Integrated Resource Plan (NIRP 2022), aimed at strengthening security of supply, reducing imports, and expanding least-cost renewable generation across the country. The programme seeks to promote the development of renewable energy and increase private sector participation in electricity generation.

In line with these objectives, Tsika Energy (Pty) Ltd (hereafter referred to as *the proponent*) intends to contribute to the REFIT Programme through the development, construction and operation of the Shankara 20-megawatt (MW) solar photovoltaic (PV) power plant. The proposed development will be located at Shankara Village, within the Ndonga Linena Constituency of the Kavango East Region, Namibia. The proposed solar facility and associated infrastructure will be constructed within a footprint of approximately 50 hectares (ha).

The construction and operation of a solar photovoltaic (PV) power plant constitute listed activities in terms of the Environmental Management Act, 2007 (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA) Regulations of 2012, and therefore may not be undertaken without an Environmental Clearance Certificate (ECC).

To ensure compliance with the relevant environmental legislation, the proponent has appointed Savannah Environmental Consultant Services (SECS), an independent environmental consultancy, to undertake the required Environmental Scoping Assessment (ESA) process and to prepare and submit the application for an ECC on their behalf. The ESA process will identify potential environmental and socio-economic impacts associated with the proposed project and recommend appropriate mitigation measures to guide environmentally responsible project implementation.

PROJECT DESCRIPTION

Once the ECC is issued, the proponent intends to adopt a systematic approach to the project as follows:

Planning phase – Preparation of all the administrative and technical requirements needed for the actual works on the ground. The planning would entail obtaining the necessary permitting and authorization from relevant national and local stakeholders (such as affected land custodians/users), facilitating the recruitment and procurement processes, etc.

Construction and installation Phase

The construction phase will be temporary in nature and will comprise activities including site preparation and levelling, vegetation clearance strictly limited to the approved project footprint, establishment of temporary construction camps, and installation of mounting structures, solar photovoltaic panels, inverters, transformers, internal electrical reticulation, , access and internal roads network, laydown areas, auxiliary buildings, staff lockers, switch room, gatehouse security, control centre, office, warehouse, visitors centre, cement batching areas, construction camp with ablution facilities, perimeter fencing and security infrastructure. Construction activities will require the use of construction machinery and equipment, delivery vehicles, water, a diesel generator, and a temporary workforce. Waste generated during this phase will be managed in accordance with applicable Namibian legislation and recognized industry best practice.

Operational Phase

The operational phase represents the long-term phase of the project and will involve the generation of electricity through solar photovoltaic technology. Activities during this phase will include routine monitoring of system performance, preventative and corrective maintenance of electrical equipment, cleaning of photovoltaic panels using minimal water, vegetation control within the facility, and periodic replacement of components as required. All operational activities will be conducted in compliance with relevant environmental, health, and safety requirements.

Decommissioning phase

Once the operation phase needs to cease, closure plan should be developed by the proponent through a consultant at least 5 years prior to the expected date of decommissioning.

PUBLIC CONSULTATION

The public consultation process enabled the Environmental Consultant to identify potential impacts, mitigation measures, and project alternatives. Communication with Interested and Affected Parties (I&APs) was carried out through the circulation of a Background Information Document (BID) to pre-identified and newly registered I&APs, publication of notices in Windhoek observer and *The villager* (19 December 2025) and a consultation meeting with affected landowners held on the 10 January 2026 at Mr. Willem Mukwangu house under the tree ((Shankara Village), All inputs from the consultation, together with findings from the site visit and literature review, were integrated into the Environmental Scoping Assessment (ESA) Report and Environmental Management Plan (EMP).

POTENTIAL IMPACTS IDENTIFIED.

The proposed project is expected to deliver benefits such as job creation, increased renewable energy production, reduced greenhouse gas emissions, and stimulation of the local economy. Potential adverse impacts include temporary disturbance to soil and vegetation during construction, dust and noise generation, waste production, occupational health and safety risks, visual impacts, and possible soil or water contamination from accidental spills. These impacts will be evaluated in detail, with appropriate mitigation measures outlined in the Environmental Management Plan

RECOMMENDATIONS

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project can be effectively managed through the implementation of recommended mitigation measures. Proper monitoring and strict adherence to these measures will further ensure that the activities are undertaken in a sustainable and environmentally responsible manner.

DISCLAIMER

The findings and conclusions presented in this report were prepared in accordance with the methodologies outlined in the Scope of Work and the Environmental Management Act (EMA), 2007, which represent accepted practice for conducting an Environmental Impact Assessment (EIA). While due care was taken to identify recognized environmental conditions, certain site conditions may not have been identifiable within the scope of the assessment or based on available information.

The Consultant considers the information obtained from public consultations, interviews, and documentary reviews to be reliable. However, no warranty is made regarding the completeness or accuracy of information provided by external sources. The conclusions and findings are limited to the date of evaluation, and no additional warranties, expressed or implied, are provided. This report is also subject to the limitations inherent in historical documentation, record accuracy, and the recollections of individuals consulted.

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LIST OF ABBREVIATIONS

Abbreviation	**Meaning**
AMSL	Above Mean Sea Level
BID	Background Information Document
CV	Curriculum Vitae
DEAF	Department of Environmental Affairs and Forestry
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ESA	Environmental Scoping Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GG	Government Gazette
GN	Government Notice
I&Aps	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
MIME	Ministry of Industries , Mines and Energy

PPE	Personal Protective Equipment
Reg	Regulation
S	Section
TOR	Terms of Reference

1 INTRODUCTION

1.1 Project Background

Tsika Energy Pty Ltd, hereafter referred to as the Proponent, has appointed Savannah Environmental Consultant Services (SECS), hereafter referred to as the Environmental Consultant, to undertake an environmental assessment for the proposed construction and operation of the Shankara 20 megawatt (MW) solar photovoltaic (PV) power plant at Shankara Village, within the Ndonga Linena onstituency of the Kavango East Region, Namibia (Figure 1). The proposed development and associated infrastrucrure footprint will occupy an area of approximately 50 (ha).

The proposed project forms part of Namibia's broader commitment to increasing the contribution of renewable energy to the national electricity mix, enhancing energy security, and reducing reliance on imported electricity, fossil fuel-based generation and expanding least-cost renewable generation across the country. Namibia has one of the highest solar irradiation levels globally, with average daily solar radiation ranging between 5.5 and 6.5 kWh/m² across most regions, making solar photovoltaic technology a technically and economically viable option for utility-scale power generation (Hancock & Evans, 2017; Ministry of Mines and Energy, 2017).

The development further aims to contribute to the Renewable Energy Feed-in Tariff (REFIT) Programme, which is jointly implemented by NamPower and the Electricity Control Board (ECB) of Namibia. The REFIT Programme was established to promote investment in renewable energy generation by Independent Power Producers (IPPs) through the provision of guaranteed tariffs for electricity generated from approved renewable energy technologies, including solar photovoltaic systems. The programme plays a strategic role in diversifying Namibia's energy supply, stimulating private sector participation, and supporting national renewable energy targets (Electricity Control Board, 2016; NamPower, 2018).

The proposed project is aligned with national development and energy planning instruments, including the Harambee Prosperity Plan II and the National Integrated Resource Plan, which prioritise the expansion of renewable energy capacity and the development of sustainable energy infrastructure to meet growing electricity demand while minimising environmental impacts (Government of the Republic of Namibia, 2021; Ministry of Mines and Energy, 2017). Solar PV

projects are particularly encouraged due to their low greenhouse gas emissions during operation, minimal water requirements, and suitability to Namibia's arid and semi-arid climatic conditions.

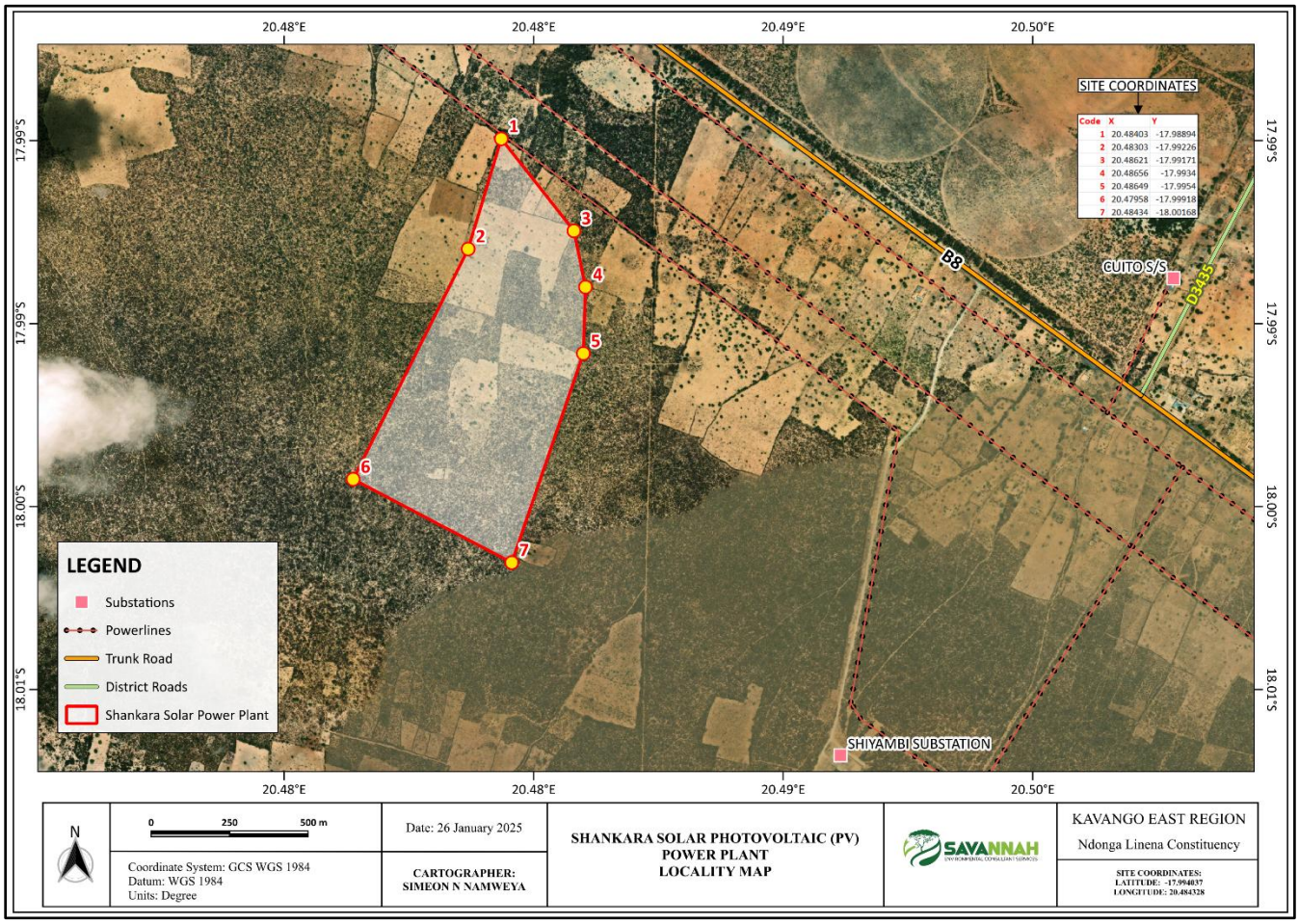

Figure 1: The locality map of the proposed project

Section 27 (1) of the Environmental Management Act (EMA) (No. 7 of 2007) and its 2012 Environmental Impact Assessment (EIA) Regulations, provides a list of activities that may not be carried out without an EIA undertaken and an ECC obtained. The proposed activity is among the activities are listed among activities that may not occur without an ECC. Therefore, no individuals or organizations may carry out the proposed activities without an ECC being granted.

1.2 The Need for an ESA and Environmental Clearance Certificate (ECC)

The proposed activity is among the listed activities in the Environmental Impact Assessment (EIA) Regulations (2012) of the Environmental Management Act (EMA) No. 7 of 2007 that may

not be undertaken without an Environmental Clearance Certificate (ECC). The activities that are relevant to the proposed project are as follows:

In accordance with the Environmental Management Act, No. 7 of 2007, and its Environmental Impact Assessment Regulations (Government Gazette No. 4878, GN No. 30 of 2012), the proposed project is one of the listed as:

(1.a) The construction of facilities for the generation of electricity;

(1.b) The construction of facilities for the transmission and supply of electricity;

(2.1) The construction of facilities for waste sites, treatment of waste and disposal of waste.

(2.3) The import, processing, use and recycling, temporary storage, transit, or export of waste; (4.) The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorisation in terms of the Forest Act, 2001 (Act No. 12 of 2001) or any other law;

(9.2) Any process or activity which requires a permit, licence or other form of authorisation, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, licence or authorisation or which requires a new permit, licence or authorisation in terms of a law governing the generation or release of emissions, pollution, effluent, or waste.

The purpose of the EIA Scoping Study and subsequent issuance of the ECC is therefore to ensure that the proposed project activities are undertaken in an environmentally & socially friendly and sustainable manner, through the effective implementation of recommended environmental management measures to minimize the adverse identified impacts while maximizing the positive impacts.

1.3 Terms of Reference, Scope of Works, and Appointed EA Practitioner

There were no formal Terms of Reference (ToR) provided to Savannah Environmental Consultant Services by the Proponent. Therefore consultant, instead, relied on the requirements of the Environmental Management Act (No. 7 of 2007) (EMA) and its EIA Regulations (GN. No. 30 of 2012) to conduct the study.

The EIA project is headed by Ms. Aili Iipinge a qualified and experienced EAP. The consultation and reporting process are being carried out by Mr. Mandume Leonard and reviewed by Ms. Aili Iipinge. Their CVs are presented as an appendices.

1.4 Motivation for the Proposed Project

The global shift toward a more diversified energy mix, with an increasing contribution from renewable energy sources, underscores the need for efficient energy storage solutions. Electricity generation does not always align with periods of peak demand, making both short-term and long-term storage essential for maintaining a stable and reliable power supply.

This need is especially evident in base-load power plants, which achieve optimal efficiency through continuous operation but often generate excess electricity during off-peak periods. In addition, non-dispatchable renewable energy technologies, such as solar and wind, produce power only when the resource is available, further reinforcing the importance of energy storage systems and effective grid output management.

Namibia is endowed with high levels of solar irradiation throughout the year, making solar energy an appropriate and sustainable option for electricity generation. The proposed Shankara 20 MW solar PV plant and associated infrastructure at Shankara Village is intended to contribute to national renewable energy targets, enhance energy security, and support the transition to a low-carbon economy.

This project demonstrably addresses a critical national need for energy solutions. Furthermore, it aligns with both national energy development plans, while offering significant technical and socio-economic advantages. Therefore, the project represents a sound investment with the potential to contribute meaningfully to Namibia's energy security and economic development

2 PROJECT DESCRIPTION

2.1 Project component

- The Shankara Solar PV plant and associated infrastructure is situated at the Shankara Village within the Ndonga Linena Constituency of the Kavango East Region, Namibia. The Solar PV facility will have a contracted capacity of 20MW with a development footprint approximately 50ha. The site is accessible from B8 road, which diverts into the existing roads. The solar system/ technology to be utilized/ installed would be the PV system,

which comprises photovoltaic cells to generate renewable energy by converting sunlight into electricity. The proposed Solar PV facility and associated infrastructure will be within a footprint of up to 50ha and will include the following:

- Solar photovoltaic (PV) panel technology (monofacial or bifacial) with fixed, single or double axis tracking mounting structures (panels will be grouped into 'tables' and tables will be arranged in arrays).
- Crystalline silicon or thin film technology
- Facility substation
- Powerline tower structures
- 33kV electrical reticulation cabling between the project components and the onsite IPP substation
- Inverter-stations, and transformers
- Site and internal access roads
- Laydown areas
- Auxiliary buildings
- An Operation and Maintenance (O&M) building area (including control rooms, site offices, maintenance buildings, workshop and storage areas, parking areas and ablution facilities) Rainwater Tanks/ Conservancy Tank
- Gatehouse and/or security building
- Septic Tanks
- Construction Camp with ablution facilities
- Hazardous Store
- Cement Batching Areas
- Fencing around the project development areas
- A 33kV switching station and IPP substation
- Up to two single or double circuit 33kV powerlines connecting the IPP substation to Shiyambi Substation

Photovoltaic modules, which convert the solar radiation into direct current;

  - The single or double axis tracking mounting structures, which supports and orients the PV modules to minimize the angle of incidence between the incoming sun rays and the PV module's surface during the day;

- The string combiner boxes, which consolidate the output of the strings of photovoltaic modules before reaching the inverter;
- Central inverters, which convert DC from the solar field to AC; and
- The Power Transformers, which raise the voltage level from low to medium.

2.2 Inverters

The inverters will convert the Direct Current (DC) produced by the photovoltaic modules to Alternating Current (AC). The inverters typically comprise the following components:

- One or several DC-to-AC power conversion stages, each equipped with a Maximum Power Point Tracking System (MPPT). The MPPT will vary the voltage of the DC array to maximize production depending on the operating conditions.
- Protection components against high working temperatures, over- or under-voltage, over- or under-frequencies, minimum operating current, mains failure of transformer, anti-islanding protection, protection against voltage gaps, etc. In addition to the protections for the safety of the staff personnel, and
- A monitoring system, which has the function of relaying data regarding the inverter operation to the owner (current, voltage, power, etc.) and external data from monitoring of the strings in the DC array (if a string monitoring system is present).

2.3 On-site substation and transmission line

A small onsite substation will likely be constructed to collect the electricity produced onsite and step it up to the correct voltage to transfer via the transmission line to the existing Shiyambi Nampower Substation . The physical dimensions of the substation will likely be dictated by the optimal capacity of the solar field.

An overhead transmission line is expected to be constructed along a transmission corridor to connect the proposed onsite substation to the existing main substation Shiyambi (Nampower Substation).

2.4 CONSTRUCTION/PRE-OPERATION PHASE

The project will not be constructed in a phased-approached and could take up to 36 months based on similar projects undertaken in Namibia. Based on similar projects in South Africa, approximately 70 to 100 job opportunities would be created over the construction phase, with the majority of employment opportunities and procurement opportunities reserved for Namibians.

Delivery of construction material and equipment will require heavy transport vehicles, but no abnormal or hazardous loads are expected. The typical equipment to be transported would include steel, cement, panels, transformers, cables, filling material, and machinery. Construction vehicles are to make use of the existing roads to transport equipment and materials to the construction site. During the construction phase, some vegetation clearing would be required to pave the way for construction activities. Some excavation would be required to fix the panels to the ground surface. This could generate spoil material. Spoil is earth material excavated during construction, and it is expected to be reused onsite for backfilling.

2.5 OPERATIONAL PHASE

It is anticipated that the PV facility would have a lifespan of approximately 25 years. Toilet and ablution facilities for operational personnel must include infrastructure (for example, a French drain) to prevent any unwanted substances from infiltrating any local aquifers. To ensure that maximum sunlight reaches the PV panels, it is important to undertake regular cleaning of the panels. Dust, dirt, pollen, and bird droppings can reduce the efficiency of PV panels. The frequency of panel cleaning would depend on the site conditions; however, it is expected that some panels might break and may need to be replaced throughout the operational phase. PV panels are considered to be electronic waste and also hazardous waste. To implement the waste hierarchy, components of broken panels would be recycled, where possible. Any hazardous waste generated, that cannot be recycled, would be disposed of at specially engineered landfill sites in Rundu.

2.6 Additional infrastructure

These will include, among others, a boundary fence for safety and security reasons; water supply infrastructure for groundwater and/ or surface water abstraction and stormwater management infrastructure, if required. The fences would either be electrical or barbed wire fences, depending on the preference of the developer. A guard cabin would also be required for 24-hour security. Water would be required during both construction and operational phases for office use and solar panel cleaning, approximately 5,482 megalitres. It is proposed that water will be piped from the main NAMWATER pipe.

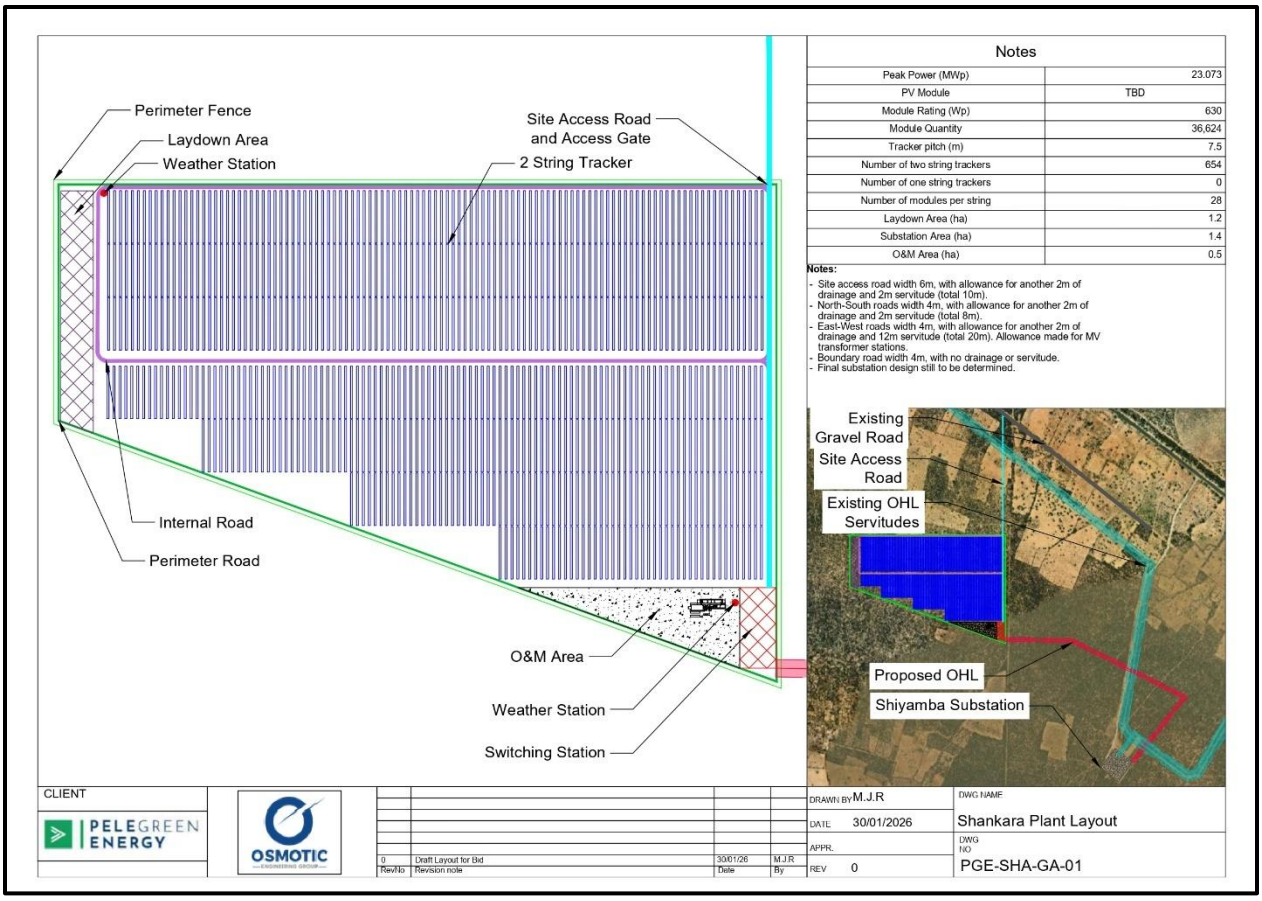

Figure 2 The site layout of the proposed site

Other aspects of the proposed site include:

2.6.1 Accessibility to Site

The site is accessible from the B8 road which diverts into the existing road that leads to the site. Additionally, corridors of small access roads will be constructed for constructing, servicing, and maintaining the facility. Where possible, the layout of these roads would be designed to coincide with the existing dirt tracks. The design of the new access point would be undertaken by a professional engineer to ensure the safety of road users.

2.6.2 Services and Infrastructure

- **Power supply:** Power required during the construction phase will be provided by diesel generators. About 1500 liters of diesel will be used per day.

- **Fuel (diesel for generators and other equipment):** The fuel (diesel) required for equipment will be stored in a tank mounted on a mobile trailer. Drip trays will be readily available and monitored to ensure that accidental fuel spills are cleaned up as soon as they have been detected/observed. Fuel may also be stored in a bunded diesel bowser on site, and in jerry cans placed on plastic sheeting to avoid unnecessary contamination of soils.

2.6.3 Waste Management

- **Sewage Management:**
  Mobile chemical ablution facilities will be provided on-site. Sewage waste will be managed and disposed of in accordance with the manufacturer's instructions to ensure compliance with health and environmental standards.
- **Solid Waste Management:**
  Adequate waste bins and containers will be made available at all sites and campsites. Collected waste will be stored safely and transported for disposal at the nearest approved waste management facility which is Rundu Dumping site, being managed by the Rundu Town Council.
- **Hazardous Waste Management:**
  Hazardous waste, including used fuel and oils, will be carefully stored in standardized, leak-proof containers. These will be transported to and disposed of at an approved hazardous waste management facility located in the nearest town (Rundu).

2.6.4 Health and Safety Measures

- All project personnel will be provided with adequate and appropriate Personal Protective Equipment (PPE).
- A minimum of two well-stocked first aid kits will be available on-site at all times.
- Fire extinguishers will be readily available in vehicles, at construction sites, and at campsites to mitigate risks of accidental fire outbreaks.

2.7 Decommissioning and Rehabilitation Phase

The 20 MW Solar PV Power Plant is expected to be operational for a 25-year period, thereafter the solar power plant can either be upgraded or be completely decommissioned. Under the provisions of the Environmental Management Act, 2007 it is necessary to take into account the impacts on the environment during the decommissioning phase of the project. Namibian

legislation considers decommissioning as a separate activity and an EIA should therefore be carried out prior to its decommissioning.

3 PROJECT ALTERNATIVES

Alternatives are defined as the “different means of meeting the general purpose and requirements of the activity” (EMA, 2007). This section highlights the different ways in which the project can be undertaken and identifies alternatives that may be the most practical, but least damaging to the environment.

Once the alternatives have been established, these are examined by asking the following three questions:

- What alternatives are technically and economically feasible?
- What are the environmental effects associated with the feasible alternatives?
- What is the rationale for selecting the preferred alternative?

3.1 Types of Alternatives Considered

3.1.1 The "No-go" Alternative

The “no action” alternative implies that the status quo remains. Should the proposal be discontinued, none of the potential impacts (positive and negative) identified would occur. If the proposed project is to be discontinued, the current land use for the proposed site would remain unchanged.

This no-go option is considered, and a comparative assessment of the environmental and socio-economic impacts of the “no action” alternative is undertaken to establish what benefits might be lost if the project is not implemented.

3.1.2 Solar Plant Location

The project considered establishing the power plant on fthe village within a 1.5 km radius of the Shiyambi NamPower substation, which is located in Shankara, Ndonga Linena Constituency, Kavango East Region, near the Shiyambi substation.

Technology alternatives:
Various photovoltaic (PV) technologies, including thin-film modules with single-axis tracking, were assessed to optimise energy output and efficiency. As the final design is still under

development, the preferred technology will be confirmed during detailed engineering and incorporated into the final construction and operational plans.

3.2 Services Infrastructure

Alternatives were considered for different supporting infrastructures to ensure that the most feasible options were selected. The technological, economic, and environmental limitations were considered to select the most feasible option. The alternatives considered in this regard are presented in table 1.

Table 1 :The presentation of service infrastructure alternatives considered for the project activities

Category of Alternative	Alternatives Considered	Justification for Selected Alternative
Access Roads	• Create new access roads on site • Use existing access roads as much as possible	Existing access roads within and around Shankara Village will be used as far as possible to reduce construction costs, limit environmental disturbance, and minimise impacts on surrounding land within the Ndonga Linena Constituency.
Ablution Facilities	• Fixed ablution facility with septic tank • Portable container facilities with septic system	Portable containerised ablution facilities were selected to avoid permanent visual impacts in Shankara Village and to minimise rehabilitation costs once construction activities are completed.
Water Supply	• Obtain water from nearby NAMWATER pipeline • Bring / carting water from the river	Water will be sourced from the existing NAMWATER supply line near Shankara Village, reducing costs and avoiding additional pressure on local groundwater resources in the Kavango East Region.

Diesel Storage	• Fixed above-ground diesel tank on site • Trailer-mounted diesel tank with containment bund	A temporary fixed above-ground diesel tank was selected to ensure sufficient fuel storage while minimising pollution risks in the local environment.
Power Supply	• Diesel generator • Solar panels for camp domestic power • Grid connection or substation	A diesel generator is the most practical and cost-effective option during the construction phase, given the site's location in Village and limited immediate access to grid power.
Site Offices, Storage, and Worker Accommodation	• Disassemblable prefabricated container units • Permanent buildings • Off-site offices	Prefabricated container units were selected due to ease of installation, low cost, and ease of dismantling and relocation, while avoiding long-term visual impacts within the Kavango East Region.

4 LEGAL FRAMEWORK: LEGISLATION, POLICIES, AND GUIDELINES

This section outlines the relevant legal frame works that the proponent should consider once the ECC of the proposed project is issued. The legislations included or identified in this document, need to be honored by the proponent, during the course of the project. The legal requirements provided here are those that are required for the proposed project are presented in table 2 below.

Table 2 Regulatory framework applicable to the project

Legislation Required	**Custodian Organ of State**	**Aspect of the Project Regulated**
Constitution of the Republic of Namibia (1990)	Government of the Republic of Namibia	Promotes sustainable use of natural resources, environmental protection, and responsible development throughout the project lifecycle.
Environmental Management Act No. 7 of 2007 & EIA Regulations (2012)	MEFT – Department of Environment, Forestry and Agriculture (DEAF)	Requires environmental clearance, public participation, impact assessment, and implementation of mitigation measures via an EMP.
Electricity Act No. 4 of 2007	Ministry of Mines and Energy (MME) / Electricity Control Board	Regulates electricity generation and requires licensing for the construction and operation of the PV power plant.
National Energy Policy (2017)	Ministry of Mines and Energy (MME)	Guides renewable energy development, sustainability, local participation, and energy security.
Pollution Control and Waste Management Bill	MEFT and relevant authorities	Controls air, water, noise, dust pollution, and waste management arising from construction and operation activities.

Water Act No. 54 of 1956	MAWLR – Department of Water Affairs	Protects surface and groundwater from pollution during construction and operation.
Water Resources Management Act No. 11 of 2013	MAWLR	Regulates abstraction, use, and protection of water resources, including water supply for construction.
Forestry Act No. 12 of 2001	MEFT	Regulates vegetation clearance and protection of trees and shrubs on the project site.
Soil Conservation Act No. 76 of 1969	MAWLR	Prevents soil erosion and degradation resulting from site clearing, earthworks, and traffic movement.
Petroleum Products and Energy Act No. 13 of 1990 & Regulations (2001)	MIME – Petroleum Affairs Division	Regulates storage and handling of diesel and other fuels during construction.
National Heritage Act No. 27 of 2004	Ministry of Education, Arts and Culture (MEAC)	Protects archaeological and heritage resources; provides procedures for chance finds.
Public Health Act No. 36 of 1919	Ministry of Health and Social Services (MoHSS)	Controls public health risks such as dust, noise, sanitation, and nuisance impacts.
Labour Act, 2007	Ministry of Labour, Industrial Relations and Employment Creation (MLIREC)	Governs employment conditions, worker rights, occupational health and safety.
Hazardous Substances Ordinance No. 14 of 1974	MoHSS	

		Regulates storage, handling, and disposal of hazardous substances such as fuels and oils.
National Solid Waste Management Strategy	MEFT & Local Authorities	Guides waste minimisation, recycling, storage, and disposal of construction and operational waste.

4.2 Other Application International Statutes (Treaties and Conventions) and Policies

The other international statutes, such as policies, standards, and conventions that may govern the project activities, are provided under Table 4.

Table 3 Other international treaties and conventions governing the proposed activities on the site

Statue	Relevant Provisions	Implications for the Project / Requirements
The United Nations Convention to Combat Desertificatio n (UNCCD) 1992	Address land degradation in arid regions to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change. The convention's objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability, United Nations Convention.	The project activities should not be undertaken in such that contributes to desertification.

Convention on Biological Diversity 1992	Regulate or manage biological resources important for the conservation of biological diversity, whether within or outside protected areas, to ensure their conservation and sustainable use. Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings.	The removal of vegetation cover and destruction of natural habitats should be avoided and, where not possible, minimized.
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: "a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.
Equator Principles	A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects (August 2013). The Equator Principles have been developed in conjunction with the International Finance Corporation (IFC) to establish an International Standard with which companies must comply to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The principles apply to all new project financings globally across all sectors.	These principles are an attempt to: '…encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.'

5 ENVIRONMENTAL BASELINE

The proposed project will be undertaken within defined environmental and social settings. Establishing the pre-project baseline conditions provides essential background information on the current state of the environment and allows for future projections of potential changes following the proposed activities on site. This process further assists the Environmental Assessment Practitioner (EAP) in identifying environmentally sensitive features that require protection through the implementation of appropriate mitigation measures and monitoring actions.

The baseline information presented in this report is derived from multiple sources, including published studies and technical reports related to the Ndonga Linena constituency, in Kavango East region. Additional data was obtained by the Consultant during the site visit, ensuring that both secondary literature and primary field observations inform the environmental assessment.

5.1 Biophysical Environment

5.1.1 Climate

The climate of the Shankara resemble that of the Ndonga Linena constituency, where the solar project location is to be situated; at about 1252m above mean sea level has a semi-arid climate. The average rainfall amounts to more than 500 mm, though in some years it could be twice that amount. The rainy seasonlasts from November to April is hot, reaching 35° C, but relatively easy to bear due to high humidity (Mendelsohn, 2003). The area experiences high solar radiation, with an average of approximately 8–9 hours of sunshine per day , increasing to 9–10 hours per day during the dry season and decreasing to about 7–8 hours per day during the wet season. These conditions make the area highly suitable forsolar energy projects. Namibia is one of the sunniest countries on Earth with a solar radiation of about 6 kWh per m² per day (100 x 60 W light bulbs in 1 hour). The proposed project location is ideal since the village receives up to 9 hours of sunshine on a daily basis.

5.1.2 Landscape and Topography

The proposed site is characterized by topography with elevations ranging from 816 to 21252 m above sea level. The terrain shows lower-lying plains in the surrounding area. Figure 2 and Figure3 below shows the landscape and topography map and visuals of the project area, respectively.

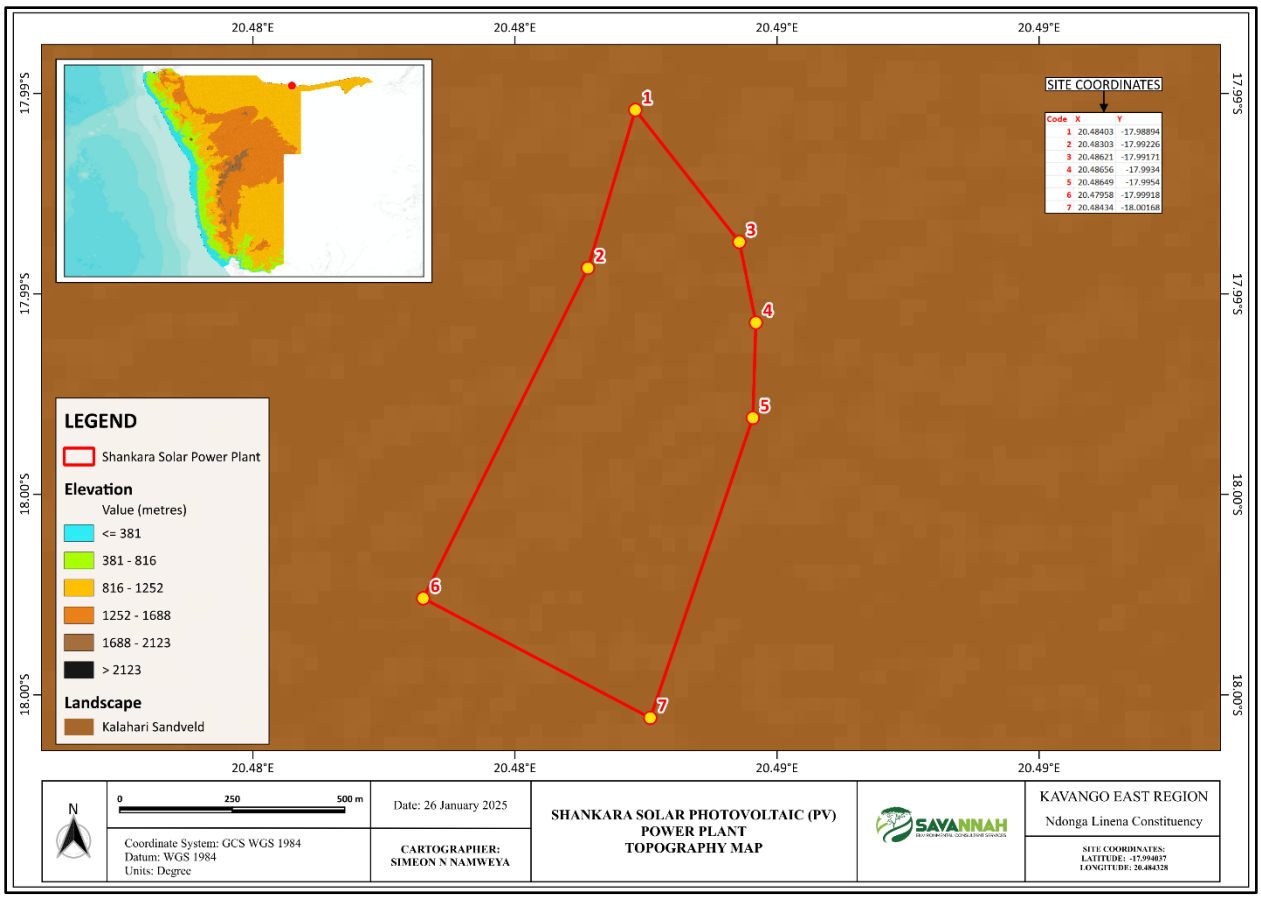

Figure 3: The topographic map of the project area

5.1.4 Soil and geology

The proposed area lies within the Kalahari Sandveld.The Kalahari Sandveld is part of the extensive Kalahari Basin—a broad, gently undulating landscape dominated by deep, unconsolidated sands derived from ancient wind-blown deposits. These sandy plains often form longitudinal dunes and sand sheets with little surface water because rain rapidly infiltrates into the deep sand layer. Vegetation in this semi-arid environment includes xeric savanna grasses, shrubs, and scattered drought-tolerant trees such as acacias and camelthorn, with more substantial woodland in areas receiving relatively higher rainfall. Watercourses that cross the sandveld are usually dry except after heavy rain, and only small pans hold water temporarily. (Mendelsohn et al., 2013).

The project area is dominated by Ferrallic aerosols soils. Ferralic Arenosols in this region are **deep, sandy soils** derived mainly from Kalahari sand deposits. They are highly permeable, well-drained, and low in nutrients due to weak soil development and low clay content. These soils

support mainly **woodland and savanna vegetation** and are best suited for extensive livestock grazing rather than cropping. Their low water- and nutrient-holding capacity limits agricultural potential and makes them vulnerable to degradation under overgrazing (Mendelsohn et al., 2002). figure 3 shows the soil map, while figure 4 shows the soil type observed during the site visit.

Therefore, the Soil Conservation Act (No 76 of 1969) should be taken into account to ensure that soils are conserved in a way that does not promote soil erosion. (Refer to the EMP).

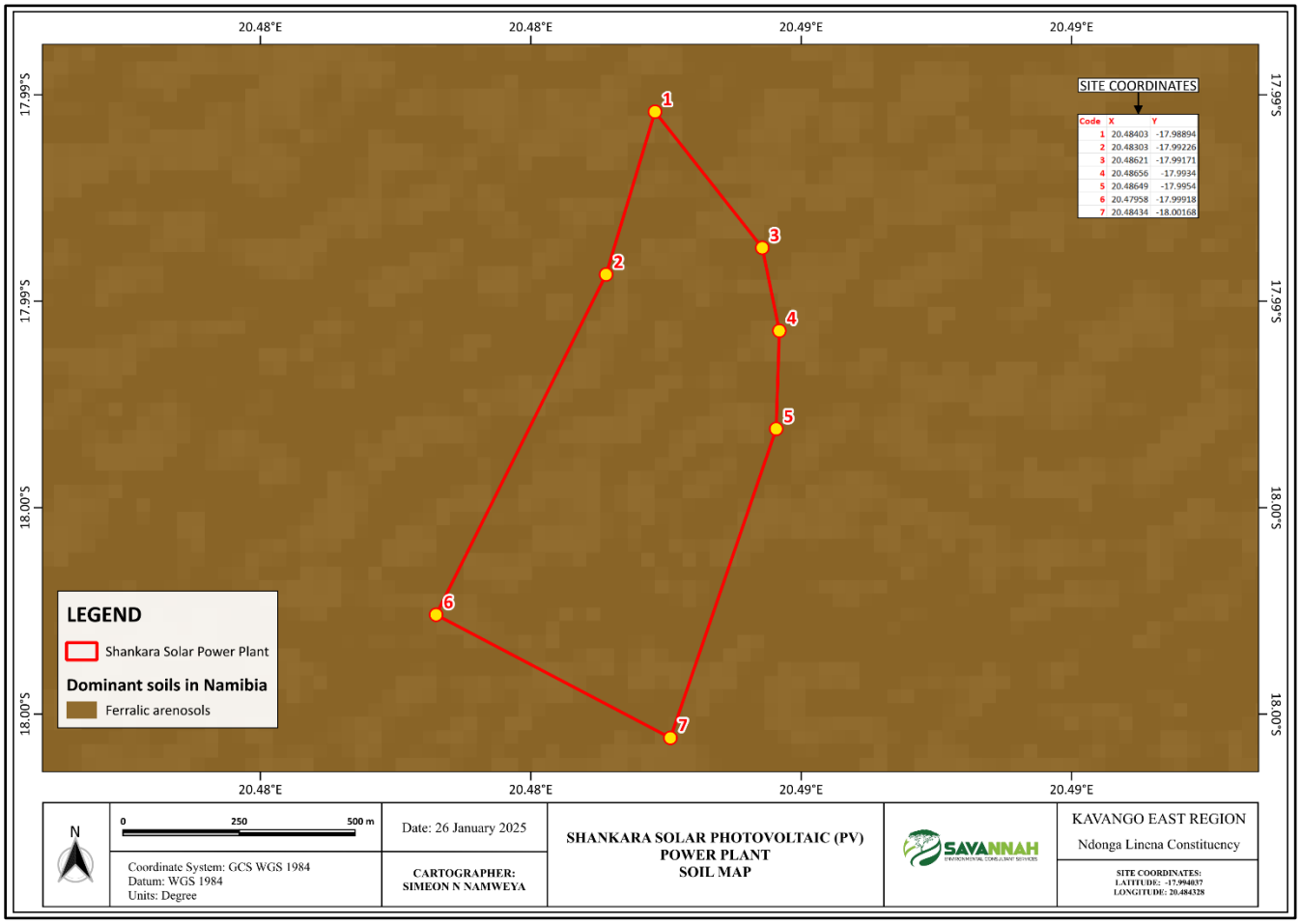

Figure 4: Map of soil distribution in the project area

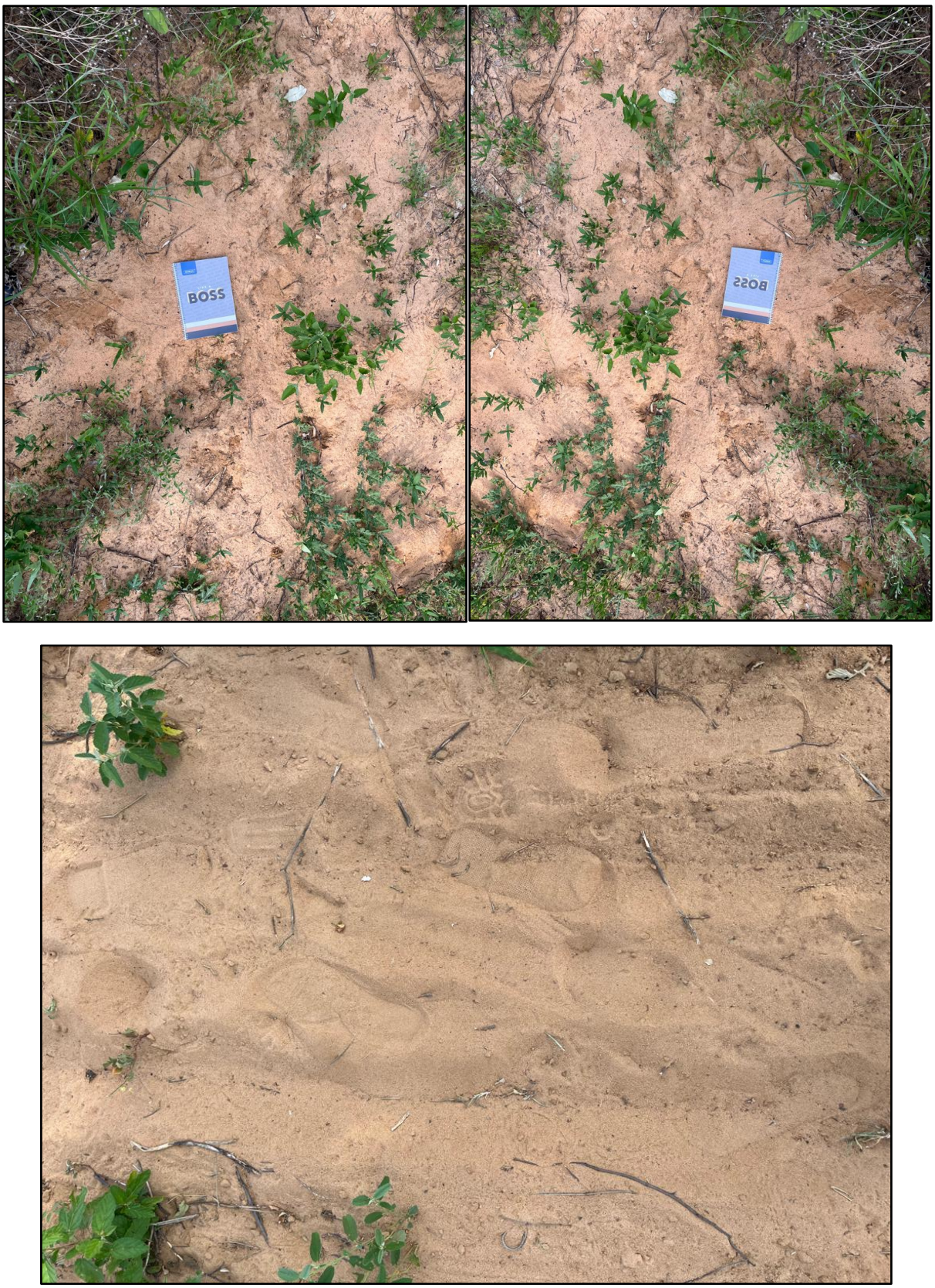

Figure 5: Soil type observed within the project area

5.1.5 Hydrology, Groundwater Vulnerability to Pollution, and Water Resources

The area of Ndonga Linena lies within the Okavango River Basin, with the Okavango (locally called the Kavango) River being the main surface water feature. This river originates in the higher-rainfall highlands of Angola and flows southeast through the Kavango Region of Namibia, providing a perennial source of surface water in an otherwise semi-arid landscape. Its flow supports riparian ecosystems, shallow alluvial soils, and human water use for domestic supply and limited irrigation. Groundwater in this region is found primarily within porous Kalahari-sand aquifers and alluvial deposits adjacent to the river; these aquifers receive some recharge from both direct rainfall and river losses, although recharge rates are generally low because much water is lost through evapotranspiration and infiltration to deep sediments. Groundwater levels tend to be shallower near the river and deepen away from it, reflecting the interaction between surface water and groundwater in the basin. Since it is covered by the porous Kalahari-sand aquifers, its rate rather moderate to groundwater pollution vulnerability.

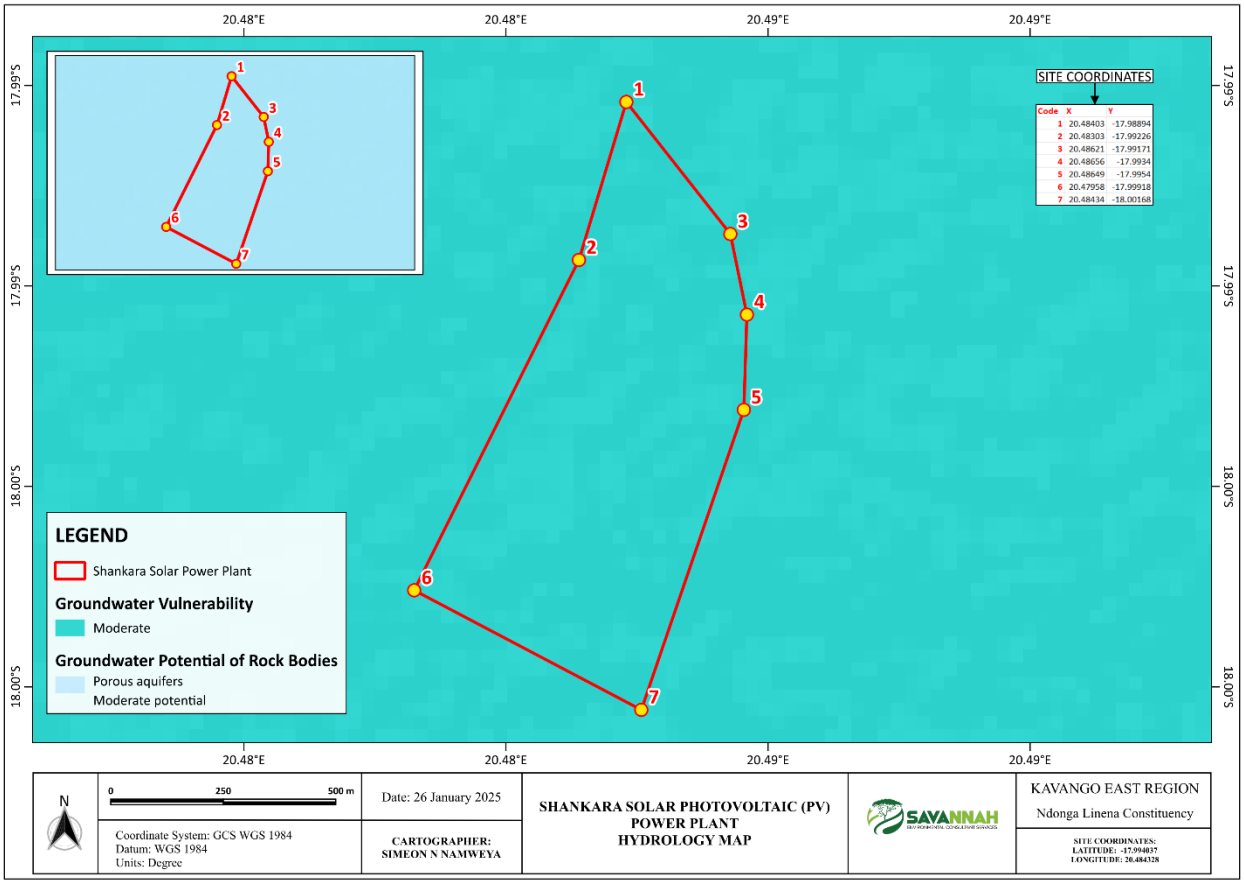

Figure 6: The hydrologic map of the project area

5.1.6 Flora and Fauna

5.1.6.2 Flora

The proposed site area is located within the North-eastern Kalahari Woodlands zone of northern-east Namibia. The North-eastern Kalahari Woodlands in this part of Namibia are a type of broad-leaved, semi-deciduous woodland that occur on deep, sandy Kalahari soils. They form part of the larger Kalahari Acacia–Baikiaea woodland ecoregion, characterized by open to moderately closed tree savanna with species adapted to a semi-arid climate and nutrient-poor sands. Common tree species include *Pterocarpus angolensis* (kiaat), *Burkea africana*, *Terminalia sericea*, *Guibourtia coleosperma* and other broad-leafed woodland species, with a grassy understory of perennial savanna grasses. (Mendelsohn et al., 2013).The recommendation measures/ mitigation measures stipulated in the EMP must be adhered to, regarding the removal of protected plants on site

Figure 6 illustrates the vegetation distribution map around the project area, providing a broader perspective of the regional vegetation patterns and **Figure 7** displays the plant types that were observed during the site visit, providing a more detailed and localized perspective.

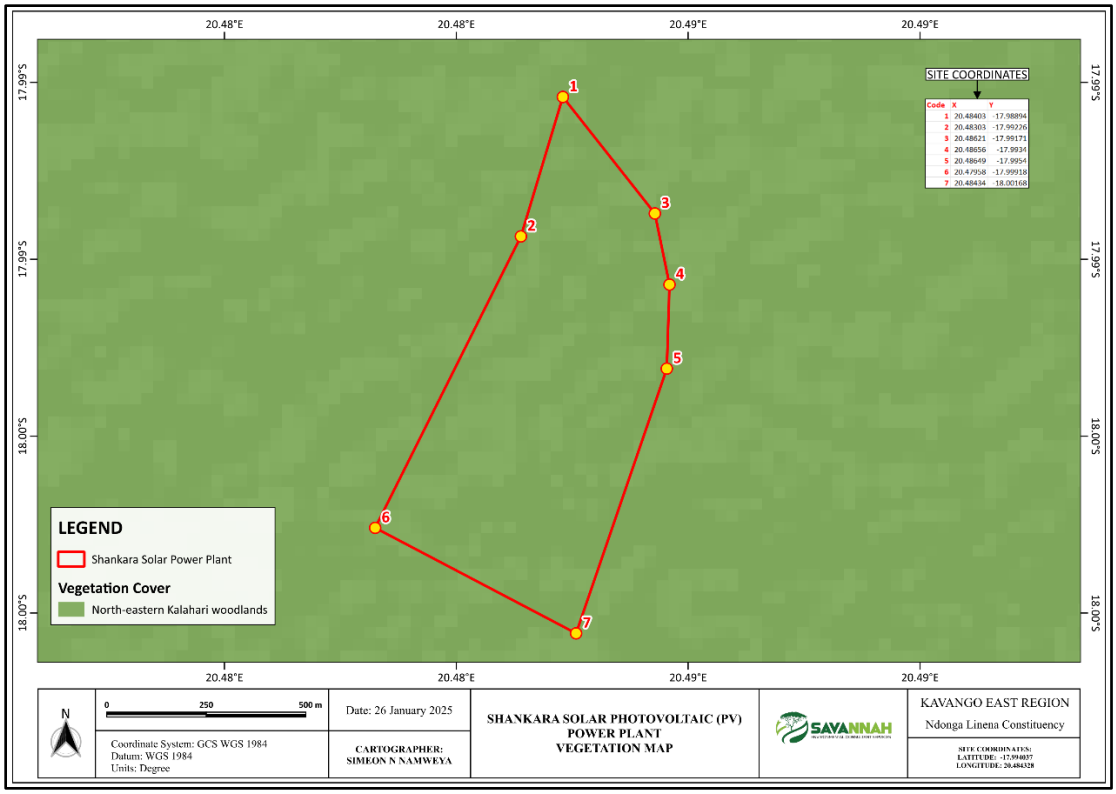

Figure 7 : Vegetation Cover Map of the Project Area

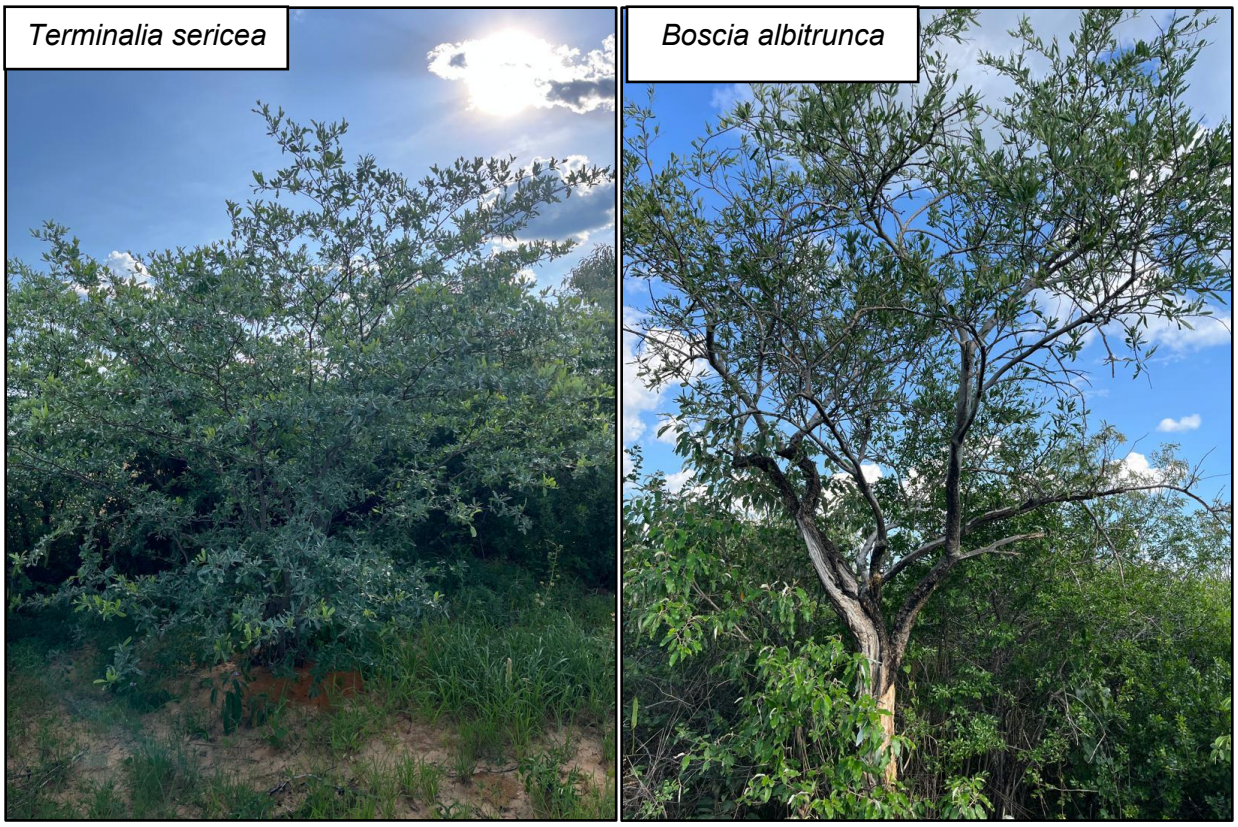

Figure 8 : Typical vegetation within the project area

5.1.6.2 Fauna

The project area falls within communal land where local farmers practice subsistence and commercial farming, keeping both small and large livestock such as cattle, sheep, goats, and chickens. Ongoing human activities, including ploughing, grazing, and settlement, have fragmented and modified the natural habitat, thereby limiting the presence of larger or more sensitive wildlife species. Consequently, the area is considered to have low to moderate faunal sensitivity, and no endemic or protected species are expected to occur within the proposed project footprint (MEFT, 2020).

5.2 Socioeconomic Status of the area

Shankara is one of the rural settlements within the Ndonga Linena Constituency in the Kavango East region of Namibia, which had an estimated population of about 14,936 people in 2023. The local economy is primarily based on subsistence agriculture (crop farming and livestock rearing), with small-scale farming being the dominant livelihood activity. Residents engage in crop

production (e.g., mahangu, and maize) and livestock (goats and cattle) for food and limited income.

The Ndonga Linena area includes irrigation projects (e.g., Shitemo and Ndonga Linena green schemes) that provide employment and support vegetable and grain production, contributing to local income and food security. Shankara Rest Camp is noted as a tourism establishment in the constituency, indicating some tourism-linked economic activity.

Rural electrification efforts have reached some villages in the constituency, improving access to electricity for education and small enterprises; however, many rural households still lack reliable electricity and basic services. Access to water, toilets, and sanitation remains a challenge for many in the broader Kavango East region, implying similar conditions may affect Shankara.

5.3 Heritage and Archaeology

There are no recognized archaeological or heritage sites within the proposed project area. While isolated findings in the wider area relate to recent historical events rather than archaeological heritage, all heritage resources in Namibia are legally protected, should they be encountered. The proposed solar plant development is therefore not anticipated to impact known archaeological resources; however, a chance-find procedure will be implemented during construction in accordance with national heritage legislation, and appropriate safety measures will be applied should any hazardous historical artefacts be identified.

6 PUBLIC CONSULTATION PROCESS

Public consultation is an important component of an Environmental Assessment (EA) process. It provides potential Interested and Affected Parties (I&APs) with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process, thus assisting the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and the extent to which further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures. Public consultation for this scoping study has been done in accordance with the EMA and its EIA Regulations.

6.1 Pre-identified and Registered Interested and Affected Parties (I&APs)

Relevant and applicable national, regional, and local authorities, local leaders, and other interested members of the public were identified. Pre-identified I&APs were contacted directly, while other parties who contacted the Consultant after project advertisement notices in the newspapers, were registered as I&APs upon their request.

6.2 Communication with I&APs

Regulation 21 of the EIA Regulations details the steps to be taken during a public consultation process, and these have been used in guiding this process. Communication with I&APs with regarding the proposed development was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the proposed work was compiled and emailed to pre-identified I&APs, and upon request to all new registered I&APs;
- Notices for the Environmental Scoping Assessment of the proposed project were published in Windhoek Observer and the villager newspapers on the 19 December 2025, respectively, briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- A consultation meeting was scheduled and held with the affected landowners on the 10 January 2026, under the tree at Mr. Willem Mukwangu house in Shankara village (under a tree), at 15h00.

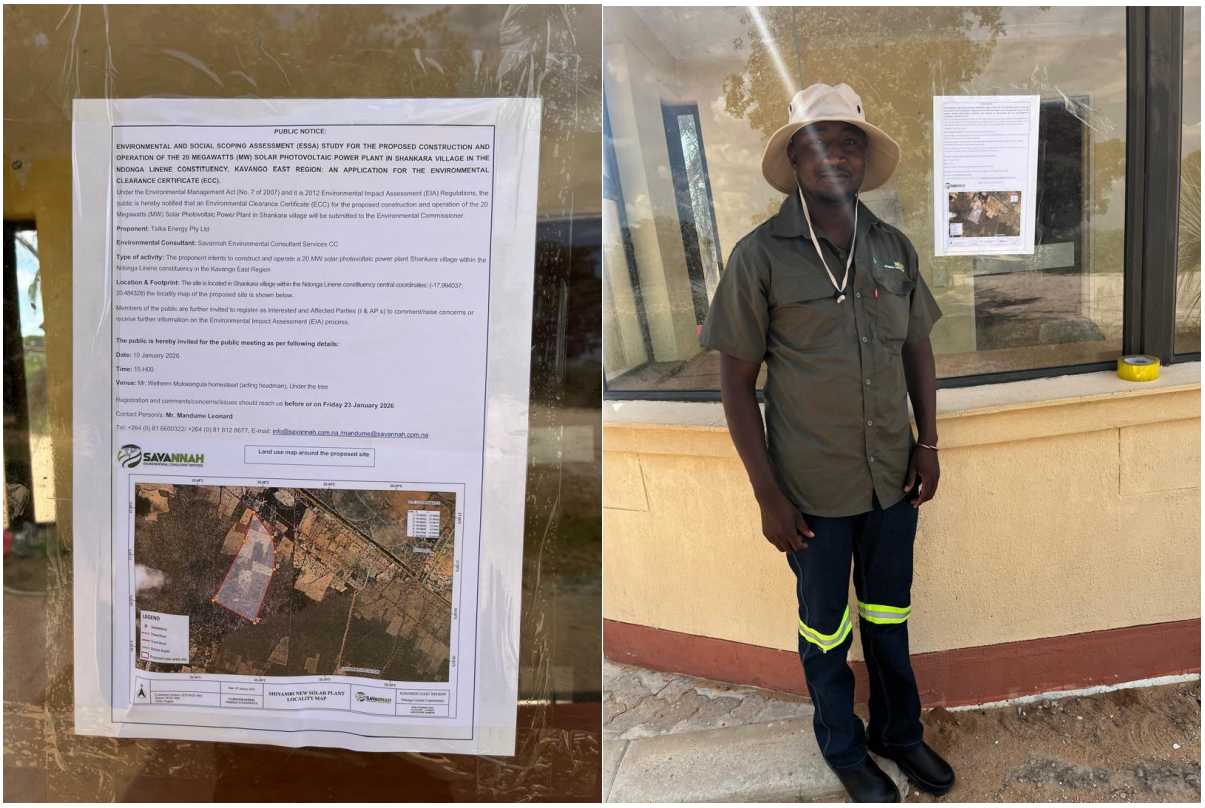

Figure 9: EIA study site notice placed at the Kavango East Regional Council Ndonga Linena Constituency Office for the proposed site

Figure 10: Evidence of site consultation meeting held in Shankara Village, under the tree

6.3 Feedback and Issues Raised by the Stakeholders (I&APs)

Some key issues were raised by I&APs during the consultation period, and these issues have been recorded and incorporated in the Scoping Report and EMP. The summarized key issues are presented below:

1. Employment must priorities the local people, from the construction to the operational phase.
2. Will Tsika Energy distribute electricity to the nearby villages that are not electrified yet.
3. The installation of solar panels in the area how will it affect the area's temperature and rainfall?

7 IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION MEASURES

7.1 Impact Identification

Proposed developments/activities are usually associated with different potential positive and/or negative impacts. For an environmental assessment, the focus is placed mainly on the negative impacts. This is done to ensure that these impacts are addressed by providing adequate mitigation measures such that an impact's significance is brought under control, while maximizing the positive impacts of the development. The potential positive and negative impacts that have been identified from the proposed activities are listed as follows:

<u>Positive impacts (although temporary):</u>

- Employment creation,
- Increased renewable energy generation,
- Reduced greenhouse gas emissions, and
- Stimulation of local economic activities.

<u>Potential negative (adverse) impacts:</u>

- Temporary disturbance to soil and vegetation during construction,
- Dust and noise generation,
- Waste generation,
- Occupational health and safety risks,

- Visual impacts, and
- The potential for soil or water contamination from accidental spills.

7.2 Impact Assessment Methodology

7.2.1 Impact Assessment Methodology

The Environmental Assessment process primarily ensures that potential impacts that may occur from project activity are identified and addressed with environmentally cautious approaches and legal compliance. The impact assessment method used for this project is following Namibia's Environmental Management Act (No. 7 of 2007) and its Regulations of 2012, as well as the International Finance Corporation (IFC) Performance Standards.

The identified impacts were assessed in terms of scale/extent (spatial scale), duration (temporal scale), magnitude (severity), and probability (likelihood of occurring), as presented in Table 6.

To enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable. It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following process will be applied to each potential impact:

- Provision of a brief explanation of the impact,
- Assessment of the pre-mitigation significance of the impact; and
- Description of recommended mitigation measures.

The recommended mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment. The following criteria (in Table 4) were applied in this impact assessment:

Table 4: Criteria used for impact assessment (extent, duration, intensity, and probability)

The Criteria used to assess the potential negative impacts.				
The extent or (spatial scale) - extent is an indication of the physical and spatial scale of the impact.				
Low (1)	**Low/Medium (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
The impact is localized within the site boundary: Site only	The impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond the site boundary: Regional	Impact extends to the National or over international boundaries
Duration- Duration refers to the timeframe over which the impact is expected to occur, measured over the lifetime of the project				
Low (1)	**Low/Medium (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
The Criteria used to assess the potential negative impacts.				
Immediate mitigating measures, immediate progress	The impact is quickly reversible, and short- term impacts (0-5 years)	Reversible overtime; medium-term (5-15 years)	Impact is long-term	Long-term; beyond closure, permanent; irreplaceable , or irretrievable commitment of resources
Intensity, Magnitude/severity - Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. This is a qualitative type of criteria.				
H-(10)	**M/H-(8)**	**M-(6)**	**M/L-(4)**	**L-(2)**
Very high deterioration, high quantity of deaths, injury or illness / total loss of habitat, total	Substantial deterioration, death, illness or injury, loss of habitat/diversity	Moderate deterioration, discomfort, partial loss of habitat/biodiversity or resource,	Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species	Minor deterioration, nuisance or irritation, minor change in

alteration of ecological processes, extinction of rare species	or resource, severe alteration, or disturbance of important processes	moderate alteration	numbers	species/habitat/diversity or resource, no or very little quality deterioration.
Probability of occurrence - Probability describes the likelihood of the impacts occurring. This determination is based on previous experience with similar projects and/or based on professional judgment.				
Low (1)	**Medium/Low (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.

7.2.2 Impact Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact "without mitigation" is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this chapter, for this assessment, the significance of the impact without prescribed mitigation actions was measured.

Once the above factors (Table 4) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

SP = (magnitude + duration + scale) x probability

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate, or low significance, based on the following significance rating scale (Table 5).

Table 5: Impact significance rating scale

Significance	Environmental Significance Points	Color Code
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L
Neutral	0	N
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M
High (negative)	>-60	H

For an impact with a significance rating, mitigation measures are recommended to reduce the impact to a low or medium significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period to enable the confirmation of the significance of the impact as low or medium and under control.

The assessment of the project phases is done for both pre-mitigation (before implementing any mitigation) and post-mitigation (after mitigations are implemented). The objective of the mitigation measures is to first avoid the risk, and if the risk cannot be avoided, mitigation measures to minimize the impact are recommended. Once mitigation measures have been applied, the identified risk will be of low significance.

7.2.3 Description and Assessment of Potential Impacts

The potential impacts of the proposed project activities are described and assessed in Table

7. The management and mitigation measures in the form of management action plans are provided in the Draft EMP.

Table 6: Assessment of Potential Negative Impacts

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Positive Impacts											
Employment creation	Although temporary, the project activities will create employment site preparation, construction and throughout the project. This will include casual laborers, technical assistants, cooks, etc.	L / M- 2	L / M - 2	L / M - 4	L – 1	L - 8	M / H - 4	H - 5	M - 6	H - 5	H - 75
Land use fees for socio-economic development	Compensation the land owners will assist in uplifting farmers/landowners (generation of additional income).	L / M- 2	L / M - 2	L / M - 4	L – 1	L - 8	M / H - 4	H - 5	M - 6	H - 5	H - 75

Empowerment of local businesses	Procurement of local goods and services for by small and medium businesses will promote local entrepreneurship, empowerment, and local economic development (income generation during the project).	L / M- 2	L / M - 2	L / M - 4	L / M – 2	L - 16	M - 3	M / H - 4	L / M - 4	M / H - 4	M - 44
Negative (Adverse) Impacts											
Physical disturbance to the site soils	The excavations and land clearing to enable the siting of project structures and equipment will potentially result in soil disturbance through target site establishment, access road creation, and unnecessary off-	M - 3	M / H – 4	L / M - 4	M / H – 4	M – 44	L / M - 2	L / M - 2	L / M - 4	L / M - 2	L - 16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	road driving. These would leave the site soils exposed to erosion (areas with no to little vegetation cover to the soils in place). The movement of heavy vehicles and equipment may lead to compaction of the soils during site preparation and construction. This will, however, be a short-term and localized impact.										

Impact on the sensitive Biodiversity: Fauna and Flora Illegal hunting (poaching)	Fauna: If activities such as trenching are not carefully conducted, this would result in land degradation. The degradation would lead to habitat loss for a diversity of fauna and flora onsite. presence and movement of the workforce and the operation of project equipment and heavy vehicles would disturb wildlife in the area. There is also a potential illegal hunting (poaching) of local livestock by project-related workers. This could lead to a loss	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: - 2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	or a reduction of specific faunal species, which also impacts tourism in the community (area). Flora: The vegetation in the area would be impacted through land clearing to create access roads, setting up project equipment and infrastructure, and activities such as trenching and drilling. The clearing of vegetation, where deemed necessary, will be limited to the specific route and minimal and avoiding protected tree										

	species. The impact will be localized, site-specific, and therefore manageable.										
Conflict between the Proponent and existing land uses	The fact that there are existing land uses such as farming and tourist activities on some farms, there might be a conflict in terms of land uses, if one significantly infringes another's activities. Therefore, a	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

	good understanding should be made between the										

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	visual nuisance (impacting scenic views), especially for farm tourists and other road users in the vicinity. .										

Water Resources Demand and Use	There will be a need for water for dust suppression and mixing concrete during the construction , thus the Proponent will store the	M - 3	M – 3	M - 6	M / H – 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	water in industry-standard water reservoirs/tanks onsite and refill as required. Therefore, the impact of the project activities on the local water resources would be very low to none.										

Soil and Water Resources Pollution	The proposed activities are associated with a variety of potential pollution sources (i.e., lubricants, fuel, and wastewater) that may contaminate/pollute soils and eventually groundwater and surface water, if not handled properly. The anticipated potential source of pollution to water resources from the project activities would be hydrocarbons (oil) from project vehicles, machinery, equipment, and potential wastewater/effluent from related activities. The spills (depending on volumes spilled on the soils)	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: - 2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	from this machinery, vehicles, and equipment could be washed into surface water bodies such as rivers and streams. However, it should be noted that the scale and extent/footprint of the activities where potential sources of pollution will be handled are relatively small. Therefore, the impact will be moderately low.										

Waste Generation (Environmental pollution)	Waste types such as solid, wastewater, and possibly hazardous will be produced onsite. If the generated waste is not disposed of responsibly, land pollution may occur on the and around the site. If solid waste such as paper and plastics is not properly stored or just thrown into the environment (littering), these may be consumed by wild animals in the area, which could be detrimental to their health. Improper handling, storage, and disposal of hydrocarbon products and hazardous materials at the site may lead to	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L - 1	L - 1	L - 2	L / M - 2	L - 8

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	soil and groundwater contamination in the case of spills and leakages.										

Occupational and Community Health and Safety Risks	Project personnel (workers) involved in the project activities may be exposed to health and safety risks. The use of heavy equipment, especially during drilling, and the presence of hydrocarbons on sites may result in accidental fire outbreaks. This could pose a safety risk to the project personnel and locals, too.	M - 3	M – 3	M - 6	M / H – 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12
Vehicular Traffic Safety	The local roads are the main transportation routes for all vehicular movement in the site area.	M - 3	M / H - 4	L / M - 4	M / H – 4	M - 44	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	There would be a potential slight increase in traffic flow, especially during construction stages, due to the delivery of supplies, goods, and services to the site at some point. However, there will only be a single heavy truck, 1 to 2 medium vehicles, and 2 to 3 small vehicles frequenting the area to and from sites. works will be undertaken in stages, on certain days of the week, with a few vehicles, and the work will be temporary.										

	Therefore, the risk is anticipated to be short-term and not intense or frequent.										
Noise and vibration from drilling	There is a potential for noise from certain activities (drilling and trenching), which may be a nuisance to the community. The excessive noise and vibrations without any protective measures in	M - 3	M - 3	M - 6	M / H - 4	M – 48	L - 1	L / M - 2	L - 2	L / M -2	L - 10

	place can also be a health risk to workers on site as well as a nuisance to farm										

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	animals. Thus, the impact likelihood is minimal.										

Archaeological and Heritage Resources	The area within the site has LOW Archaeological significance, and this is based on the surface walk- over conducted, which recorded only a few rock shelter features, rock outcrops/boulders, and graves.	M / H - 4	M – 3	M - 6	M – 3	M – 39	L - 1	L / M - 2	L - 2	L / M -2	L - 10

8 RECOMMENDATIONS AND CONCLUSION

8.1 Recommendations

The potential impacts of the proposed project activities were identified and assessed, and appropriate mitigation measures were recommended for implementation by the Proponent, their contractors, and project-related employees for significant adverse (negative) impacts rated as medium. These mitigation measures aim to reduce the impact severity to an acceptable level and prevent or minimize any negative effects on the environment, local communities, and cultural resources.

The concerns raised by registered Interested and Affected Parties (I&APs) were carefully considered, incorporated into this report, and addressed through the recommended management and mitigation measures. Most potential impacts were rated as medium in significance, but the effective implementation of these measures will minimize their severity, reducing the rating to low. To ensure this outcome and maintain low impact ratings, the Proponent, or their appointed Environmental Control Officer (ECO), should monitor the implementation of the proposed management and mitigation measures.

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by effective implementation of the recommended management and mitigation measures, and with more effort and commitment put towards monitoring the implementation of these measures.

It is, therefore, recommended that in the case of ECC issuance for this project, the proposed activities may be granted an ECC, provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.
- All required permits, licenses, and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use agreements, and service provision agreements (water provision) to explore and ensure compliance with these specific legal requirements.
- Transparency in communication and continued engagement with landowners (for land access before and during the project activity), as well as other stakeholders, should be maintained before and throughout the project.

- The Proponent, their project workers, or contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by the issuing authorities.
- The EMP implementation onsite should be checked and done by the responsible team member onsite (Environmental Control Officer) and audited by an Independent Environmental Consultant on a bi-annual basis to compile Environmental Monitoring (Audit) Reports. These reports are to be submitted to the Environmental Commissioner at the DEAF. This will be required by the Environmental Commissioner (as part of the ECC conditions).

Conclusion

In conclusion, to maintain the desired rating and ensure that the potential impacts are under control, the implementation of management and mitigation measures should be monitored by their Environmental Control Officer (ECO) and audited by an Independent Environmental Consultant on a bi-annual basis. The monitoring of this implementation will not only be done to maintain the reduced impacts' rating or maintain a low rating, but also to ensure that all potential impacts that might arise during implementation are properly identified in time and addressed immediately.

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