



ENVIRONMENTAL IMPACT ASSESSMENT (EIA)





Environmental and Social Impact Assessment (ESIA) for the Proposed Construction and Operation of a Solar PV Plant on Camp 12 (Portion of the !Oe #Gan Traditional Authority and Gaingu Conservancy), Erongo Region

To support the proposed production of Green Hydrogen on Portion 7 of Farm 58, Walvis Bay, Erongo Region

Chiffon Trading (Pty) Ltd

22 July 2024

DOCUMENT INFORMATION		
Title	<p>Environmental and Social Impact Assessment (ESIA), for the Proposed Construction and Operation of a Solar PV Plant on Camp 12 (Portion of the !Oe #Gan Traditional Authority and Gaingu Conservancy), Erongo Region</p> <p>To support the proposed production of Green Hydrogen on Portion 7 of Farm 58, Walvis Bay, Erongo Region</p>	
ECC Application Reference number	APP: 004489	
Listed Activity	Activity 1: Energy Generation, Transmission and Storage Activities	
Location	Camp 12 (portion of the !Oe #Gan Communal Land), adjacent to Husab and Rossing Uranium Mines, in the vicinity fo the town of Arandis, Erongo Region	
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EXECUTIVE SUMMARY

- **Leasehold Application**

The Solar PV Plant will be constructed at Camp 12, a communal land parcel under the custodianship of the !Oe #Gan Traditional Authority which has been gazetted as a Conservancy (Gaingu), located approximately 70km east of Walvis Bay, adjacent to the Husab and Rossing Uranium mines, in the vicinity of Arandis.

The Environmental Scoping Report (ESR) has been developed to obtain an Environmental Clearance Certificate (ECC) to support the leasehold application for the construction of a Solar PV Plant, at Camp 12.

The proposed Solar PV Plant is part of the larger Green Hydrogen project in Walvis Bay.

- **Project Proposal**

The Proponent, Chiffon Trading (Pty) Ltd is a Namibian Company with strategic international partners exploring opportunities in Green Hydrogen production / manufacturing in Namibia. The proposed project would amount to significant capital investment, create employment and drive the country towards the 4th industrial revolution.

- **Project Components, Location and EIA Scope**

The project has 3 sites:

ID	Description	Project Components	Current EIA Scope
Site 1	Camp 12 Arandis	Solar PV Plant	Focus
Site 2	Farm 58, Walvis Bay	Desalination, Electrolyser Plant, H2 production, NH3 Synthesis Battery Storage System	Excluded
Site 3	North Port, Walvis Bay	NH3 Storage and shipment	Excluded
Linear Infrastructure		Sub-stations & Transmission Lines Ammonia Pipeline	Excluded

1. The site (Camp 12) is adjacent to the Husab and Rössing Uranium Mines, in the vicinity of the town of Arandis.
2. Farm 58 is located close to the Walvis Bay Airport, within the Walvis Bay Townlands.
3. Site 3 is located at North Port, Namport, Walvis Bay.

NB:

1. As highlighted in the table, the scope of this EIA is limited to the **suitability of Camp 12 for the construction of an 8.4 GW Solar PV Plant** only.
2. All other components are **NOT** part of the scope of this EIA and will be covered in a separate EIA.

- **Camp 12 – Leasehold Application**

The site earmarked for the proposed Solar PV Plant, is a portion of communal land (known as (Camp 12), under the custodianship of the !Oe #Gan Traditional Authority and the #Gaingu Conservancy.

As a result, a right of Leasehold is required from the Erongo Communal Land Board and the Ministry of Agriculture, Water and Land Reform (MAWLR).

The Applicant submitted a Leasehold Application to the Erongo Land Board as guided by Section 31 (1) of the Communal Land Reform Amendment Act 2013 (Act No. 13 of 2013).

The Environmental Impact Assessment (EIA) and Environmental Clearance Certificate (ECC) are required by the Land Board to support the leasehold application for the construction of the Solar PV Plant.

- **Traditional Authority, Conservancy and Land Board**

Due to the harsh desert environment (*no rainfall, no water and no Grazing*), Camp 12 is not suitable for community settlements nor grazing. Thus, both the !Oe #Gan Traditional Authority (TA) and the Gaingu Conservancy strongly support the Leasehold Application for Camp 12 to form part of the larger Green Hydrogen project in context.

The Erongo Communal Land Board also support the leasehold application, pending the completion of the EIA and issuance of the Environmental Clearance Certificate (ECC).

- **Site suitability for Solar PV Plant**

Namibia has one of the highest solar irradiance in the world (where irradiance is measured as the power of solar radiation per unit area in watts per square meter (W/m²)), and thus Camp 12 is a perfect fit and great opportunity for the proposed Solar PV Plant.

1. One of the highest solar irradiance / potential for solar power generation
2. Far enough from the ocean (to avoid / mitigate corrosivity of solar panels, frames and other infrastructure from the ocean weather (fog)
3. Flat topography = easy solar installation (plug and play)
4. Existing access roads

- **Affected environment**

In essence, Camp 12 is barren land, comprising 99.9% of sand, gravel and weatherly rock.

5. No community settlements = No displacements
6. No / minimal plants (few scattered trees)
7. No Welwitchia plants observed on site
8. No / minimal animals (1 or 2 springboks from nearby farms and some beetles)

- **Environmental Impact Assessment**

The identification of potential impacts was guided by literature, site assessment, specialist studies and public participation process.

To determine the suitability of the site (Camp 12) for the proposed construction of the **Solar PV plant**, the study assessed the following biophysical and social aspects:

1. Biodiversity (flora and fauna)
2. Socio Economic (human settlements, grazing, tourism, employment)
3. Presence of Heritage and Archaeological materials.

Table 1: Summary of probable Impacts and Mitigation potential

No	Aspect	Summary of Impact	EIA Scope	Without Mitigation	With Mitigation
(a)	Land use	Displacement of people	Construction of Solar PV plant	Low 1	Low 1
(b)	Land use	Destruction of livelihoods e.g Grazing	Construction of Solar PV plant	Low 1	Low 1
(c)	Land use	Interruption of tourism activities	Construction of Solar PV plant	Low 3	Low 2
(d)	Biodiversity	Loss of critical biodiversity	Construction of Solar PV plant	3	2
(e)	General Waste and Pollution Control	General littering and solid waste pollution	Construction of Solar PV plant	Low 3	Low 2

No	Aspect	Summary of Impact	EIA Scope	Without Mitigation	With Mitigation
(f)	Occupational health and safety	Injuries and health risks to employees during working hours	Construction of Solar PV plant	High 12	Low 4
(g)	Noise and Vibration	Noise pollution and vibration could be nuisance to the nearby landowners / residence and health hazard to employees	Construction of Solar PV plant	Medium 6	Low 2
(h)	Dust Pollution	Dust pollution to nearby landowners / residents and exposure of employees to excess dust could be harmful to their health.	Construction of Solar PV plant	Medium 9	Low 4
(i)	Land degradation	Land degradation by movement of heavy vehicles from digging and trenching during construction	Construction of Solar PV plant	Medium 9	Low 4
(j)	Heritage and Archaeology Material	Destruction Heritage and Archaeological resources	Construction of Solar PV plant	Medium 6	Low 4
(k)	Employment Creation and skill transfer	Unfair labour practices and lack of skill transfer	Construction of Solar PV plant	Low 5	Low 3

- **Conclusion**

The study conclusively found that the proposed construction of the Solav PV Plant on Camp 12 will **NOT** have any significant impact on the biophysical and socio-economic environment.

The project presents significant investment potential for the country and has realistic potential to become one of the first Green Hydrogen manufacturers in Namibia.

It is envisaged that at completion, the project would amount to significant capital investment, create substantial employment opportunities and propulsion of Namibia into the 4th industrial revolution.

- **Recommendation**

ECC for the **construction footprint** of the **Solar PV Plant** for Camp 12

1. Construction of the Solar PV Plant
 - i. Footprint
 - ii. Suitability of Camp 12 to host the PV Solar Plant
 - iii. Support the leasehold application

Undertake full EIAs for the following project components, separately:

2. Operation of the Solar PV Plant and associated infrastructure
 - iv. Sub-stations
 - v. Power Transmission Lines
 - vi. Batter Energy Storage System (BESS)
3. Desalination Plant
 1. Brine effluent and pipelines
 2. Distilled water pipelines and storage
4. Electrolyser Plant
 - Hydrogen Production
 - Hydrogen pipeline to Ammonia Synthesis Plant
5. Ammonia Synthesis Plant
 - Ammonia Production and Storage
 - Ammonia Pipelines to the port for export

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ACRONYMS

AIDS	Acquired Immuno Deficiency Syndrome
BID	Background Information Document
DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
EBRD	European Bank Reconstruction and Development
EBSA	Ecological Biologically Significant Areas
EC	Environmental Commissioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessments
EMA	Environmental Management Act (Act No. 7 of 2007)
EMP	Environmental Management Plan
EP	Equator Principle
EPFI	Equator Principle Financial
ESF	Environmental Social Framework
ESMS	Environmental Social Management System
HIV	Human Immune Virus
I&AP	Interested and Affected Parties
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
MEFT	Ministry of Environment, Forestry and Tourism
ToRs	Terms of References
WB	Walvis Bay

1. INTRODUCTION

The Proponent, Chiffon Trading (Pty) Ltd is a Namibian Company with strategic international partners exploring opportunities in Green Hydrogen production / manufacturing in Namibia. The proposed project would amount to significant capital investment, create employment and drive the country towards the 4th industrial revolution.

1.1 The Proposed Green Hydrogen Project

Green Hydrogen is produced through an Electrolysis process. The production process has two (2) main components; (i) Energy generation by Solar Photovoltaic System (figure 1.1), and (ii) Distilled Water from Seawater Desalination Plant (figure 1.2).



Figure 1.1. Illustration of the proposed Solar PV Plant at Camp 12, near Arandis

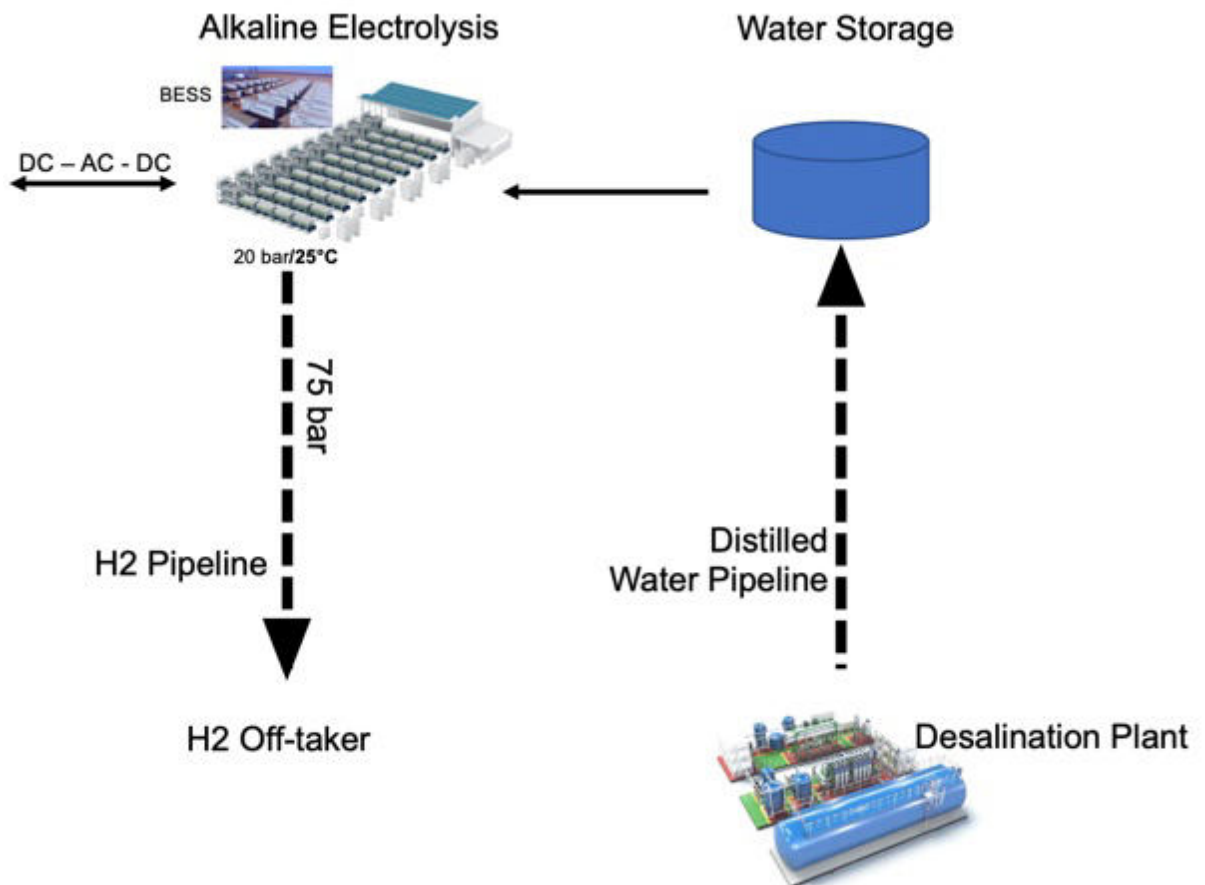


Figure 1.2. Illustration of the Green Hydrogen Project at Farm 58, Walvis Bay

1.2 Project Components

1. Solar PV Plant
 - Construction footprint
 - Suitability of Camp 12 to host the proposed Solar PV Plant

2. Operation of the Solar PV Plant and associated infrastructure
 - Sub-stations
 - Power Transmission Lines
 - Batter Energy Storage System (BESS)

3. Desalination Plant
 - Brine effluent and pipelines
 - Distilled water pipelines and storage

4. Electrolyser Plant
 - Hydrogen Production
 - Hydrogen pipeline to Ammonia Synthesis Plant

5. Ammonia Synthesis Plant
 - Ammonia Production and Storage
 - Ammonia Pipelines to the port for export

All processes are powered by the Solar PV Plant, and hence the terminology “Green Hydrogen”.

1.3 Scope of this EIA

The project has 3 sites:

ID	Description	Project Components	Current EIA Scope
Site 1	Camp 12, Arandis	Solar PV Plant	Focus
Site 2	Farm 58, Walvis Bay	Desalination, Electrolyser Plant, H2 production, NH3 Synthesis Battery Storage System	Excluded
Site 3	North Port, Walvis Bay	NH3 Storage and shipment	Excluded
Linear Infrastructure		Sub-stations & Transmission Lines Ammonia Pipeline	Excluded

4. Camp 12 is adjacent to the Husab and Rössing Uranium Mines, close to Arandis.
5. Farm 58 is located close to the Walvis Bay Airport, Walvis Bay Townlands.
6. Site 3 is located at North port, Namport, Walvis Bay.

NB:

1. As highlighted in the table, the scope of this EIA is limited to the **construction footprint** and suitability of Camp 12 for the proposed **8.4 GW Solar PV Plant**.
2. All other components are **NOT** part of the scope of this EIA and will be covered in a separate EIA.

2 STATUTORY REQUIREMENTS

2.1 The Environmental Management Act 2007 (Act No. 7 of 2007)

The protection of the Namibian environment is enshrined in the Namibian constitution under article 95(l)². This constitutional provision provided for the enactment of the Environmental Management Act 2007 (Act No. 7 of 2007) (EMA) and its Environmental Impact Assessment Regulation, Government Gazette 6 February 2012 No. 4878.

The EMA promotes the sustainable management of the environment and the use of natural resources by establishing principles for decision making on matters affecting the environment. These principles must be applied by Government institutions, private persons, companies, institutions and organizations when planning for activities that may have significant impacts on the environment. The EMA provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.

Section 27(2)(b) of EMA provides a list of activities that may not be undertaken without an Environmental Clearance Certificate (ECC). The proposed Solar PV plant is listed activities and may not be undertaken without an ECC as indicated in (Table 2:1) below.

Table 2:1. Namibian regulatory requirement applicable to the proposed project

Environmental Impact Assessment Regulation 2012 GRN Gazette No. 4878		
Activity	Description	Applicability to the project
Activity 1 The Construction of facilities for - (a) the generation of electricity	Construct a Photovoltaic Solar Plant and its associated Battery Storage System and Power Transmission Lines	The Photovoltaic Solar Plant will provide energy to all project components

2.1.1 Leasehold Application – Communal Land Reform Amendment Act 13 of 2013

Camp 12 is communal land under the custodianship of the !Oe #Gan Traditional Authority and has been gazette as a Conservancy (Gaingu) (Figure 2.1). Section 31 (1) of the Communal Land Reform Amendment Act 2013 (Act No. 13 of 2013) obliges Chiffon Trading to apply for the leasehold (land right) to the land board because the indented activities is business and not customary right.

Furthermore, Section 30 (2) of the Communal Land Reform Amendment Act 2013 (Act No. 13 of 2013) stipulates that consent is required the Traditional Authority to support the leasehold application.

² 1The Constitution of Namibia Article 95(l) *“The State shall actively promote and maintain the welfare of the people by adopting policies aimed at ... The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future”*.

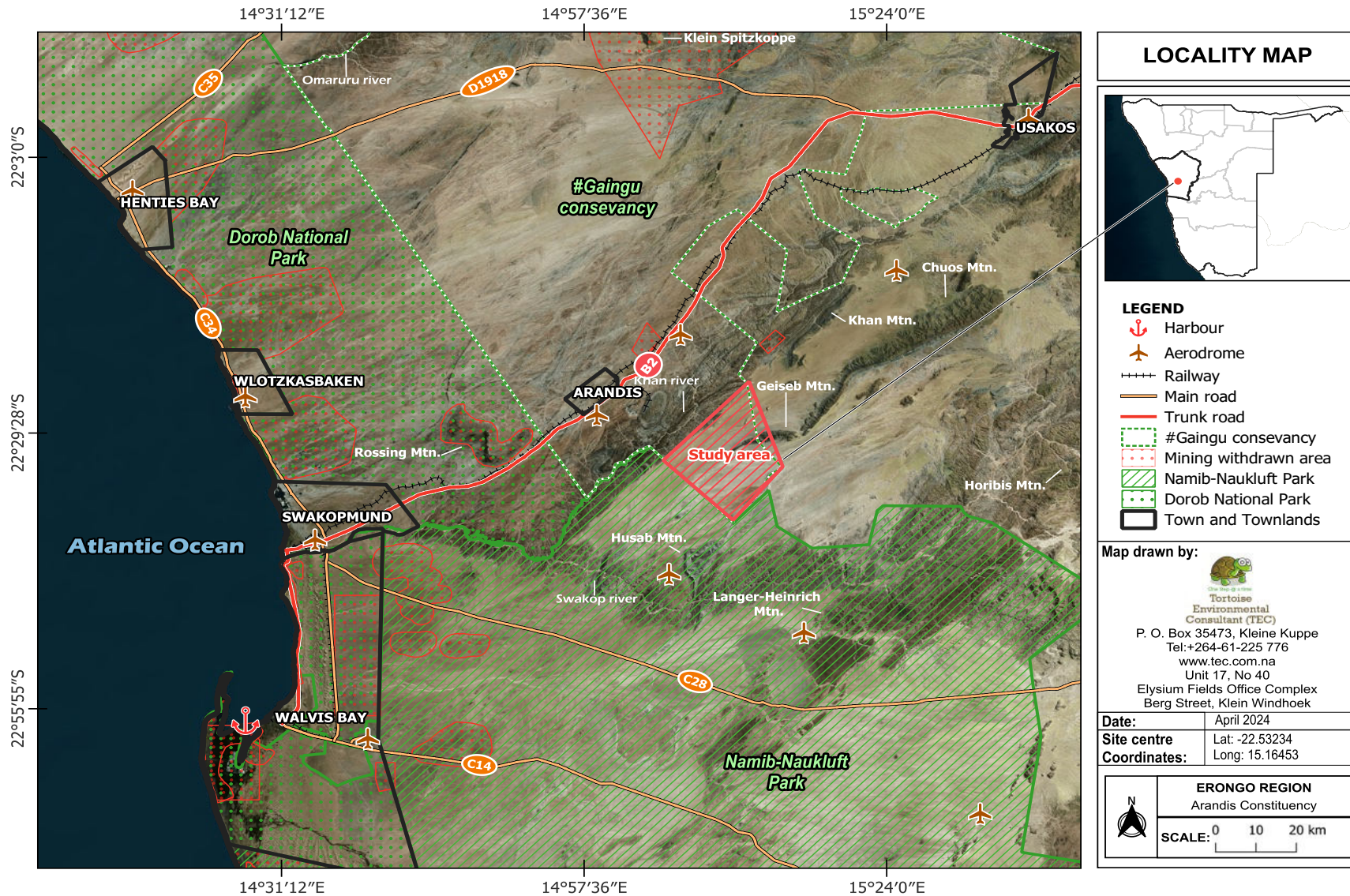


Figure 2.1. Location of study Area – Camp 12 is a Portion of the Oe #Gan Communal Land and Gaingu Conservancy

2.2 Project Consent

2.2.1 Consent from the Traditional Authority

Due to the harsh desert environment, Camp 12 is not suitable for community settlements nor grazing, but it is perfect for the establishment of a Solar PV Plant and Electrolyser plant.

Thus, both the !Oe #Gan Traditional Authority (TA) and the Gaingu Conservancy are in favour and strongly support the Leasehold Application for Camp 12 to form part of the larger Green Hydrogen project in context (*figure 1.2*).

2.2.2 Erongo Communal Land Board

With the support from the Traditional Authority and the Conservancy, the applicant (Chiffon Trading) was invited to present the proposed project to Erongo Communal Land Board.

Similar to the TA and Conservancy, the Erongo Communal Land Board also strongly support the leasehold application, pending the completion of the ESIA process and issuance of the Environmental Clearance Certificate (ECC).

2.3 The need and desirability of the project

The project is expected to create 1000 of jobs during construction and hundreds of permanent jobs during the operational phase. There will indirect economic benefit where through smaller local companies and subcontractors, hundreds of people will move to Walvis Bay, Arandis and Swakopmund, build houses and infrastructure in an emerging industrialised town. The indirect financial effects for these coastal municipalities will be positive.

The project will be amongst the pioneer project of Green Hydrogen in Namibia, hence it comes with critical capacity building through skill transfer for locals.

Climate change present one of the biggest challenges faced by humanity. Energy generation and use through fossil fuel is known to be the main contributing factor to climate change. The production and use of Green Hydrogen has zero emission, which will significantly reduce reliance on fossil fuel and consequently reduce warming.

3 PROJECT DESCRIPTION

3.1 Photovoltaic Solar Plant

A solar PV plant will be constructed with reinforced concrete foundations, cable trenches, PV solar arrays and power transmission lines (Figure 3.1).

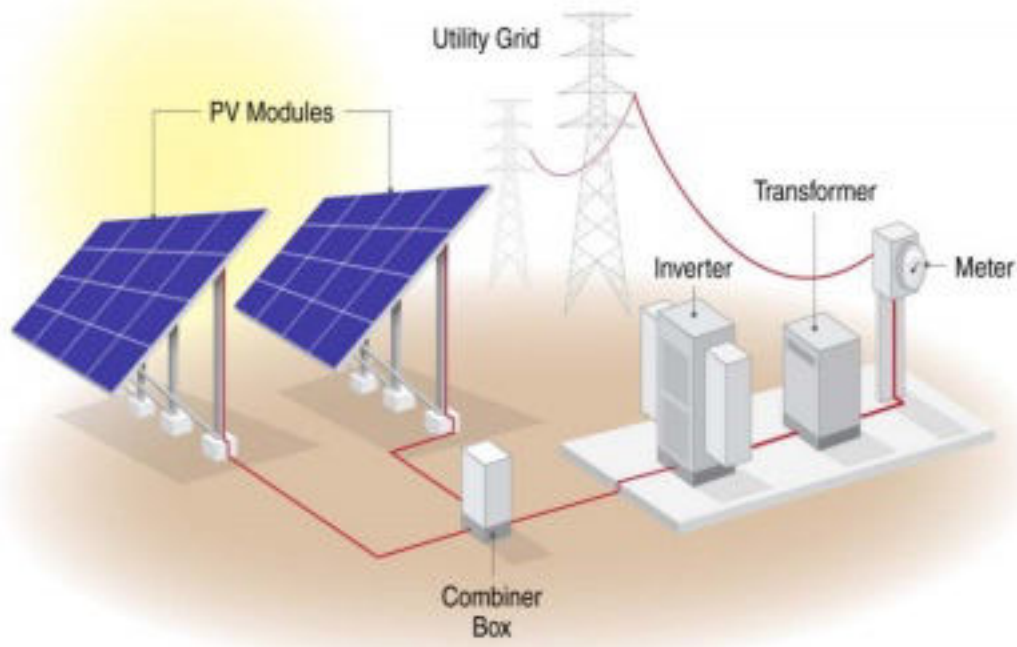


Figure 3.1. Typical grid-connected PV system (U.S Department of Energy)

3.2 Construction Phase

3.2.1 Sourcing of Construction Materials

Sourcing of materials for the construction of the Solar PV plant is not a problem. Many other mega projects (such as Husab and Rossing Uranium Mines) have been developed around the study site, e.g. for road construction, there are existing sand mining borrow pits and quarries, who supply sand, concrete stones, etc. In-addition, during the rainy season, the Kuiseb and Swakop river are deposited with huge amount sand, of which controlled / regulated harvesting is permitted.

The Proponent indicated that, as part of economic diversification and support of local existing businesses, construction materials will be sourced from various supplier in the surrounding area. Water for construction will be brought in with water trucks.

3.2.2 Access Roads

Camp 12 is accessible via existing gravel roads D1914, D1991 and D1989 (Figure 3.2). Next page.

All the access road are gravel and are mainly used by mineral exploration and tourism activities. The full ESIA will constitute Traffic Impact Assessment to (i) mitigate flow of traffic and (ii) ensure protection of sensitive areas.



Figure 3.2. Access roads to Camp 12 (Red-Triangle=Project Site)

3.2.3 Transport and Accommodation for Construction Personnel

About 1,000 construction workers will be required at Camp 12 during peak construction. A temporally base camp will be constructed to accommodate some of these people which will mitigate amongst others traffic. The base camp will be constructed with temporary facilities including containers, prefabricated materials that will include warehouses, canteen and a health facility. Using 65-seater buses, it is expected that about 20 daily trips will be made during construction.

3.2.4 Construction Activities

Construction vehicle / equipment: Similar to any civil construction, the project will use heavy construction equipment (yellow plant) such as tip trucks, crane trucks, water tankers, bulldozer, front loaders, excavators etc.

Digging and Trenching: The surface area is covered by desert sand with a rocky bedrock. It might be necessary to use explosives to break the bedrock. While holes for Solarr PV trackers or other poles will be dug will drilling machines.

Concrete Batching: A huge amount of concrete will be required for the project. Such as an onsite concrete batching plant will be developed.

Other activities: such as fabrication (welding) will be undertaken onsite (workshops)

3.3 Operational Phase

3.3.1 Transport and Accommodation for Personnel

At operation, about 300 people will permanently be employed for the operation of the Solar PV Plant. About 50 people will be making shift turns to ensure that plant has people on standby everyday every time.

Henceforth, there will be about 70 accommodation facilities at Camp 12. Thus, only about four 65 seater buses per day will be required to transport personnel during morning and late afternoon, giving about 8 trips per day.

3.4 Supporting Infrastructures

3.4.1 Household Sewer management

During construction, a temporal sewage collection tank will be constructed where sewage trucks will collect it to be disposed of at the nearest approved sites (Arandis, Usakos, Swakopmund towns).

For operational phase and in line with Section 22 (1)³ of the Water Act 1954 (Act No of 1954) the project will construct an onsite Sewage Treatment Plant (STP) with capacity of 300 people estimated to have a daily sewage discharge of 10m³ per capita.

Treated waste water will be used for dust suppression. Sewage sludge will dried and disposed of in accordance with the law.

3.4.2 Solid Waste

The project is not aiming to construct an onsite solid waste disposal site. Rather, a specialised solid water management based on recycling will be development. The will be skip bins for building rubbles, wood materials and other solid waste that are not suitable for recycling. These solid waste will be collected and disposed at approved site. Recycled material will be offered to recycling companies freely are reverage of collection and one site management.

³ Notwithstanding the provisions of the Public Health Act, 1919 (Act No. 36 of 1919), or any other law, but subject to the provisions of sub-section (2), a local authority having jurisdiction over the disposal of sewage may, after purifying the effluent derived from the treatment of such sewage in accordance with standards prescribed under sub-section (1) of section twenty-one, and with the permission of the Minister, use such effluent for any purpose approved by the Minister or dispose of such effluent for use by any person or discharge such effluent into a public stream”.

4 POLICY AND REGULATORY FRAMEWORK

4.1 National Regulatory framework

Table 4:1. Policy and Legal framework governing the project

Policy/Legislation	Provisions	Applicability to the Project
The Namibian Constitution	Article 95(1) ⁴ Namibian constitution is committed to sustainable development.	Undertake Environmental Assessment to protect the environment and maintain ecological process.
Environmental Management Act (No. 7 of 2007)	The Environmental Management Act (No. 7. of 2007) aims to promote the sustainable management of the environment and the use of natural resources and to provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.	The acts provide a list of activities that may not be undertake without an Environmental Clearance Certificate, consequently, carry out the EIA and develop an EMP for the project.
Draft Pollution Control and Waste Management Bill	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) when it comes into force. The Bill also provides for noise, dust or odour control that may be considered a nuisance. Further, the Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a waste management licence for any activity relating to waste or hazardous waste management.	Management of Waste, and any pollutant resultant of the project.
The Occupational Safety and Health Act No. 11 of 2007	Safety: A safety risk is a statistical concept representing the potential of an accident occurring, owing to unsafe operation and/or environment. In the working context “SAFETY” is regarded as “free from danger” to the health injury and to properties.	During construction, accidents are bound to happen if the working environmental is not safe and healthy. The project should maintain good and healthy standards, at the workplace,

⁴ “The State shall actively promote and maintain the welfare of the people by adopting policies aimed at ... The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future”.

Policy/Legislation	Provisions	Applicability to the Project
	<p>Health: Occupational Health is aimed at the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers in all occupations. This is done by ensuring that all work-related hazards are prevented and where they occur, managed.</p>	<p>cleanliness, adequate sanitary facilities, protection against dangerous substances.</p>
<p>Public Health Act No. 36 of 1919</p>	<p>The Act serves to protect the public from nuisance and states that 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.</p>	<p>The Proponent should ensure that the site is off limits from public during construction to avoid fatalities.</p>
<p>Water Resources Management Act (2004)</p>	<p>This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Furthermore, any watercourse on/or in close proximity to the site and associated ecosystems should be protected in alignment with the listed principles.</p>	<p>Optimum use of water, prevention of water pollution by project activities, regulation of wastewater and effluents.</p>
<p>Water Act No, 54 of 1956</p>	<p>This act states that, all water resources belong to the State. It prevents pollution and promotes the sustainable utilization of the resource. To protect these resources, this act requires that permits are obtained when activities involve the following:</p> <ol style="list-style-type: none"> 1. Discharge of contaminated into water sources such as pipe, sewer, canal, sea outfall 2. Disposal of water in a manner that may cause detrimental impact on the water resources 	<p>Optimum use of water, prevention of water pollution by project activities, regulation of wastewater and effluents</p>
<p>Petroleum Product and Energy Act No, 13 of 1990</p>	<p>This Act provides a framework for handling and distribution of petroleum products which may include purchase, sale, supply, acquisition, possession, disposal, storage or transportation thereof.</p>	<p>During construction, there would be handling of fuel and hydrocarbons for heavy vehicles. Hence the act compels the proponent to handle hydrocarbons with safety and care not to pollute the environment.</p>

Policy/Legislation	Provisions	Applicability to the Project
Labour Act No. 6 of 1992	This Act aims to regulate labour in general and includes the protection of the health, safety and welfare of employees. The 1997 Regulations relating to the Health and Safety of employees at work sets out the duties of the employer, welfare and facilities at the workplace, safety of machinery, hazardous substances, physical hazards, medical provisions, construction safety and electrical safety.	Ensure that labour laws are followed to prevent unrest and provide a safe and healthy working environment
Regional Council Act, 1992 (Act No. 22 of 1992)	The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development. The main objective of this Act is to initiate, supervise, manage and evaluate development at regional level.	The area is in the jurisdiction of Erongo Regional Council. All relevant by-laws must be abided to.
Soil Conservation Act No. 76 of 1969	This act promotes the conservation of soil, prevention of soil erosion.	Improper planning of construction can cause soil degradation and erosion through earth work.
National Heritage Act No. 27 of 2004	The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains, while Section 48 sets out the procedure for application and granting of permits such as	Uncoordinated construction activities such as digging and trenching may unearth heritage archaeological material. Ensure heritage studies are done to ensure protection of heritage materials.
Word's Best Practises	<p><i>Precautionary Approach Principle</i> This principle is worldwide accepted when there is a lack of sufficient knowledge and information about the possible threats to the environment.</p> <p><i>Polluter Pays Principle</i> This principle ensures that proponents take responsibility of their actions. Hence in cases of pollution, the proponent bears the full responsibility to clean up the environment.</p>	Although not envisioned, the Proponent is urged to apply great precaution in an even of uncertainty. In the event of a pollution, the Proponent shall incur clean-up cost.

4.2 International Regulatory Framework

4.2.1 The World Bank Environmental and Social Management Framework

The World Bank (WB) Environmental and Social Framework (ESF) sets out the World Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards (ESS) that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity (World Bank, 2017)⁵ (**Table 4:2**)

Table 4:2. The World Bank Environmental and Social Standards

No	ESS	Description	Applicability to the project
a)	Assessment and Management of Environmental and Social Risks and Impacts	This ESS sets out the borrowers' responsibility to identify, assess, manage and monitor environmental and social risks and impacts associated with each stage of the project.	(a)Use the WB ESF (b)Conduct an environmental and social assessment proposed project, including stakeholder engagement (c)Undertake stakeholder engagement and disclose appropriate information (d)Develop an ESCP and implemented all measures and actions set out in the ESCP (e)Conduct monitoring and reporting on environmental and social performance of project against ESS
b)	Labour and Working Conditions	This ESS recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions	Requirements prescribed for: <ul style="list-style-type: none"> • Working conditions and management of worker relationships • Protecting the work force • Grievance mechanism • Occupational Health and Safety • Contracted Workers • Community Workers

⁵ International Bank for Reconstruction and Development/World Bank (2017). Environmental and Social Framework

No	ESS	Description	Applicability to the project
			<ul style="list-style-type: none"> • Primary Supply workers
c)	Resource Efficiency and Pollution Prevention and Management	This ESS recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, eco- system services and the environment at the local, regional, and global levels. It sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life cycle.	Requirements prescribed for: <ol style="list-style-type: none"> a) Resource efficiency (Energy use, Water use, Raw materials use) b) Pollution prevention and management
d)	Community Health and Safety	This ESS recognises that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. Communities that are already subjected to impacts of climate change may experience intensification of impacts due to project activities. It addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Borrowers to avoid or minimize such risks and impacts, with particular attention to vulnerable people	Requirements prescribed for: <ul style="list-style-type: none"> - Community health and Safety <ol style="list-style-type: none"> 1. Infrastructure and equipment design and safety 2. Safety of Services 3. Traffic and road safety 4. Ecosystem services 5. Community exposure to health issues 6. Emergency preparedness and response 7. Management and safety of hazardous materials - Security personnel
e)	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	This ESS applies to permanent or temporary physical and economic displacement resulting from land acquisition or restrictions on land use undertaken or imposed in connection with project implementation.	<ol style="list-style-type: none"> 1. General requirements: <ol style="list-style-type: none"> 1. Eligibility classification 2. Project design 13. Compensation and benefits for affected persons 14. Community Engagement

No	ESS	Description	Applicability to the project
		<p>Objectives:</p> <p>8. To avoid or minimise involuntary resettlement</p> <p>9. To avoid forced evictions</p> <p>10. To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use</p>	<p>15. Grievance mechanism</p> <p>16. Planning and implementation</p> <p>2. Displacement</p> <p>17. Physical displacement</p> <p>18. Economic displacement</p>
f)	Biodiversity Conservation and Sustainable Management of Living Natural Resources	<p>The requirements of this ESS are applied to all projects that potentially affect biodiversity or habitats, either positively or negatively, directly or indirectly, or that depend upon biodiversity for their success.</p> <p>Objectives:</p> <p>19. To protect and conserve biodiversity and habitats</p> <p>20. To apply the mitigation hierarchy and precautionary approach in the design and implementation</p> <p>21. To promote the sustainable management of living natural resources</p> <p>22. To support livelihoods of local communities and adoption of practices that integrate conservation needs and development priorities</p>	<p>a) Assessment of risks and impacts</p> <p>b) Conservation of biodiversity and habitats</p> <p>c) Legally protected and internationally recognised areas of high biodiversity value</p> <p>d) Invasive alien species</p> <p>e) Sustainable management of living natural resources</p>
g)	Indigenous Peoples/Sub-Saharan African Historically Underserved	<p>This ESS contributes to poverty reduction and sustainable development by ensuring that projects supported by the Bank enhance opportunities for Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local</p>	<p>a) Avoidance of adverse impacts</p> <p>b) Mitigation and development benefits</p> <p>c) Meaningful consultation tailored to indigenous peoples/Sub-Saharan African historically underserved traditional local communities</p>

No	ESS	Description	Applicability to the project
	Traditional Local Communities	Communities ⁶ to participate in, and benefit from, the development process in ways that do not threaten their unique cultural identities and well-being	d) Obtain Free Prior and Informed Consent (FPIC) e) Establish grievance mechanism
h)	Cultural Heritage	<p>This ESS sets out general provisions on risks and impacts to cultural heritage from project activities. The term ‘cultural heritage’ encompasses tangible and intangible heritage, which may be recognized and valued at a local, regional, national or global level, as:</p> <p>23. Tangible cultural heritage (includes immovable objects, sites, structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance</p> <p>24. Intangible cultural heritage (includes practices, representations, expressions, knowledge, skills and cultural spaces associated with that community.</p>	<p>a) Stakeholder consultation and identification of cultural heritage b) Legally protected cultural heritage areas c) Provisions for specific types of cultural heritage d) Commercial use of cultural heritage</p>
i)	Financial Intermediaries (FIs)	FIs are required to monitor and manage the environmental and social risks and impacts of their	<p>a) Environmental and social procedures b) Environmental and social policy</p>

⁶ As the applicability of the term “Indigenous Peoples” varies widely from country to country, the Borrower may request the Bank to use an alternative terminology for the Indigenous Peoples as appropriate to the national context of the Borrower.

No	ESS	Description	Applicability to the project
		<p>portfolio and FI subprojects, and monitor portfolio risk, as appropriate to the nature of intermediated financing.</p> <p>Objectives:</p> <p>25. To set out how the FI will assess and manage environmental and social risks and impacts associated with the subprojects it finances</p> <p>26. To promote good environmental and social management practices in the subprojects the FI finances</p> <p>27. To promote good environmental and sound human resources management within the FI</p>	<p>c) Organisational capacity and competency</p> <p>d) Monitoring and reporting</p> <p>e) Stakeholder engagement</p>
j)	Stakeholder Engagement and Information Disclosure	<p>This ESS recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice.</p> <p>Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation</p>	<p>a) Stakeholder identification and analysis</p> <p>b) Establish a Stakeholder Engagement Plan</p> <p>c) Provide Information disclosure</p> <p>d) Undertake meaningful consultations</p> <p>e) Continue engagements during project implementation and external reporting</p> <p>f) Establish and implement a grievance mechanism</p> <p>g) Organisational capacity and commitment</p>

4.2.2 Equator Principles⁷

The Equator Principles (EP) are used by financial institutions to identify, assess, and manage environmental and social risks when financing projects (**Table 4:3**). The EP apply to all industry sectors globally, to five (5) financial products:

- a) Project Finance Advisory Services of project capital more than USD10 million
- b) Project Finance with project capital costs of more than USD10 million
- c) Project-Related Corporate Loans
- d) Bridge Loans
- e) Project-related Refinance, and Project-related Acquisition Finance

Table 4:3. The Equator Principles

Equator Principle	Description
a) Review and Categorisation	<p>A project proposed for financing is categorised based on the magnitude of potential environmental and social risks and impacts, including those related to Human Rights, climate change, and biodiversity. The Categories are based on the International Finance Corporation (IFC)’s environmental and social categorisation process”</p> <p>28. Category A- Projects with significant adverse environmental and social risks that are irreversible or unprecedented</p> <p>29. Category B- Projects with potential limited adverse environmental and social risks that are largely reversible and can be addressed through mitigation measures</p> <p>30. Category C- Project with minimal or no adverse environmental risks or impacts</p>
b) Environmental and Social Assessment	<p>Clients are required to conduct appropriate assessments to address environmental and social risks and the scale of impacts of the proposed project. The assessment should include measures to minimise, mitigate, compensate/offset for risks and impacts to those affected.</p>
c) Applicable Environmental and Social Standards	<p>The Environmental and Social Assessments should first address compliance with the relevant laws, regulations and permits pertaining to environmental and social issues of the host country.</p>
d) Environmental and Social Management System and Equator Principles Action Plan	<p>For all Category A and Category B projects, clients are required to develop and maintain an Environmental and Social Management System (ESMS) to address issues raised in the assessment process.</p>

⁷ Equator Principles (2020). Equator Principles EP 4- July 2020. Source: <https://equator-principles.com/about-the-equator-principles/>

e) Stakeholder Engagement	For all Category A and Category B projects, clients are required to demonstrate effective stakeholder engagement as an ongoing process, in a structures and culturally appropriate manner with all affected parties.
f) Grievance Mechanism	As part of the ESMS, for all Category A and B projects, clients are required to establish effective grievance mechanisms that are designed for use by all affected parties
g) Independent Review	For all Category A and B projects, an independent Environmental and Social Consultant will carry out an independent review of the assessment including the ESMPs, ESMS and stakeholder engagement process to assess due diligence and compliance to the EP.
h) Covenants	<p>For all Projects, where a client is not in compliance with its environmental and social covenants, the EPFI will work with the client on remedial actions to bring the Project back into compliance.</p> <p>If the client fails to re-establish compliance within an agreed grace period, the EPFI reserves the right to exercise remedies, including calling an event of default, as considered appropriate.</p>
i) Independent Monitoring and Reporting	To assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting
j) Reporting and Transparency	The EPFI will, at least annually, report publicly on transactions that have reached Financial Close and on its Equator Principles implementation processes and experience

4.2.3 European Bank for Reconstruction and Development (EBRD)

The EBRD is an international financial institution providing project financing for banks, industries and businesses, for both new and existing companies. The EBRD funds come mainly from bilateral donors such as Climate Investment Funds, European Union, Global Environment Facility and Green Climate Fund. The bank provides direct financial instruments such as loans, equity investments and guarantees⁸.

- The EBRD was the first multi-lateral development bank to have an explicit environmental mandate in its charter and has pledged to dedicate 40% of its financing into the Green Economy Transition⁹.
- The EBRD has an Environmental and Social Policy with 10 requirements. All projects financed by the EBRD should be structured to meet the requirements of

⁸ EBRD Sustainability report. Source: www.ebrd.com

⁹ Mahmood, M., & Orazalin, N. (2017). Green governance and sustainability reporting in Kazakhstan's oil, gas, and mining sector: Evidence from a former USSR emerging economy. *Journal of cleaner Production*, 164, 389–397

the policy. The 10 performance requirements of the EBRD are based on the 10 World bank Environmental and Social standards and will hence not be repeated.

4.2.4 International Finance Corporation (IFC) ¹⁰

The IFC is a member of the World Bank Group and is the largest global development institution focused exclusively on the private sector in developing countries.

The IFC has eight (8) Performance Standards that should be met throughout the life cycle of the project financed. All the eight (8) performance standards are derived from the on the World Bank's 10 ESS with the exception of ESS9 (Financial Intermediaries) and ESS10 (Stakeholder Engagement and Information Disclosure).

The performance standards of the IFC are designed to provide guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities.

For direct investments, IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts so that development opportunities are enhanced.

¹⁰ Source: www.ifc.org

5 PROJECT ALTERNATIVE

Section 1 of Namibian EIA regulation defines “alternatives” as different means of meeting the general purpose and requirements of the activity, which may include alternatives to –

1. the property on which or location where it is proposed to undertake the activity;
2. the type of activity to be undertaken;
3. the design or layout of the activity;
4. the technology to be used in the activity; and
5. the operational aspects of the activity;

The “no-go” option is the alternative of not implementing the project foregoing all the socio-economic that the project would have brought. This alternative is triggered when the potential impact are severe or in cases where the potential impact are not fully understood and believed to be catastrophic. However, this alternative is good for the environmental, as the environment will continue to be in its pristine state.

5.1 Alternative options

5.1.1 Project Location

The Solar PV Plant is located at Camp 12, a communal land located in the Namib Desert. This land was identified due to its suitability for setting up a Solar Photovoltaic plant that will support all components of the Green Hydrogen. The site suitability is supported by and attributed to:

1. One of the highest solar irradiance in the world means high potential for solar power generation
2. Far enough from the ocean (to avoid / mitigate corrosivity of solar panels, frames and other infrastructure from the ocean weather (fog)
3. Flat topography = Suitable for solar installation
4. Existing access roads
5. No community settlements = No displacements
6. No / minimal plants (few scattered trees)
7. No Welwitschia plants on site
8. No / minimal animals (few springboks from the surrounding, some rats, gecko and beetles)

Other project alternatives are described below and will be explored further during the undertaking of a full ESIA.

5.1.2 Water use

Generally, Namibia is an arid country, and the Namib Desert is extremely dry, with very little to no rainfall. Throughout the country, groundwater is the main source of water. The mushrooming of Uranium mines (as referred to as the Uranium ‘rush’) prompted the development of the country’s first desalination plant “Areva

Desalination now known as Orano, to supply water to the Uranium mines. The project intent to set-up a desalination plant.

Seawater Desalination is outside the scope of this EIA, a separate EIA for the Seawater Desalination plant will be undertaken.

5.1.3 Electricity

The project will use solar in the first phase of operation and possibly wind power for future phases will be considered. The wind intensity at Camp 12 has not been assessed and it is also not known to be strong. Other alternative source of green energy the project could explore is tidal energy. The use of fossil fuel to generate energy is not acceptable under the production of “green” hydrogen.

5.1.4 Construction base camp or daily commuting

The project will construct construction workers’ base camp. The advantage of the base camp includes (i) reduce traffic congestion, (ii) prevent road accident (iii) increase efficiency (iv) avoid workers to engage in harmful activities such as abuse of drug and alcohol. The opposite would apply as disadvantages if construction workers where to commute every day from towns.

6 STUDY APPROACH / METHODOLOGY

6.1 Site Assessment

The study took a blended approach, where project engineers and environmentalist undertook a desktop study to determine the project feasibility. The desktop study was followed with ground truthing. Additionally, a Biodiversity, Socio-Economic and Heritage and Archaeological studies were commissioned.

6.2 Impact Assessment

The criteria used to assess the impacts and the method of determining their significance is outlined below (Table 2:1). This process conforms with international best practices and the Environmental Impact Assessment Regulations of Environmental Management Act, 2007 (Government Gazette No. 4878) EIA regulations. The core principle of impact assessment followed a mitigation which aims to avoid the negative impact through preventative means, minimise the negative impacts to acceptable low levels and, if the two are not possible, remedy or compensate the impact.

Table 6:1. Criteria for Impact Assessment

Risk Event	Rating	Description of the risk that may lead to an Impact
Probability	The probability that an impact may occur under the following analysis	
	1	Improbable (Low likelihood)
	2	Low probability
	3	Probable (Likely to occur)
	4	Highly Probable (Most likely)
	5	Definite (Impact will occur irrespective of the applied mitigation measure)
Confidence level	The confidence level of occurrence in the prediction, based on available knowledge	
	L	Low = limited information
	M	Medium = moderate information
	H	High = sufficient information
Significance (Without Mitigation)	0	None (Based on the available information, the potential impact is found to not have a significant impact)
	L	Low (The presence of the impact's magnitude is expected to be temporal or localized, that may not require alteration to the operation of the project)

Risk Event	Rating	Description of the risk that may lead to an Impact
	M	Medium (This is when the impact is expected to be of short term moderate and normally regionally. In most cases, such impacts require that the projects is altered to mitigate the impact or alternative method of mitigation is implemented)
	H	High (The impact is definite, can be regional or national and in long term. The impact could have a no go implication unless the project is re-designed or proper mitigation can practically be applied)
Mitigation	The applied measure / alternative to reduce / avoid an impact	
Significance (With Mitigation)	0	None (Based on the available information, the potential impact is found to not have a significant impact)
	L	Low (The presence of the impact's magnitude is expected to be temporal or localised, that may not require alteration to the operation of the project
	M	Medium (This is when the impact is expected to be of short term moderate and normally regionally. In most cases, such impacts require that the projects is altered to mitigate the impact or alternative method of mitigation is implemented)
	H	High (The impact is definite, can be regional or national and in long term. The impact could have a no go implication unless the project is re-designed or proper mitigation can practically be applied)
Duration	Time duration of the impacts	
	1	Immediate
	2	Short-term (0-5 years)
	3	Medium-term (5-15 years)
	4	Long-term (more than 15 years)
	5	Permanent
Scale	The geographical scale of the impact	
	1	Site specific
	2	Local
	3	Regional
	4	National
	5	International

6.2.1 Risk Assessment

The impact significance was determined using a risk matrix (**Table 6:2**). A five-by-five matrix was used where the impact severity was categorised and assigned scores from 1 to 5 as follows:

Improbable=1, Low=2, Medium=3, High=4 and Severe=5. Similarly, the likelihood was assigned scores as follows; improbable=1, Low Likely=2, Probable=3, High Probability=4, Definite=5. The impact rating was determined by multiplying the impact severity and likelihood.

Table 6:2. Risk assessment matrix¹¹

LIKELIHOOD	5 Definite	5 Low	10 Medium	15 High	20 Severe	25 Severe
	4 High Probability	4 Low	8 Medium	12 High	16 High	20 Severe
	3 Probable	3 Low	6 Medium	9 Medium	12 High	15 High
	2 Low	2 Low	4 Low	6 Medium	8 Medium	10 Medium
	1 Improbable	1 Negligible	2 Low	3 Low	4 Low	5 Low
	1 Negligible	2 Minor	3 Medium	4 High	5 Severe	
	IMPACT SEVERITY / CONSEQUENCE					
	Negligible	Low	Medium	High	Severe	

¹¹ Risk Management Guideline for the BC Public Sector (Province of British Columbia Risk Management Branch and Government Security Office 2012)

7 DESCRIPTION OF THE AFFECTED ENVIRONMENT

7.1 Bio-Physical Environment

As mentioned earlier, Camp 12 is communal land under the custodianship of the !Oe #Gan Traditional Authority and has been gazette as a Conservancy (Gaingu). It is a barren land comprises 99.9% of sand, gravel and weatherly rock in the Namib Desert and in close proximity to some of the world largest Uranium Mines (Husab and Rössing Uranium Mines).

The construction and operation of the project is not expected to cause significant impact on bio-physical environment. Conversely, the Solar PV infrastructure will create a new micro habitat for both desert plants and small animals, by shielding them from direct sunlight. This implies that the Solar PV Plant will have a positive impact on biodiversity.

There sparsely scattered shrubs and glass cover. During the day, desert beetles where spotted and from biodiversity studies, rats and geckos were found to be living in the area and studies indicated that these desert animals normally burry themselves underground in avoiding scorching heat of the Namib Desert.

For a close aerial view, the area was divided into four (4) blocks (**Figure 7.1 – 7.5**).

The physical site assessment is shown by **Figure 7.7 – 7.15** below.

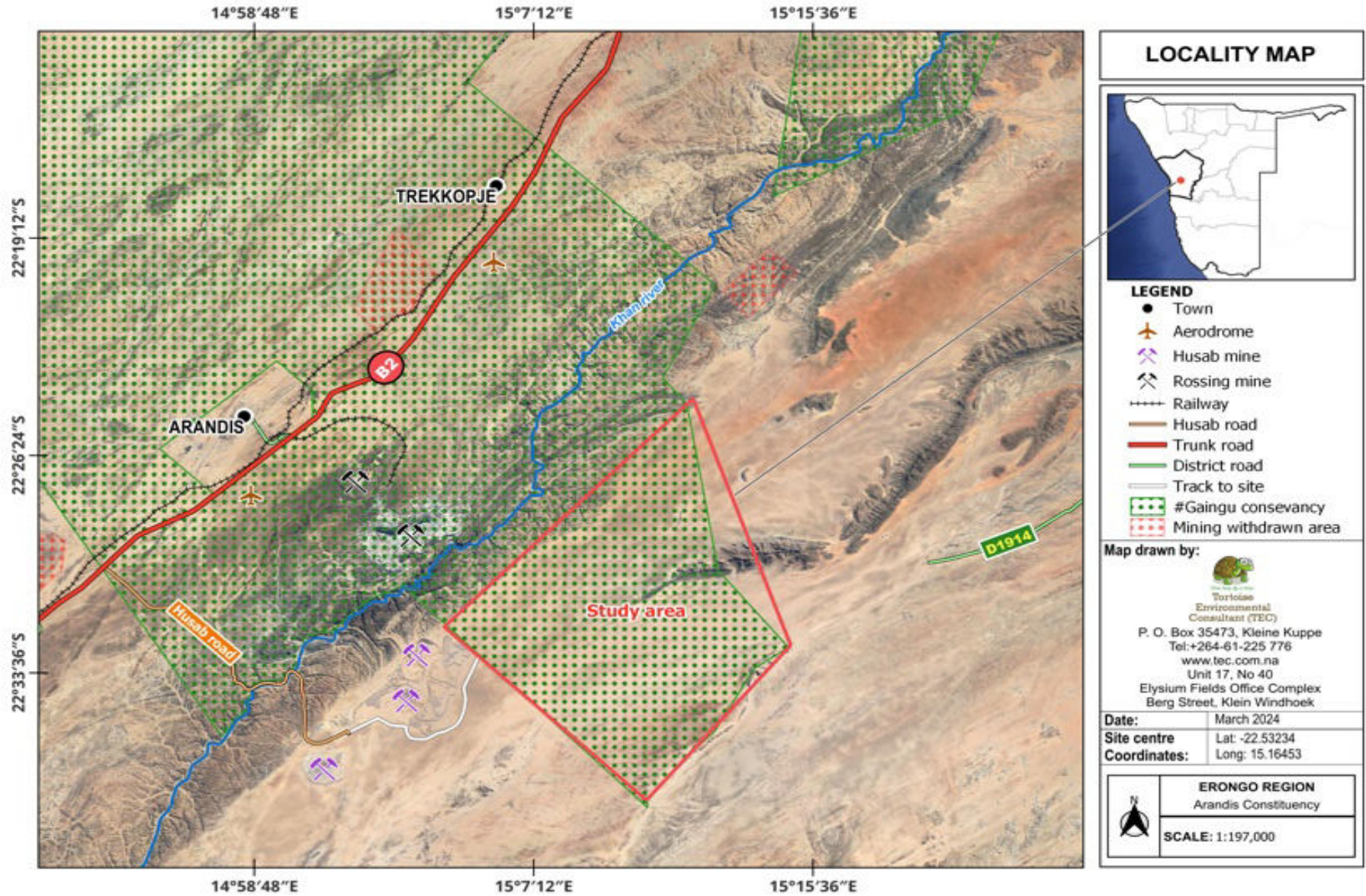


Figure 7.1. Study site – close to Husab and Rössing Uranium Mines

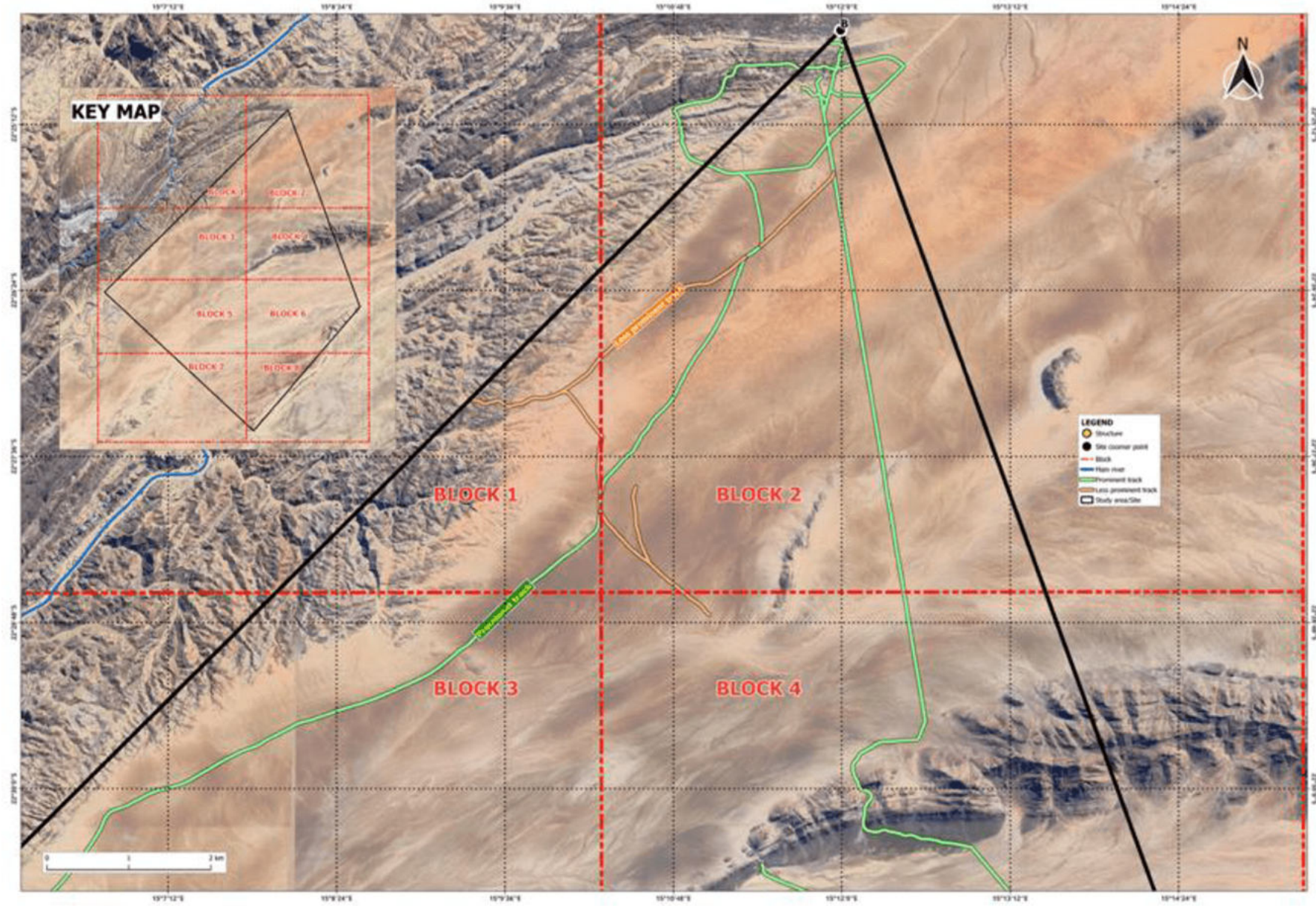


Figure 7.2. Camp 12 – Study Area (Block 1 & 2)

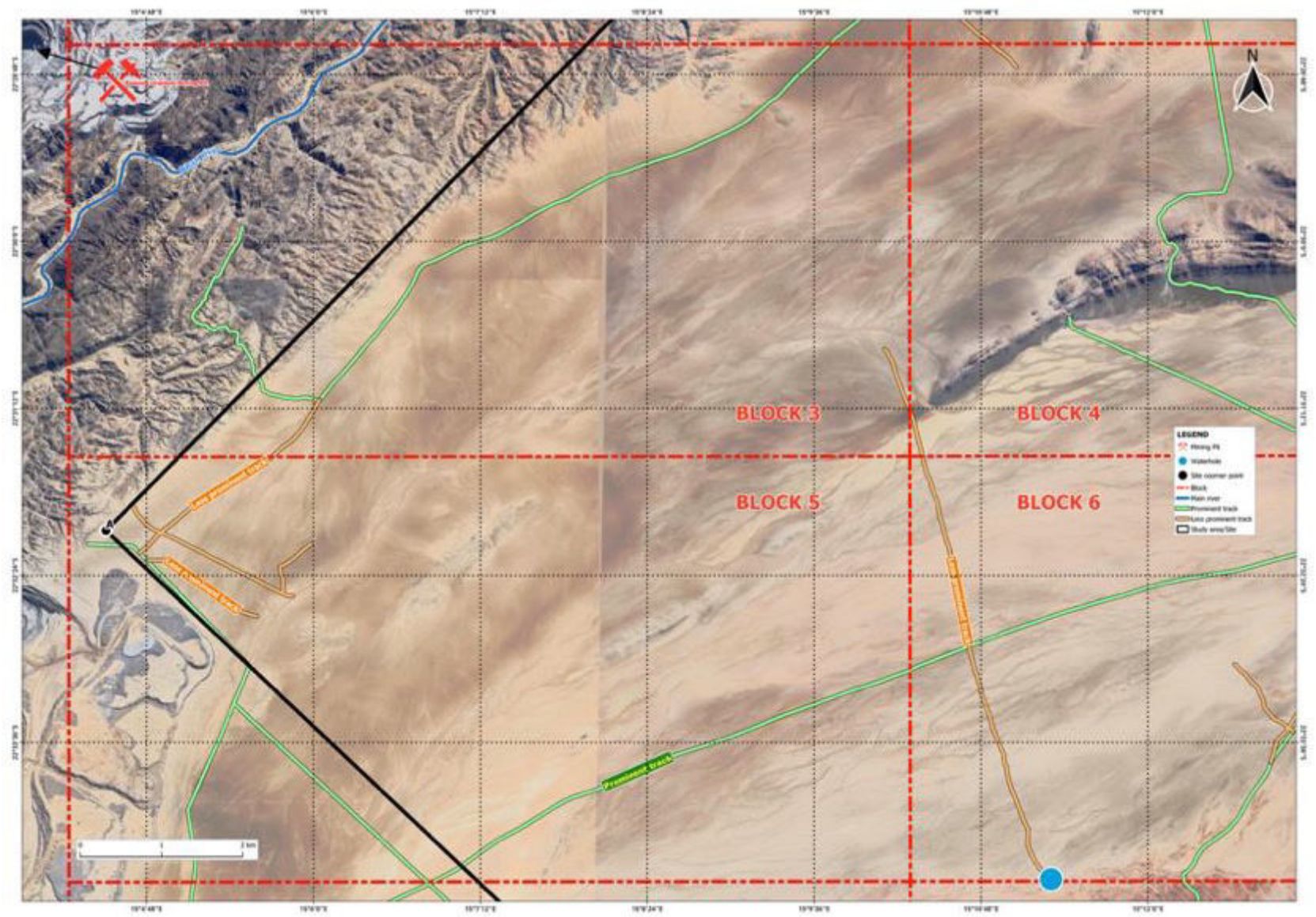


Figure 7.3. Camp 12 – Study Area (Block 3&5)

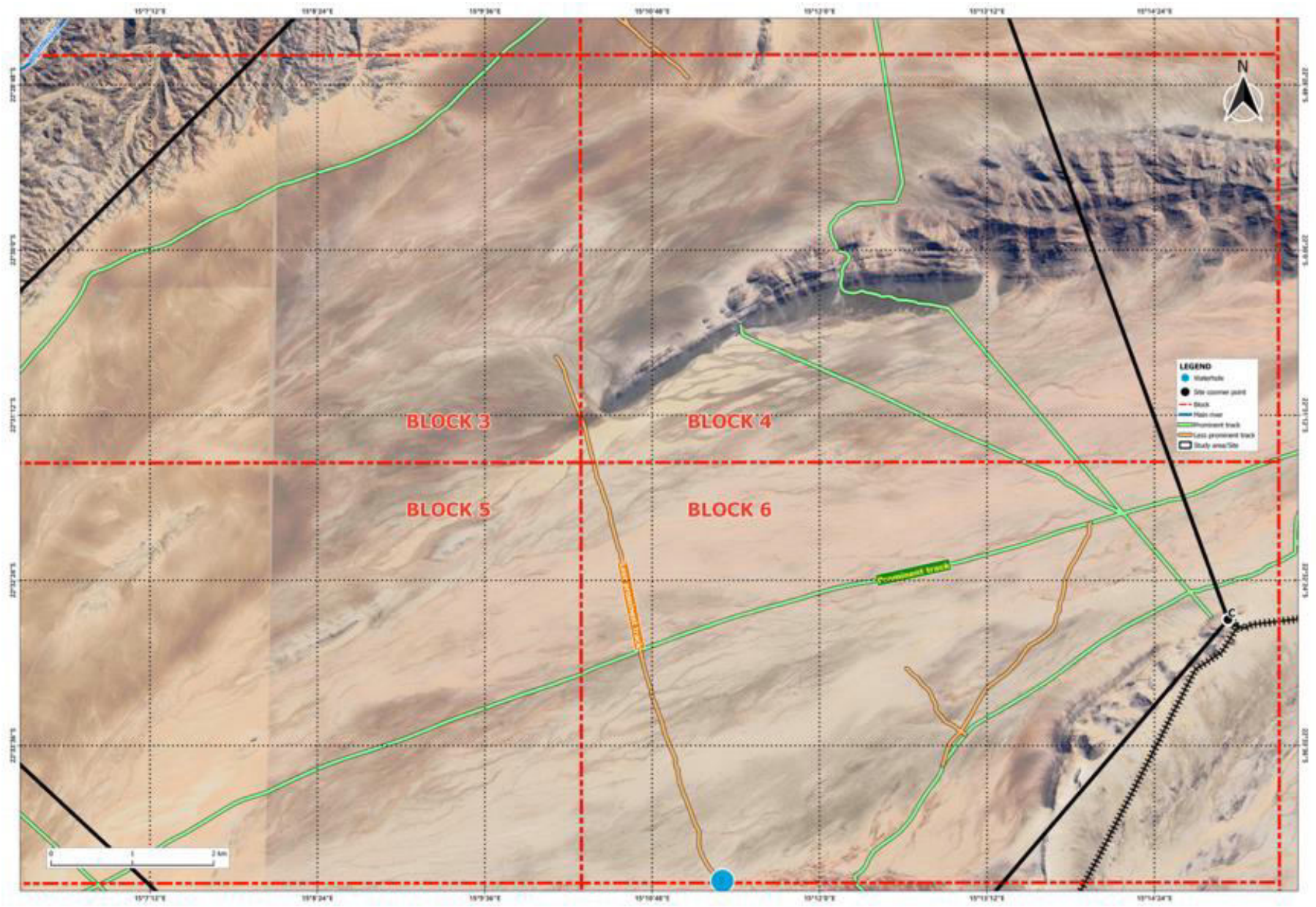


Figure 7.4. Camp 12 – Study Area (Block 4&6)

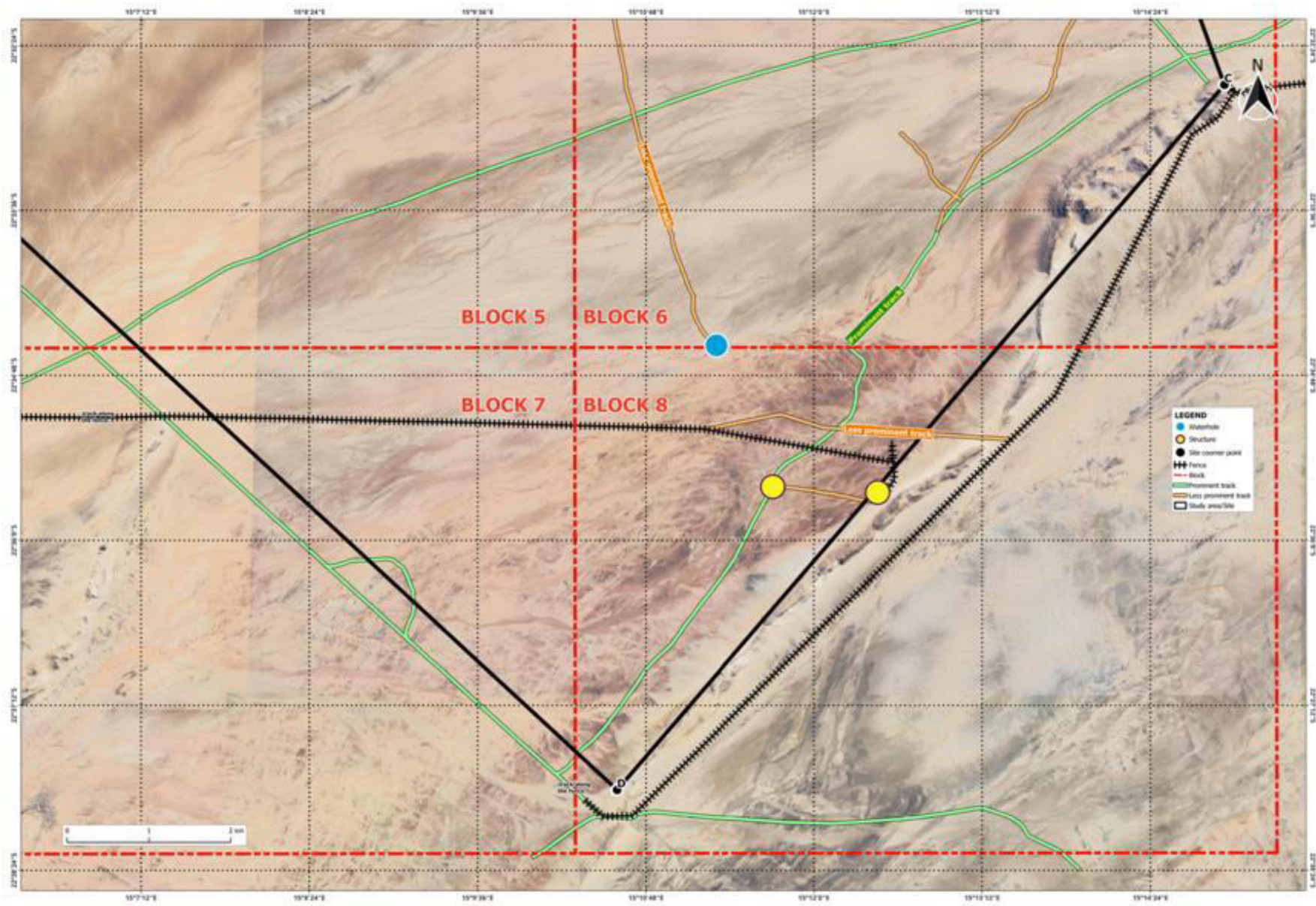


Figure 7.5. Camp 12 – Study Area (Block 7&8)



Figure 7.6. Camp 12 – Study Area – Entry gate



Figure 7.7. Camp 12 – Study Area – Barren Land



Figure 7.8. Camp 12 – Study Area – Barren Land



Figure 7.9. Camp 12 – Study Area – Scattered shrubs



Figure 7.10. Camp 12 – Study Area – Old fence Footprint



Figure 7.11. Camp 12 – Study Area – Rock / Gravel plain



Figure 7.12. Camp 12 – Study Area – Barren Land



Figure 7.13. Camp 12 – Study Area – Barren Land



Figure 7.14. Camp 12 – Study Area – Barren Land



Figure 7.15. Camp 12 – Study Area – Barren Land

7.2 Biodiversity

7.2.1 Flora

Composition of plant communities within the Namib Desert depends on numerous factors including soil types, climate and habitat. The seven major habitats in the region are gravel plains, coastal hummocks, sand dunes, washes, riverbeds, rocky ridges and inselbergs. In general, the climatic condition of Namib Desert does not support high abundance of vegetation. Vegetation in the desert is normally characterized by dwarf shrubs.

The general vegetation type in the study area is described as Namib desert. The Namib desert Biome makes up a large proportion (32%) of the land area of Namibia with parks making up 69% of the protected area network (Barnard, 1998). Four of the 14 desert vegetation types are adequately protected with up to 94% representation in the protected area network in Namibia (Barnard, 1998). The region has low plant diversity. Mendelsohn *et al.* (2002) indicated that, there are mainly grass and dwarf shrubland in the Namib which are sparsely distributed hence the average plant production is very low.

The sparse plant cover varies according to the substrate, herbs, small shrub and grass usually grow on gravel plains. As may be expected many, if not all, of the species are adapted to the extreme conditions of the Namib, with a high proportion of annual species that rapidly germinate, grow, produce seed and die in a very short space of time after rain, and many succulent and geophyte species. Several species are restricted, or largely restricted, to mountain outcrops, ridges, drainage lines and rivers, which also carry the highest plant biomass for much of the year.

Vegetation within the study site is very sparse with plants that are typical to the Namibian desert conditions. About 99.9% of the proposed site is free of vegetation (Figure 7.16: Isolated vegetation observed on the site). Importantly, there are no Welwitschia Mirabilis plants within the study area.



Figure 7.16: Isolated vegetation observed on the site

7.2.2 Fauna

The Namib Desert environment is generally hostile to support animals and only a handful can survive. Ecological studies of the Namibia Desert indicated that, animal life seem to be absent during the day while in actual fact, a lot of life goes on during the night. Which is simply an arid survival of biodiversity. During the day, the temperature is extremely hot, plant and animal hide in various places, some burry themselves under the sand.

In general, the Desert is home to insects, snakes, geckos, mice, ants, beetles, spider and bigger animals such as springboks Ostriches, Oryx and Jackals. A site assessment was done during the day which only observed a Tenebrionic beetle and Springboks dropping within the study area (Figure 7.17. Camp 12 – Study Site: Springbok droppings and Tenebrionic beetle).



Figure 7.17. Camp 12 – Study Site: Springbok droppings and Tenebrionic beetle

7.3 Land use

7.3.1 Land Right

Camp 12 is a communal land under the jurisdiction of the #Gaingu traditional authority and regulated in accordance with the provisions of the Communal Land Reform 2002 (Act 5 of 2002), of which applicable land uses include human settlements, livestock and crop farming.

However, due to the harsh desert climatic conditions, the site is not suitable for livestock or crop farming.

Thus, the Proponent has thus applied to the #Gaingu Traditional Authority and the Erongo Communal Land Board to lease the land for the construction of a Solar PV Plant and Electrolyser Plant.

7.3.2 Communal Conservancy

Before Namibia gained its independence in 1990, residents in the communal area had few rights to use wildlife (mainly hunting). After independence, and in line with Article 95l of the Namibian Constitution, Namibia adopted policies, legal instruments, and strategies enabling communities and private businesses to benefit from wildlife-based tourism and sustainable natural resource management commonly known as Community-Based Natural Resource Management (CBNRM).

The CBNRM concept is based on the understanding that if natural resources have sufficient value to rural communities, and allow for rights to use, benefit and manage, then appropriate incentives for people to use natural resources in a sustainable way will be created through the establishment of a Conservancy.

Camp 12 is part of the #Gaingu Conservancy which cover an areas of 7732km². Camp 12 measure about 20,000 hectares which is 2.6% of the total conservancy land (Figure 1.2). As mentioned above, the site is a Baren Desert land which is not suitable for human settlement or farming.

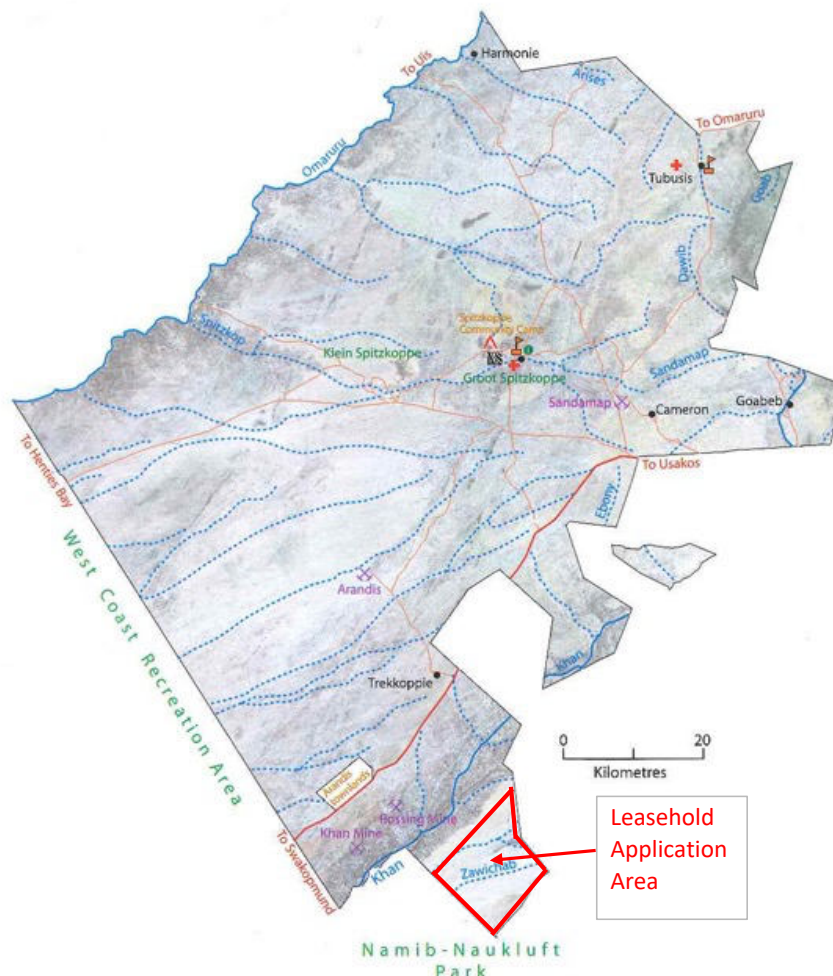


Figure 7.18. Map of #Gaingu Conservancy showing the leasehold application land portion

7.3.3 Active Mining

The area borders some of the two world largest Uranium open pit mines (Rössing and Husab Uranium Mines) as well as Khan and Valencia mines in the north (Figure 7.1).

7.3.4 Mineral Right Application

In Namibia, all mineral rights are vested in the State and are regulated by the Minerals (Prospecting and Mining) Act of 1992. Section 2 of this Act states that, *“subject to any right conferred under any provision of this Act, any right in relation to the reconnaissance or prospecting for, and the mining and sale or disposal of, and the exercise of control over, any mineral or group of minerals vests, notwithstanding any right of ownership of any person in relation to any land in, on or under which any such mineral or group of minerals is found, in the State”*.

The mineral right can thus be acquired through application. There are mineral Exploration Prospecting Licenses (EPLs) in the study which is expected as individual or companies prospecting for mineral resources apply for the EPL over any piece of land, unless withdrawn as protected area.

7.3.5 Tourism

The Namib Desert is one of the world’s biggest tourism attractions. Some of the main features are, Sand Dunes and Welwitschia Mirabilis. There are no tourism activities on site, however, some of the access roads to the site are also used by tour operators. Thus, a traffic assessment study will ensure that the project does not damage access roads which could obstruct tourism activities.

7.4 Climatic Conditions

7.4.1 Namib Desert

Climate conditions of the Namib Desert are generally characterized by hot temperatures and windy conditions. However, temperatures variability is high, it fluctuates from below 0°C to above 50°C on a daily and seasonal basis mostly influenced by the Atlantic Ocean. The average annual temperature of the area ranges between 4 – 28°C, with an average maximum of 24 - 28 °C and minimum of 4 - 6 °. The hottest month is usually December and coolest month is July. The area barely receives significant rainfall. Close to the coast, annual rainfall is about 20mm and it increases toward inland. Camp 12 receives about 50 millimetres per annum.

7.5 Geology and soils

The Namib Desert is mainly made up of sand deposit and is home to sand dunes. It has a vast array of landscapes and scenery, and a huge sense of wilderness, novel to tourist and highly accessible compared to most extreme desert ecosystems. In general, much of the

desert areas do not have much of soil but exposed bedrocks of Precambrian metamorphites such as mica schists, quartzites and marbles. This is mostly linked to wind erosion. Arable soils are limited to river valleys and flood plains.

The geological framework of most of the project area consists of intense faulting and folded Damara rocks, before being covered by sedimentary deposits at places. The geological formations consist of surficial deposits (quaternary sediments). The Karoo age dolerite bodies are common in the area in the form of dykes and sills.

7.6 Hydrogeology

The Central Namib Desert stretches from the Kuiseb River to the Brandberg. Hydrologically, camp 12 forms part of catchment of the Swakop and Khan Rivers. Overall, the area is dry (no surface water), the flow of the Swakop River is influenced by inland flow.

Groundwater is found in fractured aquifers of the Swakop Group of the Damara Sequence which generally have minimal groundwater potential. The study area does not fall within a groundwater control area.

7.7 Heritage and Archaeological Resource

7.7.1 Definition of Heritage and Archaeology

The United Nation Education Scientific Cultural Organization (UNESCO) provide the following definition of Heritage and Archaeology as follows:

“World Heritage is the designation for places on Earth that are of outstanding universal value to humanity and as such, have been inscribed on the World Heritage List to be protected for future generations to appreciate and enjoy. Places as diverse and unique as the Pyramids of Egypt, the Great Barrier Reef in Australia, Galápagos Islands in Ecuador, the Taj Mahal in India, the Grand Canyon in the USA, or the Acropolis in Greece are examples of the 1007 natural and cultural places inscribed on the World Heritage List to date”.

“Archaeology studies human cultures through the analysis of their historical traces and their context. It aims at explaining the origin and development of civilizations, as well as the understanding of culture and history. Underwater archaeology is a sub-discipline, which studies submerged sites, artifacts, human remains and landscapes”.

7.7.2 Scope of Heritage Study

A heritage scoping study was undertaken using desktop study, complemented by site visit to define the presence or potential presence of Heritage and Archaeological materials within the boundaries of Camp 12 where the proposed project is aimed to take place.

The study acknowledges the rich heritage and archaeology documentation in Namibia, particularly Erongo Region (Figure 7.19). For practicality this study is narrowed within the boundaries of the project in which the Proponent will have jurisdiction control.

7.7.3 Policy and Legal Framework

The World Heritage Convention, created in 1972 is aimed to the Protection of the World Cultural and Natural Heritage. Namibia, is a signatory to this convention, henceforth, the Namibian government has committed to the protection of cultural and heritage through the National Heritage Council Act 27 of 2004. This act provides for the protection and conservation of places and objects of heritage significance and the registration of such places and objects; to establish a National Heritage Register; and to provide for incidental matters.

7.7.4 The Human History in Namibia

This section aims to uncover heritage and archaeological discoveries in Namibia as well as the history, particularly colonial history known for atrocities, genocide which leads mass graves and lost antiques.

Evidence of the presence of human and their ancestors in Namibia is said to be beyond written record. Evidence of their existence is provided by graves, dwelling places, stone tools and a wealth of rock art (John Kinahan 2011) which dates to the Southern African Middle Stone Age.

At the Apollo 11 rock shelter, at the confluence of the Orange and Great Fish Rivers, the oldest known rock painting in southern Africa was found, dated to around 26 000 BP (Lewis-Williams 1997, 7; thackeray 2005, 27).

Narrating their story on human history in Namibia, Glenn C. Conroy *et al* 1993¹², said, “the afternoon of June 4, 1991, we were searching Namibia's mountains for a rarer kind of stone, fossilized evidence of human evolution in southern Africa. What we found instead was the rarest “diamond” of all, one that no one had ever seen before on the African continent south of equatorial East Africa. What we found was incontrovertible evidence that prehuman “apes” were living in southern Africa millions of years before *Australopithecus* roamed the veld” The discovery was the middle Miocene hominoid *Otavipithecus namibiensis*, found at the Berg Aukas mountains in Otavi area which is traced back to millions of years.

¹² Diamonds in the desert: The discovery of *Otavipithecus namibiensis*

Location of Heritage Sites

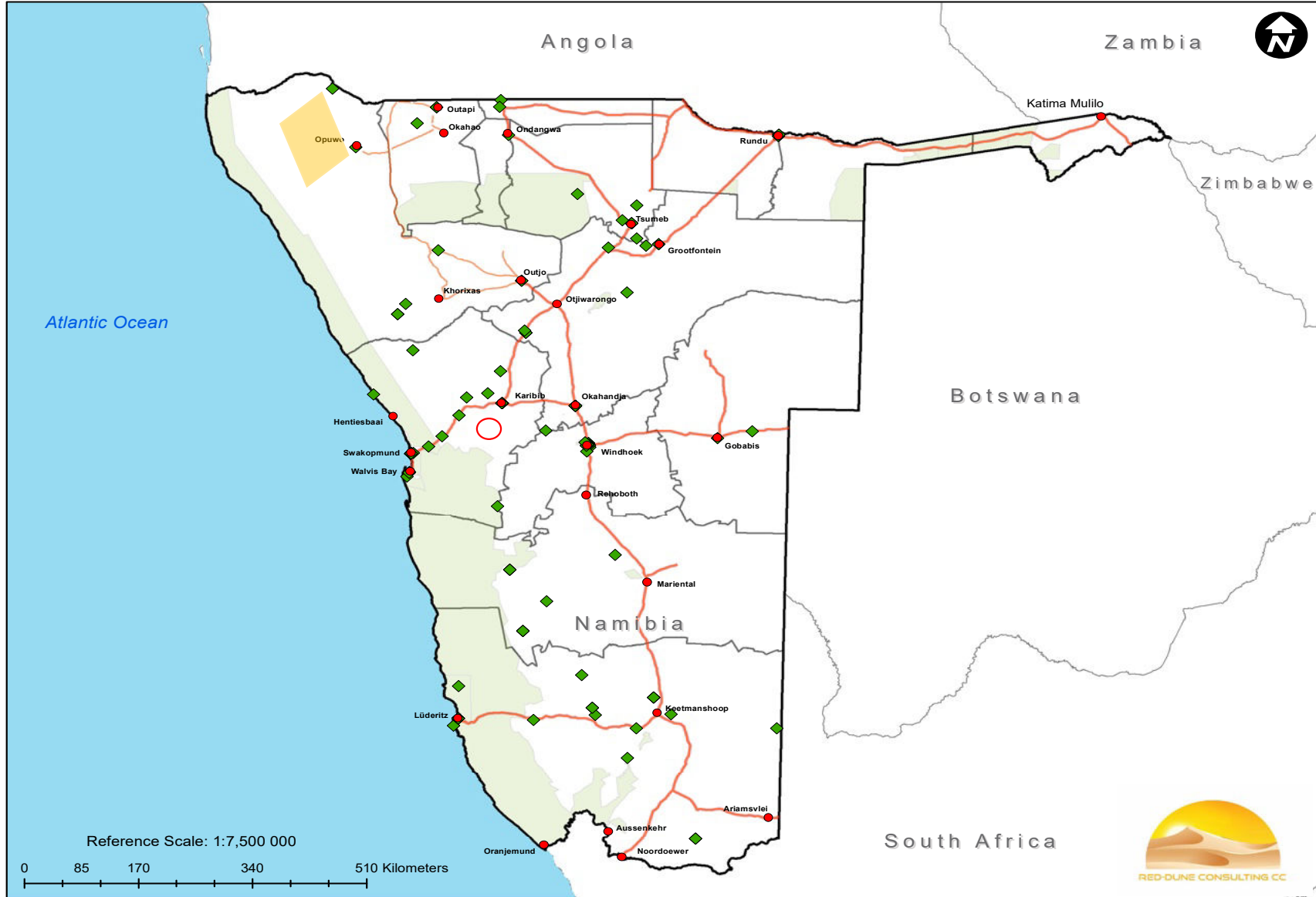


Figure 7.19. Distribution of National Heritage Site in Namibia. The Red Circle indicate the project area

7.8 Archaeological and Heritage Assessment

In consultation with local people and random movement on site as well the use of National Heritage Register, there were no heritage or archaeological sites found, neither known on the project site. A discovery of archaeological material is possible during exploration activities in a similar fashion that the *Otaviipithecus namibiensis* was found at Berg Aukas mountain.

Furthermore, owing to the knowledge that, geological setting of areas that has potential of dimension stones consists of granite, sandstones and dolomite forms that are associated with archaeological landscapes that may constitute characteristics of Later Stone Age (LSA). The investigation of LSA in dimension stones can only be established after drilling. A chance find for the heritage and archaeological materials is develop for the environmental management plan (EMP).

7.8.1 Chance find

A chance find is an important aspect towards the protection and conservation of heritage and archaeological materials. It provides awareness to all people involved in the development of the project to ensure that such materials are not destroyed. The Proponent must implement a chance find procedure for the project as follows:

1. All employees / contractors must be trained on the possible find of archaeological materials before the commencement of the project in order to create awareness. The training must be provided by an expert to ensure adequate understating of archaeological materials.
2. The Proponent / employees / contractors must implement steps to be taken for archaeological material finding (Heritage (rock painting and drawings), human remains or artefacts) are unearthed through the following procedures:
 1. Stopping the activity immediately
 2. Informing the operational manager or supervisor
 3. Cordoned of the area with a danger tape and manager to take appropriated pictures.
 4. Manager/supervisor must report the finding to the following competent authorities, National Heritage Council of Namibia (061 244 375) National Museum (+264 61 276800) or the National Forensic Laboratory (+264 61 240461).
3. Archaeological material must NOT be touched. Tempering with the materials is an offence under the heritage act and punishable upon conviction by the law.

7.9 Socio-Economic Environment

7.9.1 National Economic Overview

Namibia, is geographically a large country with a small population of about 3.0 million (2024 Census Population) and 1,500 km long coastline of the Atlantic Ocean. The country enjoys political stability and has a fairly stable economy. It shares borders with Angola, Botswana, South Africa, and Zambia.

Namibia is one of the hottest and driest country in Sub-Saharan Africa. The country has high climatic variability in the form of persistent droughts, unpredictable, low, and variable rainfall patterns leading to scarcity of water¹³. Persistent extreme drought conditions caused government to declare national emergencies in 1992/1993, 1995/1996, 2012/2013, 2013/2014, 2015/2016, and 2018/2019.

These droughts severely affected the agricultural sector, a backbone to the livelihood of 70% of the population who are dependent on rain-fed agriculture, majority found in rural areas¹⁴. However, the country is rich in mineral resources such as gold, diamonds and uranium. The country's economy is mainly driven by the mining sector.

Overall, the Namibian economy is characterized by high socioeconomic inequalities resultant of colonialism and apartheid, high level of unemployment and poverty. In recent years, the country was classified an upper middle income. Since independence in 1990, poverty is estimated to have decreased from 28.7% in 2009-10 and to 17.4% by 2015-16¹⁵. This indicator does not reflect the reality on the ground as these are measured by macroeconomic growth (GDP) while the country rank second in the world, with South Africa ranking first as most unequal countries. Namibia has a Gini coefficient of 59.1 in (The USA Gini coefficient is 0.47).

The country continues to experience systematic exclusion of the black majority from full participation in economic where black majority are mainly found in informal economy.

7.9.2 National Population Demography

On 13th March 2024 the Namibian Statistic Agency released a preliminary report that gives the provisional results from the 2023 Population and Housing Census (PHC) of Namibia. According to the Media release, the presented results are provisional and will be used as provisional figures until the final results are released by October 2024. The final results may differ slightly from the statistics presented in the preliminary report.

The population demographic results are summarized below:

¹³ Namibia Fourth National Communication to the United Nations Framework Convention on Climate Change. Windhoek: Ministry of Environment Forestry and Tourism, March 2020.

¹⁴ Namibia Statistics Agency, 2019. The Namibia Labor Force Survey 2018.

https://d3rp5jatom3eyn.cloudfront.net/cms/assets/documents/Labour_Force_Survey_final_-_2018.pdf

¹⁵ IPL; 2017 PPP

1. The Namibia population figure from the 2023 PHC is 3.02 million people (Figure 7.20).
2. The population has increased by 909,324 people from the 2.1 million people recorded in 2011, constituting a growth rate of 3.0% per annum. This rate is double what was observed in the previous intercensal period (2001 to 2011 which was 1.4% per annum) and is the highest observed since independence (see Figure 29). At this rate, by the year 2050 the population of Namibia would be over 6 million.

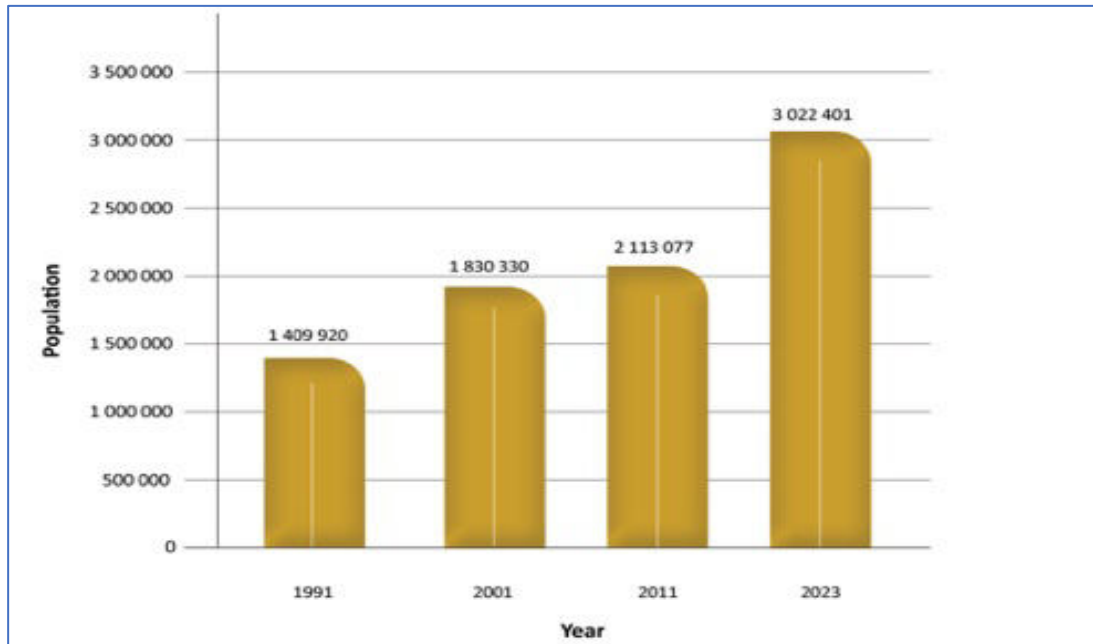


Figure 7.20. Namibia Population Trend, NSA 2024

3. Females make up a greater proportion of the population in the 2023 PHC as has been the trend for the past four censuses.
4. The population is growing, at an increasing rate compared with previous censuses.
5. Khomas region remains the most populous region in Namibia with a population of 494,729 people. Ohangwena region closely follows as the second most populous region with a population count of 337,729 people. These two regions are respectively four and three times bigger than the size of the least populous region, the Omaheke Region. Omusati is the third most populous region, with a population count of 326,671 people and these are similar trends as observed in the 2011 census.
6. Erongo region is the fifth populous region, whose population in 2011 was 150 809 and grew to 240 206 representing 59.3 % change and 7.9% of the total population.
7. //Kharas region and Erongo region recorded the smallest household size of 3.1 people per household while the largest household size was recorded in Kavango East and Kavango West Regions, with a household size of 5.3 and 5.5 respectively. In nine out of the 14 regions, households had less than four members, on average.

8. Average household size, which has been on the decline since 1991, is 3.8 persons per household.
9. The total number of households has grown by 291,500 (representing a 62.7% increase) over the 464,839 households enumerated in 2011. Household size decreased by 0.6 persons per household from 4.4 in the 2011 census.
10. The region with the highest population density is Ohangwena with 31.5, persons per square kilometre, followed by Oshana region with 26.7 persons per square kilometre, and Khomas region with 13.4 persons per square kilometre. //Kharas Region, Hardap, and Kunene represent the most sparsely populated regions with 0.7 and 1.0 persons per square kilometre respectively (Figure 7.21).
11. It is observed that from 2011, urban population increased from 903 434 to 1,494,992 people in 2023 while the rural population increased from 1,209 643 in 2011 to 1,527,409 in 2023. This represent 65.5 and 26.3 percent increase in urban and rural population respectively

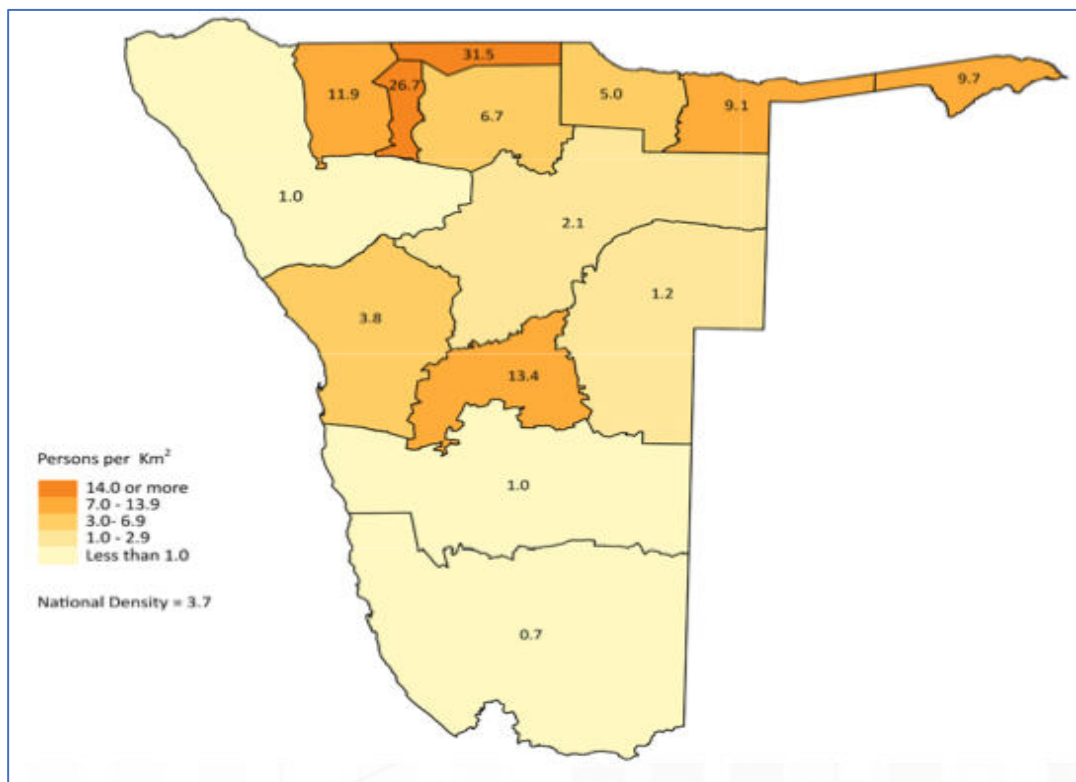


Figure 7.21. Namibian Regional Population Density (NSA, 2023)

7.9.3 Population Demographic Erongo Region

The Erongo Region, comprising seven constituencies: Omaruru, Karibib, Daures, Arandis, Swakopmund, Walvis Bay Rural, and Walvis Bay Urban (NSA, 2014) is a dynamic region reflecting diverse population characteristics (Figure 7.22). Erongo

Region ranks amongst the least impoverished regions in Namibia, with a poverty rate of 4.4% as compared to the national rates of 17.4%¹⁶

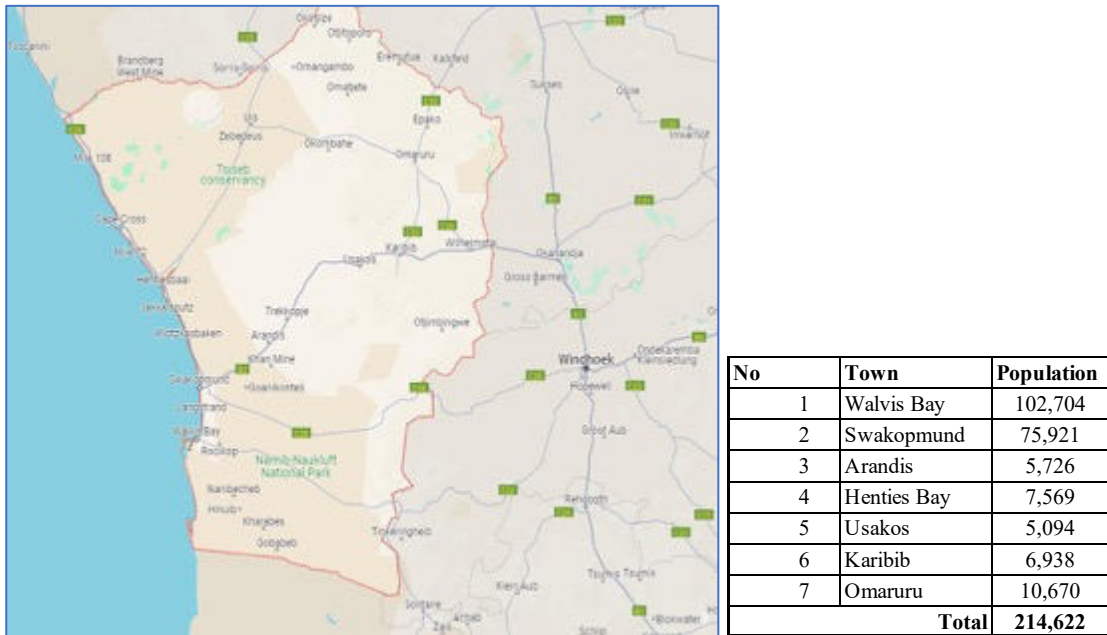


Figure 7.22. Map of Erongo Region and Population

7.9.4 Regional Economic growth

At the time of compiling this report, it was assumed that all regional towns will greatly benefit through employment and supply chains. The project area is close to Arandis and Swakopmund town.

As a result, the majority of the personnel that will be commuting will be residing between these two towns (*please note that only a handful of workers, mainly skilled ones will be commuting. Majoring of the construction workforce will be accommodated at the onsite base camp*). Economic development, particularly brought by uranium mines has resulted in significant infrastructure development of coastal towns and has similarly resulted in the increase of informal settlements.

The increase in informal settlement is normally fuelled by retrenchment, end of project development leaving many construction workers jobless.

¹⁶ NSA, 2017

8 STAKEHOLDER CONSULTATION

Section 21 of the EIA regulation requires the undertaking of an Environmental Impact Assessment (EIA) to follow a robust and comprehensive stakeholder consultation. This is an important process, because it gives members of the public, especially the Interested and Affected Parties (I&APs), an opportunity to comment or raise concerns that may affect the socio-economic or general environment as a result of the project.

Stakeholder Engagement Report is attached.

9 IDENTIFICATION OF KEY ENVIRONMENTAL IMPACT

Potential impacts were identified in accordance with the key Environmental Social Indicators (ESI) and using literature review, site assessment and public participation process. Overall, the KEY issues associated with Solar PV Plant is mainly habitat destruction by civil construction. The impacts were identified through phase of project which includes Planning, Construction and Operational Phase.

9.1 Planning Phase

The initial stage of the project commenced with presenting the project to various organs of state, competent authorities (National Local and Regional) and Traditional Authorities (TA) to seek support for the project (**See Table 8 below**).

Table 9:1. Project Planning

No.	Stakeholder	Purpose of Consultation	Outcome of Consultation
•	Ministry of Mines and Energy	Present project concept to seek in principal government support	The Ministry has, in principle supported the proposed project and emphasised that the project should obtain all relevant permits
•	Ministry of Environmental Forestry and Tourism	Present project concept to seek guidance on undertaking the EIA	The project concept was presented to the Environmental Commissioner (EC). The EC provided guidance towards the project undertaking the EIA. He emphasised that, the project components needed to be split for critical issues to be well addressed (Annexure 8).
•	Namibia Investment Promotion Board	Present project concept to seek government support	The NIPB has endorsed the project and it has been registered with the institution.
•	Erongo Land Board	Support and guidance for Leasehold Application	The Land Board supported the application of the leasehold (Annexure 3)
•	!Oe #Gan Traditional Authority	Support and Consent for Leasehold Application	TA supported the leasehold application and provided a support letter (Annexure 1)
•	#Gaingu Conservancy	Support and Consent for Leasehold Application	Walvis Bay, at its council meeting approved the land application for the project development (Annexure 2)

9.2 Construction Phase

9.2.1 Construction Phase

The construction phase will involve general earth works such as, digging, trenching, concrete batching and material transportations. It will also involve setting up a base camp for construction workers. Many areas will require blasting to break the bedrocks.

The key potential impacts during construction includes:

Table 9:2. Key impacts during construction

No	Construction Activity	Potential Impact
1.	Transportations of Construction Material	Employment creation Destruction of gravel roads = impact on other road users (Traffic Impact) Dust and Noise Safety Risk / Road Accidents
2.	Earth Works Workshops	Employment creation Land degradation Noise, Vibrations and Dust Generation of solid waste Generation of household waste Health and Safety Risks Habitat destruction = Biodiversity loss Visual impact / Eye shore Soil pollution Water pollution

9.3 Operational Phase

The operational phase of the Solar PV plant will involve technological advanced control system, and maintenance of equipment. The key potential impacts identified during operation includes:

No	Operational Activity	Potential Impact
1.	Maintenance of equipment	Occupational health and risk Solid waste generation
2.	Staff accommodation and offices	Household waste generation

9.4 Decommissioning Phase

At this stage, decommissioning of the project is not envisioned. The infrastructures are estimated to have a life span of 25 years. In 25 years' time, the environment would change greatly, with some of the infrastructures providing some ecosystem services. Hence at time of decommissioning, an EIA would be required.

10 IMPACTS ASSESSMENT

10.1 Construction Phase

10.1.1 *Employment Creation and skill transfer*

During construction, the project is expected to employ a significant amount people for a duration of about 3 years. While permanent employment is expected during the operational phase of the project. The employment opportunities that the project will create is critical as Namibia is grappling with high youth unemployment hence the project would attract job seekers from various part of the country.

Monitoring Program			
Aspect to Monitor	Frequency	Responsibility	How
1. Employment contract	Bi-Annual	Site Environmental Officer	Employment records
2. Training and capacity building programs		Labour inspector	On-site inspection and
3. Workshop and Training attendance registers			interviews with employees
4. Employees certificate of attendance			

Enhancement measures

- Unskilled labour must all be reserved for local
- Only employ foreigners where skills and expertise in not in Namibia
- Abide by the labour act
- Provide contract to employees
- Support local training to develop capacity

10.1.2 Loss of Biodiversity

As mentioned earlier, the climatic condition in desert does particularly Camp 12 does not support high vegetation. The desert animals such as springboks frequent the area, but the area is not their habitat. The available “Dwarf shrub” is not threatened, it is widely distributed in the entire Namib Desert.

Summary of Impact: Destruction of Biodiversity and Habitat													
Key Mitigation Measures:													
i. Only remove shrubs that are on demarcated site for the construction and access													
i. Poaching of animals is strictly forbidden and punishable by law													
i. Off road driving is not allowed													
Without Mitigation							With Mitigation						
Impact type	Probability	Severity	Extent	Duration	Significance	Confidence	Impact type	Probability	Severity	Extent	Duration	Significance	Confidence
-ve	Probable	Low	Local	Immediate	Medium	High	-ve	Low	Low	Local	Immediate	Low	High
Quantitative assessment							Quantitative assessment						
	3	2	2	1	6	3	-ve	2	2	2	1	4	3
Monitoring Program													
Aspect to Monitor					Frequency		Responsibility			How			
i. Indiscriminate removal of vegetation					Weekly		Site Environmental Officer			Physical observations			
i. Reported incidence of poaching										Report of poaching			
i. Off road driving													
i. Night lighting													

10.1.3 Heritage and Archaeological Resource

The Heritage impact study found that the project areas do not have rich heritage and archaeological resources. Thus the impact is expected to be minimal. However, a chance find must be implemented to ensure their protection under a chance find scenario.

Summary of Impact: Destruction of Heritage and Archaeological Materials													
Summary of impact													
1. Workers must be trained on the possible find of archaeological material in the area 2. Establish a “Chance Find Procedure” where if any archaeological finding (Heritage (rock painting and drawings), human remains or artefacts) is encountered. 3. The activity must be stopped immediately, and the operation manager of that activity be informed; 4. The manager must ensure the cordoning off the area with a danger tape and take appropriate records and pictures 5. The manager must immediately report the findings to the National Museum (+264 61 276800) or the National Forensic Laboratory (+264 61 240461).													
Without Mitigation							With Mitigation						
Impact type	Probability	Severity	Extent	Duration	Significance	Confidence	Impact type	Probability	Severity	Extent	Duration	Significance	Confidence
-ve	Probable	Low	Local	Immediate	Medium	High	-ve	Low	Low	Local	Immediate	Low	High
Quantitative assessment							Quantitative assessment						
	3	2	2	1	6	3	-ve	2	2	2	1	4	3
Monitoring Program													
Aspect to Monitor					Frequency		Responsibility			How			
Reported Heritage Material					Weekly		Site Environmental Officer			Physical observations			

10.1.4 Civil Construction

To be addressed in the full ESIA

Summary of Impact: Loss of natural scenic and aesthetic value													
Key mitigations													
a) Ensure good house keeping													
b) Piles of excavated sand must be well stored													
c) Rehabilitate the excavated area back to its natural state													
d) Do not burry waste on site													
Without Mitigation							With Mitigation						
Impact type	Probability	Severity	Extent	Duration	Significance	Confidence	Impact type	Probability	Severity	Extent	Duration	Significance	Confidence
-ve	Probable	Medium	Site Specific	Short term	Medium	High	-ve	Low	Low	Site Specific	Immediate	Low	High
Quantitative assessment							Quantitative assessment						
	3	3	1	3	9	3	-ve	2	2	1	1	4	3
Monitoring Program													
Aspect to Monitor					Frequency		Responsibility			How			
a) Solid waste generation and management					Bi-weekly		Site Environmental Officer			Physical observation, complaints from general public			
b) Rehabilitation of excavated areas													

10.1.5 General Waste and Pollution Control

General waste during construction includes, building rubble, planks, household waste such as, liquid waste, plastic and parts of equipment. Litter would be a nuisance to the Desert environment.

To be addressed in the full ESIA

10.1.6 Hazardous waste

Heavy vehicles use a lot of oil during construction. Excavators would not necessarily drive to service station for re-fuelling. Handling there would be handling of hydrocarbons on site. The site where grease, oils, lubricant and fuel get handled requires to be properly designed to avoid soil contamination that may consequently contaminate underground water.

To be addressed in the full ESIA

10.1.7 Occupational health and safety

Job opportunities lead to new social relationship which often spread disease, particularly pandemic such as HIV and AIDS and substance abuse. Furthermore, the working environmental is an isolated environment that need to cater for all health emergencies for the employees.

Exposure to excess noise and dust could impact employees hearing ability and lung related disease respectively thus damaging their health. During construction, employees are prone to safety risks such as injuries, thus it is critical to ensure an adequate health and safety plan.

Erect warning signs at designated sites to alert public of potential dangers

To be addressed in the full ESIA

10.1.8 Noise and Vibration

Breaking rock from the bedrock will require the use of explosives. Although this will be site specific, the shock vibration could cause damage to surrounding properties and if not communicated properly, it could be noise nuisance to people (this could be applicable to tourist camping in area around Swakop River).

Employees hearing could be compromised due to exposure of excessive noise from heavy vehicles during construction. Overall, this impact is expected to be temporal and localised.

To be addressed in the full ESIA

10.1.9 Dust Pollution

Natural, dust level in the Namib Desert is higher due to high winds. Land clearing, digging and excavation of trenches, movement of vehicles and heavy machinery on project sites, concrete work, transportation of sand to site and concrete stones, cement mixing may create fugitive dust, uncoordinated / reckless driving on gravel roads could cause low visibility to other road users. This is expected to be short term.

To be addressed in the full ESIA

10.1.10 Tourism

The area does not have designated tourism attraction site. Access roads used by the tourism activities will not be impacted.

10.2 Operational Phase

The assessment focused on the suitability to construct (i) Solar PV Plant to support the leasehold application.

Detailed impact assessment for the operation of the Solar PV Plant and associated components will be addressed in the full EIA.

11 DECOMMISSIONING AND REHABILITATION

The proposed project is not envisaged to be decommissioned in the near future.

At the time when decommissioning is considered, it will be required that EIA is undertaken to assess the impact of decommissioning and rehabilitation.

12 CONCLUSION AND RECOMMENDATION

12.1 Conclusion

The study conclusively found that the proposed construction of the Solar PV Plant on Camp 12 will **NOT** have any significant impact on the biophysical and socio-economic environment.

The project presents significant investment potential for the country and has realistic potential to become one of the first Green Hydrogen manufacturers in Namibia.

It is envisaged that at completion, the project would amount to significant capital investment, create substantial employment opportunities and propulsion of Namibia into the 4th industrial revolution.

12.2 Recommendation

12.2.1 ECC for the **construction footprint** of the **Solar PV Plant** for Camp 12

2. Construction of the Solar PV Plant
 - vii. Footprint
 - viii. Suitability of Camp 12 to host the PV Solar Plant
 - ix. Support the leasehold application

12.2.2 Undertake **full EIAs** for the following project components, separately:

3. Operation of the Solar PV Plant and associated infrastructure
 - i. Sub-stations
 - ii. Power Transmission Lines
 - iii. Batter Energy Storage System (BESS)
4. Desalination Plant
 3. Seawater intake
 4. Brine effluent and pipelines
 5. Distilled water pipelines and storage
5. Electrolyser Plant
 6. Hydrogen Production
 7. Hydrogen transfer to the Ammonia Synthesis plant
6. Ammonia Synthesis Plant
 8. Ammonia Production, storage and shipment transfer

13 ANNEXURES

- 13.1 Annex A – Socio-Economic Study
- 13.2 Annex B – Heritage and Archaeology Study
- 13.3 Annex C – Biodiversity Assessment Study
- 13.4 Annex D – Hydrogeology Study

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