APP-003881

ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT PLAN FOR THE 20 MW AUSSENKEJR ENERGY INVESTMENTS PHOTOVOLTAIC PLANT IN AUSSENKEHR, //KARAS REGION

ENVIRONMENTAL ASSESSMENT SCOPING REPORT

Assessed by:

GEO Pollution Technologies Namibia

Assessed for:

Aussenkjer Energy Investments (Pty) Ltd

May 2024

Project:	**ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT PLAN FOR THE 20 MW AUSSENKEJR ENERGY INVESTMENTS PHOTOVOLTAIC PLANT IN AUSSENKEHR, //KARAS REGION**	
Report Version/Date	Final May 2024	
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Cite this document as:	**Bosman Q, Faul A, Strauss J, Pelser E; 2024 May; Environmental Impact Assessment and Management Plan for the 20 MW Aussenkjer Energy Investments Photovoltaic Plant in Aussenkehr, Environmental Assessment Scoping Report**	
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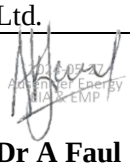
Report Approval	 **Dr A Faul**	

I TIRONAWN KAHUIMA, the Proponent, hereby confirm that the project description contained in this report is a true reflection of the information which the Proponent has provided to Geo Pollution Technologies. All material information in the possession of the Proponent that reasonably has or may have the potential of influencing any decision or the objectivity of this assessment is fairly represented in this report.

Signed at WINDHOEK on the 27 day of MAY 2024.

AUSSENKER ENERGY INVESTMENT PROPRIETARY LIMITED
Reg. 2016/0103
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Aussenkjer Energy Investments (Pty) Ltd

2023/0434
Company Registration Number

EXECUTIVE SUMMARY

Aussenkjer Energy Investments (Pty) Ltd obtained 50 ha of land, adjacent to an operational solar plant in Aussenkehr //Karas Region. It is their intention, to use this land to construct a 20 MW photovoltaic (PV) solar plant, next to the existing plant. Geo Pollution Technologies (Pty) Ltd was appointed by Aussenkjer Energy Investments (Pty) Ltd to undertake an environmental assessment for the construction and operation of this plant.

It is planned that the solar plant will use the same type of technology already used in the area with the proposed plant having a similar configuration as the existing plant. Electricity generated by the proposed plant, is planned to be fed into the National Electricity Grid via the Aussenkehr Substation. In this regard, both NamPower and the Electricity Control Board have indicated their preliminary project approval by confirming that the substation will be able to accommodate the additional electricity generated.

The environmental assessment determines all environmental, safety, health and socio-economic impacts associated with the construction and operational activities of the project. Relevant environmental data was compiled by making use of secondary data and from a reconnaissance site visit. Potential environmental impacts and associated social impacts were identified and are addressed in this report while alternative layout and site options were considered.

During the environmental assessment phase and related feasibility assessment, options were also considered for the grid connection to the Aussenkehr Substation. These were deliberated, taking into account the existing surrounding land use and infrastructure, which include two power lines, one of which is a NamPower 66 kV transmission line. The other power line acts as the grid connection between the existing plant and the Aussenkehr Substation. The most feasible grid connection option was concluded to be tying into the existing power line and grid connection. This power line will have to be upgraded to provide additional capacity, but the option would negate the erection of an entirely new power line. Thereby reducing possible additional impacts on the environment.

Another noteworthy change in the initial layout of the solar plant relates to the inclusion of an ecological corridor across the site, to allow for animal passage and mitigating habitat fragmentation. The inclusion of the ecological corridor, reduces the site footprint to 30 ha. This corridor falls outside on the registered servitudes across the site, which is also accommodated.

The adoption of these two alternatives, play an important role in reducing the possible negative impacts which could affect the environment. In addition to these measures, impact specific mitigation actions are proposed in this report. Apart from contamination risks; health and safety requirements and ecological disturbance, timing of the construction of the solar plant is of importance. The surrounding land use include the cultivation of table grapes and dates for export markets. During the related harvesting seasons, the area has a significant increase in not only labour, but also harvesting equipment and vehicles, including tractors and carts. Since the site is accessed by the same roads used by these operators, construction during the harvesting period would significantly increase traffic collision and incidents risks. Moreover, dust presents a substantial risks to crops, especially during the harvesting season. It is therefore recommended that the timing of the construction period be agreed upon with adjacent landowners to be outside of the harvesting season. During public consultation about the project, adjacent land owners especially mentioned the possible impact of dust on their export products. Alleviation and prevention measures as included in this report, have been informed by adjacent land owners.

The solar plant will not only contribute to the national strategy to increase renewable energy sources, but will also contribute to the construction sector and increase employment during the construction and operational phases. By appointing local employees and by implementing monitoring and training programs, the positive socio-economic impacts can be maximised. Regular monitoring of

environmental performance is recommended to ensure regulatory compliance and the implementation of corrective measures when necessary

The environmental management plan included in this report should be used as an on-site reference document during all phases (planning, construction and operations) of the project. All monitoring and records kept should be included in six monthly reports to ensure compliance with the environmental management plan and the Ministry of Environment, Forestry and Tourism's requirements. Parties responsible for transgression of the environmental management plan should be held responsible for any rehabilitation that may need to be undertaken. The safety, health, environment and quality policy should be used in conjunction with the environmental management plan. Operators and responsible personnel must be taught the contents of these documents. Local or national regulations and guidelines must be adhered to and monitored regularly as outlined in the environmental management plan.

Table of Contents

List of Appendices

List of Figures

List of Tables

List of Photos

List of Abbreviations

AC	Alternating Current
AIDS	Acquired Immune Deficiency Syndrome
BID	Background Information Document
CBD	Convention on Biological Diversity
CITES	Convention on International Trade of Endangered Species
dB	Decibel (expression of the relative loudness of the un-weighted sound level in air)
dBA	Decibel (expression of the relative loudness of the A-weighted sound level in air)
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
EA	Environmental Assessment
ECB	Electricity Control Board
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
ELF	Extremely Low Frequency
EMA	Environmental Management Act, 2007 (Act no. 7 of 2007)
EMF	Electromagnetic Fields
EMP	Environmental Management Plan
EMS	Environmental Management System
GHG	Greenhouse Gas
GPT	Geo Pollution Technologies (Pty) Ltd
ha	Hectare
HIV	Human Immunodeficiency Virus
HMV	Heavy Motor Vehicle
HPP	Harambee Prosperity Plan
Hr	Hour
Hz	Hertz
IAP	Interested and Affected Parties
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IFC	International Finance Corporation
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
km	Kilometre
km/hr	Kilometre per hour
kV	Kilovolt
m	Meter
m/s	Meter per second

m^3	Cubic meter
Ma	Million years
mbs	Meters below surface
MEFT	Ministry of Environment, Forestry and Tourism
mm	Millimetre
mm/a	Millimetres per annum
MME	Ministry of Mines and Energy
mS/m	Millisiemens per meter
MSDS	Material Safety Data Sheet
MW	Megawatt
MWA	Megawatt Ampere
MWAC	Megawatt Alternating Current
MWh	Megawatt hour
MWth	Megawatt Thermal
NaCl	Sodium Chloride
NDP	National Development Plan
NGO	Non-Government Organisation
^oC	Degrees Celsius
PPE	Personal Protective Equipment
PV	Photovoltaic
SADC	Southern African Development Community
SANS	South African National Standards
SAPP	Southern African Power Pool
SEA	Strategic Environmental Assessment
UNFCCC	United Nations Framework Convention on Climate Change
V/m	Volts per meter
VIP	Ventilated Improved Pit Latrine
WHO	World Health Organization
WMP	Waste Management Plan

Glossary of Terms

Alternatives - A possible course of action, in place of another, that would meet the same purpose and need but which would avoid or minimize negative impacts or enhance project benefits. These can include alternative locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The "no-go" alternative constitutes the 'without project' option and provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid undesirable negative impacts.

Assessment - The process of collecting, organising, analysing, interpreting and communicating information relevant to decision making.

Biodiversity - The variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part.

Competent Authority - means a body or person empowered under the Local Authorities Act or Environmental Management Act to enforce the rule of law.

Cumulative Impacts - in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Environment - As defined in the Environmental Assessment Policy and Environmental Management Act - "land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, palaeontological or social values".

Environmental Assessment (EA) - Namibian terminology for a process of assessing the effects on the environment through either a scoping assessment or a combination of a scoping- and detailed assessment.

Environmental Management Plan (EMP) - A working document on environmental and socio-economic mitigation measures, which must be implemented by several responsible parties during all the phases of the proposed project.

Environmental Management System (EMS) - An Environment Management System, or EMS, is a comprehensive approach to managing environmental issues, integrating environment-oriented thinking into every aspect of business management. An EMS ensures environmental considerations are a priority, along with other concerns such as costs, product quality, investments, and strategic planning. An EMS generally makes a positive impact on a company's bottom line. It increases efficiency and focuses on customer needs and marketplace conditions, improving both the company's financial and environmental performance. By using an EMS to convert environmental problems into commercial opportunities, companies usually become more competitive.

Evaluation – means the process of ascertaining the relative importance or significance of information, the light of people's values, preference and judgements in order to make a decision.

Hazard - Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant; that is, it would present the same hazard wherever it was present.

Interested and Affected Party (IAP) - any person, group of persons or organisation interested in, or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.

Mitigate - The implementation of practical measures to reduce adverse impacts.

Proponent (Applicant) - Any person who has submitted or intends to submit an application for an authorisation, as legislated by the Environmental Management Act no. 7 of 2007, to undertake an activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment & Tourism.

Public - Citizens who have diverse cultural, educational, political and socio-economic characteristics. The public is not a homogeneous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of publics, some of whom may emerge at any time during the process depending on their particular concerns and the issues involved.

Scoping Process - process of identifying: issues that will be relevant for consideration of the application; the potential environmental impacts of the proposed activity; and alternatives to the proposed activity that are feasible and reasonable.

Significant Effect/Impact - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment

Stakeholder Engagement - The process of engagement between stakeholders (the proponent, authorities and IAPs) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process. Stakeholder engagement can therefore be described by a spectrum or continuum of increasing levels of engagement in the decision-making process. The term is considered to be more appropriate than the term "public participation".

Stakeholders - A sub-group of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term therefore includes the proponent, authorities (both the lead authority and other authorities) and all interested and affected parties (IAPs). The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.

Extremely low frequency (ELF) - fields includes alternating current (AC) fields and other electromagnetic, non-ionizing radiation from 1 Hz to 300 Hz. ELF fields at 60 Hz are produced by power lines, electrical wiring, and electrical equipment.

Electromagnetic Fields - Electromagnetic fields are a combination of invisible electric and magnetic fields of force. They are generated by natural phenomena like the Earth's magnetic field but also by human activities, mainly through the use of electricity.

1 BACKGROUND & INTRODUCTION

Geo Pollution Technologies (Pty) Ltd has been appointed by Aussenkjer Energy Investments (Pty) Ltd (the Proponent) to conduct an environmental assessment for the development and operation of a new 20 MW photovoltaic (PV) plant in the //Karas Region, situated on a 50-hectare (ha) section of Farm 498 (Figure 1-1). This PV facility, which will be connected to the national power grid via the Aussenkehr Substation, marks an extension of Aussenkjer Energy's commitment to renewable energy, following their successful establishment of an operational solar plant on an adjacent site.

The proposed plant will feature advanced inverters/transformers that convert direct current from the PV panels into alternating current, stepping up the voltage for efficient transmission. These inverters, each capable of a peak output of 630 kW, will be housed in prefabricated concrete containers approximately 7 m x 3 m x 3.5 m in size. Underground cabling will link these units to a newly constructed grid connection substation, which will host essential medium voltage circuit breakers and 66/22 kV power transformers to manage and dispatch the generated electricity.

The Proponent requested Geo Pollution Technologies (Pty) Ltd (GPT), as an independent environmental consultant, to apply for an environmental clearance certificate (ECC) for the construction and operation of the proposed solar plant. As such, and in line with the current requirements of the Ministry of Environment, Forestry and Tourism (MEFT), an environmental assessment (EA) and environmental management plan (EMP) are proposed to be prepared for submission to the MEFT. The EA and EMP will be prepared in line with the Environmental Management Act No. 7 of 2007 (EMA) and its regulations as published in 2012.

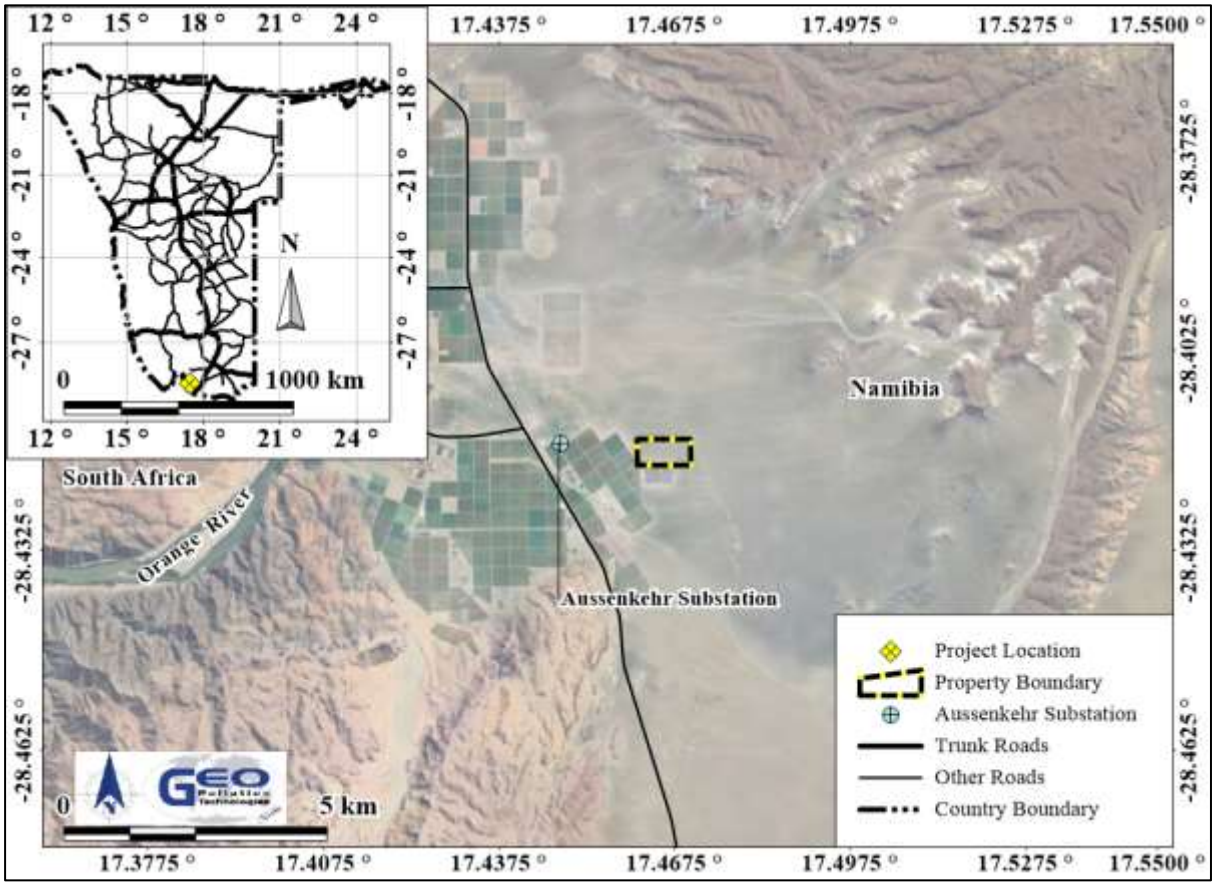

Figure 1-1 Project Location

A detailed project description is provided in Section 3. The potential impacts of the project on the environment, resulting from the construction, operation and related activities, as well as possible decommissioning activities, were determined through the risk assessment as presented in this report.

The environment being defined in the Environmental Management Act as "land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values". The environmental assessment was conducted to apply for an environmental clearance certificate in compliance with Namibia's Environmental Management Act (Act No 7 of 2007).

Project Justification – The collective initiative in Aussenkehr, that is, the production of table grapes and dates for export purposes, generate a variety of social spin-offs. However, one has to understand how Aussenkehr has been structured and how it is functioning. The greater farm Aussenkjer FMV/00147 is privately owned. Properties located further away from the river have been developed and earmarked for planned solar plants. The aim thereof to supplement the electricity supply required for use by the commercial farmers. Significant electricity is required for the extensive irrigation conducted in the valley. The areas have, since its initial establishment, seen an exponential growth in the agricultural sector which is solely reliant on the Orange River for all water requirements. All operators pump water from the Orange River to irrigate their crops. Electricity required for pumping, was in the past, only provided by NamPower. The demand grew in such measures that NamPower erected a new substation and constructed a new power line to the area. Local operators also invested in small scale solar panels to help alleviate the demand on the national power utility. The construction of a new dedicated solar plant, will assist in meeting the electricity demand in the area, while providing additional electricity for the National electricity grid. It is against this back-drop that the Proponent has endeavoured to develop the additional solar plant.

2 SCOPE

The scope of this report is to, in compliance with the requirements of EMA:

1. Present a detailed project and environmental description related to the Proponent's activities.
2. Determine the potential environmental impacts emanating from the Proponent's activities and potential future decommissioning of such activities.
3. Identify a range of management actions to mitigate the potential adverse impacts to acceptable levels.
4. Provide sufficient information to the relevant competent authority and the MEFT to make an informed decision regarding the project and the issuing of an environmental clearance certificate.

3 ASSUMPTIONS AND LIMITATIONS

Assumptions and limitations which are pertinent to this environmental assessment include the following:

- No expansion beyond the indicated areas are proposed for future development.
- National demographic data for the area may be outdated since the recent census data has not been released at the time of the compilation of the report.
- Data presented by the Proponent is true and correct for the time-period of this assessment.
- Technical details regarding the upgrading of the existing transmission line (between the existing solar plant and the NamPower Aussenkehr Substation), including the related effects such as crossing of the NamPower 66 kV transmission line, needs to be confirmed with NamPower.

4 METHODOLOGY

Methods employed to investigate and report on potential impacts of the Proponent's activities on the social and natural environment include:

1. Detailed infrastructure and operational procedures received from the client are presented in this report.
2. Baseline information about the site and its surroundings was obtained from primary information, existing secondary information as well as from a reconnaissance site visit.
3. As part of the scoping process to determine potential environmental impacts, interested and affected parties (IAPs) were consulted about their views, comments and opinions, all of which are presented in this report.
4. As per the findings of this environmental assessment, a scoping report with an EMP were prepared and this will be submitted to the MEFT.

5 PROJECT DEVELOPMENT AND RELATED ACTIVITIES

Before any construction activities may commence, proper planning of such activities are required, inclusive of various approvals and negotiations. This assessment document forms only part of the planning phase, although, in its efforts to guide sustainable use of the environment, incorporates various aspect of the planning phase such are governmental negotiations etc. Although no details will be included in the report, it is pertinent to mention that the following activities have been conducted as part of the planning phase:

- Land acquisition rights;
- Land subdivision;
- Negotiations with the adjacent landowners;
- Negotiations with NamPower regarding provision of renewable energy use;
- Engineering planning with regards to site access, layout and service provision.

For the 20 MW photovoltaic plant to be developed by Aussenkjer Energy Investments, a detailed technical setup is envisaged. The plant will comprise a significant number of solar modules, specifically designed to maximise energy capture and efficiency across the site. These modules will be installed with fixed mounting systems, indicating a non-tracking configuration, which simplifies maintenance and reduces mechanical complexity. The spacing between the modules will be strategically determined to prevent shading and ensure optimal sun exposure throughout the day.

Additionally, the project will not include on-site storage of electricity; instead, the generated power will be directly transmitted to the national grid via the Aussenkehr Substation. The Proponent was informed by NamPower that the Aussenkehr Substation has sufficient capacity to accommodate the proposed connection. This decision streamlines the initial infrastructure requirements and focuses on efficient energy production and immediate distribution. This setup aligns with standard practices for utility-scale solar projects where immediate grid integration is prioritised over storage solutions, especially in initial phases or where grid stability and capacity are adequate to handle intermittent renewable inputs.

5.1 SITE PREPARATION AND CONSTRUCTION

Prior to construction of the solar plant, the site would need to be prepared. The site is generally sloping from east to west with an approximate 3.5% slope gradient. Therefore, site preparation activities would include the following activities:

- Vegetation and boulder clearance – removal of very sparse vegetation and or large boulders / hard rock formations – including related earth works;
- Levelling and grading of areas where the array will be sited to remove slopes and undulations;
- Levelling of hard-standing areas e.g. for temporary laydown and storage areas;
- Erection of site fencing;
- Construction of temporary construction camp; and
- Upgrading of farm tracks / construction of on-site access roads.

Once the site has been prepared, prior to the installation of the PV modules, the following construction activities will take place:

- Installation of fixed aluminium structures to support the PV modules;
- Construction of the new grid connection substation;
- Construction of electrical and control room;
- Construction of site office and storage facilities, including security and ablution facilities and associated septic tanks; (please note that ablution facilities will only be required should there not be an agreement reached between an adjacent landowner which has an established toilet and septic system adjacent to the site);
- Construction of array enclosure and inverter/transformer foundations and housing; and
- Installation of transmission lines to the Aussenkehr Substation.

The exact size of each phase will be dependent on the various consents and authorisations to be obtained for the project, as well as the interconnecting technical constraints to be discussed and agreed with NamPower in the connection agreement.

During the site preparation period, the workforce required for site security, manual labour, civil works, transportation of goods and other similar services, will most likely be drawn from the local labour pool. During the first phase of construction, a highly-skilled team of solar energy technicians will train a number of potential employees, preferably from the area where available. The construction period is expected to last for approximately four months. A total of 50 people are expected to be employed during the construction phase.

Figure 5-1 Typical design of a photovoltaic power plant

The following sections provide an outline of the construction and functioning of the proposed solar plant as provided by the Proponent. The project is designed to deliver a total of 20 MWAC (Megawatt Alternating Current) into the national grid. The key components of the proposed solar plant, detailed further below, include solar panels arranged in fixed configurations to maximize efficiency, and advanced inverter/transformer that convert and step up the generated power for grid integration.

Solar energy systems generate power by converting solar radiation into electricity or heat. Photovoltaic plants utilize PV panels made up of modules, which in turn consist of numerous individual PV cells. These cells absorb solar energy, exciting electrons within the cells and

creating electrical energy. The panels are assembled in rows to form PV arrays, which produce electricity in direct current form. To integrate this electricity into the NamPower grid, it must be converted from DC to AC using an inverter.

PV cells are typically made from polycrystalline silicon. They are interconnected behind a protective glass sheet and function collectively as a single PV panel. In summary, the core components of PV technology include:

- **PV cell:** A basic photovoltaic device, which generates electricity when exposed to solar radiation. All photovoltaic cells produce direct current.
- **PV module or panel**: The smallest complete assembly of interconnected photovoltaic cells. In the case of crystalline silicon cells - following testing and sorting to match the current and voltage, the cells are interconnected and encapsulated between a transparent front (usually glass) and a backing material. The module is then typically mounted in an aluminium frame.
- **Photovoltaic array:** A mechanically integrated assembly of modules and panels together with support structure to form a direct current power producing unit. The proposed solar energy facility would consist of antireflective modules arranged in numerous arrays.
- **Inverters:** Since PV arrays produce direct current (DC) electricity, inverters are used to convert this into alternating current (AC), which is the type of electricity used by most home appliances and the grid.

5.1.1 PV Arrays and Mountings

The proposed development will include PV solar panels that will occupy 30 ha of the 50 ha site. The PV panels will each produce an output of 315 W and be mounted on aluminium fixed frame or single axis tracking structures, approximately 4 m in height from the ground. These structures will be mounted on steel screw piles or concrete foundations 1,500 mm deep, depending on soil conditions, while the distance or spacing between rows will be approximately 6.2 m. Photo 5-1 and Photo 5-2 depicts a typical array of PV panels.

Photo 5-1 Typical anodized aluminium frame

Photo 5-2 Typical PV array

5.1.2 Electrical Connections and Control

The PV panel arrays will be connected via underground cables (800 mm depth) to array junction box (see photos below). Array junction boxes combine the power generated by many PV panels and transmit that power via two underground DC cables to an inverter/transformer. The array junction box s will be mounted underneath the solar module mounting structures and will occupy an area of approximately 1 m^2.

Photo 5-3 Typical array junction box

Photo 5-4 Typical array junction box

The inverter/transformer enclosures at the PV plant contains inverters that convert the direct current generated by the solar panels into alternating current. The enclosures also house transformers that step up the low voltage AC output (350 V) from the inverters to medium voltage AC (22 kV). Each central inverter has a rated peak output of 630 kW. Two of these central inverters, along with a low voltage to medium voltage AC step-up transformer, are housed within a prefabricated concrete container measuring approximately 7 m x 3 m x 3.5 m.

The inverter/transformer enclosures are connected via underground cabling, buried at a depth of 800 mm, to a newly constructed grid connection substation. This substation, covering an area of about 2,500 m^2, is constructed from brick and designed to combine the power output from each transformer. The substation will feature two 20 MW power transformers for managing the higher power output necessary for this plant's capacity. All associated protection equipment, including circuit breakers, will be installed in the substation yard, which is built according to NamPower's specifications, ensuring compliance with national standards for safety and performance.

5.1.3 Grid Connection

The 66 kV power from the new grid connection substation will be connected to the existing Aussenkehr Substation west of the site. Transmission to the grid will see the utilisation and upgrading of the existing transmission line to the Aussenkehr Substation. The line, as constructed for the existing adjacent solar plant, will be upgraded to accommodate the additional capacity as required by this proposed plant.

The transmission line to be upgraded, follows a designated route that minimizes environmental impact and adheres to local planning regulations. However, since it will be upgraded to a higher order line, the servitude of the line will have to be increased. Approval regarding this matter will have to be sought from NamPower, prior to the construction of the plant. Similarly NamPower will have to approve any crossing of the proposed upgraded line with the existing 66 kV transmission line.

Photo 5-5 Aussenkehr Substation

Photo 5-6 Existing power line to be upgraded

The responsibility for upgrading this transmission line falls to the Proponent of the project. They will oversee the upgrading, and commissioning of the line, ensuring compliance with all relevant national standards and environmental guidelines. This approach ensures a streamlined process from generation to distribution, enhancing the efficiency of the power delivery system and supporting the region's energy demands sustainably.

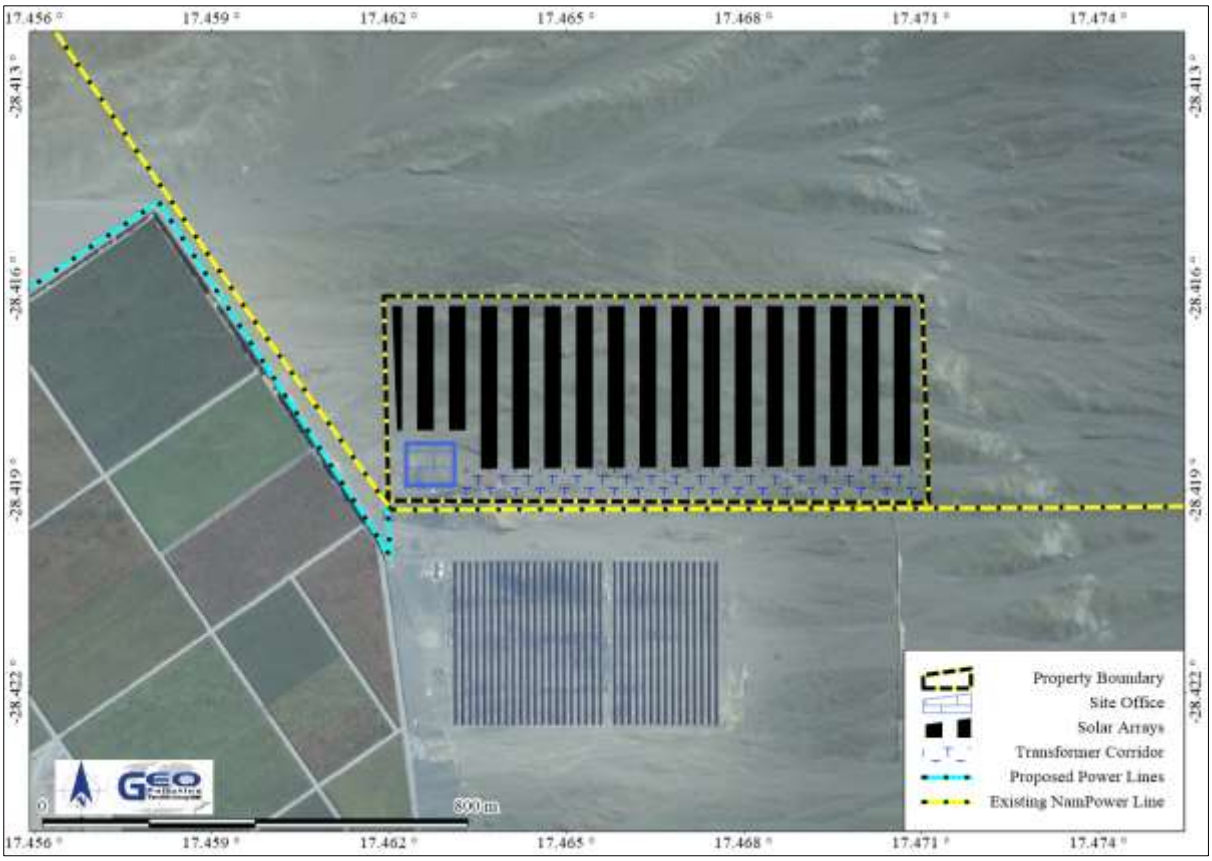

Figure 5-2 Proposed location of the site (Alternative 2) and related power line

5.1.4 Auxiliary Electrical Equipment

The following additional electrical equipment will be required for the project:

- Diesel generator sets will supply power to security and monitoring systems in the event of a grid failure,
- Security system, fence and access control,
- Fire detection system,
- Weather monitoring equipment (rainfall, wind speed/direction, solar irradiation, air moisture),
- Plant monitoring equipment and associated telecommunication links, and
- Air-conditioning equipment inside inverter/transformer enclosures which will regulate the operating temperature of the inverters.

5.1.5 Additional Infrastructure and Requirements

Additional infrastructure that will be required for the project includes the following:

- site perimeter fencing (electrical, palisade fencing of approximately 2.8 m in height) including access gates,
- lighting (the main entrance only),
- small office (security and administration),
- an office for the caretaker of the site,

- 2 cloakrooms,
- 2 chemical toilets,
- a lay-down area for the temporary storage of materials during the construction activities (Approximately 4,800 m² within the footprint area of the site as demarcated).

Should rock or soil material be required for the construction of project infrastructure, this material will be sourced from an existing borrow pit in close proximity to the site, should the material be suitable. If not proven suitable, aggregate and sand required for the construction phase will be sourced from commercially licensed vendors or as per agreement with the current land owner, on condition that all required permits for sand mining has been obtained by him.

5.1.6 Water Requirements

During the construction phase the primary water use requirement will be for dust control. However, water may also be required to moisture condition the soils for proper compaction at foundations. Water from the Orange River (subject to appropriate permissions, current abstraction limits and water quality as indicated in the land owner's water use license) will be used.

Construction Phase

- Concrete foundations: 575,586 litres (209 litres/m^3 x 2754 m^3 in total)
- Dust control and compaction: 4,800,000 litres (average of 3 truckloads / day @ 20,000 litres/truck for first 60 days and 1 truckload/day for next 60 days)
- Total water requirement for the construction phase of the project = 20,000 m^3 with a peak daily usage of 60,000 litres/day.

It is estimated that the washing of the panels at the facility will require approximately 10,000 litres/MW/year. It is the intention of the project applicant to source the required amounts of water from the current landowner as per their exiting water permit.

Maintenance will consist mostly of panel replacement and other mechanical and electrical infrastructure repairs. The solar panels would be cleaned manually with a window washer type device (covered with a specialized cloth material), soft brush, window squeegee or soft cloth.

5.1.7 Waste Management

All project generated waste will need to be managed and disposed of in a manner to prevent potential impacts on the environment and risks to human health. A waste management plan (WMP) for the proposed project will be developed. This will follow the principles of waste minimisation at source, segregation for reuse, recycling, treatment or disposal.

All wastes produced from the project activities on site will be temporary stored in designated waste storage areas. Waste streams will be generated from logistical activities associated with project activities and accommodated personnel.

It is recommended that all concrete mixing be undertaken on impermeable plastic lining to prevent contamination of the soils and surrounding areas. Construction solid waste management will incorporate reduction, recycling and re-use principles. The contractor shall remove refuse collected from the working areas at the site at least once a week. Furthermore, all builders' rubble generated during the construction phase shall be removed from the site regularly to a licensed landfill site.

All wastes generated from the project will be categorised as either non-hazardous or hazardous following an assessment of the hazard potentials of the material in line with Namibian requirements. The main sources of waste will result from the temporary construction camp

and construction and decommissioning activities. These wastes will be produced daily and comprise of the following:

- Domestic type waste:
  - residual packaging and food wastes
  - metal cans (from food and drinks)
  - plastics drinks bottles
  - glass jars and bottles
- Wooden pallets and cartons
- Paper and cardboard

The following hazardous wastes could also be produced from construction activities.

- Oily rags and absorbents
- Used oil and oil filters - from generators or vehicle maintenance
- Contaminated water – such as oily water from drip trays
- Sewage
- Possible – broken panels

There will be no medical waste as any incidents will be referred to the local clinic in either Aussenkehr or Noordoewer.

5.2 OPERATIONAL PHASE

Once the construction phase has been completed, the plant will be commissioned to have an expected lifespan of at least 25 years. Measuring the performance of the solar power plant will be done remotely, through the use of a monitoring system. Day to day facility operations will involve both regular on site preventive and corrective maintenance tasks in order to keep the solar power plant in optimal working order throughout the operational period. Intermittent cleaning of the panels will be carried out as necessary which is anticipated to be once or twice a year. A total of 12 people are expected to be employed during the operational phase which is expected to have a lifetime of approximately 20 to 30 years. All employees will stay off-site.

5.3 DECOMMISSIONING PHASE

The solar power plant will after 20-30 years be decommissioned, alternatively upgraded or an application submitted to obtain a new license. Should the solar plant be decommissioned, the site will be rehabilitated to its original state:

- PV panels will be removed from the fixed aluminium frames;
- Fixed aluminium frame structures will be removed;
- PV panels will be transported to special recycling facilities (alternatively used at other operational sites);
- Electrical equipment (transformers) will either be re-used on other developments/projects, or sold;
- Underground cable runs (where applicable) will be removed;
- Gravel/chipstone on the access roads, onsite service roads, guardhouse foundations will be removed;
- Buildings, such as the guardhouse can be taken over by the landowner for operational purposes, alternately all the reusable material can be removed, the shells demolished and the rubble transported to a municipal waste site;
- Disturbed land areas will be rehabilitated, and replanted with indigenous vegetation if required;
- All transmission lines to the substation will be removed.

6 ALTERNATIVES

Alternatives as referred to within the EMA and its regulations, require any proposed development to consider various alternatives proposed within a project framework, to ensure the most suited and environmentally sustainable options. For the purposes of this assessment, it should be noted that the proposed site had been chosen due to a combination of the substation availability and proximity to the substation within the existing, surrounding planned and current land use. Surrounding land use includes existing and planned solar systems and agriculture.

Various alternatives related to the project are considered and each of these alternatives is discussed. The alternatives can roughly be grouped into three main groups namely:

- Location alternatives;
- Technical and service alternatives;
- No go alternative.

6.1 LOCATION ALTERNATIVES

Site alternatives can be considered for two aspects of the project. The first relates to the actual site location and the latter relates to options for the power line alignment.

6.1.1 Site Location Alternative

The Proponent has been allocated the property in question mainly due to the existing and planned photovoltaic installations around it. The land south and north of the property has existing plants or have been allocated for the development of additional solar plants. All other areas in Aussenkehr, which have a suitable topography, is being, or has already been developed. Therefore the site location alternatives are deviations of each other. The first alternative to the proposed site, Alternative 1, is depicted in Figure 6-1. To achieve the optimal distance to the Aussenkehr Substation, the boundaries of this alternatives are located close to an existing solar plant (located south of the site) and incorporated the 66 kV NamPower transmission line and related servitude. The two main advantages of this location are a flatter slope and the proximity to the Aussenkehr Substation. However, a portion of the site will not be used, due to the presence of the 66 kV transmission power line and related servitude. Construction related earthworks will be in close proximity to existing plantations and solar plant.

During the project feasibility phase, this first alternative sees the fencing of areas that are not viable for this development i.e. the servitude of the existing 66 kV transmission line. Therefore the site will be divided by the 66 kV power line and it servitude and will thus only have a narrow corridor available for development, between the 66 kV transmission line and the southern existing solar plant.

A second alternative was suggested to exclude the entire 66 kV transmission line and related servitude, as well as the remaining narrow corridor from the site. This second alternative, Alternative 2, reduces the size of the site from 50 ha to approximately 30 ha, which is still viable to accommodate the 20 MW plant. An additional advantage relating to the second alternative, is the creation of a wildlife corridor between the existing and the proposed solar plants. The unfenced areas will allow for an access way for wildlife between the conservation areas (east of the site) and the Orange River (west of the site).

Figure 6-1 Site location alternative 1

Figure 6-2 Site location alternative 2

6.1.2 Power Line Route Alternatives

Once the most suited site option was determined, possible power line alignments could be considered. Two power line route alternative alignments were developed during the planning phase of the project. As part of determining the most suited power line route, biophysical, economic and social attributes of the area were considered. In particular, the existing power lines and substation location (and related connection requirements) were of key concern. Technical aspects and possibilities were informed by NamPower and specialised engineering consultants. Additional consideration was given to existing land uses such as agriculture activities and infrastructure which may play a role in the route alignment. Consideration were also given to proposed surrounding land use (the proposed construction of other solar plants adjacent to the site), and serviceability of the power line. The two possible routes considered for the power line, in relation to the existing power lines and substation in the area, are presented in Figure 6-3. Option 1, would see the use of an existing power line, which is used by the existing solar plant, south of the site. The line will be upgraded to accommodate the 20MW plant's requirement in addition to its existing capacity.

Option 2, proposes a new line to be built to extend from the north-western corner of the site towards the existing power line, from there it could either follow the alignment of the existing power line, or tie into the line which would need to be upgraded to accommodate the additional load.

Option 1 is preferred due to technical and biophysical considerations. Making use of an existing line will negate the requirement of an additional grid connection with the Aussenkehr Substation. The substation's surrounding land-use poses some challenges in relation to access to the substation as existing vineyards, predating the establishment of the substation, are located south-east, south and south-west of the site. Utilising and existing grid connection, is a significant advantage to the alternative of adding another connection to the substation. Furthermore, Option 1 will also negate the creation of another power line, as per the requirement of Option 2, therefore additional impacts related to the creation on another line, are avoided. Such impacts include bird strikes, habitat loss etc.

Figure 6-3 Alternative power line options

6.2 TECHNICAL AND SERVICES ALTERNATIVES

The type of technology to be used for the plant is well known and established in the industry. The photovoltaic panels are available and easily repairable in Namibia. Due to its proven track record, no alternative was considered. However, some deliberation may still be had relating to the power line pole structures to be employed as part of the project.

6.2.1 Power line Pole Structure

Two main power line pole design options are available to the Proponent for the construction of the proposed 66 kV power line. The main differences relating to the pole material either being steel or wooden. Steel structures need to be permanently earthed (via and optical ground wire) while wooden structures are earthed by means of a galvanised wire running vertically from the ground to the top of the pole, as required. An advantage comparison relating to both types of structures are presented in Table 6-2.

Table 6-1 Transmission line pole design (Power Line Design - Trans-Africa Projects (taprojects.co.za)

Aspect	Advantage	Disadvantage
Wooden Pole Structure	Relatively lightweight. Cost-effective. Readily available.	Require regular maintenance due to susceptibility to rot, termites, and weathering. The risk of fire.
Steel Pole Structure	Exceptional strength and stability. Resistant to corrosion and can handle heavy loads. Modular design allows for easy assembly and disassembly.	Costly Additional earth wiring required

There are no major flaws for either of the structures in considering conditions of the environment for this project. Neither will any of the options result in a significantly greater impact, such as on birds. Therefore, both options remain viable. The final decision regarding the power line pole design and structure, may further be informed by the requirements of NamPower.

6.2.2 Services Alternatives

Alternatives to internal services were considered by the Proponent. For some instances, such as with sewerage infrastructure (during the operational phase), the alternatives are largely determined on a micro scale. However, the provision of water is not only required for the security on site, but also for maintenance of the panels. Washing of the panels are proposed bi-annually, as a rule, unless otherwise required.

Table 6-2 Construction phase alternatives considered

Service	Proposed	Alternative
Water supply	Tanked water for domestic and construction purposes.	No boreholes available for groundwater abstraction. There is also no NamWater connection in close proximity to the site.
Worker's accommodation	Off-site (from Aussenkehr and within walking distance from the site).	Complete temporary residential units (ablution, recreation and cooking amenities included).
Sewerage	Chemical toilet. Recommended as it is easily transportable and have no direct impact on the environment and ecology (if properly disposed).	Ventilated improved pit (VIP) latrine. Not proposed due to the geology and hard rock conditions of the site.

Service	Proposed	Alternative
Energy for cooking on site (only if accommodated on site)	Gas stoves.	Electric devices or generators.

Table 6-3 Operational phase alternatives considered

Service	Proposed	Alternative
Water supply (panel cleaning)	Tanked water trucks with mobile unit.	Piped water connection from the NamWater line.
Waste management	Weekly removal of all domestic and general waste by the Proponent or contracted party and disposal thereof to a registered and dedicated landfill site.	None. Not removing general waste should not be an alternative.
Energy for lightning and heating	Electrical power connected to the national grid is preferred for firm power supply.	Individual solar systems (i.e. solar geysers and installed solar panels). This alternative was incorporated into the design.

6.3 THE NO-GO ALTERNATIVE

The "No-Go" alternative is the option of not proceeding with the project and it typically means that the current status quo of the site and surrounds will remain. Should the proposed development not commence, none of the potential impacts (positive and negative) identified would occur. Finally, revenue generated for Namibia will be reduced. The biophysical attributes of the area allow for limited alternative uses. Not continuing with the project may see the land utilised for significantly less profitable operations such as informal settlement proliferation and waste accumulation area (from the informal settlement area).

7 ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans and programmes deemed to have adverse impacts on the environment require an ECC. Namibian legislation lists specific activities which are required to apply for an ECC. The proposed development falls within the ambit of these activities, as per Section 3 of Government Gazette No 4878. Listed activities which require an ECC application (Government Regulation No 29 of 2012) related to this project are listed below. Note that even though they are listed below, only those pertaining to the actual solar plant will be assessed in this report.

Section 1: Energy Generation, Transmission and Storage Activities

- 1(a) The construction of facilities for the generation of electricity. The Proponent proposes to establish and operate a 20 MW photovoltaic (PV) plant.
- 1(b) The construction of facilities for the transmission and supply of electricity. The Proponent proposes to establish and operate a 20 MW photovoltaic (PV) plant and feed the electricity into the NamPower grid via a 66 kV line.

The legislation and standards provided in Table 7-1 to Table 7-3 speak to the environmental assessment process in Namibia, and are relevant to this assessment.

Table 7-1 Namibian law applicable to the proposed solar plant

Law	Key Aspects
The Namibian Constitution	• Promote the welfare of people • Incorporates a high level of environmental protection • Incorporates international agreements as part of Namibian law

Law	Key Aspects
Environmental Management Act Act No. 7 of 2007, Government Notice No. 232 of 2007	♦ Defines the environment ♦ Promotes sustainable management of the environment and the use of natural resources ♦ Provides a process of assessment and control of activities with possible significant effects on the environment
Environmental Management Act Regulations Government Notice No. 28-30 of 2012	♦ Commencement of the Environmental Management Act ♦ Lists activities that requires an environmental clearance certificate ♦ Provides Environmental Impact Assessment Regulations
Electricity Act 4 of 2007 Act No. 4 of 2007 Government Notice No. 187 of 2007	♦ Provides for the requirements and conditions for obtaining licences for the provision of electricity.
Atomic Energy and Radiation Protection Act 5 of 2005 Non-Ionising Radiation Regulations Government Notice 126 of 2020 (GG 7228)	♦ Provides for protection of the environment of the people in current and future generations against harmful effects of radiation, by controlling radiation sources and nuclear materials ♦ Provide standards for mom-ionising radiation
Water Resources Management Act of 2013 Act No. 11 of 2013, Government Notice No. 332 of 2013	♦ Provides for management, protection, development, use and conservation of water resources ♦ Prevention of water pollution and assignment of liability
Forest Regulations: Forest Act, 2001 Government Notice No. 170 of 2015	♦ Declares protected trees or plants ♦ Issuing of permits to remove protected tree and plant species
Soil Conservation Act Act No. 76 of 1969, Government Notice No. 995 of 1969 (Republic of South Africa)	♦ Law relating to the combating and prevention of soil erosion, the conservation, improvement and manner of use of the soil and vegetation and the protection of the water sources in Namibia
Mountain Catchment Areas Act Act No. 63 of 1970, Government Notice No. 1683 of 1970 (Republic of South Africa)	♦ To provide for the conservation, use, management and control of land situated in mountain catchment areas, and to provide for matters incidental thereto
Petroleum Products and Energy Act Act No. 13 of 1990, Government Notice No. 45 of 1990	♦ Regulates petroleum industry ♦ Makes provision for impact assessment ♦ Petroleum Products Regulations (Government Notice No. 155 of 2000) ♦ Prescribes South African National Standards (SANS) or equivalents for construction, operation and decommissioning of petroleum facilities (refer to Government Notice No. 21 of 2002)
Public and Environmental Health Act Act No. 1 of 2015, Government Notice No. 86 of 2015	♦ Provides a framework for a structured more uniform public and environmental health system, and for incidental matters ♦ Deals with Integrated waste management including waste collection disposal and recycling, waste generation and storage, and sanitation

Law	Key Aspects
Labour Act Act No 11 of 2007, Government Notice No. 236 of 2007	♦ Provides for Labour Law and the protection and safety of employees ♦ Labour Act, 1992: Regulations relating to the health and safety of employees at work (Government Notice No. 156 of 1997)
National Energy Policy 2017	♦ To initiate the timely development, provision and efficient use of all relevant energy resources necessary for the sustainable development of the country, and enhance access to, and the productive use of, energy to the benefit of the present and future generations of Namibians
National Renewable Energy Policy 2017	♦ To enhance the uptake and use of solar thermal technologies across the country.
National Policy for Independent Power Producers (IPPs) 2018	♦ Outlines the power market model, pricing regime, procurement approach, and requirements for IPPs to develop power generation projects. ♦ Establishes procurement approaches for small-scale renewable energy projects, medium-sized projects, and large projects.
Atmospheric Pollution Prevention Ordinance Ordinance No. 11 of 1976	♦ Governs the control of noxious or offensive gases ♦ Prohibits scheduled process without a registration certificate in a controlled area ♦ Requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process
Hazardous Substances Ordinance Ordinance No. 14 of 1974	♦ Applies to the manufacture, sale, use, disposal and dumping of hazardous substances as well as their import and export ♦ Aims to prevent hazardous substances from causing injury, ill-health or the death of human beings
Nature Conservation Ordinance 4 of 1975	♦ Regulate the hunting and protection of wild animals (including game birds), problem animals, fish, and the protection of indigenous plants.
Pollution Control and Waste Management Bill (draft document)	♦ Not in force yet ♦ Provides for prevention and control of pollution and waste ♦ Provides for procedures to be followed for licence applications
The Electricity Bill, (2017)	♦ Sees the introduction of the licensing for the storage of electricity; system operator; and market operator ♦ The main objective of energy policy is to provide "the security of all relevant energy supplies to the country; to create cost-effective, affordable, reliable and equitable access to energy for all Namibians; to promote the efficient use of all forms of energy; and to incentivise the discovery, development and productive use of the country's diverse energy resources ♦ Supports renewables expansion.

Table 7-2 Relevant multilateral environmental agreements

Agreement	Key Aspects
Stockholm Declaration on the Human Environment, Stockholm 1972.	♦ Recognizes the need for a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment
United Nations Framework Convention on Climate Change (UNFCCC)	♦ The Convention recognises that developing countries should be accorded appropriate assistance to enable them to fulfil the terms of the Convention
Convention on Biological Diversity, Rio de Janeiro, 1992	♦ Under article 14 of The Convention, EIAs must be conducted for projects that may negatively affect biological diversity

Table 7-3 Standards or codes of practise

Standard or Code	Key Aspects
South African National Standards (SANS)	♦ SANS 10131 (2004) is aimed at above-ground storage tanks for petroleum products ♦ Provide requirements for spill control infrastructure

7.1 ADDITIONAL NATIONAL PLANNING LEGISLATION

Additional national planning legislation considered include the 5th National Development Plan (NDP5); the National Climate Change Strategy and Action Plan (2013 – 2020) as well as the related policies.

The project ties in with NDP5 which purposes to set out a roadmap for achieving envisioned rapid industrialization while adhering to the four integrated pillars of sustainable development as identified in the plan. The proposed plant will contribute primarily to the "Economic Progression" pillar by contributing to the identified programme of Rural Infrastructure Development. One of the focus areas of the economic progression pillar of NDP5 is Rural development. The NDP5 aims to increase major infrastructure components, such electricity supply to rural areas as a key enabler to economic sustaining activities. The plans set our specific targets in order to construct energy plant in order to increase the production of energy in the country. One of the strategies identified aims to:

increase the number of independent power producers providing energy supply through renewable sources "and to "increase the renewable energy generation capacity".

During the development of the various National Development Pans and policies, strategies an actions plans are also formulated in order to achieve the targets as set out in the Development Plans. Therefore the project will not only be in line with the overall National Development Plan, but also the related action plans which could be related thereto, such as the National Energy Policy (2017) which state as a policy objective: *"To enhance the uptake and use of solar thermal technologies across the country."*. Namibia has also developed a National Renewable Energy Policy (2017) to underpin development of renewable resources.

In addition to the National Development Plans and related strategies, Namibia has also drafted a National Climate Strategy and Action Plan which needs to be dovetailed with the various development strategies. The cross cutting synergy relates to the use and development of the renewable energy sector. National climate change aspects are also reported on to the United Nations with the most recent report known as the Fourth National Communication to the United Nations Framework Convention on Climate Change March 2020; and Namibia's Updated Nationally Determined Contribution 2021. All of these documents refer to the development of the renewable energy sector.

7.2 INTERNATIONAL GUIDELINES

Apart from the national initiatives related to the renewable energy strategies, Namibia also subscribes to the Southern African Development Community SADC Climate Change Strategy and Action Plan of 2015 (Version 24 July 2015). Amongst others, the plan includes strategies to promote the development and use of renewable energies in the region. Its related action is to promote advocacy communication and information sharing on renewable energy technologies.

The proposed project will rely on international funding. Therefore, the Proponent would like to subscribe to international best precise relating to environmental consideration and mitigation measures to reduce impact on the environment. In many instances, Namibian legislature lacks specific, enforceable pollution parameters, for example relating to air quality or noise. In light of the lack of enforceable standards, projects may revert to the World Bank and International Finance Corporation's (IFC) Environmental, Health, and Safety Guidelines (known as the EHS guidelines). These guidelines are technical reference documents which may be considered by specific industries. The use of these guidelines are hinged on the condition that the guidelines be adapted to site specific variables, considering the sensitivity of the environment and project factors as indicated in the environmental assessment.

For the purposes of this project, reference is made to the various IFC guidelines as listed in Table 7-4. Recommendation and mitigation measures from these guidelines have been incorporated into the environmental management plan, Section 10.

Table 7-4 Relevant IFC Guidelines

Guideline	Key Aspects
Environmental, Health, and Safety (EHS) Guidelines **General EHS Guidelines: Environmental Wastewater And Ambient Water Quality**	♦ These guidelines are applicable to industrial discharges to sanitary sewers that discharge to the environment without any treatment. Process wastewater may include contaminated wastewater from utility operations, storm water, and sanitary sewage.
Environmental, Health, and Safety (EHS) Guidelines **General EHS Guidelines: Environmental Waste Management**	♦ Sets recommendations and standards for waste prevention, recycling, treatment, handling, storage and disposal. ♦ Allows for management measures for general and hazardous waste management.
IFC's EHS Guidelines: Water and Sanitation	♦ Sets recommendations and standards for water withdrawal, wastewater treatment, water discharge. ♦ Details performance indicators and industry benchmarks.
IFC's EHS for Electric Power Transmission and Distribution	♦ Provides impact management measures for power lines ♦ Provides monitoring guidelines and sets emissions and exposure limits.

8 ENVIRONMENTAL CHARACTERISTICS

This section lists the most pertinent environmental characteristics of the study area and provides a statement on the potential environmental impacts on each.

8.1 LOCALITY AND SURROUNDING LAND USE

Aussenkehr is located in the Karasburg-West constituency of the //Karas Region in Namibia. It is located on the banks of the Orange River which forms an international border with South Africa. The area is accessed by the C13 Route (D2012 District Road) from Noordoewer (a tar road). The entire settlement and all related agricultural activities are located on privately owned land on the Farm Aussenkjer FMV/00147. This farm has also been declared, in part, as a private nature reserve (private conservation area) by the owner of Aussenkjer Farm 147. The Ai-Ais

National Park is located approximately 18 km to the northeast of the greater Aussenkehr while the Richtersveld National Park of South Africa, is located adjacent (west) of Aussenkehr. These areas have together been classified as the Ai-Ais Richtersveld Transfrontier Park. Namibian protected areas in proximity to the site are indicated in Figure 8-1 as well as the location of the project within Aussenkehr (-28.411712°S 17.465240°E).

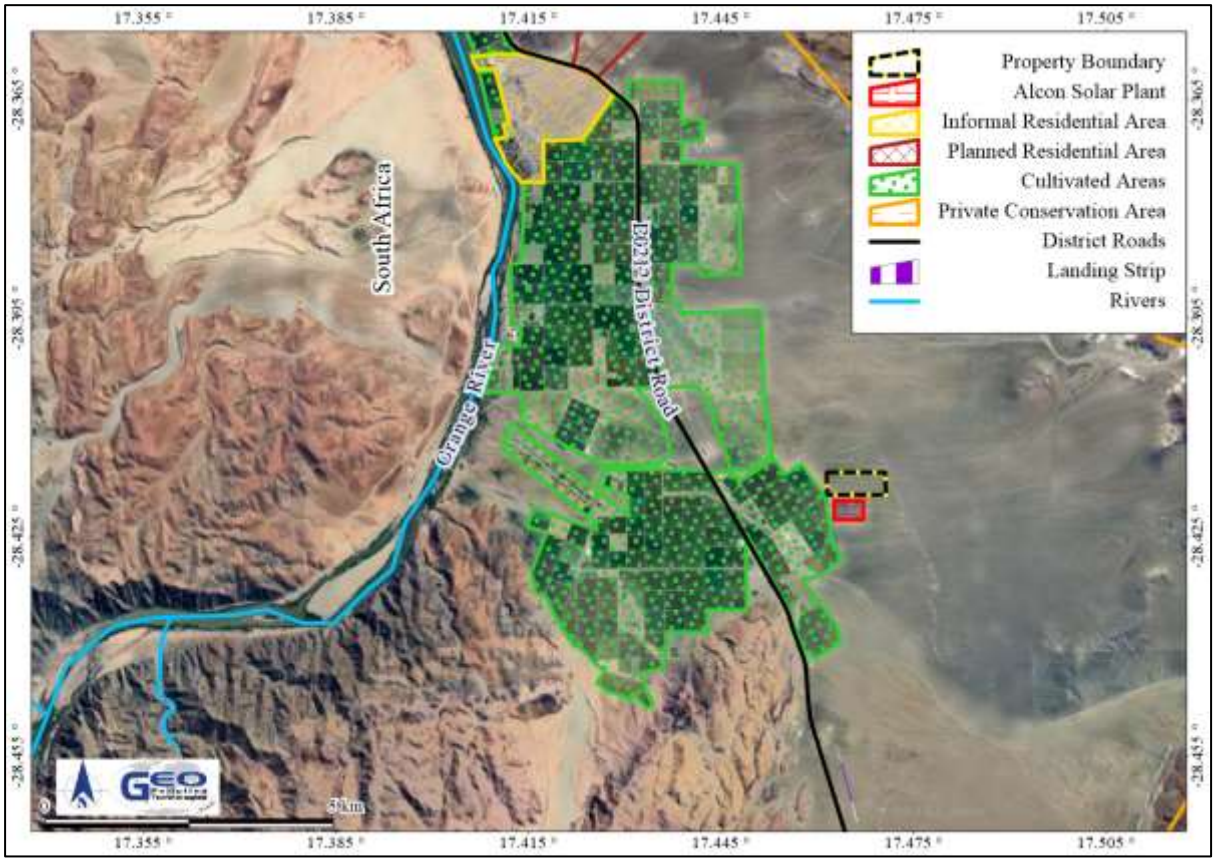

Figure 8-1 Surrounding land-use

The proposed solar plant will be located on the fringe of the agricultural development. Vineyards and date plantations are located west of the proposed solar plant (Figure 8-1), while the Aussenkehr commercial and residential areas are located north-west of the site. There are no mining claims or exclusive prospecting licenses registered across the property.

Photo 8-1 The existing solar plant and two existing power lines adjacent to the site

Photo 8-2 Agricultural areas located west of the site

Implications and Impacts

The proposed solar plant is ideally located adjacent to an existing solar plant and close to the NamPower Aussenkehr Substation. The erection of the proposed plant will result in a long-term change of land use. Operations thereof are not foreseen to detrimentally affect any of the sensitive conservation areas in the proximity and neither will there be a significant detrimental affect on the landscape character.

8.2 CLIMATE

Aussenkehr, located in the Orange River valley, is renowned for its extremely hot and dry summers and up to 12 hours daylight in the summer. On average, the area receives approximately 10 hours of daily sunlight per annum. Direct normal solar irradiance for the area is 8.035 kWh/m²/day. Although the average maximum temperature is approximately 30 ºC, extreme heat conditions occur in the summer months with some days peaking above 45 ºC. Temperatures of over 50 ºC have been recorded.

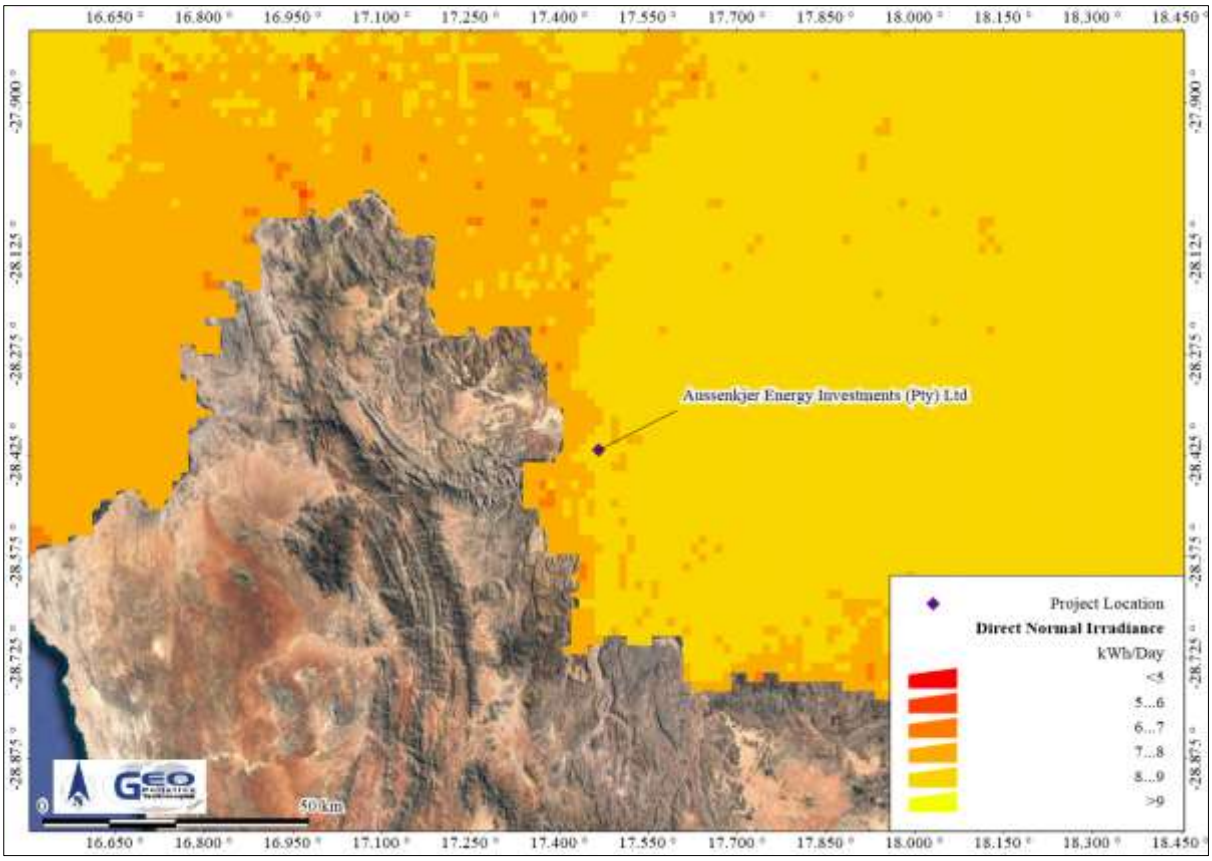

Figure 8-2 Direct normal irradiation for the project area

According to the Köppen-Geiger Climate Classification system the project is located in a hot desert climate (BWh) (http://koeppen-geiger.vu-wien.ac.at/present.htm). This means that the area receives precipitation well below potential evapotranspiration and no more than 200 mm of precipitation annually. The average rainfall varies from approximately 100 mm/a (at 20º east longitude) to less than 50 mm/a west of Aussenkehr. Evaporation decreases from 3,400 mm/a in the east (20º east longitude) to approximately 2,500 mm/a along the coast of the //Karas Region. At Aussenkehr, the potential evapotranspiration is approximately 2,600 – 2,700 mm/a. The common border (with South Africa) area falls in a region where evaporation losses are more than 30 times the average annual rainfall (IWRM Plan Joint Venture Namibia, 2010). By dividing the mean annual potential evapotranspiration into the mean annual precipitation, an aridity index value for the area was computed as 0.0, which indicates the area to be hyper arid.

Localised wind patterns are mostly influenced by uneven heating of the surrounding earth surface and topography, resulting in slight westerly winds during the year. Dust storms have been known to occur. Localised and less intense whirl winds, also known as dust devils, occur frequently in the area.

Table 8-1 Summary of climate data (Atlas of Namibia Project, 2002)

Average annual rainfall (mm/a)	0 - 50
Average annual evaporation (mm/a)	3,000 - 3,200
Water deficit (mm/a)	2,100 - 2,300
Average annual temperatures (°C)	17 - 18
Solar radiation kWh Per m2	5.6 – 5.8
Sunshine per day (hours/day)	9 - 10
Wind speed	Light to moderate breeze throughout the year
Localised wind direction	South-Westerly

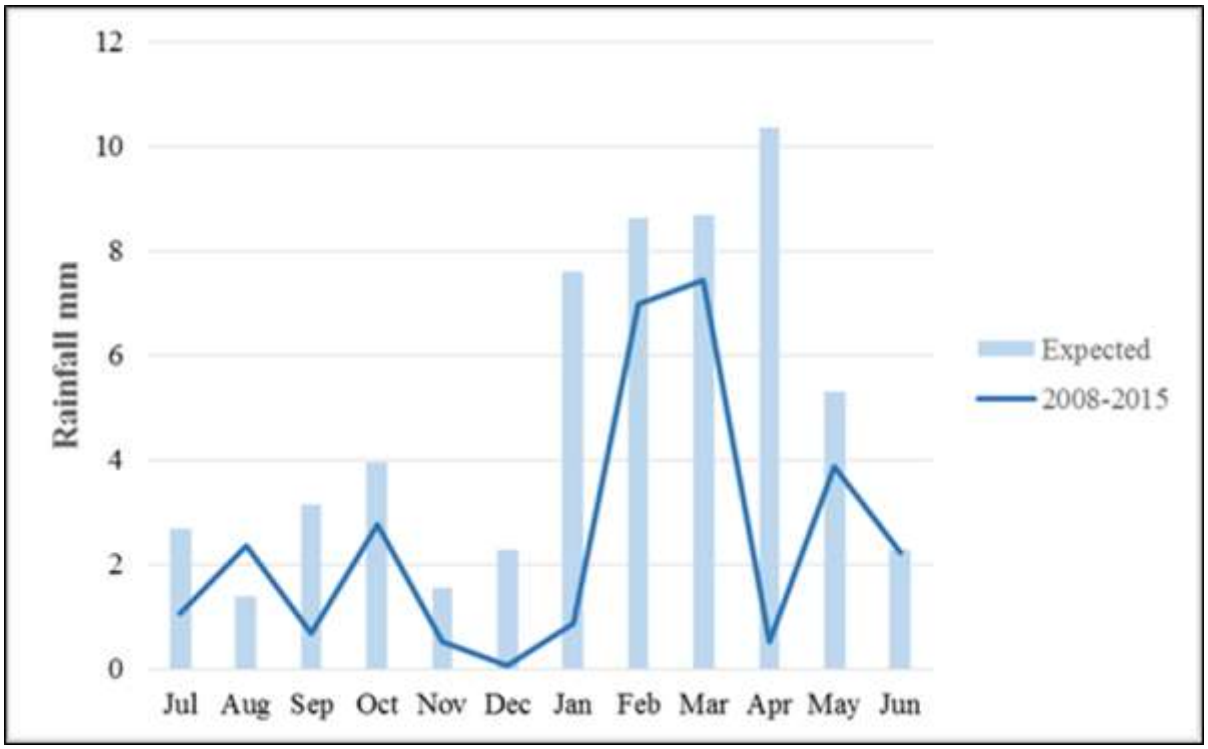

Figure 8-3 Average monthly rainfall: expected (Atlas of Namibia Project, 2002) vs recorded 2008-2015

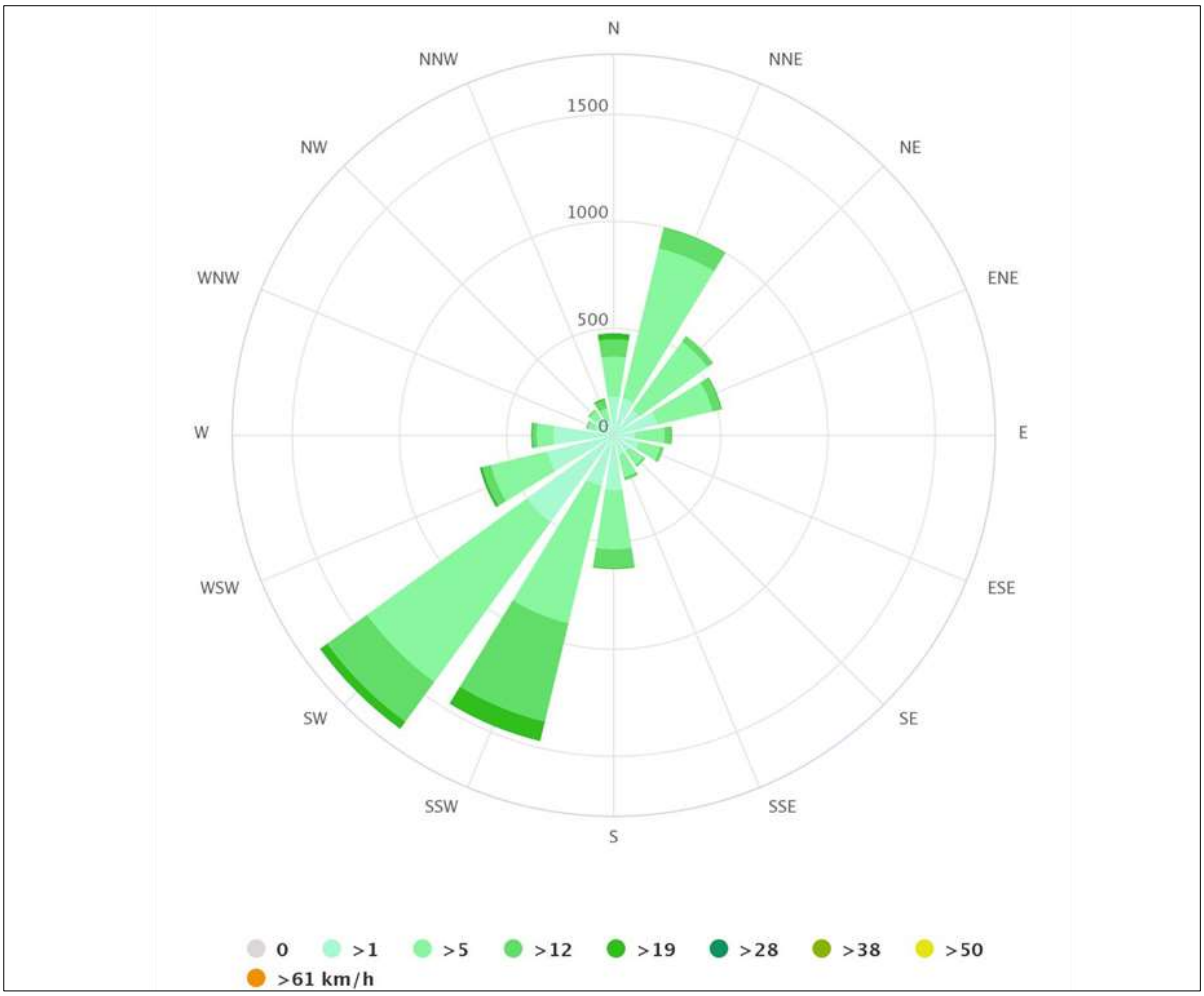

Figure 8-4 Modelled wind rose for Aussenkehr (Meteoblue, 2023)

Climate change is predicted to influence soil moisture levels in the areas negatively as these are predicted to decline further as temperatures rise and rain variability increases. According to studies compiled during the development of the //Karas Regional Structure Plan, it was determined that a drop of 10% in rainfall may be expected for the southern parts of the //Karas Region (including Aussenkehr) over the next 35 years and a further decrease in rainfall of up to 20% in another 30 years (by 2080) (Koch *et all*, 2011). This translates to an average rainfall of less than 35 mm/a. In addition, the higher evaporation losses may have detrimental effects on the Orange River. Climate change effects in the upper reaches of the Orange River may cause reduced runoff in lower lying areas, which may, even though the system is regulated, cause reductions in available water for all users. The situation may be remediated by the proposed construction of a dam in the lower reaches of the Orange River at Noordoewer, located upstream of Aussenkehr.

Implications and Impacts

High radiation and UV exposure levels coupled with very high summer temperatures, may result in heatstroke for construction workers. However, these condition are ideal for the operation of a solar plant. Hot, dry winds increases the risk to damages to infrastructure while dust devils are known to contaminate and litter plantations and the residential areas. Increased dust due to wind, may require shorter cleaning intervals (when the solar panels are cleaned during the operational phase).

8.3 TOPOGRAPHY AND DRAINAGE

The project falls within the Gamkab Basin, a landscape dominated by large, open valleys of gently south draining ground underlain with rocks of the Namaqua Metamorphic Complex and younger sediments and dolerites of the Karoo Supergroup. Located in one of the open valley system, Aussenkehr is surrounded by ridges. Figure 8-5 depicts the area's topography. Aussenkehr itself is generally flat, slightly sloping from east to west. The most eastern portions of the development area is located at the foothills of a ridge and has a slightly steeper slope with a variation of about 30 m between the eastern and western border of the site. The southern portion of the site therefore has an average slope gradient of 3.5%.

Localised drainage is well developed. All runoff flows towards the Orange River and mainly through the Inaub River. Numerous ephemeral streams cross the plain, draining into the Orange River along its southern boundary, where it drops into the rugged landscape of the Orange River. The localised catchment for the drainage lines across the site is indicated in Figure 8-5.

Flash floods are known to occur in the area and according to local knowledge has a frequency of every four to five years. These floods cause considerable damage to especially homesteads and livelihoods of the community members, many of which have constructed their dwellings in the drainage lines. Flash-floods are different from the flooding of the Orange River which occurs more frequently.

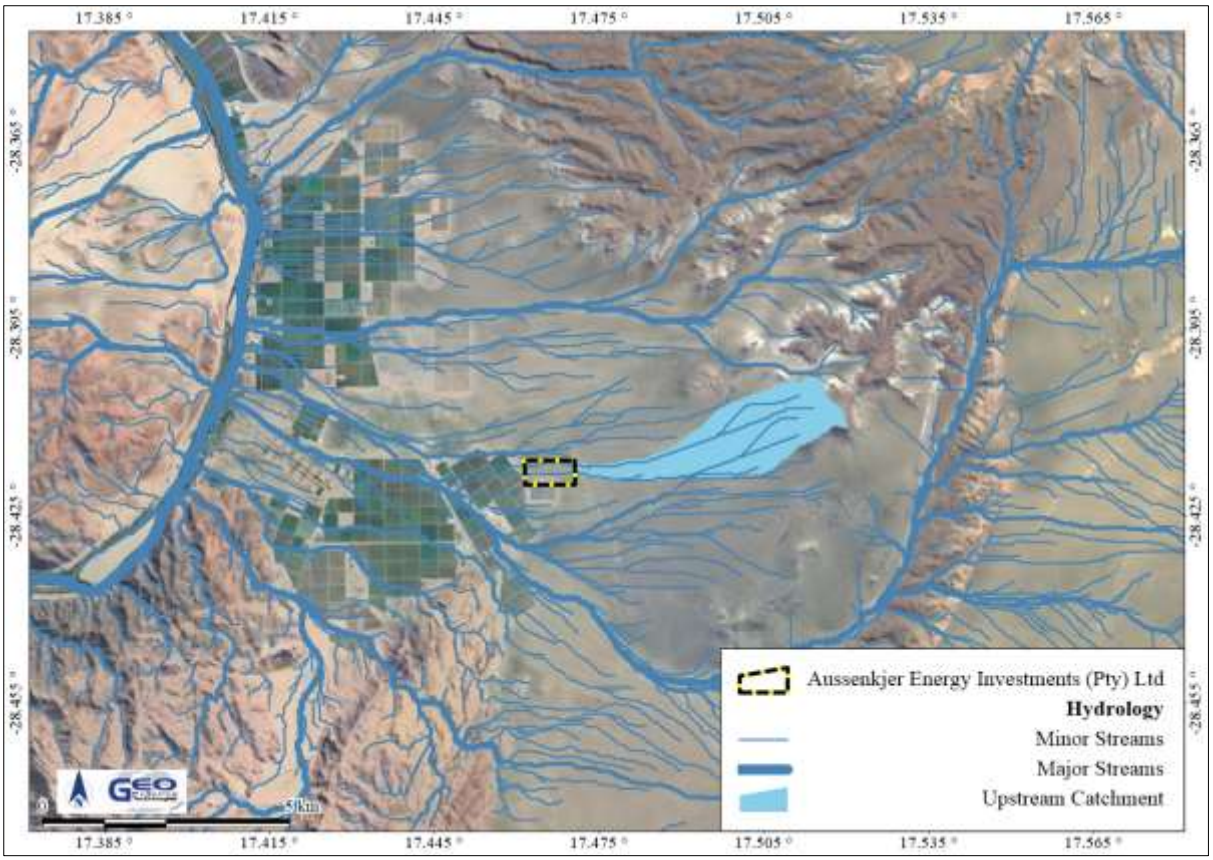

Figure 8-5 Drainage of the area in relation to the project location

Implications and Impacts

The gradient of the site will necessitate levelling through earthworks, prior to construction of the solar plant. The site is not located in a major drainage line and no additional significant precautions with regards to storm water management will be required.

The area could be adversely impacted in the short-term from erosion caused during construction of the plant, as well as by the construction of ancillary facilities such as transmission line to the existing substation.

8.4 SOIL

Dominant soil type for this area is Eutric Skeletic Lithic Leptosol which refers to a soil type with a stony characteristic or very shallow depth over a continuous rock surface. These soils are typically found in hills where erosion takes place at a higher rate than soil formation or sediment deposition. Due to this, and the fact that these soils form a thin layer with high drainage, leptosols are poor candidates for crop production. In addition to this, the leptosol of this particular area is known for: having, within 10 cm from the soil surface, continuous hard rock; having, to a depth of 100 cm from the soil surface, between 40 and 90% (by weight) gravel or other coarse fragments. The composition of soil in this particular area is roughly 75-80% sand, 10-15% silt and 20-25%, clay which gives it the characteristics and texture of loam soil. Bulk density was computed to be 1,450-1,500 mg/cm^3, which means that the soil will affect the root growth of various plants, but not necessarily restrict it. Soils in this area typically reach depths of 130-140 cm, have a pH of 7-7.5 and a cation exchange capacity of 13-16 cmol/kg.

Implications and Impacts

The presence of gypsum in the soil may impact on concrete structures and can cause increased corrosion. Clay content in certain soils may result in the soil densification with the administration of water.

8.5 GEOLOGY

The project area is mostly underlain by formations of the Dwyka and Ecca Group rocks of the Karoo Supergourp. The Ecca Group in the project area consist out of shale and siltstone of the Prince Albert Formation (Pa) and shale, sandstone and siltstone of the Aussenkehr Formation (Pa). The Ecca Group rocks are underlain by rocks of the Dwyka Group (CDW). The Dwyka Group rocks consist out of mudstone, sandstone erratics, lime concretions and siltstone. The sandstone is frequently ripple-marked and intensively traversed by invertebrate tracks, composed of drop stone-bearing shale, and intercalated layers of boulder-mudstone. Dolerite (Jd) occur as sills and dykes north and east of the site.

Outwash fans with dry braided drainage patterns, dating from the Quaternary, caused recurring erosion and deposition episodes to take place on the valley slopes along the Orange River valleys, especially in the Aussenkehr valley, partly covering the underlying rock formations. Tertiary aged river terraces along the Orange River may contain diamonds.

The surface cover present in the valley makes the identification of geological structures difficult. A number of faults can however be seen in the outcrops south of the project area and it is expected that these faults will continue through the project area. This can form preferential flow paths in underlying hard rock.

Groundwater information in the area is very limited as groundwater resources were not developed due to the Orange River supplying an easier resource. Flow in the subsurface soil will mainly be through primary porosity in the unconsolidated top layers and through secondary porosity in the

consolidated formations. It is conceptualised that the majority of flow will be towards the river in the unconsolidated layers.

Implications and Impacts

Although groundwater is not utilised in the area, it must still be protected against pollution. Polluted groundwater may transport pollutants to the nearby Orange River. Hard rock formations will necessitate earthworks during the construction period of the site.

8.6 AUSSENKEHR WATER SUPPLY

All water supply to Aussenkehr is pumped from the Orange River. Potable water, for households and general consumption, is, for some agricultural operations, fed from storage dams supplying households while other companies rely on the recently commissioned NamWater supply system.

NamWater was contracted for bulk water supply for the Aussenkehr area with the intention that local government levels will be responsible for the distribution networks. A NamWater water treatment works and related pipelines were constructed and these could supply potable water to the Proponent.

Implications and Impacts

Firm potable water supply is available for the project during the construction and operational phases.

8.7 FAUNA AND FLORA

The site falls within the Nama Karoo Biome of Namibia which is recorded to have a grass cover of between 2 and 10% (Mendelsohn J, 2002). However, this biome is known for hosting a wide diversity of flora due to its various soils and geological substrates. It can further be classified under the Karas dwarf shrubland sub-biome and forms part of the floristic group of Gordonia. The area hosts up to 44.0 species of flora with 0-5% of the area being covered by woody plants. Due to the hyper aridity of the area, most of the land is bare. This corresponds with the Average Green Vegetation Biomass Production Atlas for Namibia which classifies the area as a category 2: Bare ground. The entire site falls within the CPL 11 Agro-Ecological Zone. A summary of the vegetation cover of this is zone is presented in Table 8-3.

Table 8-2 General flora data (Mendelsohn, 2002)

Vegetation type	Karas dwarf shrubland
Vegetation structure type	Sparse shrubland
Number of plant species	100 -150
Percentage tree cover	0.1-1
Percentage dwarf shrub cover	3,6
Dwarf shrub height (m)	0.5
Grass height (m)	0.5

Table 8-3 Vegetation cover in the CPL 11 Agro-Ecological Zone

Vegetation Type	Percentage Cover
Shrubs	0.31% (± 0.3%)
Dwarf Shrubs	1.52% (±0.9%)
Grass	0.60% (±0.5%)

Herbs	2.25% (±0.8%)
Total	4.71% (±1.6%)

Although the habitat is further classified as being suitable for quiver trees, most of the valley has been transformed by agricultural activities and no such trees have been observed in the area or close to the site. An ecological study conducted in 2016 (Faul, 2016) included a vegetation survey on an areas west of the site. That area has now been completely transformed by agricultural activities. On-site conditions are relatively pristine with some vegetation established in the washes across the site. These washes, developed from west to east, extend into mountain ridges. Known to have softer soil, these areas hosts the majority of the vegetation onsite, therefore, having a higher biodiversity. The ridge areas are mostly void of vegetation, being very rocky. Unfortunately it was also noted that throughout the site, some vegetation, especially in the washes, had wind-blown toilet paper caught in it.

Several animal tracks were observed on site. The tracks were mainly located along the washes and softer sand, all leading from Aussenkehr to the mountains east of the site. Although some of the tracks are suspected to be dog tracks, jackal and general wildlife, including kudu, oryx and springbuck, are known to traverse the area to reach the Orange River.

Photo 8-3 ***Sisyndite spartea*** **(Desert Broom) adjacent to the site**

Photo 8-4 ***Calicorema apitate*** **(Grey Desert Bush) adjacent to the site**

Photo 8-5 Drainage line (sheetwash area) with more vegetation than ridge areas

Photo 8-6 Toilet paper caught in vegetation around the site

Table 8-4 General fauna data (Mendelsohn, 2002)

Mammal Diversity	61 – 75 Species
Rodent Diversity	20 – 23 Species
Bird Diversity	81 – 110 Species
Reptile Diversity	61 – 70 Species
Snake Diversity	20 – 24 Species
Lizard Diversity	> 35 Species
Scorpion Diversity	16 – 17 Species

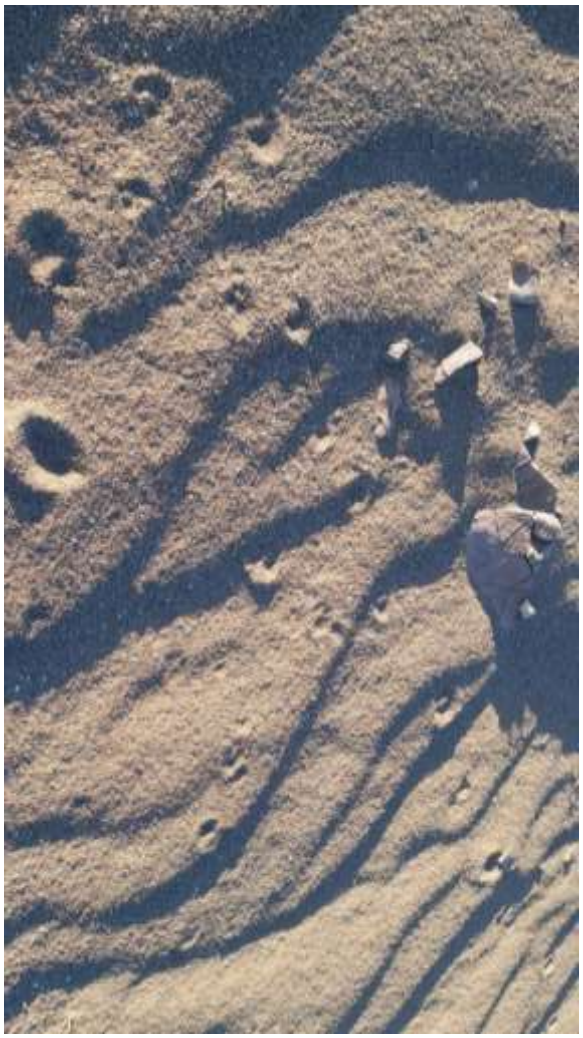

Photo 8-7 Unidentified animal track on site

Photo 8-8 Weathered tracks on site

Implications and Impacts

Vegetation on site is mostly found in the washes associated with the drainage line across the site. These washes have a higher biodiversity and act as ecological corridors. Although wind-blown, physical pollution is present, the site remains mostly pristine. Construction and operations of the plant, considered in the cumulative development sense, will restrict animal access paths (from the protected sensitive areas adjacent to the site) to the Orange River. However, the decision to reduce the site size by allowing a corridor between the existing and proposed plant, will suffice as a wildlife corridor. The corridor is suitable inclusive of some wash areas along which wildlife moves.

8.8 LOCAL ECONOMY

The //Karas Region's economy is a diverse representation of various sectors and industries within the Region. These include (but are not limited to) fishing, mining, tourism and agriculture; all of which have shown potential to be developed. The Karasburg West Constituency has less economic diversity and the agricultural sector, specifically the irrigation schemes at Aussenkehr, is a large contributor, if not the largest. Not only does it create jobs, but it has also been the main driving force of infrastructure development and related capital expenditure which are on-going.

The lack of a formal town infrastructure and status has exempted Aussenkehr from having to develop economic development plans and policies, which are required for the rest of the towns in the //Karas Region. The table grape sector and irrigation scheme have however been

incorporated in the Regional Land Use Plans. The most significant of these plans relate to water and sanitation infrastructure and housing. The housing sub-sector goal states:

"Provide support to Regional Councils and Local Authorities to ensure effective and efficient physical planning and service delivery for affordable land, services and shelter in order to improve social and living conditions in general and of low-income groups in particular within the context of sustainable human settlements development" (NACOMA, 2012).

Implications and Impacts

The development of the new solar plant will contribute to the local economy and enhance the livelihoods of those in the Aussenkehr area. Local persons will be employed during the construction and operational phases of the project.

8.9 SOCIAL AND CULTURAL CHARACTERISTICS

The project is located within the //Karas Region, falls under the Karasburg West Constituency and is located within division V. The total population for this region is 85,759 of which 43,270 are male and 42,489 are female. The region also has a density of 0.5 people/km² and a literacy rate of 96.1%, while the constituency has a total population of 16,470 and a density of 0.4 people/km².

Statistics for the demographic profile of Aussenkehr have proven to be lacking in reliable and recent data. Various stakeholders to the project as well as inhabitants of the area have estimated the number of people residing in the valley to be up to 30,000 during the harvesting season (October to January). This number is widely accepted to drop to a quarter during the rest of the year. Seasonal and migrant workers are the greatest component of the workforce. During the harvesting and packing season, thousands of these workers flock to the area from all over Namibia, seeking employment opportunities. Statistics used by NamWater to determine the amount of water that should be provided in future, estimate that for every employed worker in the area, there are six persons who are not economically active. They reside in the informal residential area alongside permanent employees. It is estimated that every employee has an average of two adults and two children dependants residing with them outside of the harvesting season.

During this environmental assessment two key issues related to Aussenkehr's development and planning surfaced. Although no official documentation has been included, it was established that a certain portion of the greater Farm Aussenkjer FMV/00147 was donated to the government for the establishment of adequate housing / town complex. As mentioned earlier, a NamWater water treatment plant was constructed to service this proposed development.

There are ongoing initiatives regarding public health and services to be provided in the area by the National Planning Commission. Discussions with the local and regional councils confirmed that any infrastructure development funding will have to be sourced from governing ministries rather than local or regional government. Development of the formalised settlement area (for labourers) is hinged on governmental input and participation.

This informal area, as indicated in the photos below, is serviced through a joint community effort and NamWater to provide running water and effective waste removal. Dwellings are of a temporary nature mostly constructed from reeds and or corrugated iron. Local services established in the informal area include the following:

- Primary school,
- Child care centres,
- Orphanage,
- Police station,

- Post office,
- Clinic,
- Tuberculosis care unit, and
- Public water point.

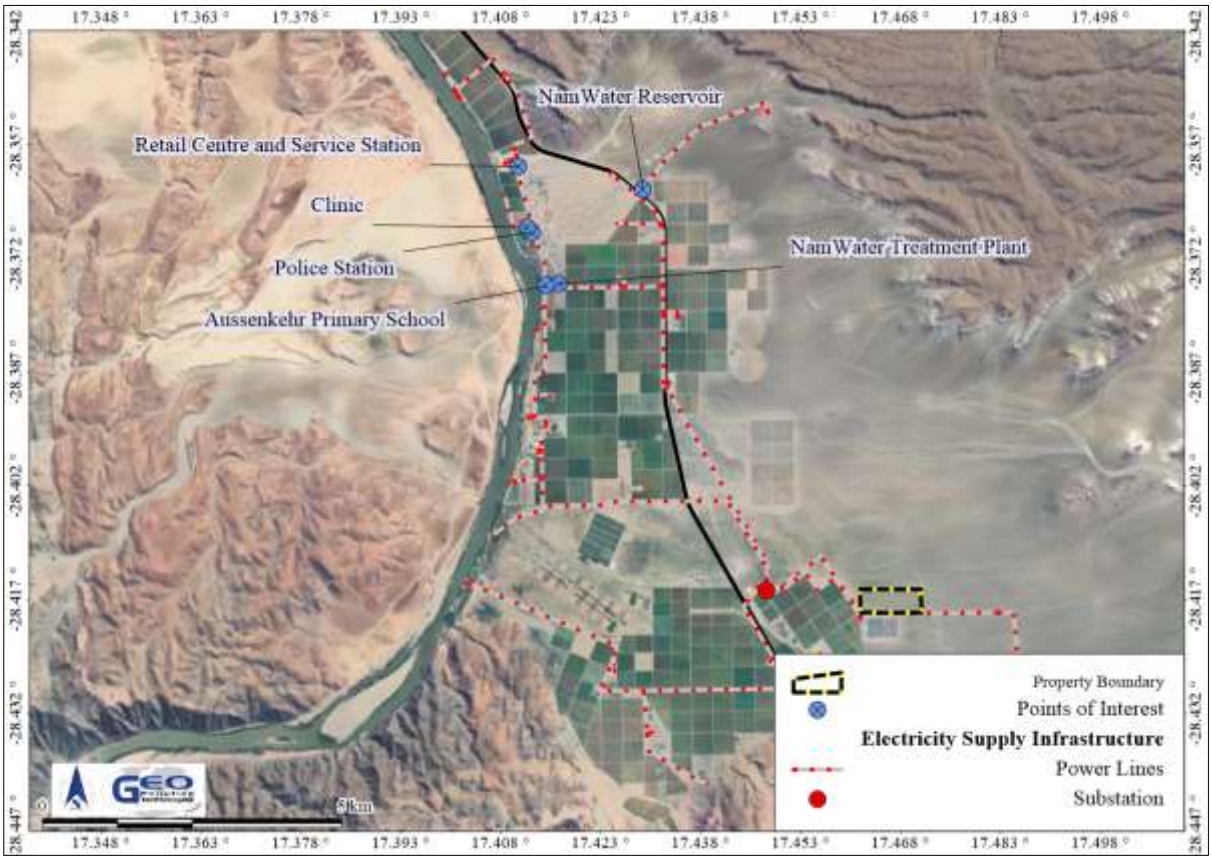

Figure 8-6 Community points of interest in the Aussenkehr

Implications and Impacts

The construction and development of the solar plant project will create additional employment opportunities in the area. Currently, services are primarily focused on town-keeping initiatives managed by local entities. There is significant potential for enhancements in sanitation, waste management, and electrical supply within the Aussenkehr community.

8.10 ARCHAEOLOGICAL CONSIDERATIONS

An archaeological specialist assessment (Kinahan, 2016) was conducted for the Aussenkehr area to identify possible archaeological artefacts and or areas which may harbour such sites, in and around Aussenkehr. Various such sites were identified. However, none were, or are located close to the project location.

Implications and Impacts

The area harbours archaeological and palaeontological resources. However, none of these resources were or are located close to the project location.

9 PUBLIC CONSULTATION

Consultation with the public forms an integral component of an environmental assessment. It enables interested and affected parties (IAPs) e.g. neighbouring landowners, local authorities, civic associations and communities, to comment on the potential environmental impacts associated with the operations.

IAPs are provided with the opportunity to also identify additional issues which they feel should be addressed in the scoping assessment. Public consultation was initiated and facilitated through notification letters, site and press notices. Individual meetings were held with the adjacent landowners, while other stakeholders in the area were notified in writing. A copy of the report is made available to all on the IAP database for the project.

9.1 PRESS NOTICE

Press notices were placed in two national newspapers for two consecutive weeks. Notices appeared in The Republikein and The Namibian Sun on 20 November and 27 November 2023.

9.2 SITE NOTICE

Site notices for this particular application were erected on site on and were still present at the time of the compilation of this report. Additional photographs of the site notices are attached in Appendix B.

9.3 NOTIFICATION LETTERS

Neighbours and key IAPs, (including NGO's and governmental agencies such as the regional and local government, NamWater, NamPower, NamPol etc.), received notifications informing them about the proposed development and inviting them to provide their comments and concerns. During the notification period, meetings were also held with the two adjacent IAP. Comments were received during this phase and the main concerns related to the following:

- Concerns related to the capacity of the existing NamPower Substation to accommodate the proposed development, especially in the light of some of the IAP also planning to generate electricity and supply such electricity back into the national electricity grid, via the same substation.
- Concerns related to dust generation during the construction phase and the impact of such dust on the adjacent agricultural produce.

10 ASSESSMENT OF IMPACTS

The purpose of this section is to assess and identify the most pertinent environmental impacts that are expected from the construction, operational and potential decommissioning activities of the proposed project. An EMP based on these identified impacts are also incorporated into this section.

For each impact an environmental classification was determined based on an adapted version of the Rapid Impact Assessment Method (Pastakia, 1998). Impacts are assessed according to the following categories: Importance of condition (A1); Magnitude of Change (A2); Permanence (B1); Reversibility (B2); and Cumulative Nature (B3) (see Table 10-1).

Ranking formulas are then calculated as follow:

Environmental Classification = A1 x A2 x (B1 + B2 + B3).

The environmental classification of impacts is provided in Table 10-2.

The probability ranking refers to the probability that a specific impact will happen following a risk event. These can be improbable (low likelihood); probable (distinct possibility); highly probable (most likely); and definite (impact will occur regardless of prevention measures).

Table 10-1 Assessment criteria

Criteria	Score
Importance of condition (A1) – assessed against the spatial boundaries of human interest it will affect	
Importance to national/international interest	4
Important to regional/national interest	3
Important to areas immediately outside the local condition	2
Important only to the local condition	1
No importance	0
Magnitude of change/effect (A2) – measure of scale in terms of benefit / disbenefit of an impact or condition	
Major positive benefit	3
Significant improvement in status quo	2
Improvement in status quo	1
No change in status quo	0
Negative change in status quo	-1
Significant negative disbenefit or change	-2
Major disbenefit or change	-3
Permanence (B1) – defines whether the condition is permanent or temporary	
No change/Not applicable	1
Temporary	2
Permanent	3
Reversibility (B2) – defines whether the condition can be changed and is a measure of the control over the condition	
No change/Not applicable	1
Reversible	2
Irreversible	3
Cumulative (B3) – reflects whether the effect will be a single direct impact or will include cumulative impacts over time, or synergistic effect with other conditions. It is a means of judging the sustainability of the condition – not to be confused with the permanence criterion	
Light or No Cumulative Character/Not applicable	1
Moderate Cumulative Character	2
Strong Cumulative Character	3

Table 10-2 Environmental classification (Pastakia 1998)

Environmental Classification	Class Value	Description of Class
72 to 108	5	Extremely positive impact
36 to 71	4	Significantly positive impact
19 to 35	3	Moderately positive impact
10 to 18	2	Less positive impact
1 to 9	1	Reduced positive impact
0	-0	No alteration
-1 to -9	-1	Reduced negative impact
-10 to -18	-2	Less negative impact
-19 to -35	-3	Moderately negative impact
-36 to -71	-4	Significantly negative impact
-72 to -108	-5	Extremely Negative Impact

10.1 RISK ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

The EMP provides management options to ensure impacts of the project are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The environmental management measures are provided in the tables and descriptions below. These management measures should be adhered to during the various phases of the operation of the project. This section of the report can act as a stand-alone document. All personnel taking part in the operations of the project should be made aware of the contents in this section, so as to plan the project accordingly and in an environmentally sound manner.

The objectives of the EMP are:

- to include all components of construction activities (including future upgrades, maintenance, etc.) and operations of the project;
- to prescribe the best practicable control methods to lessen the environmental impacts associated with the project;
- to monitor and audit the performance of construction and operational personnel in applying such controls; and
- to ensure that appropriate environmental training is provided to responsible construction and operational personnel.

Various potential and definite impacts will emanate from the construction, operational and decommissioning phases. The majority of these impacts can be mitigated or prevented. The impacts, risk rating of impacts as well as prevention and mitigation measures are listed below.

As depicted in the tables below, impacts related to the operational phase are expected to mostly be of medium to low significance and can mostly be mitigated to have a low significance. The extent of impacts are mostly site specific to local and are not of a permanent nature. Due to the nature of the surrounding areas, cumulative impacts are possible.

10.1.1 Planning

During the phases of planning for construction, operations and decommissioning of the solar plant, it is the responsibility of the Proponent to ensure they are and remain compliant with all legal requirements. The Proponent must also ensure that all required management measures are in place prior to and during all phases, to ensure potential impacts and risks are minimised. The following actions are recommended for the planning phase and should continue during various other phases of the project:

- Ensure that all necessary permits from the various ministries, local authorities and any other bodies that governs the construction activities and operations of the project are in place and remains valid. This includes agreements with the Electricity Control Board.
- Ensure all appointed contractors and employees enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractors, sub-contractors, employees and all personnel present or who will be present on site.
- Make provisions to have a health, safety and environmental (HSE) coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site. Provision should be made for monthly environmental performance audits and reports during the initial phases.
- Have the following emergency plans, equipment and personnel on site where reasonable to deal with all potential emergencies:
  - Risk management / mitigation / EMP/ emergency response plan and HSE manuals
  - Adequate protection and indemnity insurance cover for incidents;
  - Comply with the provisions of all relevant safety standards;
  - Procedures, equipment and materials required for emergencies.
- Establish and / or maintain a reporting system to report on aspects of construction activities, operations and decommissioning as outlined in the EMP.
- Submit bi-annual reports to the MEFT to allow for environmental clearance certificate renewal after three years, if required. This is a requirement by MEFT.
- Appoint a specialist environmental consultant to update the EIA and EMP and apply for renewal of the environmental clearance certificate prior to expiry, if required.

10.1.2 National Development Goals and National Planning Regarding Greenhouse Gas Emission Reduction

According to the National Climate Change Strategy and Action Plan (2013 – 2020), various governmental ministries (such as MME, MEFT and MAWLR), parastatals and the private sector, are urged to promote and invest in renewable energy sources as part of the policy target to explore and promote sustainable energy in Namibia. The overall project will contribute to the cumulative renewable energy sector and the climate adaption strategies set to achieve climate change target set for Namibia.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Information sharing about proposed renewable energy project	4	1	2	2	3	28	3	Probable
Daily Operations	Contribution to the national energy supply with renewable sources	2	1	2	2	2	12	2	Probable

Desired Outcome: Making a significant contribution to the country's development goals.

Actions

Enhancement:

- The Proponent should ensure that all project information regarding the development and implementation is in line with government planning and further provided to government agencies to incorporate into future planning and reporting.
- Information sharing about the project's progress should be made available to governmental agencies and the IAPs. The Proponent and affected parties should use the information generated during the environmental assessment to realistically plan for future growth and optimisation of servicing efforts. Open communication regarding future development, if any, should be maintained.
- The Proponent must employ local Namibians where possible. Deviations from this practise should be justified appropriately.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Progress reports on implementation kept.

10.1.3 Ideals and Aspirations

During the environmental assessment, public consultation was conducted with adjacent land owners, key community services, Ausenkehr residents and interested and or affected parties. Knowledge about the proposed project can inform local business development plans, especially due to the nature of the project. The project was considered as a benefit to Aussenkehr. It was noted that the proposed plant may also contribute to the perception of Aussenkehr being a place where employment is provided and a place of growth and opportunity. In turn this may affect demographic processes such as migration (whether seasonal or permanent) to the area. Plans about the proposed development has mostly been well-received. Growth in the community is associated with additional pressure which may be exerted onto governmental agencies and services. Aspects related to the demographic profile are discussed in Section 10.1.5.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Planning /Construction	Information sharing the proposed solar plant	2	2	2	2	3	28	3	Probable
Daily Operations	Information sharing related to maintenance schedules and repairs, security operations	2	1	2	2	2	12	2	Probable

Desired Outcome: Continued sharing of activity plans with IAPs, especially adjacent land owners and governing agencies. Maintaining an open door policy with neighbours and employees. To establish a grievance mechanism through which community members can voice their complaints as managed by a community liaison officer.

Actions

Enhancement:

- Information sharing about the project's progress should be made available to governmental agencies and the IAPs. The Proponent and affected parties should use the information generated during the environmental assessment to realistically plan for future growth and optimisation of the distribution system. Open communication regarding future development should be maintained.
- Contractors' tenders to include best practise requirements for construction safety, security and environmental management for any future development.
- The Proponent must employ Namibians where possible. Deviations from this practise should be justified appropriately.
- A community liaison officer should be appointed during the construction phase especially to facilitate community grievances and concerns and or enquiries about employment opportunities.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Records kept of all information shared with authorities, neighbours and employees,
- Complaints and enquiries register kept on file.

10.1.4 Revenue Generation and Employment

The initial construction phase requires a dedicated workforce which will contracted by the Proponent. Semiskilled and unskilled labour will make up the largest segment of the labour force. Such labour should easily be sourced from the Aussenkehr informal settlement. Through the remuneration of professional services, as well as the general labour force, revenue streams related to the construction industry will be boosted during the construction phase while additional permanent employment opportunities will be generated during the operations phase in especially the security and maintenance sectors. During this phase, employment will be limited but will include contract work related to maintenance, general upkeep and solar panel cleaning.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Employment and contribution to local economy	2	1	2	2	2	12	2	Definite
Daily Operations	Employment contribution to local economy	3	1	3	3	2	24	3	Definite
Indirect Impacts	Decrease in unemployment, contribution to local economy	3	1	3	3	3	27	3	Definite

Desired Outcome: Contribution to national treasury and provision of employment to local Namibians.

Actions

Enhancement:

- The Proponent must employ local Namibians and contractors where possible.
- Develop an employment strategy to include how employees from the area will be made aware of any possible employment opportunities and how recruitment will be conducted. This should include contractors. All contractors should be made aware of the requirement to use local labour as far as possible.
- If the skills exist locally, employees must first be sourced from the town, then the region and then nationally.
- Deviations from this practice must be justified.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Summary report based on employee records.
- Employment strategy kept on file.

10.1.5 Demographic Profile and Community Health

The project is reliant on labour during the construction and operational phases. New developments always create the idea of opportunity and growth, especially in the employment sector. Development of the project may drive jobseekers, especially in the construction sector, to Aussenkehr. Such in-migration towards the area may be of a temporary or permanent nature. In addition, the construction phase will make use of some specialised labour not from Aussenkehr. The partly foreign workforce and or additional job seekers in the area is something that is known and well accommodated within the Aussenkehr community. Such in-migration is not considered to result in a significant change in the demographic profile or community health. The existing community has developed resilience and adapted to not only seasonal influxes of job seekers, but also seasonal employment. This is a strongly cumulative aspect considering all developing initiatives in Aussenkehr It is further expected that that the in-migration will be from other existing urban centres in Namibia, as well as partially from rural communities.

Additional aspects related to the community health and safety include possible electrocution, electromagnetic interference, visual amenity, construction noise and dust. However, the proposed development is far-removed from the residential areas in Aussenkehr and the site will be strictly access controlled. The probability of such risks are considered unlikely.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	In-migration and social ills related to unemployment	1	-1	1	1	2	-4	-1	Probable
Daily Operations	In-migration and social ills related to unemployment	1	-1	1	1	2	-4	-1	Probable
Indirect Impacts	The spread of disease	1	-1	2	1	2	-5	-1	Probable

Desired Outcome: To prevent the in-migration and growth in informal settlements and to prevent the spread of communicable diseases and prevent / discourage socially deviant behaviour.

Actions

Prevention / Mitigation:

- Training of local people should be considered from the start. These measures will reduce the influx of newcomers to the area and thereby reduce growth in the informal settlement.
- Construction workers should always be supervised.
- Workers' conduct should be guided by a code of conduct to be developed by the contractors.
- The construction areas should be fenced to avoid unauthorized entry.
- Employ only local people from the area, deviations from this practice should be justified appropriately.
- Consultations with and involvement of local communities in project planning and implementation.
- Mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws.
- Adopt any by-laws relating to environmental health.

- All provisions of the Labour Act must be adhered to.
- Construction teams and related workforce to be easily identifiable and distinguishable.
- Educational programmes for employees on HIV/AIDS and general upliftment of employees' social status should be considered.
- Use of signs, barriers (e.g. locks on doors, use of gates).
- Grounding of electricity conducting objects.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Project inspection sheet for all areas which may present environmental health risks, kept on file.
- Summary report based on educational programmes and training conducted.
- Summary report based on any theft related incidents.
- Employment records kept on file.

10.1.6 Increased Electricity Supply to the National Grid

The proposed solar plant will be a renewable energy contributor to the National electricity grid. Not only will it be able to provide additional electricity in contributing to enhancing energy security, but it will also enable local and national economic development. However, it is planned to use an existing transmission line, which will have to be upgraded to accommodate the additional electricity load. The upgrading of this line may affect the existing solar plant and its connection to the Aussenkehr Substation, possibly resulting in a temporary loss of income and or interrupt electricity supply to the national grid from this plant. In addition, the project transmission line to be upgraded, crosses under an existing NamPower 66 kV transmission line. Upgrading of the project transmission line may present a risk to the NamPower Transmission line, due to possible breach of safety aspects. Resulting incidents may include compromising of both the power line as well as the Aussenkehr Substation, this could potentially lead to power supply interruptions for the area.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Operation	Increased electricity supply to the rest of Namibia	3	2	2	2	3	42	4	Probable
Indirect Impacts	Increased electricity availability from renewable resources in Namibia	2	1	2	1	1	12	2	Probable

Desired Outcome: Increased power supply to the national grid and no power supply interruptions during the construction phase.

Actions

Preventative / Mitigation:

Construction Phase

- Timing of the transmission line upgrade to be confirmed during the planning phase with all stakeholders involved.
- All agreements related to the Electricity Control Board related to the supply of power to the National Grid, as well as all agreement with NamPower, to be finalised prior to the construction phase.
- All technical aspects related to the transmission line crossing with the existing NamPower 66 kV transmission line, should be agreed upon in writing, prior to the upgrading of the project transmission line.
- Any expected power supply interruptions, due to the proposed project, to communicated to surrounding land owners

Operational Phase

- Monitor and ensure the plant's operational efficiency to maximise its contribution to the national grid.
- Implement advanced technologies and continuous improvement strategies to increase plant productivity and reliability.
- Ensure servitude management of the project transmission line.

Responsible Body:

- Proponent.

Data Sources and Monitoring:

- Performance reports from the plant operations to assess the contribution to the national grid.

10.1.7 Traffic

The construction phase will increase traffic flow to the site. During the construction phase, traffic impacts and risks will be increased. Heavy motor vehicles will transport materials and equipment (PV panels, frames) to the site. It is anticipated that the following number of trips would be required:

- Delivery of panels: 42 loads consisting of 18.9 tons each on 12 m long trailers.
- Delivery of electrical equipment and components: four loads of 20 tons each.
- Delivery of frames: three loads of 20 tons each.

An increase in traffic to and from the site during the construction phase, may increase the risk of incidents and accidents especially during the harvesting seasons. During this season the existing surrounding operations have a higher volume of tractors and carts. Increased HMV on the access road will increase dust. Dust aspects are covered in Section 10.1.11.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Delivery of equipment and building supplies – increased risk of traffic incidents or accidents	1	-1	2	1	2	-5	-1	Probable
Indirect Impact	Delivery of equipment and building supplies – generation of dust	2	-1	2	2	2	-12	-2	Definite

Desired Outcome: No traffic incidents and no transport or traffic related accidents.

Actions

Prevention / Mitigation:

- Ensure access agreements are in place where private land needs to be entered onto or moved over. Ensure access agreements address timing of traffic (considering the harvesting periods) and dust mitigation where required.
- All access agreements, where applicable, should be in place prior to the construction phase.
- Proper traffic management planning prior to construction.
- Diversion or management of traffic when required.
- Appropriate signage and warnings on roads and vehicles to be used. Vehicle signage should be appropriate for the area to ensure visibility.
- Existing tracks and access roads leading to the site should be used if possible and new tracks or roads should not be created.
- Sensitive environmental features should be demarcated and no off-road driving should be allowed around these sites. No construction vehicles should be allowed to enter any sensitive sites.
- Where relevant, erect clear signage, regarding parking and access and exit points around construction sites and at the construction camps.
- During the planning phase, all connections (if any new accesses are planned) to national roads must be approved by the Roads Authority.
- Road safety training to be provided to all construction staff and should be implemented by any contractors used (included in tender documentation).

- During any maintenance of infrastructure which may necessitate partial or complete road closure of traffic flow disruptions, clear communication should be available to the public and should include timing of maintenance.
- Measures should be in place to prevent (or repair) damage to road surfaces during the construction phase, especially during wet conditions.
- It must be ensured that a backlog of traffic does not develop at access points during peak hours, through the implementation of an efficient and effective access control system.
- Internal speed limits should be set for the construction and operational phases.
- Tender documentation to clearly specify the requirements of road worthy vehicles to be used during the construction phase by contractors while also stipulating the requirements for the transport of employees etc.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Any complaints received regarding traffic issues should be recorded together with action taken to prevent impacts from repeating itself.
- A bi-annual report should be compiled of all incidents reported, complaints received, and action taken.

10.1.8 Health, Safety and Security

Activities associated with the construction and operational phases are reliant on human labour. As such, labourers are exposed to health and safety risks. Some activities, especially associated with the operation of heavy equipment, machines and heavy motor vehicles and or hazardous chemicals, poses the main risks to employees. In addition to these expected risks, severe climatic characteristics of the area (extreme heat conditions), may contribute to conditions such as sunstroke, fatigue, dehydration and related symptoms. Security breaches are another concern which relates to the development of properties, as well as any construction camp. A construction workforce presents the opportunity of ill-intending persons to pose as project team members for nefarious and criminal reasons. Construction sites are often targeted by criminal elements and the site will therefore increase the risk of crime within the immediate area. Theft or damage of construction materials and properties is an important local risk.

During construction and operations, the facility will carry the risk of electric shocks and arch flashes which is an explosion of energy that can occur in a short circuit situation. This explosive release of energy causes a flash of heat and a shockwave, both of which can cause serious injury or death.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Physical injuries, exposure to chemicals and criminal activities	1	-2	3	3	2	-16	-2	Probable
Daily Operations	Physical injuries or damage to infrastructure or property	1	-2	3	3	2	-16	-2	Probable

Desired Outcome: To prevent injury, health impacts and theft.

Actions

Prevention/ Mitigation:

- The site should be access restricted and warning signs related to the dangers of electrocution erected along the perimeter as well as at the entrance to the plant.
- All personnel or contractors should be suitably trained during the installation and maintenance of any component of the solar plant.
- All health and safety standards specified in the Labour Act should be complied with. The responsible contractor must ensure that all staff members are briefed about the potential risks of injuries on site. The Contractor should be obliged to adhere to the following:
  - Adhere to health and safety regulations pertaining to personal protective clothing, first aid kits, warning signs, etc.;
  - Ensure that adequate emergency facilities, including first aid kits, are available on site;
  - Equipment that must be locked away on site and must be placed in a way that does not encourage criminal activities;
  - Induction training for all who enter the site is required;
  - Security personnel to prevent unauthorised entry of the construction site; and
  - Ensure all workers are issued with protective eyewear when working with photovoltaic panels.
- All staff members to be briefed about the potential risks of injuries on site.

- Security measures on site to prevent theft of solar panels or cables.
- Clearly label dangerous and restricted areas as well as dangerous equipment and products during the construction phase as well as during maintenance of infrastructure.
- Equipment that will be locked away on site (during the construction phase) must be placed in a way that does not encourage criminal activities (e.g. theft).
- Ensure that all personnel receive adequate training on operation of equipment / handling of equipment and/or hazardous substances.
- Implementation of a maintenance register for all equipment and hazardous substance storage areas.
- Adopt local policies and procedures for dealing with all forms of waste, including possible effluent as well as community health aspects such as noise etc.

Responsible Body:

- Health and safety officers for implementing and monitoring safety protocols.
- Security managers to oversee site security.
- The Proponent to ensure overall compliance and funding for health, safety, and security measures.

Data Sources and Monitoring:

- Regular safety audits and inspection reports.
- Security logs and surveillance footage to assess security measures.
- A monthly report should be compiled of all incidents reported during the construction and operational phase. The report should contain dates when training were conducted and when safety equipment and structures were inspected and maintained.

10.1.9 Fire

Fires outside of designated areas, especially near laydown and material storage areas, may increase the risk of the occurrence of uncontrolled fires. Chemicals and fuels stored and used for general construction activities may be flammable. Improper waste burning or discarding of cigarette butts around accumulated waste, or in the vicinity of hazardous chemicals, further increases fire risks. Currently, if there is a fire in Aussenkehr, the local business responds with mobile fire fighters and water tankers to assist the community in extinguishing the fire. The provision and maintenance of fire extinguishers throughout the facility as well as training on the use thereof, remains paramount.

The risk of fire related to the PV panels themselves are low. Only a small portion of materials in the panels are flammable, and those components cannot self-support a significant fire. However, heat from an intense fire or energy from an electrical fault can ignite a PV panel. The possibility of fire due to an electrical fault is however very unlikely.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Fire and explosion risk	1	-2	2	2	1	-10	-2	Improbable
Daily Operations	Fire and explosion risk	1	-2	2	2	1	-10	-2	Improbable

Desired Outcome: Minimise the risk of fire and ensure rapid response capabilities to protect life, property, and the environment.

Actions

Prevention/Mitigation:

- Firefighting measures as per the MSDS of the product should be adhered to.
- In addition to this, all personnel have to be sensitised about responsible fire protection measures and good housekeeping, such as the removal of flammable materials including rubbish, dry vegetation, and hydrocarbon-soaked soil from the vicinity of the construction. Regular inspections should be carried out to check for these materials at the site.
- It must be assured that sufficient firefighting resources are available. A holistic fire protection and prevention plan is needed. This holistic plan must include an emergency response plan and firefighting plan. Regular surveys of the fire-fighting equipment and water supply should be carried out.
- An integrated fire prevention plan should be drafted before construction commence.
- All fire precautions and fire control at the site must be in accordance with relevant SANS regulations or better. Firefighting measures as per the MSDS of the products should be adhered to.
- Personnel training (safe operational procedures, firefighting, fire prevention and responsible housekeeping practices) should form part of all contractor's tender requirements for further construction work.
- Establish a maintenance schedule for all fire related infrastructure as constructed and or managed by the Proponent.
- Maintain regular site, mechanical and electrical inspections and maintenance.
- No open and unattended fires should be allowed during the construction phase.

- The Proponent should liaise with the nearest fire brigade / local fire responders, to ensure that all fire requirements are met and that contractors adhere to all requirements related to fuel storage and handling during the construction phase.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Supervision of work is required and reports of safe and unsafe practice to be brought to the attention of the health safety and environmental officer.
- Any incidents reported must be recorded together with steps taken to mitigate the impacts.
- Continuation of training and fire safety practices established during the construction phase.
- Record when fire drills were conducted and when firefighting equipment were tested and training given.
- A register of all incidents must be maintained. This should include measures taken to ensure that such incidents do not repeat themselves.
- A bi-annual report should be compiled of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

10.1.10 Electromagnetic Fields

Electromagnetic fields (EMF), also referred to as radiation, is generated by solar plants as well as power lines. However, these EMF's, generated due to electricity is non-ionizing. This means that the radiation can *move* atoms in a molecule around, but cannot *remove* any atoms (such in the case of ionising radiation). In other words the radiation, as related to electrical installations, could create heat, for example, but not cause molecule damage to for instance to DNA.

The proposed project is not located close to any residential areas or close to offices or places of business. The relatively low voltages in a solar facility, and the fact that electric fields are easily shielded (i.e., blocked) by common materials, such as plastic, metal, or soil, means that there is no concern of negative health impacts from the electric fields generated by the solar plant (Cleaveland, 2017). Therefore effects of EMFs related mostly to the fauna and flora under or close to the power line. According to Levitt, *et all*, 2022, non-ionizing EMFs result in biological effects at both high and low-intensity man-made exposures, many with implications for wildlife health and viability Sensitive magnetoreception allows living organisms, including plants, to detect small variations in environmental EMF and react immediately as well as over the long term, but it can also make some organisms exquisitely vulnerable to man-made fields. The existing power line servitude is void of vegetation, however the line is located next to cultivated areas.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Exposure to electric and magnetic fields	1	-1	3	2	1	-6	-1	Probable

Desired Outcome: Minimise exposure and cumulative effects form electric and magnetic fields.

Actions

Prevention:

- Evaluating potential exposure to the public against the reference levels developed according to the Non-Ionising Radiation Regulations - exposure limits for general public exposure to o time-varying electric and magnetic fields (unperturbed rms values) Average and peak exposure levels should remain below the recommendation for General Public Exposure.
- Should EMF levels be confirmed or expected to be above the recommended exposure limits, application of engineering techniques should be considered to reduce the EMF produced by power lines, substations, or transformers. Examples of these techniques include:
    - Shielding with specific metal alloys
    - Burying transmission lines
    - Increasing height of transmission towers
    - Modifications to size, spacing, and configuration of conductors
- Identification of potential exposure levels in the workplace, including surveys of exposure levels in new projects and the use of personal monitors during working activities.

- Training of workers in the identification of occupational EMF levels and hazards.
- Implementation of action plans to address potential or confirmed exposure levels that exceed reference occupational exposure levels Personal exposure monitoring equipment should be set to warn of exposure levels that are exceeding occupational exposure reference levels. Action plans to address occupational exposure may include limiting exposure time through work rotation, increasing the distance between the source and the worker, when feasible, or the use of shielding materials.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Record any complaints and / or incidents regarding electric and magnetic fields.

10.1.11 Air quality

Particulate matter is a known health concern related to air quality. Specific parameters were developed by the World Health Organisation (WHO) relating to the safe limits of particulate matter in ambient air. Future construction and or maintenance activities could entail earth moving activities which may temporarily suspend material in the air. Frequent travelling of HMV over un-surfaced areas may increase soil disturbance resulting in finer particles which are more easily suspended in the air. An increase of dust settling on adjacent properties may impact the table grape sector, however the proposed solar plant is far removed from residential areas. Furthermore, the construction period will be of short duration and, considering prevailing south-westerly wind conditions, the impact has a lower significance rating related to human impacts. Effects on surrounding activities, mainly the cultivation of table grapes and dates, will vary in significance, depending on the timing of the construction period, and especially earth moving activities. During the harvesting periods, the impact may be much more severe than during the vineyards resting periods.

It is not foreseen that the greenhouse gas emissions (GHG) from construction related activities, will have a significant impact. The project in its entirety aims at contributing positively to the National Climate Change Strategy.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive dust generated from construction activities, exposure to airborne particulates	1	-1	2	2	1	-5	-1	Definite

Desired Outcome: To prevent health impacts and minimise dust generated.

Actions

Prevention / Mitigation:

- Erect a barrier (such as shade netting) around the construction site to act as a dust shield between the site operations and neighbouring agricultural activities. Additional dust mitigation measures should be discussed as related to the access road and related farming operators.
- Personnel are to be issued with dust masks when needed.
- Excavations and earthworks during strong wind conditions should be avoided to prevent dust from being a nuisance if dust suppression is not adequate.
- Excavations and earthworks should ideally not be conducted during harvesting seasons.
- Personnel issued with appropriate masks where excessive dust are present.
- A complaints register should be kept for any dust related issues and mitigation steps taken to address complaints where necessary.
- Notice to be given to nearby receptors prior to activities generating excessive dust which cannot be mitigated, if any.
- If feasible, consider covering the road with a natural dust suppressant or wet as required.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Any complaints received regarding dust should be recorded with notes on action taken.
- Photos of shade netting be kept on file along with maintenance record of the construction perimeter fence.
- All information and reporting to be included in a bi-annual report.

10.1.12 Noise and Vibration

Construction or maintenance noise, which may constitute high volume and repetitive noises, are known to impact human health. Excessive noise may result in a nuisance to nearby receptors and possible hearing loss in staff.

Noise standards have been developed by the Health and Safety Regulations of the Labour Act and WHO, to protect workers and communities against the health impacts and nuisances of noise. The project construction phase could cause periods of elevated noise with mechanical excavations increasing the intensity of such noise. However, there are no nearby residential areas or sensitive receptors. The impact therefore is considered to have a reduced significance rating. During the operational phase, little to no noise impact is expected.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive noise and vibrations generated from construction activities – nuisance and hearing loss	2	-2	1	2	1	-16	-2	Definite
Indirect Impact	Cumulative noise	2	-1	2	2	1	-8	-1	Definite

Desired Outcome: To prevent any nuisance and hearing loss due to noise and vibrations generated.

Actions

Prevention / Mitigation:

- The World Health Organization (WHO) guideline on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment can be followed during the construction phase. This limits noise levels to an average of 70 dB over a 24 hour period with maximum noise levels not exceeding 110 dB during the period. It is recommended that a survey of the noise levels be carried out if complaints are received.
- Construction workers to be issued with hearing protection where needed.
- Follow the Health and Safety Regulations of the Labour Act for limits on noise in the workplace to prevent hearing impairment.
- All machinery must be regularly serviced to ensure minimal noise production.
- Notification to nearby receptors (through a community liaison officer) of construction commencement.
- To reduce vibration levels, it is recommended that all machinery and vehicles be maintained in a good condition and that a maintenance record be kept.
- Unnecessary vibrations can be minimised by ensuring that no machinery or vehicles are left idling when not in use.
- The appropriate and correct placement of specific work activities can ensure the reduction of handling of machinery that cause heavy vibrations.
- Ensure personnel running the equipment are trained accordingly so that machinery is used properly.
- Pre assessment to allow for mitigation measures for any elevated levels of vibrations should take place if there is any suspicion that there may be excessive vibration levels on site during construction. These mitigation measures should then be in accordance with local regulations and standards.

- Should any blasting be conducted, a related survey of all properties will have to be conducted and an amendment to the environmental assessment and related environmental management plan will have to be submitted to MEFT.
- Hearing protectors as standard PPE for workers in situations with elevated noise levels.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Health and Safety Regulations of the Labour Act and WHO Guidelines.
- Maintain a complaints register.
- Report on complaints and actions taken to address complaints and prevent future occurrences.

10.1.13 Waste Production

Waste production during the construction and operational phases are very different and require unique waste management measures to address related impacts and prevent contamination. Construction waste may have a greater component of building rubble, discarded materials and hydrocarbon-contaminated materials, with less general and domestic waste in comparison. Waste should be managed by the contracting agent responsible for construction within a specific area. Wind may blow waste, such as old cement bags (which is a hazardous waste), plastic bags and polystyrene, from the site to beyond the site boundaries. Construction waste may present physical pollution as well as chemical contamination. Any soil polluted by hydrocarbons that may be encountered during the construction phase should be treated as hazardous waste.

Although solar modules may last up to 30 years, maintenance may require the removal of damaged or broken panels. In addition, a significant quantity of material needs to be disposed of at the end of the life of the modules. Because modules can contain potentially hazardous materials consideration should be given at the start of a solar project as to how units will be disposed of at the end of their useful life. Indiscriminate and unplanned disposal of panels or any construction waste will have a local, negative impact.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Construction waste production, littering, illegal dumping, contaminated materials	2	-2	2	2	2	-24	-3	Definite
Operation	Generation of all waste types, littering and illegal dumping	1	-2	2	2	2	-12	-2	Definite

Desired Outcome: To reduce the amount of waste produced, and prevent pollution and littering as well as safety risks associated with accumulated waste and sound waste disposal practices.

Actions

Prevention / Mitigation:

- A waste management system should be adopted and presented for the construction phase and should include measures related to construction waste handling and management.
- All construction related tender documentation should include the waste management system and should include contractual penalties for failing to adhere to the waste management requirements.
- Products that can be re-used or re-cycled should be kept separate.
- Waste should be disposed of regularly and at appropriate disposal facilities.
- Hazardous materials should be disposed of in an appropriate way at an appropriately classified waste disposal facility (follow MSDS).
- Adequate temporary ablution facilities must be erected at the construction site if no alternative facilities exists.
- Temporary waste disposal facilities should be present on site. This should include separate containers for products that can be re-used or recycled.

- Removal of waste should be at regular (weekly) intervals to maintain visual orderliness, but more so to not give time for liquid waste to enter the soil substrate. Dry waste is at risk of increasing the dust / litter impact so should be removed regularly.
- Contaminated soils can be remediated in accordance with accepted procedures at a site dedicated for this purpose.
- Develop a waste management plan for the discarding of broken or old solar panels, many components of photovoltaic modules are recyclable and some solar module manufacturers provide recycling of the panels with purchase. Recycling will greatly reduce potential adverse impacts associated with panel disposal and should be included in the waste management plan.
- Ensure waste cannot be blown away by wind during all phases of the project.
- Prevent scavenging (human and non-human) of waste.
- Weekly site inspections should be conducted by a representative of the Proponent to ensure implementation of the waste management plan and compliance to the EMP.
- An independent waste and EMP management audit should be conducted on a monthly basis for the duration of construction contracts.
- Liaise with the regional council regarding waste and handling of hazardous waste.
- Empty chemical containers that may present a contamination/health risk must be treated as hazardous waste. Workers should not be allowed to collect such containers for purposes of storing water or food. This can be achieved by puncturing or crushing such containers prior to disposal.
- Report all fuel spills greater than 200 litres to the Ministry of Mines and Energy and enact emergency response plans for fuel spills.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/project.
- Waste management plan, weekly and monthly audit reports kept on site.
- Any complaints received regarding waste should be recorded with notes on action taken.
- All information and reporting to be included in a bi-annual report.

10.1.14 Flora

Construction related activities presents the greatest risk to habitats within the area associated with the Orange River. However, this site is located far removed from the Orange River and therefore is highly unlikely to affect the flora associated with the river. Vegetation on site is very sparse and only located in the drainage washes within the area. Removal of limited vegetation, and an increase in the human footprint to the area could result in habitat destruction, illegal collection of plant materials and poaching by construction workers etc.

Construction and operational activities can create habitat for flora species to establish e.g. disturbed soil is favourable for the establishment of weeds and invader species. Washing of panels result in additional moisture on disturbed soil, which may prove favourable for the establishment of alien vegetation. Illegal collection of plant materials may occur. Employees should not be allowed to harvest any flora without the required permission. Although the operational phase is not expected to have direct physically altering activities on or around sensitive habitat areas, deviant or criminal social behaviour may result in damage to flora resources or vineyards.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Impact on flora and loss of biodiversity	1	-1	3	2	2	-7	-1	Improbable
Daily Operations	Change in localised ecosystems	1	-1	3	2	2	-7	-1	Improbable

Desired Outcome: To avoid pollution and negative impacts on sensitive habitats and related flora.

Actions

Prevention / Mitigation:

- Restrict construction activities and land clearing to the construction site to prevent unnecessary habitat loss. This should include the area between the existing plant and the proposed plant. Care should be taken to avoid any movement in especially the drainage wash of this area.
- All employees and contractors should be educated about the value of biodiversity.
- Strict conditions prohibiting harvesting and poaching of flora should be part of employment contracts and contractor conditions.
- If ever required after exceptionally high rainfall for the area, use only herbicides approved by the MAWLR during site and power line servitude management.
- All dumping of waste material in the environment, especially contaminated materials or soils, must be prevented.
- No storage of vehicles or equipment will be allowed outside of the designated area.
- Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts.
- For construction activities, contain construction material to a designated laydown area and prevent movement out of areas earmarked for clearing and construction.
- Take disciplinary action against any employees failing to comply with contractual conditions related to harvesting of flora.
- Implementation of an alien vegetation management plan for the site is required. This is especially in areas that have been disturbed.

Responsible Body:

- Contractor
- Proponent

Data Sources and Monitoring:

- All information and reporting to be included in a bi-annual report.

10.1.15 Fauna and Avifauna

Construction activities could lead to the displacement of faunal communities due to habitat loss and disturbance (noise, dust and vibration) and/or direct mortalities. However, the site is mostly void of vegetation and related habitats with very little fauna species present. These are mostly confined to the drainage washes across the site. These areas are active corridors linking the conservation areas east of the site, with the rest of the Aussenkehr Valley and Orange River. Establishment of the plant will destroy these habitats and corridors as located within the site boundaries and could disturb possible resident bird species (although the likelihood of such occurrence is low). However, the Proponent has reduced the site significantly to accommodate an existing NamPower servitude, south of the site. South of the servitude, there is another significant drainage wash as wildlife corridor. This drainage wash has also been excluded from the site to allow for its corridor function between the existing and proposed plant.

This provision has been allowed for as per the specialist requirement of Dr J Irish, who stated that an ecological corridor should be retained in providing access to the Orange River for wildlife. It is proposed that the corridor be retained along the main washes where there is more vegetation since these areas have a richer biodiversity. The ecological corridor will serve to connect the conservation areas with the river and it should allow for animal passage.

Since it is proposed that an existing power line be used, albeit after it is upgraded, no additional impacts are expected on especially avifauna. No additional line will be constructed. However, the additional solar plant will have a strongly cumulative effect. Reflective surfaces may cause disorientation of flying birds, resulting in injury or death as part of the operational phase. However PV panels are less reflective than other solar systems. In addition, should panels be kept in a fixed position, they may be attractive roosting sites. Although the operational phase is not planned to have direct physically altering activities on or around habitat areas, deviant or criminal social behaviour may result in damage to protected fauna species.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Impact on fauna and loss of biodiversity, displacement, disturbance	1	-1	3	2	2	-7	-1	Improbable
Daily Operations	Change in localised ecosystems,	1	-1	3	2	2	-7	-1	Improbable

Desired Outcome: Minimise impacts on fauna and loss of biodiversity by reducing risks of habitat disruption and fragmentation, collision, and electrocution. Promoting biodiversity and compliance with wildlife conservation regulations.

Actions

Prevention / Mitigation:

- It is proposed that an ecological buffer zone be allowed for, along the southern boundary of the site. This area should not be fenced to allow for wildlife passage.
- Preconstruction monitoring needed to determine the presence of threatened, rare, endemic or range restricted bird species.
- All unnecessary destruction of nests should be avoided during the construction phase.

- Create awareness on the negative impacts of poaching and the importance of recording all incidents.
- Ensure the entire length of the power line, when upgraded, is marked with anti-collision marking devices & upgrade with bird friendly designs to prevent electrocution. Upgrading of the line should consider:
  - Marking should be on the top conductor at 10 – 15 metre intervals in alternating black and white devices.
  - Power line poles:
    - Each wire on the pole should be "gapped" (an air space safety gap)
    - Stay wire should all be "gapped" by insulators.
    - Offset jumpers where possible
    - T- Piece perch must be placed on top of the pole at each bend point and above the transformer structures.
  - Power line transformers: Ensure the design does not attract birds for perching etc.
- It is important to note that habitats can be created inadvertently by the panels, especially when situated in a slanted, fixed position. Regular inspection must be performed to monitor for bird impacts and mitigation measures investigated if required.
- Report any extraordinary animal sightings, conflict or incidents to the MEFT.
- Take disciplinary action against any employees failing to comply with contractual conditions related to poaching and the environment.

Responsible Body:

- Contractor
- Proponent

Data Sources and Monitoring:

- All information and reporting to be included in a bi-annual report.
- Report any extraordinary animal sightings to the MEFT.
- Regular monitoring of the power line as well as the plant should be conducted to determine bird mortalities. This data should be kept and made available for conservation purposes.

Figure 10-1 Wildlife corridor

10.1.16 Groundwater, Surface Water and Soil Contamination

Contamination risks may be linked to the construction and operational phases. Sources of contamination can be spills and leaks from construction vehicles, chemicals used during construction such as paints and sewage. Elevated groundwater may lead to rapid dispersion of pollutants, and may potentially negatively impact surrounding underground utilities of infrastructure (considering the phased approach). Changes in the soil structure due to site excavation, clearance and especially ground breaking may lead to trenches along which contamination may travel.

Porous surface substrate can allow unwanted hazardous and ecologically detrimental substances to seep down to the water table either at the site of spill or after being washed away by surface flow. Leakages from construction vehicles, accidental spills of fuel or transformer oils, paints and other chemicals might occur.

Dust abatement measure may include wetting surfaces with water. Concrete may further react with the water and soil combination which will result in corrosion.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Contamination from hazardous material spillages, hydrocarbon leaks and sewage.	2	-1	2	2	1	-10	-2	Probable
Daily Operations	Groundwater contamination from solar panel cleaning	1	-1	2	2	1	-5	-1	Probable

Desired Outcome: Prevent contamination of soil, groundwater, and surface water to protect the local ecosystem and comply with environmental regulations.

Actions

Prevention:

- All precautions are to be taken to prevent contamination of the soil as this could enter the ecosystem.
- Appointing qualified and reputable contractors is essential.
- Any fuel spills must be reported and remediation action taken.
- Polluted soil and building rubble must be transported away from the site to an approved, appropriately classified waste disposal site. Polluted soil can be remediated.
- Leaking equipment shall be repaired immediately or be removed from site to facilitate repair.
- Due to the nature of some hazardous materials they should be disposed of in an appropriate way at an appropriately classified waste disposal facility. See the MSDS available from suppliers if the user is not sure how to dispose of the substance.
- Proper training of operators of construction machinery and vehicles and employees must be conducted on a regular basis (fuel and chemical handling, spill detection, spill control).
- All construction machines should be maintained to be in a good working condition during operations.
- Employ drip trays and spill kits when servicing / repairs of equipment are needed (such as transformer oils etc).

- Prevent off-road driving or movement of earthmoving equipment outside of areas designated for clearing.
- No dumping of rocks and removed soil in environmentally sensitive areas. Where possible it can be used to fill erosion ditches or old quarries, if any are present.
- Use landscaping and other natural barriers to reduce surface runoff that could carry potential contaminants.

Mitigation:

- Any fuel spillage of more than 200 litre must be reported to the Ministry of Mines and Energy.
- Spill clean-up means must be readily available on site as per the relevant MSDS and any spill must be cleaned up immediately.
- Continue monitoring soil and water quality to detect any signs of contamination.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A report should be compiled bi-annually of all spills or leakages reported. The report should contain the following information: date and duration of spill, product spilled, volume of spill, remedial action taken, and a copy of documentation in which spill was reported to Ministry of Mines and Energy. The latter is only for fuel spills of 200 litres or more.
- Servicing records of vehicles / equipment and infrastructure, to be kept on file.
- Records kept of any old or used hydrocarbon and or other hazardous waste removed from site.

10.1.17 Archaeological and Historical Resources

The general Aussenkehr area is known to have harboured historical and or archaeological resources. These have been documented and were located in areas far removed from the site. However, due the historical and archaeological significance of the area, and in particular the Orange River, the site has the possibility to have some resources as well as possible paleontological resources. Sites with archaeologically or culturally important significance might be uncovered during excavations.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Destruction, disturbance or damage to archaeological, paleontological or historical resources.	1	-1	2	2	2	-6	-1	Unlikely

Desired Outcome: To avoid any destruction, disturbance or damage to archaeological, paleontological or historical resources.

Actions

Prevention / Mitigation:

- If such a site or any other archaeologically important artefact is found during the development phase any work in that area must be halted and the relevant authorities must be informed. Firstly, the Namibian Police must be informed. Secondly, the National Monuments Council dealing with heritage should be informed.
- Should any resources be discovered, all prevention and mitigation measures to be identified by a registered Archaeologist, should be adhered to according to the provisions of the National Heritage Act. Such measures should be included in the EMP once determined.
- Construction may only continue at that location once permission has been granted.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Record any discoveries and proof of notifications to authorities on file.

10.1.18 Visual Impact and Landscape Character

Changes in the landscape character will occur during the construction phase and subsequently also during the operational phase. However, the proposed plant is not a new component of the landscape and will contribute to the cumulative aspects of the solar plants. The existing solar plant and related power line is mostly shielded from public view by the surrounding vineyards and natural topography. The proposed plant will however be located at a slightly higher elevation which increases its visibility, especially during the construction phase. However, the panels are not foreseen to will have an impact due to reflection on either motorists or aircraft.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Aesthetic appearance and integrity of the construction sites	1	-1	2	2	2	-6	-1	Probable
Operation	Visually intrusive to motorists and aircraft	1	-1	2	2	2	-6	-1	Unlikely
Indirect Impact	Change in settlement and landscape character	2	1	2	2	2	12	2	Definite

Desired Outcome: To minimise aesthetic impacts associated with the establishment.

Actions

Mitigation:

- Regular maintenance and general upkeep of the plant will ensure continuous low visual impact and maintain the general integrity of the solar plant.
- Construction activities must be restricted to the construction site to minimize the impacts of the construction phase.
- Storm water discharge points should be designed to minimize erosion.
- Regular waste disposal, good housekeeping and routine maintenance on infrastructure will ensure that the longevity of structures are maximised and a low visual impact is maintained.
- All contractors' camps to be clearly demarcated, fenced off and kept neat.
- Active construction areas to be clearly indicated, demarcated and kept neat.
- Construction to be approached in a systematic manner to ensure uniform and methodical completion of construction areas.
- Construction planning to be shared with IAPs.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A maintenance record should be kept.
- A bi-annual report should be compiled of all complaints received and actions taken.

10.2 IMPACT SUMMARY

Construction phase activities will mostly be restricted in terms of the project footprint and planned construction duration. Negative impacts such as dust generation may be reduced in significance when adopting mitigation measures and adhering to international best practises. Site specific mitigation related to the unique operations of the area need to be adopted, especially considering the export produce being cultivated in the area. The most significant biophysical impacts relate to habitat fragmentation and disturbance as well as possible bird collisions associated with the existing power line to be upgraded. The project will however generate revenue and provide employment for a large number of employees, especially during the construction phase, thereby contributing significantly to the economy and related development set for the //Karas Region. In addition, the operations of the solar plant will, in itself, be a positive contribution to the renewable energy sector in Namibia.

10.3 DECOMMISSIONING AND REHABILITATION

Closure and decommissioning of the solar plant, as a whole, is not foreseen during the validity of the environmental clearance certificate, or in the near future. However, it possible that certain components of the project may be decommissioned or replaced at a later stage. Decommissioning is therefore included for this purpose as well as the fact that construction activities may also include modification and decommissioning of infrastructure. Future land use after decommissioning should be assessed prior to decommissioning and rehabilitation initiated if the land will not be used for similar future purposes. Should decommissioning occur at any stage, rehabilitation of the area may be required. Decommissioning will entail the complete removal of all infrastructure including buildings and support infrastructure. Any pollution present on the site must be remediated. The impacts associated with this phase include noise and waste production as structures are dismantled. Noise must be kept within Health and Safety Regulations of the Labour Act and/or WHO standards. Waste should be contained and disposed of at a dedicated waste disposal site and not dumped in the surrounding areas. Implementation of the waste management plan for especially the disposal of the modular panels will be paramount. The EMP and waste management plan for the project will have to be reviewed at the time of full decommissioning to cater for changes made to the site and to implement any update guidelines and mitigation measures.

11 CONCLUSION

The solar plant project plays a pivotal role in the //Karas Region by enhancing infrastructure with improvements in electrical supply. The development utilises land beneficially, creating income through employment in construction and maintenance phases, thereby aiding in the development of Aussenkehr as a community.

Project-related impacts must be mitigated through stringent monitoring and control measures. All necessary permits and approvals should be secured from relevant ministries or authorities. These include approvals from the Electricity Control Board. In addition, access and related agreements should be agreed upon with surrounding land owners where required. Pollution prevention strategies must be robust to safeguard the soil, groundwater, and surface water from potential incidents. Adherence to health, safety, and security regulations is crucial, in line with applicable laws and standards.

The EMP should serve as an on-site reference throughout all phases of the project. Those responsible for violations of the EMP must be accountable for any necessary rehabilitation efforts. Should an ECC be granted, it should specifically pertain to the project areas outlined in the initial proposal. Any expansions or additional operational areas should be clearly demarcated and addressed either as amendments to the current document or through a separate environmental assessment.

12 REFERENCES

Atlas of Namibia Team, 2022, Atlas of Namibia: its land, water and life, Namibia Nature Foundation, Windhoek

Belcher, T. (July 2012). Freshwater Assessment for Aussenkehr Bulk Water Supply System. Windhoek: Aurecon Namibia (Pty) Ltd.

Cleveland, T. 2017. White Paper on Health and Safety Impacts of Solar Photovoltaics. N.C. Clean Energy Technology Center at N.C. State University

Faul A. 2016. Silverlands Vineyards Agricultural Project at Aussenkehr: Ecological Study

Funk, C., Peterson, P., Landsfeld, M., Pedreros, D., Verdin, J., Shukla, S., Husak, G., Rowland, J., Harrison, L., Hoell, A. and Michaelsen, J., 2015, The climate hazards group infrared precipitation with stations – A new environmental record for monitoring extremes. Scientific Data, 2, 150066. https://doi.org/10.1038/sdata.2015.66

Government of Namibia. (2012). Activities that may not be undertaken without an Environmental Clearance Certificate. Government Notice No. 29 of 2012. Windhoek

Government of Namibia. (2012). Commencement of Environmental Management Act, No. 7 of 1997. Government Notice No. 28 of 2012. Windhoek.

https://www.arpansa.gov.au/sites/default/files/legacy/pubs/emr/spectrum.pdf

International Commission on Non-Ionizing Radiation Protection (ICNIRP), Guidelines for Limiting Exposure to Time-varying Electric, Magnetic, and Electromagnetic Fields, Health Physics 74 (4): 494-522 (1998). Available online at: http://www.icnirp.de/documents/emfgdl.pd

IWRM Plan Joint Venture Namibia. (2010). Integrated Water Resources Management Plan. Windhoek: Ministry of Agriculture, Water and Forestry

Koch, K., Pallett, J., Tarr, P., Wetzel, G., 2011, Strategic Environmental Assessment (SEA) for the Karas Integrated Regional Land Use Plan (KIRLUP)

Levitt, B., Lai, H. and Manville, A. (2022) Effects of non-ionizing electromagnetic fields on flora and fauna, Part 2 impacts: how species interact with natural and man-made EMF. Reviews on Environmental Health, Vol. 37 (Issue 3), pp. 327-406. https://doi.org/10.1515/reveh-2021-0050

Mendelsohn et al. (2002). Atlas of Namibia: A portrait of the land and its people. Cape Town, South Africa: David Philips Publishers

Meteoblue. (2017, August). Meteoblue/Archive/Climate. Retrieved from https://www.meteoblue.com: https://www.meteoblue.com/en/weather/forecast/modelclimate/-21.977N16.735E1415_Africa%2FWindhoek

NACOMA. (2012). Updated Strategic Environmental Assessment for the Coastal Areas of the Erongo and Kunene Regions. Windhoek: Ministry of Environment and Tourism

Namibia (2020). Fourth National Communication to the United Nations Framework Convention on Climate Change. URL: https://

unfccc.int/sites/default/files/resource/Namibia%20-%20NC4%20-%20Final%20signed.pd

Namibian Statistics Agency, 2011. Namibia 2011 Population & Housing Census Main Report

National Planning Commission. (2012). Namibia 2011 Population and Housing Census – Preliminary Results. Windhoek, Namibia: Namibian Government.

Pastakia, C. M. (1998). The Rapid Impact Assessment Matrix (RIAM) – A new tool for Environmental Impact Assessment. Denmark: VKI Institute for the Water Environment.

Ronald Gelaro, et al., 2017, J. Clim., MERRA-2 Overview: The Modern-Era Retrospective Analysis for Research and Applications, Version 2 (MERRA-2), doi: 10.1175/JCLI-D-16-0758.1

Smit HA. 2012. Guidelines to minimize the impact on birds of solar facilities and associated infrastructure in South Africa. BirdLife South Africa, Johannesburg.

Werner, M. (2006). The stratigraphy, sedimentology, and age of the Late Palaeozoic Mesasaurus Inland Sea, SW-Gondwana: New implications from studies on sediments and altered pyroclastic layers of the Dwyka and Ecca Group (Lower Karoo Supergroup) in southern Namibia

Appendix A. Authorities Consultation

Ministry of Mines and Energy

GEO Pollution Technologies

TEL.: (+264-61) 257411 ♦ FAX.: (+264) 88626368
CELL.: (+264-81) 1220082
PO BOX 11073 ♦ WINDHOEK ♦ NAMIBIA
E-MAIL: [illegible]@thenamib.com

MINISTRY OF MINES AND ENERGY
OFFICE OF THE EXECUTIVE DIRECTOR
2024 -05- 24
RECEIVED

To: **The Executive Director**
Ministry of Mines and Energy
6 Aviation Road
Private Bag 13297
Windhoek

24 May 2024

Re: **Environmental Impact Assessment for the Construction and Operations of three Photovoltaic Power Plants at Aussenkehr, //Karas Region**

Dear Sir / Madam

In terms of the Environmental Management Act (No 7 of 2007) and the Environmental Impact Assessment Regulations (Government Notice No 30 of 2012), notice is hereby given that applications will be made with the Environmental Commissioner for the construction and operations of three photovoltaic power plants in Aussenkehr, //Karas Region. The projects are tabled below:

Proponent	Project
Aussenkehr Solar Company (Pty) Ltd	Construction and Operation of the 50 MW Aussenkehr Solar Company Photovoltaic Plant in Aussenkehr, //Karas Region
Oryx Orange River Solarpark (Pty) Ltd	Construction and Operation of the 50 MW Oryx Orange River Solarpark Photovoltaic Plant in Aussenkehr, //Karas Region
Aussenkjer Energy Investments (Pty) Ltd	Construction and Operation of the 20 MW Aussenkjer Energy Investments Photovoltaic Plant in Aussenkehr, //Karas Region

Attached to this letter is a background information document for each project, providing additional information about the proposed developments. The three plants will be located adjacent to each other and cover approximately 250 hectares. Each plant will be connected to an aboveground power line which is proposed to be linked to the National grid via the Aussenkehr Substation. Solar panels will be installed on mounting racks to form solar panel arrays. The direct current (DC) produced by the plants will be converted into alternating current (AC) by means of inverters. Construction will include land preparation, minor earthworks, installation of solar panels and linking with the Aussenkehr Substation as per NamPower requirements. Operations include on site security, daily maintenance, cleaning and repairs when required.

Geo Pollution Technologies (Pty) Ltd was appointed by the Proponent to conduct an Environmental Assessment (EA) for the construction and operations of the photovoltaic plant. As part of the assessment we notify interested and / or affected parties. You are hereby invited to share with Geo Pollution Technologies, any comments, issues or concerns related to the proposed project, for consideration in the Environmental Assessment.

Please forward your inputs to:
E-mail: solar@thenamib.com
Fax: 088-62-6368.

Should you require any additional information please contact Geo Pollution Technologies at telephone 061-257411.

Thank you in advance.

Proof of Public Consultation Authorities

Public Participation Notification: Environmental Assessment Construction and Operation of the 20 MW Aussenkjer Energy Investments Photovoltaic Plant in Aussenkehr, //Karas Region

Privacy Block

Name & Surname	Organisation/Address			
K. Cloete	Noordoewer S.			
CS Muncluk	Nanzpel			

Geo Pollution Technologies
Aussenkjer Energy Investments (Pty) Ltd
December 2023

Proof of Communication with Nampower

From: Privacy Block @nampower.com.na>
Date: 29 April 2024 at 20:15:25 CAT
To: Privacy Block @yahoo.com
Cc: Privacy Block @nampower.com.na>, Privacy Block
Privacy Block a@nampower.com.na Privacy Block <Saarty.Mikka@nampower.com.na>

Subject: RE: Substation Connection

Dear Tironen

Connection is possible to both substation and it all depends on which voltage level is being connected to.

At Aussenkher SS:,

1. If you connect on the 22kV side we have a 5MWp Solar PV plant on it and our new transformer is 30MVA, hence adding 20MW is okay. Using the lowest power factor as stipulate din the grid code and NamPower specifications, this is about 28MVA.
2. If you connect on the 132kV side, this is also possible
3. Both options does not require upgrades but just normal shallow connections

NB: Kindly note that, if this plan is for supplying loads in Namibia, then both the Electricity Control Board (ECB) and the MSB will give their approvals accordingly. However if this is for export into the SAPP market, the there is a moratorium on that of which licences to be only granted after 18 months from this month of April 2024 and the same applies for any grid integration studies.

Yours Sincerely

Privacy Block

The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.

PO Box 2864, Windhoek, Namibia,
NamPower Control Building, 3 Goethe Street

Appendix B. Proof of Public Consultation

Notification sent out to IAPs

From Me

Reply | Reply All | Forward | Archive | Junk | Delete | More

To undisclosed-recipients: ;

20/11/2023, 4:24 pm

Bcc [redacted]@karasrc.gov.na, lenk[redacted]@orasecom.org, [redacted]laatjies@standardbank.com.na, [redacted]@namgrapes.com, ms[redacted]s@kharasog.gov.na, [redacted]@icloud.com, [redacted]@diekmannassoociated.com, [redacted]nachox@gmail.com, [redacted]bede@sanparks.org, [redacted] Mostert', n[redacted]rises@outlook.com, p[redacted]e@kaapagri.com.na, norotshama@africaonline.com.na, s[redacted]s@fnbnamibia.com.na

Subject **Notification - EIA - Photovoltaic Power Plants at Aussenkehr 3**

Dear Interested and/or affected Party,

Environmental Impact Assessment for the Construction and Operations of Photovoltaic Power Plants at Aussenkehr , ||Karas Region

In terms of the National Environmental Management Act, No 7 of 2007 (Section 21 to 24 of Government Notice 4878 Regulation No. 30 of 2011), all interested and affected parties as well as commenting authorities are being notified about the intention to establish three solar plants in Aussenkehr. These plants are planned next to the existing one. Since three different companies are proposing the development, three different information pieces about them are attached. An additional map, depicting all three proposed plants, is also shared.

The notifications are being sent now, during harvesting season, which is when the most people are concentrated in thearea and thereby increaseing the public awareness of the project. However, the process will remain open for any further questions or queries about the proposed plants. Kindly note that the project team will also be in Aussenkehr the second week of Desember. The three environmental impact assessment reports will only be sent for public comment next year.

This information is free to share. If there is any additional party who wishes to be added to the distribution list, kindly please register as an IAP (Please take note that if you have received this email, you are already registered). Similarly, kindly please let us know if you do not want to receive any further information about the project.

Should you require any additional information, please contact Geo Pollution Technologies at telephone 061-257411 or Quzette Bosman as per contact details below.

Sincerely,

From Me

Reply | Reply All | Forward | Archive | Junk | Delete | More

To undisclosed-recipients: ;

20/11/2023, 4:23 pm

Bcc Gerhard Van der Merv[redacted]@afol.com.na>, [redacted]@sanparks.org, Henner [redacted], j[redacted]1@gmail.com[redacted]@silverlands.com, [redacted]@fronteirfruit.com[redacted]@grapeallinancend.co.za, jkinahan@[redacted], [redacted]@namwater.com.na, [redacted]@namwater.com.na [redacted]@nec-namibia.com,mutukalola@gmail.co[redacted]@silverlands.com,[redacted]@csnam.co.na,[redacted]wa"@nampower.com.na

Subject **Notification - EIA - Photovoltaic Power Plants at Aussenkehr 2**

From Me

Reply | Reply All | Forward | Archive | Junk | Delete | More

Cc andre@thenamib.com <andre@thenamib.com>

Bcc [redacted]@yahoo.com, r[redacted]de@orvi.biz, [redacted]@tutungen[redacted], ps@mynssc.gov.na, [redacted]d@iway.r[redacted]a@namwater.com.na, [redacted]e@iway.na, [redacted]both@yahoo.com, namspar@[redacted], [redacted]n@kaapagri.co.za, d[redacted]amu@nampower.com.na, [redacted]@solargrapes.com.na, [redacted]@iafrica.com.na, [redacted]uidenhout, p[redacted]n@solargrapes.com.na, [redacted]@furnstores.co.za

Subject **Notification - EIA - Photovoltaic Power Plants at Aussenkehr 1**

20/11/2023, 4:21 pm

Dear Interested and/or affected Party,

Environmental Impact Assessment for the Construction and Operations of Photovoltaic Power Plants at Aussenkehr , ||Karas Region

In terms of the National Environmental Management Act, No 7 of 2007 (Section 21 to 24 of Government Notice 4878 Regulation No. 30 of 2011), all interested and affected parties as well as commenting authorities are being notified about the intention to establish three solar plants in Aussenkehr. These plants are planned next to the existing one. Since three different companies are proposing the development, three different information pieces about them are attached. An additional map, depicting all three proposed plants, is also shared.

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This information is free to share. If there is any additional party who wishes to be added to the distribution list, kindly please register as an IAP (Please take note that if you have received this email, you are already registered). Similarly, kindly please let us know if you do not want to receive any further information about the project.

Should you require any additional information, please contact Geo Pollution Technologies at telephone 061-257411 or Quzette Bosman as per contact details below.

Sincerely,

From Manfam <[redacted]@africaonline.com.na>

To Me

Subject **Read: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 1**

Reply | Forward | Archive | Junk | Delete | More

20/11/2023, 7:05 pm

Your message has been read.

Message details follow:

From: "Quzette Bosman" <quzette@thenamib.com>
To:
Date: Mon, 20 Nov 2023 07:20:38 -0700
Subject: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 1

From Nellis Holtzhausen <[redacted]@kaapagri.co.za>

To Me

Subject **Read: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 1**

Reply | Forward | Archive | Junk | Delete | More

21/11/2023, 7:46 am

Your message

To: Nellis Holtzhausen
Subject: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 1
Sent: Monday, November 20, 2023 4:21:56 PM (UTC+02:00) Harare, Pretoria

was read on Tuesday, November 21, 2023 7:45:54 AM (UTC+02:00) Harare, Pretoria.
---------- This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the system manager. ----------

---

Final-recipient: RFC822; [redacted]@kaapagri.co.za
Disposition: automatic-action/MDN-sent-automatically; displayed
X-MSExch-Correlation-Key: pguALHETSUqCR6GlJeQzuw==
X-Display-Name: Nellis Holtzhausen

rom Sisamu, Calvin <[redacted]@nampower.com.na> Reply Forward Archive Junk Delete More

To Me 21/11/2023, 8:30 am

ubject **Read: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 1**

---

his Message is subject to the NamPower disclaimer pertaining to electronic communications.
o view the disclaimer visit: https://www.nampower.com.na/Disclaimer.aspx

From Henner Diekmann Reply Forward Archive Junk Delete More

To Me 20/11/2023, 4:27 pm

Subject **Read: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 2**

Your message

To: Henner Diekmann
Subject: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 2
Sent: Monday, November 20, 2023 2:23:17 PM (UTC+00:00) Monrovia, Reykjavik

was read on Monday, November 20, 2023 2:27:21 PM (UTC+00:00) Monrovia, Reykjavik.

Final-recipient: RFC[redacted]frontierfruit.com
Disposition: automatic-action/MDN-sent-automatically; displayed
X-MSExch-Correlation-Key: DXrq1yzsKkOcVaotTQrmbw==
Original-Message-ID: <d92cf9ca-0e56-4265-8ebd-e4a15b4e1ed5@thenamib.com>
X-Display-Name: Henner Diekmann

From [redacted]n@iafrica.com.na

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To 'Quzette Bosman' <quzette@thenamib.com>

21/11/2023, 6:32 am

Subject **Read: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 2**

Your message

To: undisclosed-recipients:
Subject: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 2
Sent: 11/20/2023 4:23 PM

was read on 11/21/2023 6:31 AM.

```
Reporting-UA: iafrica.com.na; Microsoft Outlook 16.0
Final-Recipient: rfc822;[redacted]an@iafrica.com.na
Original-Message-ID: <d92cf9ca-0e56-4265-8ebd-e4a15b4e1ed5@thenamib.com>
Disposition: manual-action/MDN-sent-manually; displayed
```

From 'Nicolene Mostert'

Reply | Forward | Archive | Junk | Delete | More

To Me

20/11/2023, 6:01 pm

Subject **Read: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 3**

Your message

To: Nicolene Mostert
Subject: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 3
Sent: Monday, November 20, 2023 4:24:24 PM (UTC+02:00) Windhoek

was read on Monday, November 20, 2023 5:59:07 PM (UTC+02:00) Windhoek.

```
Final-recipient: RFC822; n[redacted]@frontierfruit.com
Disposition: automatic-action/MDN-sent-automatically; displayed
X-MSExch-Correlation-Key: LCvAfFQL3UCe7VeHr5JLtw==
X-Display-Name: Nicolene Mostert
```

From Norotshama River Resort <norotshama@africaonline.com.na>
To 'Quzette Bosman' <quzette@thenamib.com>
Subject **Read: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 3**

Reply | Forward | Archive | Junk | Delete | More

21/11/2023, 9:59 pm

Your message

To: undisclosed-recipients:
Subject: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 3
Sent: 2023/11/20 06:24

was read on 2023/11/21 11:59.

```
Reporting-UA: africaonline.com.na; Microsoft Outlook 16.0
Final-Recipient: rfc822;norotshama@africaonline.com.na
Original-Message-ID: <4e9846ae-12ae-4472-8e3f-62cae1ebb006@thenamib.com>
Disposition: manual-action/MDN-sent-automatically; displayed
```

From 'Stefnie Vermeulen'
To Me
Subject **Read: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 4**

Reply | Forward | Archive | Junk | Delete | More

20/11/2023, 4:34 pm

Your message

To: Stefnie Vermeulen
Subject: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 4
Sent: Monday, November 20, 2023 4:25:34 PM (UTC+02:00) Windhoek

was read on Monday, November 20, 2023 4:32:57 PM (UTC+02:00) Windhoek.

```
Final-recipient: RFC822 [redacted]grapealliancena.co.za
Disposition: automatic-action/MDN-sent-automatically; displayed
X-MSExch-Correlation-Key: SnWXAwQ4wUy0t6FzRMvm6A==
X-Display-Name: Stefnie Vermeulen
```

From [redacted]Visser <wvisser@silverlands.com>

Reply | Forward | Archive | Junk | Delete | More

To Me

20/11/2023, 7:58 pm

Subject **Read: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 4**

Your message

To: Willem Visser
Subject: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 4
Sent: Monday, November 20, 2023 4:25:34 PM (UTC+02:00) Windhoek

was read on Monday, November 20, 2023 7:57:48 PM (UTC+02:00) Windhoek.

```
Final-recipient: RFC822;[redacted]@silverlands.com
Disposition: automatic-action/MDN-sent-automatically; displayed
X-MSExch-Correlation-Key: KBAOEx3cxUWdX2KcfvbO2w==
X-Display-Name: Willem Visser
```

From Maria Endunde <[redacted]e@orvi.biz>

Reply | Forward | Archive | Junk | Delete | More

To Me

20/11/2023, 4:26 pm

Subject **Read-Receipt: Notification - EIA - Photovoltaic Power Plants at Aussenkehr 1**

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Reporting-UA: 192.168.1.235; ZimbraModernWebClient - FF115 (Windows)/9.0.0_GA_4564
Original-Recipient: rfc822;m[redacted]e@orvi.biz
Final-Recipient: rfc822;m[redacted]e@orvi.biz
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Disposition: manual-action/MDN-sent-manually; displayed
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Notified IAPs

Name	Surname	Organization
A	Muhongo	//Karas Regional Council
Albert	Holtzhausen	Orange River Vineyard Investments
Albert	Calitz	AW Greenworks
Alfred	Ilukena	Ministry of Sport, Youth and National Service
Andre	Brand	Navico - Farmers'
Andries	Kok	Namwater
Anne	Scott	African Conservation Services CC
Berendt	Both	//Karasburg West Constituency
Bodin	Vasiljevivc	Aussenkehr SPAR
Nellis	Holtzhausen	Kaap Agri
Calvin	Sisamu	Nampower - Power Systems Development
Charles		Solar Grapes
Coleen	Manheimer	Vegetation Specislist
Durr	Bezuidenhout	Private
Elize	van Zyl	Solar Grapes
Furnmart		Furnmart
Gerhard	v d Merwe	Town Planner
Hendrik	Prins	|Ai-|Ais/Richtersveld Transfrontier Park - SAN Parks
Henner	Dickmann	Frontier Grapes
J	Mashala	Karasburg West Constituency
Jadre	Fourie	Silverlands Vineyards
Jan	Mostert	Frontier Grapes
Jana	Joubert	GA Management
John	Kinahan	QRS / Quaternary Research Services
John	Akawa	Namwater
Jolanda	Kamburona	Namwater
Justin	Julius	NEC/Alcon (Existing Solar Plant)
Kakishi	Mufuka	ORIP
Kevin	Liddle	Silver Street Capital
Kobus	Bothma	Namibia Grape Company
Kondjeni	Nghitevelekwa	Nampower - Power Systems Development (PSD) BU
Lahya	Shitenga	Noordoewer Settlement Office
Lenka	Thamae	ORASECOM
Lerralie	Plaatjies	Standard Bank
Lize	de Jager	Namibia Grape Company
Lucia	Basson	//Karas Regional Council
Mr	Tirone	Alcon Solar Plant (Existing Solar Plant)
N	Mostert	Frontier Grapes
Nelimona	Iipinge	Namibian Environment and Wildlife Society

Name	Surname	Organization
Nick	de Goede	|Ai-|Ais/Richtersveld Transfrontier Park - SAN Parks -
Nicolene	Mostert	Manager Frontier
Oscar	Mwayanale	Mwayanale Trading Enterprise cc
Paul	Kotze	Private
R	Brand	Norothshama Owner
Salomé	Beukes	FNB
Simon	Akwenye	Agribusdev-DRIP Agribus Dev
Smut	Matengu	NamPower
Sonja	Loots	National Botanical Research Institute
Stefnie	Vermeulen	Grape Alliance
Sunia	de kock	Grape Alliance
Zelda	van Dyk	Karsten Boerdery
Theo	Shiyambi	Aussenkehr Community Committee
Wayne	Handley	Ministry of Environment, Forestry & Tourism
Wilbard	Nashandi	Ministry of Industrialization, Trade and SME Development - Namibia Investment Centre
Willem	Visser	Silverlands
Willie	Vermeulen	karsten
		//Karas Region - Governors Office
K	Cloete	Noordoewer Settlement Office
CS	Munalula	Nampol - Aussenkehr
I	Josephine	Private

IAP Details	Comment / Concern	Response
Kevin Liddle Notification meeting 15/12/2023as well as Email 21/11/2023	1. My understanding is that the 120mw of solar cannot be accommodated by the current Nampower infrastructure. If this is indeed the case then to what extent do you, in this study, consider upgrades to substations, transmission lines, etc. 2. Will the installation have any impact on the existing Nampower users. As Nampower is the sole provider of utility electricity in the valley I think it is fair to consider if there are any negative effects for all stakeholders in the valley. This may include things such as: a)The ability to obtain netmetering licences b)The ability for other land owners to supply the network c) Risk of more power cuts due to maintenance, installation, etc. d)Technical effects (e.g. harmonics)	*Response:* Cumulative considerations have taken note of two additional sola plants planned for the area. These plants have not been approved by the ECB or Nampower, unlike this application for the 20MW plaant. NamPower have indicated that the Aussenkehr Substation will be able to accommodate the additional capacity Construction of the line and connection to the Aussenkehr Substation should not result in any power delays for the agriculture sector or cause any restriction in other producers supplying electricity to the grid. However, the existing solar plant will be affected during the upgrading of the line, this is addressed in Section 10 of the report.
Kobus Botma Notification meeting 15/12/2023	During the construction of the existing solar plant, dust created during earthworks and general construction activities resulted in a problem for our operations (tablel grape production). During that time, the developers erected shade netting and employed dust mitigation measures. We would kindly request that consideration to dust management be included in the assessment.	*Response:* Dust mitigation measures have been included in Section 10 of the report.
Ann and Mike Scott Email 22/11/2023	Thanks for the feedback on this interesting project. All the best!	Noted
Lipinge Ndelimona Email 22/11/2023	Thank you The Information is well-received	Noted

Press Notice: Namibian Sun 20 and 27 November 2023

4 | MONDAY 20 NOVEMBER 2023 | NEWS | Sun

N$500k tender sparks tribal rift in Kavango West

• TRIBALISM CLAIMS RUBBISHED BY REGIONAL GOVERNOR

Kavango West governor Sirkka Ausiku said her decision to intervene and cancel a tender awarded to a **non-regional company was centred on the principles of inclusivity and promoting deliberate and equitable national development.**

KENYA KAMBOWE/
MKANDI NANGOLO
RUNDU

Kavango West governor Sirkka Ausiku's decision to intervene and cancel a tender awarded to a company not from the region has ignited a tribal storm.

She took issue with the fact that Tateeya Investment, a company owned by well-known businessman Remind Ekandjo, was selected to organise National Malaria Day, scheduled for 10 November in Nkurenkuru. The event was eventually called off.

Ausiku, in several letters addressed to health minister Kalumbi Shangula, expressed her dissatisfaction with the tender award process, stating that local entrepreneurs were overlooked and that it was unfair for them not to benefit.

Explain to the public

She questioned how the regional leadership would justify awarding a tender worth N$479 785 to a single company that is not from the region.

"It is unfortunate and disappointing that none of the entrepreneurs from the region were accorded the opportunity to participate," she argued in a letter dated 25 October.

"The experience of the region during the hosting of national events like Public Service Day and Heroes Day, local entrepreneurs were given an opportunity to render their services, and only the services that could not be procured locally were sourced from outside the region.

"It is also a concern to award one company an amount of N$479 789, and it would be difficult for the regional leadership to explain this to the public," she noted.

"Honourable minister, unemployment is a reality in all 14 regions; hence, whenever there is an opportunity for a region to host a national event, resources must benefit the region where the event is taking place. Therefore, the region is requesting for an urgent intervention from your esteemed office."

In an attempt to resolve the situation and clarify that the process was fair, with Tateeya providing goods and services not available locally while chairs and catering were handled by locals, it seems the ministry yielded to Ausiku's concerns, resulting in the indefinite postponement of the event.

Criticism

While some applauded Ausiku's intervention as heroic, others criticised her for emphasising the aspect of the regional origin of Tateeya Investment's owner rather than addressing potential corruption in the tender award process.

"Are we now saying that Kavango entrepreneurs who have business interests in other regions must be sidelined as well? Instead of encouraging local businesses to be on the lookout for tenders and apply, she is making it seem as if her local entrepreneurs should not face competition," a source argued.

"Kavango West has become a region where non-Kavangos, especially those that do not hail from her region, are being mistreated, and the name of the governor is always in the mix.

"There was also an issue with the recent Swapo Party rally where the catering company that got the tender was from Rundu – can you imagine? That region is becoming unbearable for non-Kavango West inhabitants. If this is not stopped, it will become a problem in the long run."

Matter of principle

However, Ausiku, when contacted for comment, rubbished tribalism claims.

"The reaction on this matter is not tribally motivated, but a matter of principle and out of courtesy," Ausiku argued.

"The company under discussion has previously rendered services in the region, including at the Nkurenkuru Expo. Further, many entrepreneurs not from the Kavango West Region are awarded construction projects in the region.

"Out of courtesy, it is expected that when offices, ministries and agencies host events in any region, the region, especially at the regional council level, must be informed of such events and be involved in the preparations.

"It is about sensitivity towards inclusivity to promote deliberate and equitable national development. Kavango West is among the poorest regions, and this is at the heart of this matter, not the alleged tribalism."

UNTRUE: Kavango West governor, Sirkka Ausiku.
PHOTO: KENYA KAMBOWE

NEWS IN SHORT

Traffic division receives 22 new vehicles

A fleet of 22 new vehicles were handed over to the traffic law enforcement division of the Namibian Police ahead of the festive season.
The handover was done by the police and the Road Fund Administration (RFA).
It also included five speed cameras, breath alcohol testing devices and a trailer fitted with speakers and branding.
Namibian Police Inspector-General Joseph Shikongo said, during the 2023/2024 financial year, the police were allocated N$92.7 million to procure a new fleet.
Therefore, 113 vehicles, three boats and two trailers were procured using both the police budget and financial assistance from the RFA.
"To date, 40 vehicles and two trailers have been delivered by the suppliers, while 73 vehicles and the three boats are expected in due course."
Shikongo said out of the 40 vehicles received, 21 are Toyota Hilux single cab bakkies for the traffic directorate, procured with RFA's assistance.
Meanwhile, 16 Toyota Hilux single cab bakkies, one Toyota Hilux double cab bakkie, two Toyota Corolla sedans and two livestock-transporting trailers were acquired with the police budget.
– ELLANIE SMIT

Live cattle exports decline

On a month-on-month basis, live cattle exports saw a 27.8% decline from the 13 899 heads exported in September to 10 033 exported in October.
According to the Meat Board's Market Watch, live exports are 36% lower than a year ago and 41.94% lower than the five-year average.
Live exports were dominated by South African feedlots and abattoirs (99.9%) as destinations, with Botswana accounting for only 0.1% during October.
Export abattoirs experienced a decline of 41.04% on a month-to-month basis.
"Since May, there has been an almost 50% increase in the number of cattle slaughtered at export abattoirs, compared to previous years."
The Meat Board said the number of cattle slaughtered year-to-date is 40.69% more than what was slaughtered at export abattoirs last year.
"This shift in marketing could be due to the shift in the number of cattle slaughtered at B and C class abattoirs being absorbed by export abattoirs."
– ELLANIE SMIT

PHOTO: FILE

• WORKERS URGED TO IMPROVE SERVICE DELIVERY

Unpaid overtime sparks revolt at fisheries ministry

The fisheries ministry's top administrator has urged workers to solve matters internally instead of running to unions, politicians and the media.

STAFF REPORTER
WALVIS BAY

Fisheries workers, some of whom are integral to the country's fight against illegal fishing in Namibian waters, have threatened to down tools if their outstanding overtime claims are not settled.

The situation has now seemingly pitted the ministry's top bosses against the workers, with the latter claiming their concerns are not being taken seriously.

It is understood that overtime for fisheries observers and inspectors has been outstanding for more than four months, leaving workers no choice but to consider stopping overtime work, subsequently giving private fishing companies leeway to do as they please during their fishing expeditions without watchdogs on their vessels.

Workers have also accused the ministry's leadership of going the extra mile to please fishing industry players while failing to sort out in-house operational matters that are central to the ministry's mandate.

Waiting for a crisis

Meanwhile, fishing industry activists have cautioned that the situation could lead to the depletion of fish stocks because inspectors and observers are not out at sea to control and monitor fishing activities.

"Now we only work limited hours although we usually worked shifts. We do not exceed our hours because you do not get compensated for it. We repeatedly told the ministry to solve the overtime problems by paying us on time.

"Imagine not paying workers' overtime for four months and you expect them to deliver," one of the workers, who chose to remain anonymous, lamented.

Another worker said: "The ministry is not serious when it comes to the well-being of its workers and its mandate to protect the country's marine resources because they always wait for a crisis before they act. Our overtime is always left hanging until we threaten to go on strike; only then is it attended to".

INTERNAL MATTER: Fisheries ministry executive director Annely Haiphene. PHOTO: CONTRIBUTED

Not scared

Namibian Sun spoke to the workers last week after a meeting with the ministry's executive director, Annely Haiphene, where the overtime matter was discussed in-depth.

According to ministerial insiders, Haiphene took a hard-line stance and blasted employees for turning to their unions and the media in a bid to solve the matter.

"Your overtime is there on my desk, see what your union will do to me. You guys are going to newspapers and [Popular Democratic Movement leader McHenry] Venaani about this issue," she allegedly quipped during the meeting.

She apparently added: "How can you talk [about] in-house things outside? You will see, go tell your union, I am not scared of your union".

Haiphene read the riot act to the workers and urged them to improve on the delivery of customer service and overall discipline.

Her visit coincided with the launch of the ministry's customer service charter at the Walvis Bay office.

Haiphene did not respond to calls and messages on the matter.

DILAPIDATED NORTHERN QUARANTINE FACILITY BLAMED FOR POOR MEAT QUALITY

FALLING APART: A quarantine facility servicing the Kunene, Omusati, Oshana regions is in a dilapidated state. PHOTO: FILE

ELLANIE SMIT
WINDHOEK

A lack of animal quarantine services has been highlighted in a petition to the National Assembly.

A dilapidated quarantine facility, which serves the Kunene, Omusati and Oshana regions, was raised in the petition by Lisha Empowerment and Development, calling on the National Assembly to address the urgent need to revive the market in Namibia's northern communal areas (NCAs).

It was tabled by Speaker Peter Katjavivi and was discussed last week at a public hearing by the Parliamentary Standing Committee on Economics and Public Administration.

According to the petition, the animal quarantine services for Kunene, Omusati and Oshana fall under the directorate of veterinary services.

It said the Eloolo abattoir at Oshakati and the Outapi abattoir were created to provide sustainable market access for slaughter livestock procured from farmers in these regions.

"To date, however, resident livestock farmers residing in such regions are no longer able to sustainably sell their livestock as quarantine facility and abattoirs, under the watch of the agriculture ministry, collapsed simultaneously 12 years ago."

One borehole, no electricity

The petition said for over a decade, the Omutambo Maowe quarantine facility has been unable to provide effective service due to dilapidated infrastructure.

Meanwhile, of the 13 boreholes previously installed at the facility, only one was functioning as of September 2022, it said.

The petition further noted that in July 2022, the facility was without electricity and employees at the site said that the previously installed generator had been broken for eight years.

Furthermore, livestock holding camps on the 24 000 hectare farm were without fencing at numerous places.

Interventions

A sustainable market for livestock in Namibia's NCAs requires distinct interventions, it said. These are effective quarantine services to allow procurement of healthy meat products, effective abattoirs to ensure that animal slaughter and meat value chain processing continues, and an effective programme that seeks to attain genetic improvement of local livestock as a strategic long-term investment.

Apart from making animals disease-free, no efforts have been made to improve the quality of abattoir-bound slaughter livestock, the petition read.

"This explains why over the years the local abattoirs continued to receive poor-quality animals, resulting in poor-quality meat products and no sustainable markets."

According to the petition, a formal submission was made by the Super Group of Companies to rent the land the quarantine facility is on and carry out necessary renovations. It also offered to finance the resumption of livestock procurement, to produce 100 stud bulls per year and have these distributed to farmers for free as a long-term investment for genetic improvement, as well as to build a school and clinic.

This submission was reportedly ignored for three years and when Lisha followed up, the ministry declined the offer.

Press Notice: Republikein 20 and 27 November 2023

Verkragter se vonnis verkort

› Kristian Kruger

'n Man wat tot 12 jaar tronkstraf gevonnis is op 'n klag van verkragting en diefstal, se vonnis is met twee jaar verkort nadat hy 'n aansoek om appèl by die hoërhof in Windhoek ingedien het.

Moses Musongo is in November 2022 skuldig bevind nadat 'n vrou aangevoer het dat hy haar verkrag en haar selfoon gesteel het.

Die streekhof op Rundu het hom tot 10 jaar tronkstraf gevonnis vir die verkragtingsklag en twee jaar vir diefstal.

Musongo se appèlaansoek was teen sy vonnisoplegging en skuldigbevinding op beide klagte. Die hof het egter beslis dat slegs die appèl teen die diefstalklag kan slaag.

Die klaagster het getuig sy het haar foon in haar onderklere gehad toe sy en Musongo 'n kroeg saam verlaat het. Haar foon het egter verdwyn nadat hy haar glo uitgetrek en seksuele omgang met haar gehad het.

Toe Musongo, wat homself verteenwoordig het, haar tydens kruisondervraging oor die foon uitgevra het, het sy bloot gesê: "Jy is die een wat my uitgetrek het, jy moet weet waar jy dit gesit het."

Regter Dinnah Usiku het op grond hiervan beslis sy was nie seker waar haar foon was nie.

"Sy het bloot aangeneem aangesien hy haar uitgetrek het, moes hy haar foon weggesteek het. Dit was nie die appellant [Musongo] se bedoeling om haar te bereof nie," het Usiku se uitspraak.

Usiku het dus beveel dat die vonnis van twee jaar tronkstraf ten opsigte van die diefstalklag, tersyde gestel word.

VERKRAGTING

Die vonnis vir die verkragting bly egter onveranderd.

Musongo het aangevoer hy en die klaagster het konsensuele seks gehad. Hy het gesê die hof se beslissing dat die staat bo redelike twyfel bewyse gehad het dat hy haar verkrag het, was verkeerd.

Dinnah Usiku
REGTER

"Nadat al die bewyse oorweeg is, is hierdie hof oortuig van die appellant se skuld ten opsigte van die verkragtingsklag."

Hy het in die appèlaansoek verder aangevoer dat die hof nie die teenstrydighede in haar getuienis in ag geneem het nie. Hy het bewyse die vonnis van tien jaar tronkstraf het hom geskok.

"Nadat al die bewyse oorweeg is, is hierdie hof oortuig van die appellant se skuld ten opsigte van die verkragtingsklag. Die vonnis wat in terme van dié klag opgelê is, wek nie 'n gevoel van skok nie, veral met inagneming van die erns van die misdaad en die belang van die samelewing," het die hof beslis.

Usiku het verder beslis dat die getuienis tot die toendeel – dat die seksuele omgang konsensueel was – hoogs onwaarskynlik is.

Die hoërhof in Windhoek. FOTO ARQUIVO

– kristian.kruger@republikein.com.na

» Werkers kry berading, ekstra opleiding

Otjikoto maak reg vir werksverliese

Bedrywighede by die myn se verwerkingsaanleg sal waarskynlik nog tot 2031 voortduur soos laegraaderts wat op die myn geberg word, deur die meule gesit sal word.

› Angette Graig

Die bestuur van B2Gold se Otjikoto-goudmyn beplan om ná die eerste kwartaal van 2024 tot sowat 'n derde van sy bykans 1 000 werknemers af te lê.

'n Verdere drastiese vermindering in werksgeleenthede sal in 2025 volg, wanneer mynbou in die oopgroefmyn beëindig mag word.

Bedrywighede in die ondergrondse Wolfshaguithreiding word verwag om ook in 2026 tot 'n einde te loop.

Otjikoto se algemene bestuurder, Eric Barnard, het verlede week hieroor uitgebrei gedurende 'n mediageleenthede waar top-B2Gold-beamptes, soos Bill Lytle, senior adjunkpresident en hoofbedryfsbeampte, uit Kanada Namibië besoek het.

B2Gold Namibia se raadsvoorsitter, dr. Ileke Hangala, het gesê daar is amper nie meer gouderts by die myn om te ontgin nie.

Dit kom egter nie as 'n verrassing nie, aangesien B2Gold reeds aangekondig het dat voorbereidings reeds getref word om die myn uiteindelik te sluit.

John Roos, B2Gold Namibia se streekbestuurder. FOTO'S ANGETTE GRAIG

Bedrywighede by die verwerkingsaanleg sal waarskynlik nog tot 2031 voortduur soos laegraaderts wat op die myn geberg word, deur die meule gesit sal word, volgens Barnard.

Hangala se toespraak het afgeskop met die eerste goudproduksie in Februarie 2013. Kommersiële produksie is egter eers in April 2014 bereik, breë hy uit.

"Dit was 'n reusebelegging, meer as US$300 miljoen, amper US$400 miljoen. Ons het sowat 900 mense direk in diens geneem, indirek sowat 1 000 of so, ons voel ons het tot die ekonomie bygedra en ons is uiters trots daarop."

Die myn het oor die jare reeds N$19,5 miljard tot die plaaslike ekonomie bygedra, insluitend sowat N$1,1 miljard in belasting, uit inkomste van sowat N$7 miljard in 2023. Korporatiewe sosiale beleggings vanaf die Otjikotomyn beloop sowat N$26 miljoen, insluitend N$14 miljoen vir die nuwe Ombili Primêre Skool in Otjiwarongo, is van die inligting wat tydens die geleentheid gedeel is.

"Die Otjikoto-myn word 90% deur B2Gold besit en baie van die geregte wat julle hier sien is van Kanada, en hulle het vandag hier aangekom. Hulle het gekom omdat hierdie myn deur Namibiërs bestuur word, van die grond af op," het Hangala ook gesê.

John Roos, die streekbestuurder vir B2Gold Namibia, en het gesê: "Mense geniet dit om vir B2Gold te werk. Ons werknemers bly gemiddeld sowat ses en 'n half jaar by ons, wat in [illegible] mynbedryf merkwaar[illegible] is. Tog moet ons ands[illegible] dink en beset die m[illegible] moet eendag sluit. [illegible] beskerm die nalatensk[illegible] vir almal wat vir so 'n [illegible] sonderlike ondernem[illegible] soos B2Gold Namib[illegible] werk."

Dit is hoekom die m[illegible] se menslikehulpbr[illegible] departement reeds [illegible] berading begin het [illegible] werknemers voor te be[illegible] vir die lewe na die sluit[illegible] van die myn, voeg hy b[illegible]

Opleiding oor fin[illegible] siële geletterdheid w[illegible] verskaf aan werknem[illegible] wat met groot skuld [illegible] gesondheidsambas[illegible] deurs is uitgeken, 'n w[illegible] standspan is saamge[illegible] en lede van elke portu[illegible] groep kry ondersteuni[illegible] sê hy.

Verder word uitgebre[illegible] opleiding gebied, as[illegible] hulp en toelaes om we[illegible] nemers se vaardighed[illegible] verbeter, voeg hy by.

Die myn is ook 'n vo[illegible] loper op die gebied [illegible] sonkrag in te span va[illegible] die Otjikoto-sonkraga[illegible] leg, wat reeds in 13% [illegible] die myn [illegible] kragbeho[illegible] tes voorsie[illegible]

Volgen[illegible] jaar word [illegible] aanleg [illegible] gebrei tot [illegible] m e g a w a[illegible] (MW) en [illegible] sal tot 3[illegible] van die m[illegible] en aanleg [illegible] kragtoev[illegible] "groen" w[illegible] het Roos gesê.

Die Otjikoto-myn [illegible] ook 'n voorbeeld in ter[illegible] van deurlopende bes[illegible] rings en voorbereidi[illegible] om die omgewing te re[illegible] habiliteer, asook die vo[illegible] siening van voedsel [illegible] grian en inheemse pla[illegible] van naburige komm[illegible] siële plase en 'n natu[illegible] reservaat wat B2G[illegible] gevestig het.

Skandeer die QR-kode

PUBLIC PARTICIPATION NOTICE

ENVIRONMENTAL IMPACT ASSESSMENTS FOR THE CONSTRUCTION AND OPERATIONS OF PHOTOVOLTAIC POWER PLANTS AT AUSSENKEHR, //KARAS REGION

Geo Pollution Technologies (Pty) Ltd was appointed by Aussenkehr Solar Company (Pty) Ltd, Orys Orange River Solarpark (Pty) Ltd and Aussenkey Energy Investments (Pty) Ltd to undertake environmental assessments for photovoltaic power plants in Aussenkehr in the //Karas Region. Additional and location information about the photovoltaic power plants, located adjacent to each other, can be obtained at: http://www.theraenb.com/projects/projects.html

The environmental assessments will be conducted according to the Environmental Management Act of 2007 and its regulations as published in 2012.

The three plants will be located adjacent to each other and cover approximately 300 hectares (100 ha each). Each plant will be connected to an aboveground power line which will be linked to the National grid via the Aussenkehr Substation. Construction will include land preparation, minor earthworks, installation of solar panels and linking with the Aussenkehr Substation. Operations include on site security, daily maintenance and repairs when required.

All interested and affected parties are invited to register with the environmental consultant. By registering you are provided with the opportunity to share any comments, issues or concerns related to the projects, for consideration in the environmental assessments. Additional information can be requested from Geo Pollution Technologies.

Quintte Bowman
Geo Pollution Technologies
Tel: +264-61-257611
Fax: +264-88628368
E-Mail: solar@theraenb.com

» Bouwerk vorder by Daures

'Groen' dorpie blom in die woestyn

Duitsland se ministerie van onderwys en navorsing het 'n bedrag van 12,1 miljoen euro – of sowat N$220 miljoen – geskenk om die eerste fase van die reuse-ontwikkeling te finansier.

Augetto Graig

Minstens 50 km vanaf die naaste nedersetting, in die hart van die bloedige warm Tsiseb-bewaringsgebied wat onder die Daure Daman Tradisionele Owerheid se jurisdiksie val, is 'n nuwe "groen" dorpie besig om vorm aan te neem. Die Daures Green Hydrogen Village word spesifiek in die middel van die woestyn gebou weens die sterk winde wat voortdurend in dié omgewing oor die oop vlaktes waai.

Jerome Namaseb is die jong uitvoerende hoof van die konsortium en 'n stigterslid van Enersense Energy Namibia, wat 90% van dié ambisieuse ontwikkeling besit. Die tradisionele owerheid besit 7,5% van die projek, en die Tsiseb-bewaringsgebied het 'n aandeel van 2,5%. In samewerking met die Wetenskaplike Dienssentrum vir Klimaatverwandelinge en Aanpasbare Grondbestuur in Suider-Afrika (SASSCAL) en deur die verhouding tussen die Namibiese en Duitse regerings het Duitsland se ministerie van onderwys en navorsing 'n bedrag van 12,1 miljoen euro – of sowat N$220 miljoen – geskenk om die eerste fase van die reuse-ontwikkeling te finansier.

Volgens Namaseb is sowat 66% van die bouwerk reeds voltooi, met 'n tweede 130 meter lange meteorologiese toring wat opgerig is.

Bouwerk aan kweekhuise met druppelbesproeiingstelsels wat reeds 5% voor skedule is en die vestiging van die elektroliseerder wat energie van die son gebruik om water in sy atome te verdeel en waterstof te skep) wat ook 6% voor skedule is. Verder vorder die 162 werknemers op die bouperseel van sowat 300 hektaar – uit die projekgebied wat altesaam 1 500 hektaar beslaan – vinnig met die opstel van laboratoriums, 12 behuisingseenhede, sewe boorgatdamme, 'n sonkrag-aanleg van 0,88 megawatt (MW), 0,1 MW se windturbines, en 'n elektroliseerder-aanleg van 0,25 MW sowel as 'n tru-osmosefasiliteit om jaarliks 18 ton groen waterstof uit die bruk boorwater te produseer. Daarmee sal 100 ton ammoniak per jaar vervaardig word, en uiteindelik sal die eerste ammoniumsulfaat vir kunsmis teen volgende jaar daar vervaardig word.

Groot kweekhuise met druppbesproeiingstelsels word gebou vir topgehalte landbouproduksie. FOTO AUGETTO GRAIG

Tussen 2024 en 2027 moet kunsmisproduksie drasties toeneem wanneer 6,7 MW se sonkrag, 5,1 MW se windkrag en die elektroliseerder se kapasiteit van 5 MW ingespan sal word om 602 ton waterstof, 3 500 ton ammoniak en 35 000 ton ammoniumsulfaat op 'n jaarlikse basis te vervaardig. Daarna, tussen 2029 en 2032, is die plan om die kapasiteit na 420 MW se sonkrag en 590 MW se windkrag te verhoog om die elektroliseerder van 420 MW te dryf en sodoende 121 000 ton waterstof en 352 000 ton ammoniak per jaar te kan produseer. Ná 2032 hoog die projek om sy sonkragkapasiteit tot 840 MW te verhoog, 1,18 gigawatt (GW) se windkrag op te wek en 'n elektroliseerder van 840 MW in werking te stel om 240 000 ton waterstof en 700 000 ton groen ammoniak vir uitvoerdoeleindes te vervaardig.

Die eerste fase sal aanvanklik tot 70 kubieke meter (m³) water per dag, en later 50 m³ per dag vereis, wat deur die boorgate voorsien sal word. Slegs drie van die sewe boorgate is voldoende vir die doel. Terselfdertyd vorder die ontwerp van die dorpsoon 'n finale beleggingsbesluit nader te bring, winddata word gemeet en ammoniakproduksie en die opwekking van hernubare energie word opgestoot om produksiekoste teen 2030 mededingend in die streek en die internasionale mark te maak.

Die aanvanklike elektroliseerder sal na verwagting teen Februarie volgende jaar in gebruik geneem word en die hele aanleg behoort teen Junie 2024 operasioneel te wees, brei Namaseb uit.

Die hoofman van die Daure Daman Tradisionele Owerheid, Zacharias Seibeb, sê die reuseprojek verder goeden hy het 'n beroep op alle Namibiërs gedoen om die ontwikkeling te ondersteun. Hy sê dit bied 'n nuwe geleentheid in groen waterstof wat, indien dit sukseswol uitgevoer word, 'n groot voorsprong vir alle Namibiërs sal wees. Indien die projek misluk sal dit vir alle Namibiërs 'n mislukking wees, voer hy aan.

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Skandeer die QR-kode

Gesondheidstenders op ys lê bedryf lam

Jemima Beukes

Ná die kansellasie van die omstrede "kondoomtender" het die ministerie van gesondheid en maatskaplike dienste deur die Sentrale Verkrygingsraad van Namibië (CPBN) 'n nuwe tender vir ses maande ter waarde van N$67,5 miljoen geadverteer.

Dié tender sal egter na verwagting eers aanstaande jaar toegeken word. Die gesondheidsminister, dr. Kalumbi Shangula, het in die parlement erken sy ministerie staar onsekerhede en tekorte van mediese voorraad soos handskoene in die gesig.

Die situasie word vererger deur tenders wat op ys geplaas is en 'n beperkte N$25 miljoen vir direkte aankope. Dit toon die agtergrond van 'n jaarlikse vooruitskatting vir 'n vraag ter waarde van sowat N$1,7 miljard.

"Sous sake tans staan, is die aanduidings dat geen langtermyn-tender nog vanjaar deur die CPBN gefinaliseer gaan word nie. Geen langtermyn-kontrakte sal in plek wees nie en tydelike maatreëls sal gevolglik voortduur. Dit plaas ons in 'n baie moeilike situasie. Ons het 'n baie groot lund en baie hospitale en klinieke waar daar 'n vraag na dié voorraad is," het Shangula gesê.

In Augustus 2021 het die ministerie die omstrede "kondoomtender" wat uit 419 items bestaan het, aan die CPBN voorgelê. Ná heweerde ongeryndhede het politici, insluitend parlementslede, gevra die tender moet gekanselleer word.

Ten spyte van 'n gevolglike hieproses in Junie vanjaar waaraan 83 tenderaars deelgeneem het, het die CPBN se optrede en hersieningsproses gelei tot die kansellasie van die tender vir die verskaffing van mediese voorraad vir 'n tydperk van twee jaar.

'n Nuwe tender vir 'n tydperk van ses maande wat na raming sowat N$67,5 miljoen beloop is nou onderweg, met die moontlikheid dat kontrakte eers in Januarie 2024 toegeken sal word.

Die ministerie se tender vir die verskaffing van algemene farmaseutiese produkte wat oor 'n tydperk van twee jaar sou strek en in Augustus 2021 ingedien is, staar nou ook vertragings in die finaliseringproses in die gesig omdat een van die bieërs, die bekende sakeman Shapwa Kanyama – aan wie die kondoomtender ook toegeken is – die toekenningsproses by die CPBN se hersieningspaneel uitdaag.

'n Hofverhoor-interdik van Oktober het intussen die implementering van die hersieningspaneel se bevel verbied, hangende 'n hersieningsproses deur die hof.

Shangula sê die impak van die openbare verkrygingswet is duidelik en veroorsaak uitgerekte en tydrowende prosesse vir aankope wat lei tot noodaankope vir farmaseutiese produkte.

"Dit is duidelik dat die implementering van die wet 'n beduidende invloed gehad het op die beskikbaarheid van medisyne en mediese produkte. Die aankoop van medisyne in Namibië het 'n uitgerekte en langdradige proses geword.

"Dit het die ministerie gedwing om hom te wend tot baie duur noodaankope en die uitkoop van die nodige items."

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Appendix C. Tree List

Name	Common Name	Abundance Category	Conservation Concerns and Notes
Acacia karroo	Sweet-thorn	Common to Abundant	
Adenolobus garipensis	Butterfly-leaf	Uncommon to Rare	
Aloe dichotoma	Quiver Tree	Uncommon to Rare	The lack of young trees is a concern, as is the removal of mature plants for gardens. A recent study made on the health of the Namibian *Aloe dicotoma* population concluded that it might be susceptible to climate change. Protected by the Nature Conservation Ordinance as a CITES Appendix II species. Protected by forestry legislation
Boscia albitrunca	Shepherd's Tree	Uncommon to Rare	Although widespread and hardy, it is heavily utilized by people and animals. The difficulty that young plants have in becoming established is a concern, but fortunately there appears to be a health and widespread population of young plants. Protected by forestry legislation.
Boscia foetida subsp foetida	Smelly Shepherd's-bush	Uncommon to Rare	
Ceraria fruticulosa	Slender Ceraria	Uncommon to Rare	Unless this plant was misidentified by atlassers or it is very localized in some squares, there has been fairly extensive die-off of this species.
Ceraria namaquensis	Namaqua Ceraria	Common to Abundant	
Commiphora namaensis	Nama Corkwood	Uncommon to Rare	Near-endemic to Namibia Potentially threatened by illegal pachycaul trade. Decrease in range may be a cause for concern but it could have been overlooked. Protected by forestry legislation
Diospyros lycioides subsp *lycioides*	Bluebush	Uncommon to Rare	

Name	Common Name	Abundance Category	Conservation Concerns and Notes
Euclea pseudebenus	Wild Ebony	Common to Abundant	Protected by forestry legislation
Euphorbia gregaria		No Estimate of Abundance	Endemic to southern Namibia and Richtersveld. CITES Appendix II
Euphorbia virosa	Candelabra Euphorbia	Occasional	CITES Appendix II
Ficus cordata subsp *cordata*	Namaqua Rock-fig	Uncommon to Rare	Protected by forestry legislation
Gymnosporia linearis subsp *lanceolata*	Narrow-leaved Spikethorn	Occasional	
Lycium bosciifolium	Limpopo Honey-thorn	Uncommon to Rare	
Maerua gilgii	River Bush-cherry	Common to Abundant	Very restricted along Orange River. Could be affected by increased human activity
Maerua schinzii	Ringwood Tree	Common to Abundant	Increasingly impacted by humans. Protected by forestry legislation
Nicotiana glauca	Wild Tobacco	Occasional	Alien. Not a major threat in Namibia, but should be monitored
Parkinsonia africana	Green-hair Tree	Common to Abundant	
Phaeoptilum spinosum	Brittle-thorn	Common to Abundant	
Prosopis spp		Occasional	
Searsia pendulina	White Karee	Common to Abundant	
Searsia populifolia	Poplar-leaved Karee	Uncommon to Rare	
Ricinus communis	Castor-oil Bush	Uncommon to Rare	Alien. Should be controlled.
Salix mucronata subsp *capensis*	Small-leaved Willow	Common to Abundant	Potentially threatened by wood collection

Name	Common Name	Abundance Category	Conservation Concerns and Notes
Sisyndite spartea	Desert-broom	Common to Abundant	
Tamarix usneoides	Wild Tamarisk	Common to Abundant	Protected by forestry legislation
Tetragonia schenkii		Common to Abundant	
Ziziphus mucronata	Buffalo-thorn	Common to Abundant	Protected by forestry legislation

Appendix D. Consultant's Curriculum Vitae

ENVIRONMENTAL ASSESSMENT PRACTITIONER **Quzette Bosman**

Quzette Bosman has 16 years' experience in the Impact Assessment Industry, working as an Environmental Assessment Practitioner and Social Assessment practitioner mainly as per the National Environmental Legislation sets for South Africa and Namibia. Larger projects have been completed in terms of World Bank and IFC requirements. She studied Environmental Management at the Rand Afrikaans University (RAU) and University of Johannesburg (UJ), including various Energy Technology Courses. This has fuelled a passion towards the Energy and Mining Industry with various projects being undertaken for these industries. Courses in Sociology has further enabled her to specialize in Social Impact Assessments and Public Participation. Social Assessments are conducted according to international best practise and guidelines. Work has been conducted in South Africa, Swaziland and Namibia.

CURRICULUM VITAE QUZETTE BOSMAN

Name of Firm	:	Geo Pollution Technologies (Pty) Ltd.
Name of Staff	:	QUZETTE BOSMAN
Profession	:	Social Impact Assessor /
		Environmental Assessment Practitioner
Years' Experience	:	16
Nationality	:	South African
Position	:	Senior Environmental Consultant
Specialisation	:	ESIA & ESMP; SIA
Languages	:	Afrikaans – speaking, reading, writing – excellent
		English – speaking, reading, writing – excellent
		German –speaking, reading - fair

First Aid Class A	EMTSS, 2017
First Aid LSM	OSH-Med International 2022
Basic Fire Fighting	EMTSS, 2017
Basic Industrial Fire Fighting	OSH-Med International 2022

EDUCATION AND PROFESSIONAL STATUS:

BA	Geography & Sociology	:	Rand Afrikaans University, 2003
BA	(Hons.) Environmental Management	:	University of Johannesburg, 2004

PROFESSIONAL SOCIETY AFFILIATION:

Namibian Environment and Wildlife Society

International Association of Impact Assessors South Africa (IAIA SA)

Member 2007 - 2012

Mpumalanga Branch Treasurer 2008/2009

OTHER AFFILIATIONS

Mkhondo Catchment Management Forum (DWAF): Chairperson 2008-2010

Mkhondo Water Management Task Team (DWAF): Member 2009

AREAS OF EXPERTISE:

Knowledge and expertise in:

- environmental impact assessments
- project management
- social impact assessment and social management planning
- community liaison and social monitoring
- public participation / consultation, social risk management
- water use licensing
- environmental auditing and compliance
- environmental monitoring
- strategic environmental planning

EMPLOYMENT:

2015 - Present	:	Geo Pollution Technologies – Senior Environmental Practitioner
2014-2015	:	Enviro Dynamics – Senior Environmental Manager
2010 - 2012	:	GCS – Environmental Manager (Mpumalanga Office Manager)
2007 - 2009	:	KSE-uKhozi - Technical Manager: Environmental
2006 -2007	:	SEF – Environmental Manager
2004 - 2005	:	Ecosat – Environmental Manager

PUBLICATIONS:

Contract reports	: +190
Publications	: 1