ENVIRONMENTAL MANAGEMENT PLAN

Proposed Construction and Operation of the Solar Power Plant and its Associated Infrastructure to Support the Production of Green Hydrogen at the Remainder of Farm Geluk No. 116, Erongo Region

ECT
ENVIRONAM CONSULTANTS TRADING

For: Elof Hansson Hydrogen Namibia (Pty) Ltd

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ACRONYMS

AIDS	Acquired Immuno Deficiency Syndrome
DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
EC	Environmental Commissioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act (Act No. 7 of 2007)
EMP	Environmental Management Plan
HIV	Human Immune Virus
I&AP	Interested and Affected Parties
MAWLR	Ministry of Agriculture Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
ToRs	Terms of References
WB	Walvis Bay

1 OVERVIEW

This Environmental Management Plan (EMP) is developed based on the Environmental Impact Assessment (EIA) for the proposed development of the photovoltaic solar plant and its associated infrastructure, in the Erongo Region. A comprehensive project description and impact assessment are contained in the EIA report.

2 PURPOSE OF THE EMP

This Environmental Management Plan (EMP) is a risk strategy that contains logical framework, monitoring programme, mitigation measures, and management control strategies to minimize environmental impacts. It further stipulates the roles and responsibility of persons involved in the project. These strategies are developed to reduce the levels of impacts for the projects.

An EMP is one of the most important outputs of the EIA process as it synthesises all of the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. This EMP details the mitigation and monitoring actions to be implemented during the following phases of this development:

- Planning and Design – the period, prior to construction, during which preliminary legislative and administrative arrangements, necessary for the preparation of the land, are made and engineering designs are carried out. The preparation of construction tender documents forms part of this phase;
- Construction – the period during which the proponent, having dealt with the necessary legislative and administrative arrangements, appoints a contractor for the construction of services infrastructure, buildings as well as any other construction process(s) within the development areas;
- Operation and Maintenance – the period during which the development will be fully functional, operational and maintained.

The decommissioning of this development is not envisaged; however, in the event that this should be considered, a decommissioning plan must be developed.

3 COMPLIANCE TO THE EMP

This EMP is a legally binding document as given under the provisions of the Environmental Management Act, 2007 (Act No. 7 of 2007). Elof Hansson Hydrogen Namibia (Pty) Ltd and their contractors must adhere to the framework of this document.

4 ROLES AND RESPONSIBILITY

The Proponent should assign the responsibility of managing all aspects of this development for all development phases (including all contracts for work outsourced) to a designated member of staff, referred to in this EMP as the Proponent's Representative (PR). The Proponent may decide to assign this role to one person for the full duration of the development, or may assign a different PR to each of the development phases – i.e., one for the planning and design phase, one for the construction phase and one for the operation and maintenance phase. The PR's responsibilities are depicted in Table 1 as follows:

Table 1. PR's responsibilities

Responsibility	**Project Phase**
Making sure that the necessary approvals and permissions laid out in Table 2 are obtained/adhered to	Throughout the lifecycle of this development
Making sure that the relevant provisions detailed in Section 6.4.1 are addressed during planning and design phase.	Planning and design phase
Suspending/evicting individuals and/or equipment not complying with the EMP	• Construction • Operation and maintenance
Issuing fines for contravening EMP provisions	• Construction • Operation and maintenance

4.1 ENVIRONMENTAL CONTROL OFFICER

The PR should assign the responsibility of overseeing the implementation of the whole EMP on the ground during the construction and operation and maintenance phases to a designated member of staff, referred to in this EMP as the Environmental Control Officer (ECO). The PR/Proponent may decide to assign this role to one person for both phases, or may assign a different ECO for each phase. During the operation phase the Proponent may outsource the monitoring and evaluation of the EMP to an independent Environmental Consultant. The ECO will have the following responsibilities during the construction and operation and maintenance phases of these developments:

- Management and facilitation of communication between the Proponent, PR, the contractors, and Interested and Affected Parties (I&APs) with regard to this EMP;
- Conducting site inspections (recommended minimum frequency is monthly) of all construction and/or infrastructure maintenance areas with respect to the implementation of this EMP (monitor and audit the implementation of the EMP);
- Assisting the Contractor in finding solutions with respect to matters pertaining to the implementation of this EMP;
- Advising the PR on the removal of person(s) and/or equipment not complying with the provisions of this EMP;
- Making recommendations to the PR with respect to the issuing of fines for contraventions of the EMP; and
- Undertaking an annual review of the EMP and recommending additions and/or changes to this document.

4.2 CONTRACTOR

Contractors appointed by the Proponent are automatically responsible for implementing all provisions contained within the relevant chapters of this EMP. Contractors will be responsible for the implementation of this EMP applicable to any work outsourced to subcontractors. Section 6.4.2 applies to contractors appointed during the construction phase. Section 6.4.3 to those appointed during the operation and maintenance phase. In order to ensure effective environmental management the aforementioned chapters should be included in the applicable contracts for outsourced construction, operation and maintenance work.

The tables in **Chapter 6** detail the management measures associated with the roles and responsibilities that have been laid out in this chapter.

4.3 ENVIRONMENTAL COMPLIANCE OFFICER

Compliance to EMP is enforced by the environmental inspector as provided for under Environmental Management Act (No. 7 of 2007) (EMA) from the Ministry of Environment Forestry and Tourism. However, other competent authorities such as the Ministry of Mines and Energy shall have the right to monitor the project activities.

This EMP is a legally binding document, non-compliance to the EMP is punishable in accordance to the provision of EMA.

5 APPLICABLE LEGISLATION

Legal provisions that have relevance to various aspects of this development are listed in Table 2 below. The legal instrument and applicable corresponding provisions are provided.

Table 2. Legal provisions relevant to this development

Policy/Legislation	Provisions	Applicability to the Project
The Namibian Constitution	The Namibian constitution is the supreme law of the country which is committed to sustainable development. Article 95(1) of the Constitution of Namibia states that: - "*The State shall actively promote and maintain the welfare of the people by adopting policies aimed at … The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future*".	Undertake an Environmental Assessment to protect the environment and maintain the terrestrial ecological process.
The Environmental Management Act (No. 7 of 2007)	The Environmental Management Act (No. 7. of 2007) aims to promote the sustainable management of the environment and the use of natural resources and to provide for a process of assessment and control of activities	The project must abide by the statutory requirement of EMA the EIA regulation. Carry out an EIA and

Policy/Legislation	Provisions	Applicability to the Project
	which may have significant effects on the environment; and to provide for incidental matters. The act provides a list of activities that may not be undertake without an environmental clearance certificate.	develop an EMP for the project.
EIA Regulations GN 28, 29, and 30 of EMA (2012)	GN 29 Identifies and lists certain activities that cannot be undertaken without an environmental clearance certificate. GN 30 provides the regulations governing the environmental assessment (EA) process.	Activity 1 (a) The generation of electricity. Activity 1 (b) The transmission and supply of electricity.
Convention on Biological Diversity (1992)	Article 1 lists the conservation of biological diversity amongst the objectives of the convention.	The project should consider the impact it will have on the biodiversity of the project area.
Nature Conservation Ordinance no 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants	Indigenous and protected plants have to be managed within the legal confines.
Atmospheric Pollution Prevention Ordinance (No. 11 of 1976).	The Ordinance objective is to provide for the prevention of the pollution of the atmosphere, and for matters incidental thereto.	All activities on the site will have to take due consideration of the provisions of this legislation.
Draft Pollution Control and Waste Management Bill	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) when it comes into force. The Bill also provides for noise, dust or odour control that may be considered a nuisance. Further, the Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a waste	Management of waste, and any pollution generated by the project.

Policy/Legislation	Provisions	Applicability to the Project
	management licence for any activity relating to waste or hazardous waste management.	
The Occupational Safety and Health Act No. 11 of 2007;	Safety: A safety risk is a statistical concept representing the potential of an accident occurring, owing to unsafe operation and/or environment. In the working context "SAFETY" is regarded as "free from danger" to the health injury and to properties. Health: Occupational Health is aimed at the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers in all occupations. This is done by ensuring that all work-related hazards are prevented and where they occur, managed.	During construction, accidents are bound to happen if the working environmental is not safe and healthy. The project should maintain good and healthy standards, at the work place, cleanliness, adequate sanitary facilities, protection against dangerous substances.
Public Health Act No. 36 of 1919	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	The developer and contractors are to comply with these legal requirements. The construction of powerlines would cut across public land (desert land). The proponent should ensure that the construction site is off limits from public during construction to avoid injuries/fatalities.
The Ministry of Environment, Forestry and Tourism (MEFT)	MEFT has developed a policy on HIV and AIDS. In addition, it has also initiated a programme aimed at mainstreaming HIV and gender issues into environmental impact assessments.	The proponent and its contractor/s have to adhere to the guidelines provided to manage the aspects of HIV/AIDS. Experience with

Policy/Legislation	Provisions	Applicability to the Project
Policy on HIV & AIDS		construction projects has shown that a significant risk is created when construction workers interact with local communities.
Water Resources Management Act 11, (2013)	This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Furthermore, any watercourse on/or in close proximity to the site and associated ecosystems should be protected in alignment with the listed principles.	The pollution of water resources should be avoided during construction and operation of the development.
Petroleum Product and Energy Act No, 13 of 1990	This Act provides a framework for handling and distribution of petroleum products which may include purchase, sale, supply, acquisition, possession, disposal, storage or transportation thereof.	During construction, there would be handling of fuel and hydrocarbons for construction vehicles and equipment. Hence the act compels the proponent to handle hydrocarbons safely.
Labour Act No. 6 of 1992	This Act aims to regulate labour in general and includes the protection of the health, safety and welfare of employees. The 1997 Regulations relating to the Health and Safety of employees at work sets out the duties of the employer, welfare and facilities at the workplace, safety of machinery, hazardous substances, physical hazards, medical provisions, construction safety and electrical safety.	Given the employment opportunities presented by the development, compliance with the labour law is essential.
Regional Council Act, 1992 (Act No. 22 of 1992)	The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination	The area is in the jurisdiction of the Walvis Bay Municipality and the

Policy/Legislation	Provisions	Applicability to the Project
	of regional policies and development. The main objective of this Act is to initiate, supervise, manage and evaluate development at regional level.	Erongo Regional Council. All relevant laws must be adhered to.
Local Authorities Act No. 23 of 1992	The Local Authorities Act prescribes the manner in which a town or municipality should be managed by the Town or Municipal Council.	The development has to comply with the provisions of the Local Authorities Act.
Soil Conservation Act No. 76 of 1969	This act promotes the conservation of soil, prevention of soil erosion.	Improper planning of construction can cause soil degradation and erosion through earth work.
National Heritage Act No. 27 of 2004	The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains, while Section 48 sets out the procedure for application and granting of permits.	Clearing and excavation may unearth archaeological material.
Electricity Act, 2007 (Act No. 4 of 2007)	The Act provides for the requirements and conditions for obtaining licences for the provision of electricity.	Compliance with this legislation is essential.
International Best Practises	***Precautionary Approach Principle*** This principle is worldwide accepted when there is a lack of sufficient knowledge and information about the possible threats to the environment. ***Polluter Pays Principle*** This principle ensures that proponents take responsibility for their actions. Hence, in cases of pollution, the proponent bears the full responsibility to clean up the environment.	Although not envisioned, the proponent is urged to apply great precaution in an event of uncertainty. In the event of pollution, the proponent shall incur the clean-up cost.

6 IMPACT ASSESSMENT

A set of mitigation measures were developed during the EIA study to mitigate the potential impacts to low level. This sections in this chapter shows the identified impact and a set of mitigation measures required to reduce the potential impacts to low levels. Please note the following;

- The provision of EMA empowers the Environmental Inspector to undertake environmental monitoring at projects that are issued with Environmental Clearance Certificates (ECCs). Consequently, the monitoring indicators will ensure adherence of the proponent to the set of mitigation measures.
- In this ESMP, monitoring indicators refer to what should be in place to indicate what actions are undertaken to implement project activities.

6.1 Construction Phase

Summary of Impacts during construction phase

- Unfair labour practises and lack of skill transfer
- Loss of natural scenic and aesthetic value
- Habitat destruction and loss of biodiversity
- General littering and solid waste pollution
- Pollution of the environment with hazardous waste
- Injuries and health risks to employees during working hours
- Noise pollution and vibration could be nuisance to the nearby land owners / residence
- Dust pollution to nearby land owners / residents and exposure of employees to excess dust could be harmful to their health.
- Heritage and archaeology.

6.2 Operation Phase

Summary of Impacts during operational phase:

- Unfair labour practises and lack of skill transfer
- General littering and solid waste pollution
- Pollution of the environment with hazardous waste

- Injuries and health risks to employees during working hours

6.3 Decommissioning Phase

In general, the impacts associated with this phase will be similar to that of the construction phase.

6.4 Management Actions

6.4.1 Planning and Design Phase

PLANNING AND DESIGN PHASE IMPACTS	
Impact	**Mitigation Measures**
Surface and ground water	• Appoint professional engineers to develop a detailed storm water management design as part of the infrastructure service provision of the development. • The service infrastructure should be designed and constructed by suitably qualified engineering professionals. • Develop and implement a preventative maintenance plan for the service infrastructure. • No dumping of waste products of any kind in or in close proximity to drainage lines or any water bodies. • Ensure that surface water accumulating on-site are channelled and captured through a proper storm water management system to be treated in an appropriate manner before disposal into the environment. • Wastewater should not be discharged directly into the environment. • Disposal of waste from the development should be properly managed.
Fauna and flora	• Adapt the proposed development to the local environment – e.g. small adjustments to the site layout to avoid potential features such as existing vegetation, large trees, etc. • Plant local indigenous species of flora as part of the landscaping as these species would require less maintenance than exotic species. • Prevent the introduction of potentially invasive alien ornamental plant species as part of the landscaping as these species could infestate the area further over time.
Existing Service Infrastructure	• It is recommended that alternative and renewable source of energy be explored and introduced into the proposed development to reduce dependency on the grid. • Solar geysers and panels should be introduced to provide for general lighting and heating of water and buildings. • Other 'green' technologies to reduce the proposed development's dependency on fossil fuel should be explored where possible. • Designs and building materials should be as such to reduce dependency on artificial heating and cooling in order to limit the overall energy necessities. • Water saving mechanisms should be incorporated within the proposed development's design and plans in order to further reduce water demand. • Re-use of treated waste water should be considered wherever possible to reduce the consumption of potable water. • Adhere to water quality guidelines in terms of the Water Resources Management Act 11, 2013.
Traffic	• Ensure that road junctions have good sightlines.

PLANNING AND DESIGN PHASE IMPACTS	
Impact	**Mitigation Measures**
	• Limit the type of vehicles to use the internal roads e.g. heavy trucks. • Adhere to the speed limit. • Implement traffic control measures where necessary.

6.4.2 Construction Phase

Note that all tables and figures in this sections 6.4.2 and 6.4.3 refers to Annexure G (Fauna and Flora Biodiversity Report)

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
Employment / Socio-Economic advancement of local	Possible exclusion of local communities from job opportunities. Lack of legal employment contracts, Unfair compensation of workers.	1. Ensure that all general work is reserved for local people unless in circumstances where specialized skills are required. 2. Fair compensation and labour practice as per Namibian Labour Laws must be followed 3. Abide by the labour act 4. Provide contract to employees 5. Support local training to develop capacity.	To ensure that local people are not excluded from project activities and benefits.	Low	- Proponent's Representative (PR) - Labour inspector	Employment records On-site inspection and interviews with employees	1. Employment contract 2. Training and capacity building programs 3. Workshop and Training attendance registers 4. Employees certificate of attendance

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
Skill and Knowledge transfer	Lack of capacity in the community to maintain project infrastructure, operate project intervention	1. Identify and train competent people (Preferable youth) to undertake project activities and initiatives 2. Ensure skill transfer to the locals 3. Undertake Training Needs Assessment (TNA)	To build local capacity	Low	- Proponent's Representative (PR) - Labour inspector	Undertake training and capacity needs assessment Provide training to employees	1. Number of training undertaken 2. Attendance registers and training reports, certificate of attendance
Construction and installation of powerlines	Loss of natural scenic and aesthetic value	1. Ensure good house keeping 2. Piles of excavated sand must be well stored 3. Rehabilitate the excavated area back to its natural state 4. Do not burry waste on site 5. Cordon off construction equipment to avoid being seen	To ensure trenches, vehicles tracks, and all construction prints are rehabilitated to restore the area scenic beauty.	Low	- Proponent's Representative (PR) - ECO - Contractor	Undertake physical inspection of construction area and observe public complains	3. Solid waste generation and management 4. Rehabilitation of excavated areas
Fauna	Faunal disturbance will vary depending on the scale/intensity of	1. Limit the development to actual sites to be developed and avoid affecting adjacent areas, especially	To ensure protection and conservation of fauna throughout the project cycle.		- Proponent's Representative (PR) - ECO	Undertake physical inspection of construction area	Construction Phase 1. Sensitive areas avoided; 2. Illegal capture/use/collectio

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
	the development operation and associated and inevitable infrastructure.	well vegetated Swakop/Tumas ephemeral drainage lines; rocky outcrops (especially white geology areas), throughout the entire area. 2. Avoid development & associated infrastructure in sensitive areas – e.g., well vegetated ephemeral drainage lines; rocky outcrops (especially white geology areas); small drainage lines with Welwitschia mirabilis plants; lapped-faced vulture nesting sites; rocky outcrops; brown hyena latrines, etc. – in the proposed development area (See Sections 4 & 5; Tables 10 & 12). This would minimise the negative effect on the local			- Contractor	and observe loss of habitat, public complains	n of vertebrate fauna & flora; 3. Rehabilitation of affected areas – e.g., tracks, etc.; 4. No new sites disturbed; and 5. Effectiveness of control measures. Operational Phase 1. Erosion control; 2. Illegal capture/use/collection of vertebrate fauna; and 3. Vertebrate fauna mortalities. Decommissioning Phase 1. All tracks/roads rehabilitated; 2. All development sites rehabilitated; 3. Erosion control; 4. Illegal

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		environment especially unique features serving as habitat to various vertebrate fauna species. 3. Remove (e.g., capture) unique and sensitive fauna, especially sedentary and slow-moving reptiles (e.g., Namaqua chameleon, etc.) before commencing with the development activities and/or species serendipitously located during this period and relocate to a less sensitive/disturbed sites in the immediate area. 4. Prevent and discourage the setting of snares (poaching), illegal collecting of veld foods, indiscriminate killing of perceived dangerous species (e.g., snakes, etc.)					capture/use/collection of vertebrate fauna; and 5. Vertebrate fauna mortalities.

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		and collecting of wood (e.g., Swakop River area) as this would diminish and negatively affect the local fauna – especially during the development phase(s). 5. Attempt to avoid the destruction of bigger trees during the development phase(s) – especially with the development of access & powerline routes – as these serve as habitat for a myriad of fauna. 6. Rehabilitation of the disturbed areas – i.e., initial development access route "scars" and associated tracks as well as associated development infrastructures. Preferably workers should be transported in/out to the construction sites daily to					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		avoid excess damage to the local environment (e.g., pollution, wood collection, poaching, etc.). Such rehabilitation would not only confirm the company's environmental integrity, but also show true local commitment to the environment. 7. Prevent domestic pets – e.g., cats & dogs – accompanying the workers during the construction phase as cats decimate the local fauna and interbreed & transmit diseases to the indigenous African wild cat found in the area. Dogs often cause problems when bonding on hunting expeditions thus negatively affecting the local fauna. The indiscriminate and					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		wanton killing of the local fauna by such pets should be avoided at all costs. 8. Initiate a suitable waste removal system (i.e., remove to Swakopmund/Walvis Bay and not store on site) as this often attracts wildlife – e.g., baboons, black-backed jackal, crows, gulls, etc. – which may result in human-wildlife conflict issues. 9. Educate/inform contractors and staff on protected species (See Tables 1- 16) to avoid and the consequences of illegal collection of such species. 10. Investigate the idea of employing an Environmental Officer during the construction					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		phase(s) to ensure compliance and minimise the overall impact on the fauna and the environment. **Tracks** **New proposed main access route(s)** 1. These track(s) should avoid the lapped-faced vulture nesting tree sites (See Table 12; Figures 14-15). Also avoid other sensitive areas – e.g., Salsola dune hummocks, along drainage lines, rocky outcrops, etc. (See Section 5). This would minimise the effect on localised potentially sensitive habitats in the area. **All tracks** 1. Avoid driving randomly through the area (i.e., enforce "track discipline"),					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		but rather stick to permanently placed roads/tracks – especially during the construction phase. This would minimise the effect on localised potentially sensitive habitats in the area. 2. Stick to speed limits of maximum 30km/h as this would result in fewer faunal road mortalities. Speed humps could also be used to ensure the speed limit. Lower speeds would also minimise dust pollution. 3. Implement erosion control. – i.e., avoid constructing tracks up steep gradients; incorporate erosion furrows (runoff sites) and humps along tracks to					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		channel water off the tracks to minimise erosion problems; cross drainage lines at right angles, etc. The area(s) towards & adjacent the drainage line(s) are easily eroded, and further development may exacerbate this problem. Avoid construction within 50m of the main drainage line(s) to minimise erosion problems as well as preserving the riparian associated flora and fauna. 4. Avoid disturbance of Salsola dune hummock area to the east of the saline pan). **Farm 58 Developments** 1. Avoid disturbance of rocky ridges & small vegetated ephemeral drainage lines					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		on northern/northeastern boundary. **Powerline Developments** 1. Do not leave the powerline trench open overnight and/or have escape routes at either end to allow for trapped fauna to escape. 2. The recommended alternative route (dotted white line) – See Figure 38 – would have the least impact on biodiversity and avoid pristine areas, but rather follow existing tracks along existing development corridors. 3. Implement erosion control measures along the powerline maintenance track – e.g., erosion bumps, cross drains, etc. **Farm Geluk Developments** 1. Avoid disturbances on the					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		rocky ridges with patches of Aloidendron (Aloe dichotoma) dichotomum and A. asperifolia and small vegetated ephemeral drainage lines in the northern/northeastern parts of the proposed development area (See Figure 39). 2. Avoid electrified fencing around the PV Plant area and/or lift the bottom strand 30cm off the ground to avoid electrocuting tortoises, monitor lizards, etc. 3. Avoid using chemicals to keep the PV Plant area clear of vegetation but rather use indigenous sheep (e.g., Damara sheep) to keep the vegetation short.					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		Vulture nests 1. Avoid the lapped-faced vulture nesting tree sites (See Table 12; Figures 14-15). These vultures are listed as endangered by the IUCN (2023) with an estimated world population of only 5,700 birds and a decreasing population trend. Disturbances could result in nests being abandoned further adding to the demise of this species. **Hyena latrines** 1. Brown hyena latrines are important for social and territorial purposes and should be avoided (See Table 10; Figure 12).					
Flora	Destruction of plants and their habitat	**General** 1. Avoid well vegetated Swakop/Tumas ephemeral drainage lines; rocky	To ensure protection and conservation of flora throughout the project		- Proponent's Representative (PR)	Undertake physical inspection of	Construction Phase 1. Sensitive areas avoided;

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		outcrops (especially white geology areas), throughout the entire area. 2. Identify protected and unique species (i.e., Aloe spp., Commiphora saxicola (rock corkwood), Hoodia gordonii, Lithop spp., Welwitschia mirabilis (welwitschia), etc.). Other important species are the larger Acacia erioloba (camel thorn) specimens used by the endangered lappet-faced vultures as nesting sites before the commencement of development activities in areas where these occur and avoid. 3. Prevent and discourage the collecting of firewood (e.g., Swakop River) as dead wood has an	cycle.		- ECO - Contractor	construction area and observe loss of habitat, public complains	2. Illegal capture/use/collection of flora; 3. Rehabilitation of affected areas – e.g., tracks, etc.; 4. No new sites disturbed; and 5. Effectiveness of control measures. Operational Phase 1. Erosion control; 2. Illegal capture/use/collection of flora; and Decommissioning Phase 1. All tracks/roads rehabilitated; 2. All development sites rehabilitated; 3. Erosion control; 4. Illegal capture/use/collection of flora.

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		important ecological role. Such collecting of firewood, especially for economic reasons, often leads to abuses – e.g., chopping down of live and/or protected tree species such as Acacia erioloba, etc. which is a good quality wood. 4. Avoid the removal and damage of bigger trees (especially protected species (i.e., Acacia erioloba (camel thorn), Faidherbia albida (ana tree), etc. – during developments – including the development of access routes – as these serve as habitat for a myriad of fauna. 5. Implement a policy of "no tolerance" towards the					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		existing invasive alien plant species (e.g., Nicotiana glauca, Prosopis spp. – heavy infestations observed in the Swakop River area) in the general area. This should include the removal and destruction of these species throughout the proposed development areas. Such activity would be beneficial to the overall ecology of the area, especially the Swakop River area where most of these aliens currently occur. 6. Rehabilitation of the disturbed areas – i.e., initial development access route "scars" and associated tracks, as well as temporary accommodation					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		sites. Preferably workers should be transported in/out to the construction sites daily to avoid excess damage to the local environment (e.g., wood collection, poaching, etc.). Such rehabilitation would not only confirm the various development companies' environmental integrity, but also show true local commitment to the environment. 7. Limit development – i.e., keep to the bare minimum – in the drainage lines or within 50m of these drainage lines to preserve the associated riparian flora (and associated fauna). 8. Educate/inform contractors on protected					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		species to avoid and the consequences of damaging such species. Liaise with MEFT to provide this service. 9. Investigate the idea of employing a qualified environmental officer (EO) during the construction phase to ensure appropriate conduct by contractor(s). 10. Avoid the use of herbicides for plant/weed control throughout the areas. 11. Employ an ecologist for advice on the best route(s)/sites, etc. prior to 12. construction – i.e., assist with the final alignment. **Tracks** **New proposed main access route(s)** 13. These track(s) should avoid the Acacia erioloba					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		(camelthorn) with lapped-faced vulture nest sites (See Table 12; Figures 14- Also avoid other sensitive areas – e.g., Salsola dune hummocks, along drainage lines, rocky outcrops, etc. (See Section 5). This would minimise the effect on localised potentially sensitive habitats in the area. **All tracks** 14. Avoid driving randomly through the area (i.e., enforce "track discipline"), but rather stick to permanently placed roads/tracks – especially during the construction phase. This would minimise the effect on localised potentially sensitive flora/habitats in					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		the area. 15. Stick to speed limits of maximum 30km/h as this would result in less dust pollution potentially affecting flora. Speed humps could also be used to ensure the speed limit. 16. Implement erosion control. – i.e., avoid constructing tracks up steep gradients; incorporate erosion furrows (runoff sites) and humps along tracks to channel water off the tracks to minimise erosion problems; cross drainage lines at right angles, etc. The area(s) towards & adjacent the drainage line(s) are easily eroded, and further development may exacerbate this problem. Avoid					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		construction within 50m of the main drainage line(s) to minimise erosion problems as well as preserving the riparian associated flora and fauna. **Farm 58 Developments** 17. Avoid disturbance of rocky ridges & small vegetated ephemeral drainage lines on northern/northeastern boundary. **Powerline Developments** 18. Use the excavated soil to fill the trench when installing the powerlines and not disturb other areas. 19. The recommended alternative route (dotted white line) – See Figure 38 – would have the least impact on biodiversity and avoid pristine areas, but rather follow existing					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		tracks along existing development corridors. 20. Implement erosion control measures along the powerline maintenance track – e.g., erosion bumps, cross drains, etc. **Farm Geluk Developments** 21. Avoid disturbances on the rocky ridges with patches of Aloidendron (Aloe dichotoma) dichotomum and A. asperifolia and small vegetated ephemeral drainage lines in the northern/northeastern parts of the proposed development area (See Figure 39). 22. Avoid using chemicals to keep the PV Plant area clear of vegetation but rather use indigenous sheep (e.g., Damara sheep)					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		to keep the vegetation short. **Vulture nests** 23. Avoid the Acacia erioloba (camelthorn) trees with lapped-faced vulture nest sites (See Table 12; Figures 14-15). These vultures are listed as endangered by the IUCN (2023) with an estimated world population of only 5,700 birds and a decreasing population trend. Disturbances could result in nests being abandoned further adding to the demise of this species.					
General Waste and pollution control	Project activities such as construction will produce construction wastes such as building	1. Maintain good housekeeping on site. 2. Designate a storage area for building rubbles. 3. Provide skip bins for	To prevent littering and to ensure good and tidy house keeping	Low	- Proponent's Representative (PR) - ECO - Contractor	Undertake physical inspection of construction area and observe	1. Solid waste generation and management program 2. Labelled waste drums and skip bins

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
	rubbles, used oil cans drums, metals, and household solid and liquid waste.	construction waste. 4. Provide labelled household waste drums for household solid waste. 5. Ensure separate ablution facilities for men and women.				public complains	3. Gender segregated ablution facilities
Hazardous waste	Pollution of the environment with hazardous waste	1. Vehicles must be well serviced and mantained to avoid oil spills and excessive emissions. 2. All hydrocarbons must be stored in an enclosed environment. 3. Fuelling of site bound equipment such as excavators must be done on bunded structure. 4. Parked construction vehicles and machines must be provided with drip trays. 5. Used oil, grease and lubricant cans must be	To prevent pollution from hazardous waste	Low	- Proponent's Representative (PR) - ECO - Contractor	Develop a hazardous waste management plan Physical observation of contaminated areas	1. Service record of vehicles 2. Storage area for hydrocarbons 3. Bunded fuel sites 4. Drip trays 5. Designated drums for hazardous waste

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		collected in appropriate drums and disposed of at an approved waste disposal site.					
Health and Safety for employees	Job opportunities leads to new social relationship which often spread disease, particularly pandemic such as HIV and AIDS and substance abuse. Hiring off unlicenced employees to operate vehicles and special machinery pose safety risk to themselves, co-workers and public. Additionally, employees are subject to dust and	1. Provide awareness to the employees on dangers of HIV/AIDS, alcohol and drug abuse. 2. Provide condoms on site 3. Develop a healthy and safety plan / policy. 4. All employees must go through a health and safety induction. 5. Only licensed employees should be allowed to operate specialized vehicle. 6. All heavy vehicles must have a rotating flushing light installed for visibility. 7. Ensure that all vehicle are well serviced and roadworthy.	To ensure employee and public safety	Low	- Proponent's Representative (PR) - ECO - Contractor - Random check by designated law environmental / health inspector	Site inspection checklist through physical observation, Random interviews with employees	1. Poof of HIV-AIDS and substance abuse awareness raising 2. Condoms on sites 3. Health and safety plans 4. Induction attendance registers 5. Valid driver's licences for designated drivers 6. Rotating flushing lights on heavy and construction vehicles 7. Roadworthy vehicles 8. Personal Protective Equipment 9. Adequate First Aid Kit 10. Emergency health facilities

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
	noise pollution as well as other occupational health and safety risks.	8. All employees must be provided with adequate Personal Protective Equipment (PPE). 9. No employee must be allowed to be at work station without adequate PPE. 10. There must be a first aid kid with adequate medicine. 11. Provide adequate gender sensitive ablution facility. 12. Provide clean drinking water. 13. Erect warning signs at designated sites to alert public of potential dangers. 14. Trucks carrying sand and aggregate must be covered to avoid material flying off. 15. Adhere to the Labour act, non-toxic human dust exposure levels may not exceed 5mg/m3 for					11. Ablution facilities 12. Warning sing at designated areas 13. First aid training attendance register of supervisors 14. Construction areas are fenced off/cordoned off.

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		respiratory dust and 15mg/m3 for total dust. 16. Abide by the Occupational Health and Safety and Labour Act of Namibia and other statutory requirement such as International Labour Practise (ILO). 17. Supervisors must undergo an occupational health and first aid course. 18. Train employees on the possible health hazards to avoid potential risks 19. Cordon off the construction areas / sites. 20. Provide awareness and knowledge about snakes and snakebites. 21. Ensure availability of snake catchers onsite.					
Noise pollution	Noise pollution is expected from the movement of heavy	1. Maintain low speed on project sites.	To prevent noise pollution to employees and the surrounding communities	Low	- Proponent's Representative (PR)	Physical observation, Install seed traps	1. Record of speeding 2. Record of vehicle service records

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
	machineries, digging and excavating of trenches and concrete mixing. This is site specific, hence affecting mostly employees and surrounding communities	2. All vehicles must be well serviced to prevent excessive noise. 3. Do not hoot unnecessary 4. Do not rev the vehicle engines. 5. Do not play loud music / radio. 6. Switch off engine off vehicles when not in use. 7. No employees must be exposed to noise levels above the 85dB (A) limit over a period of 8 hours. Should the noise level be higher than 85dB (A), the employer must implement a hearing conservation program such as noise monitoring. 8. Stationary vehicles and machines must be switched off at time.			- ECO - Contractor		3. Complaints of noise from employees and general public

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
Dust pollution	Land clearing, digging and excavation of trenches, movement of vehicles and heavy machinery on project sites, concrete work, transportation of sand to site and concrete stones, cement mixing may create fugitive dust, uncoordinated / reckless driving on gravels roads could cause low visibility to other road users	1. Movement of heavy vehicles must strictly be restricted on site. 2. Adhere to the minimum speed limit of 30 or 40km/hour. 3. Do not excavate and/or offload sand during heavy winds. 4. Trucks carrying sand must be covered. 5. Sand stock piles must be covered or regularly water sprayed with water. 6. On site where soil is loosened by vehicle movement, apply dust a suppression method such as water spraying. 7. Cement and concrete must be mixed with concrete mixers and not manually in the open. 8. Cement bags must be	To prevent air pollution and dust nuisance to nearby land owners / residents and prevent exposure of employees to excess dust that maybe harmful to their health.	Low	- Proponent's Representative (PR) - ECO - Contractor	Physical observation, Install dustfall buckets in the area.	Dust monitoring

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		stored and disposed of properly and may not be shaken in the open.					
Heritage Resources	The landscape has a rich ancient history, some of the works heritage sites are found there. It's possible to stumble on heritage and archaeological materials during digging and excavating that could be destroyed if precaution measures are not taken.	1. Confine developments to the designated Farm Geluk, and proposed linear route. 2. The development should avoid and not encroach on identified heritage sites in the surrounding farms. 3. Employee must be trained on the possible find of heritage and archaeological material in the area. 4. Implement a chance find and steps to be taken for heritage and archaeological material finding (Heritage (rock painting and drawings), human remains or artefacts) are unearthed by;	To ensure protection of artefacts, heritage and archaeological materials	Low	-Proponents Representative (PR) - ECO -Contractor -Heritage Council	Implement buffer zones to between development footprint and heritage/archaeological and historical resources	Reported Heritage Material

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		i. Stopping the activity immediately. ii. Informing the operational manager or supervisor. iii. Cordoned of the area with a danger tape and manager to take appropriated pictures. Manager/supervisor must report the finding to the following competent authorities, National Heritage Council of Namibia (061 244 375) National Museum (+264 61 276800) or the National Forensic Laboratory (+264 61 240461).					

6.4.3 Operational Phase

The proponent is required to implement similar mitigation measure to those of construction phase for the following impact;

- Unfair labour practises and lack of skill transfer
- General littering and solid waste pollution
- Pollution of the environment with hazardous waste
- Injuries and health risks to employees during working hours

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
Environmental Compliance	Environmental monitoring and Evaluation	1. An Environmental Practitioner should monitor the implementation of the EMP, and recommend any changes to this document when necessary. 2. The Environmental Practitioner should inspect the site on a regular basis (preferably monthly or bi-monthly). 3. Biannual reports are to be submitted to the Environmental.	Ensure environmental protection	Low	- Proponent's Representative (PR) -ECO - Contractor	Appoint environmental practitioner	Proof of appointment and record of submissions of bi-annual reports to relevant authorities

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		Commissioner.					
Surface and Groundwater	Surface and Ground Water	1. No dumping of waste products of any kind in or in close proximity to any drainage lines or water bodies. 2. Contaminated runoff from the various operational activities should be prevented from entering any drainage lines or water bodies. 3. Should it be necessary to wash equipment such as panels, wastewater should be properly managed to prevented contamination of ground or any surface water sources. 4. Ensure that surface water accumulating on-site are channelled and captured through a proper drainage	Ensure surface and groundwater protection	Low	- Proponent's Representative (PR) -ECO - Contractor	Undertake physical inspection of construction area and observe public input	Observe ground and surface water quality in the area.

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		water management system to be treated in an appropriate manner before disposal into the environment. 5. Wastewater should not be discharged directly into the environment. 6. Disposal of waste from the development should be properly managed and taken to the relevant disposal facilities. 7. Bi-annual monitoring of erosion especially in the vicinity of PV arrays should be conducted regularly to ensure erosion sites can be identified and remedied early enough. 8. Ensure that oil/ fuel spillages from vehicles and machinery are minimised and that where					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		these occur, that they are appropriately dealt with. 9. Ensure regular inspections and maintenance of equipment. 10. All materials on the site should be properly stored. 11. Disposal of waste from the site should be properly managed and taken to an approved landfill site. 12. Ablution facilities at the site should not allow any possible contact with ground water resources. These facilities should be regularly serviced. 13. Site equipment should be refueled in paved areas with a collection point in case of any spillage. 14. The service infrastructure should be designed and constructed by suitably					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		qualified engineering professionals. 15. Develop and implement a preventative maintenance plan for the service infrastructure.					
Visual Impact	Visual and Sense of Place	1. It is recommended that more 'green' technologies be implemented within the architectural designs and building materials of the development where possible in order to minimise the visual prominence of such a development within the more natural surrounding landscape. 2. Natural colours and building materials such as wood and stone should be incorporated. 3. Where feasible, implement solar farm vegetation	Ensure environmental protection	Low	- Proponent's Representative (PR) - ECO - Contractor	Undertake physical inspection of construction area and observe public complains	1. Record of good housekeeping. 2. Record of neighbouring communities and farms complaints and comments.

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		screening: • Screen should comprise of varying native species appropriate to the area and of varying height to soften not block the view of the site. • Breaks in the screen, reflecting natural breaks in existing remnants would be appropriate. • Planting should be undertaken as soon as practical in the construction process depending on the season, as it will take time for the plants to establish and become effective as a screen. Seasonal requirements for planting should					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		also be considered. • The screen should be maintained for the operational life of the solar farm.					
Occupational Health and Safety	Impact on human health	1. Prolonged exposure in the vicinity of transformers should not exceed 1 hour at a distance of not less than 2.62 m. 2. The prescribed servitudes to be observed. 3. Cameras will be installed all over the solar park, in order to provide 24/7 online security and fire protection information. This forms part of the plant monitoring and control system.	To ensure employee and public safety	Low	- Proponent's Representative (PR) - ECO - Contractor - Random check by designated law environmental / health inspector	Site inspection checklist through physical observation, Random interviews with employees	1. Poof of HIV-AIDS and substance abuse awareness raising. 2. Availability of condoms on sites. 3. Health and safety plans. 4. Induction attendance registers. 5. Valid driver's licences for designated drivers. 6. Rotating flushing lights on heavy and construction vehicles. 7. Roadworthy vehicles.

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
							8. Personal Protective Equipment. 9. Adequate First Aid Kit. 10. Emergency health facilities. 11. Ablution facilities. 12. Warning signs at designated areas. 13. First aid training attendance register of supervisors. 14. Construction areas are fenced off/cordoned off.
Air Quality	Dust pollution	1. Use appropriate dust suppression measures when dust generation is unavoidable, e.g. dampening with water, particularly during prolonged periods of dry weather.	To prevent air pollution and dust nuisance to nearby land owners / residents and prevent exposure of employees to excess dust that maybe harmful to their health.	Low	- Proponent's Representative (PR) - ECO - Contractor	Physical observation. Install dustfall buckets at Farm 58 and Farm Geluk, and at strategic locations along	Dust monitoring

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
						the linear route.	
General Waste and Pollution Control	Waste management	1. The proponent shall put in place a waste management plan aimed at minimising the production of all wastes. 2. The project sites will be kept free of waste, except in designated waste storage areas. Any wastes distributed by winds will be regularly cleaned up. 3. A sufficient number of waste bins should be placed around the site for the soft refuse. 4. A sufficient number of skip containers for the heavy waste and rubble should be provided for around the site. 5. Solid waste will be collected and disposed of at an appropriate local	To prevent littering and to ensure good and tidy house keeping	Low	- Proponent's Representative (PR) - ECO - Contractor	Undertake physical inspection of construction area and observe public complains	1. Solid waste generation and management program. 2. Labelled waste drums and skip bins. 3. Gender segregated ablution facilities.

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		waste disposal site. 6. Place priority on waste reduction, waste reuse and waste recycling, in that order.					
Fire and Explosion Risks	Fire Hazard	1. Substations will have lighting protection to reduce fires caused by lighting by employing the latest technology. 2. In addition, the plant will deploy robust integrated forest fire management systems to prevent and manage fire outbreak and contain the spread thereof to neighbouring farms. 3. Cameras will be strategically installed all over the solar park, in order to provide 24/7 online security and fire protection information. This forms part of the plant monitoring	Ensure no risk of fires	Low	- Proponent's Representative (PR) - ECO - Contractor	Undertake physical inspection of construction area and fire risk hazards	Record of fires recorded

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		and control system. 4. Emergency response procedures should be in place so as to alert the employees on how to react to fire and explosions incidents. 5. Establish and maintain designated smoking areas at the site. 6. Avoid smoking in areas that are close to fire hazard areas and environments, such as areas of dry vegetation. 7. Ensure that sufficient fire-fighting equipment is available at the development. Firefighting equipment is to be suitably maintained. 8. Supply appropriate signage and relevant emergency contact details at the					

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		development and displayed outside the site building. 9. Do not allow informal cooking or warming fires at the development. 10. Appoint a fire officer who shall be responsible for coordinating emergency response in the event of a fire according to the Emergency Response Plan. 11. All electrical wiring of the development will be installed and approved by a qualified engineering professionals who will issue a Certificate of Compliance.					
Socio-economic Environment	Quality of life	1. Ensure locals enjoy priority in terms of job opportunities, for skills that are available locally, to the extent possible. 2. Ensure local procurement	To ensure that local people are not excluded from project activities and benefits.	Low	- Proponent's Representative (PR) - Labour inspector	Employment records On-site inspection and interviews with employees	1. Employment contract. 2. Training and capacity building programs. 3. Workshop and

ESI Aspect	Impacts summary	Mitigation Measures	Mitigation objective	Risk Rating	Responsibility	Implementation action plan	Monitoring indicators.
		where commodities are available locally.					Training attendance registers. 4. Employees certificate of attendance.
Planning and Design	Infrastructure development	3. Ensure that the infrastructure is designed and supervised by suitably qualified engineering professionals.	Ensure proper project planning and design, and ensure sustainable project development	Low	- Proponent's Representative (PR)	Develop proper project designs and planning tools	Certified project designs by all relevant authorities.

7 DECOMMISSIONING AND REHABILITATION

The proposed development has an expected lifespan of more than 50 years. In general, the impacts associated with the decommissioning phase will be similar to that of the construction phase. The Environmental Management Plan for this phase must be reviewed at the time of decommissioning to cater for changes made to the development. At the end of its useful life, the plant will be completely dismantled so as to restore the area to *ante operam* conditions.

Each production unit will be uninstalled; therefore, the following waste will be produced:

- Panels: aluminium, glass, cells and polymer waste;
- Electricity lines: copper and metallic elements;
- Pipes;
- Supporting structures: metallic elements;

Unless these materials are disposed of properly, they can cause irreversible damage to the environment (surface and underground water, vegetation and animals), as well as to human health due to pollution of aquifers for example, and the deterioration of environmental conditions.

A full decommissioning plan should be developed within the first 24 months of operation; however, the following management actions are recommended as a minimum:

- Reusable, recyclable and scrapable components will be selected.
    - Disposal will consist of disassembling the modules and sending them to a suitable recycling platform which will carry out the following recovery work:
        - recovery of aluminium frames;
        - recovery of glass material;
        - recovery of cells;
        - decommissioning of the polymer material covering the cells.
    - The electricity lines of all the systems such as lighting will be removed by carrying out only the absolute necessary excavation work.
    - Copper from electricity cables and windings as well as other metallic parts will be sent to specialised centres for recovery and recycling.

- Appliances such as inverters, control panels and transformers will be disassembled and sent to specialised companies for disposal.
- Piping and electrical drawpits will be removed by excavating a set size excavation and the original situation will be restored using the excavated material.
- The exposed parts of the photovoltaic module supporting structures will be removed mechanically, whereas the foundation piles sunk into the ground will be extracted.

8 CONCLUSION

If the above-mentioned management recommendations are properly implemented, it is anticipated that most of the adverse impacts on the environment can be mitigated. An appointed representative of the proponent (PR), and an independent environmental control officer (ECO) will need to monitor or audit the site throughout construction to ensure that the EMP is fully implemented and complied with. The EMP caters for all project phases, but will need to be reviewed during all phases of project, especially when revisions are made to the project development plans.

The Environmental Management Plan should be used as an on-site tool during all phases of the proposed project. Parties responsible for contravention of the EMP should be held responsible for any rehabilitation that may need to be undertaken. It is strongly advised that the proponent appoint suitably qualified professionals to design and supervise the construction of the services and other infrastructure. It is also advised to develop and implement a preventative maintenance plan, which shall be monitored and evaluated regularly.

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