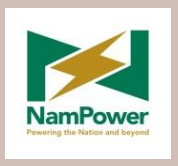
April 2022

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE PROPOSED WIND AND SOLAR POWER PLANT NEAR ROSH PINAH



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PROJECT NAME	Environmental and Social impact Assessment for the Proposed Wind and Solar Park near Rosh Pinah
REPORT	Environmental and Social Management Plan
STAGE OF REPORT	Final Draft
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DATE OF RELEASE	April 2022
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DECLARATION

I hereby declare that I do:

(a) have knowledge of and experience in conducting assessments, including knowledge of the Act, these regulations and guidelines that have relevance to the proposed activity;

(b) perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;

(c) comply with the Act, these regulations, guidelines and other applicable laws.

I also declare that there is, to my knowledge, no information in my possession that reasonably has or may have the potential of influencing –

(i) any decision to be taken with respect to the application in terms of the Act and the regulations; or

(ii) the objectivity of this report, plan or document prepared in terms of the Act and these regulations.

Stephanie van Zyl

Environmental Assessment Practitioner

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LIST OF ACRONYMS

Acromym	Description	Acromym	Description
AIDS	Acquired immunodeficiency syndrom	kV	kilovolt
AMSL	above mean sea level	m^2	Square meter
CoC	Code of Conduct	MEFT	Ministry of Environment, Forestry and Tourism
ECB	Electricity Control board	MME	Ministry of Mines and Energy
ECC	Environmental Clearance Certificate	MW	megawatt
ECO	Environmental Control Officer	NBRI	National Botanical Research Institute
ESF	World Bank Environmental and Social Framework	NHC	National Heritage Council
ESIA	Environmental and Social Impact Assessment	NP	NamPower
ESMP	Environmental and Social Management Plan	PE	Project Engineer (NamPower)
ESS	World Bank Environmental and Social Standard	PPE	Personal Protective Equipment
EWG	Environmental Working Group	SME	Small and Medium Enterprises
GIS	Geographic information system	TK(S)NP	Tsau//Khaeb (Sperrgebiet) National Park
GPS	Global Positioning System	UV	Ultraviolet
Ha	Hectare	WESCO	WESCO WASTE MANAGEMENT PTY LTD
HSE	Health, Safety and Environmental	WTG	Wind Turbine Generator
IUCN	International Union for Conservation of Nature		

1 INTRODUCTION

This Environmental and Social Management Plan (ESMP) concerns the development of the NamPower Wind Project, consisting of the development of a power generation plant near Rosh Pinah (see Figure 1 below). It will consist of a 100 MW Wind Power Farm with an option of adding a 100 MW Solar Photovoltaic (PV) Power Plant in future, hereinafter referred to in this document as ''the Project''. The development of the proposed Wind Project will be executed in multiple phases, with an initial phase being financed by KFW to develop a 40 MW Wind Power Plant to be owned and operated by NamPower.

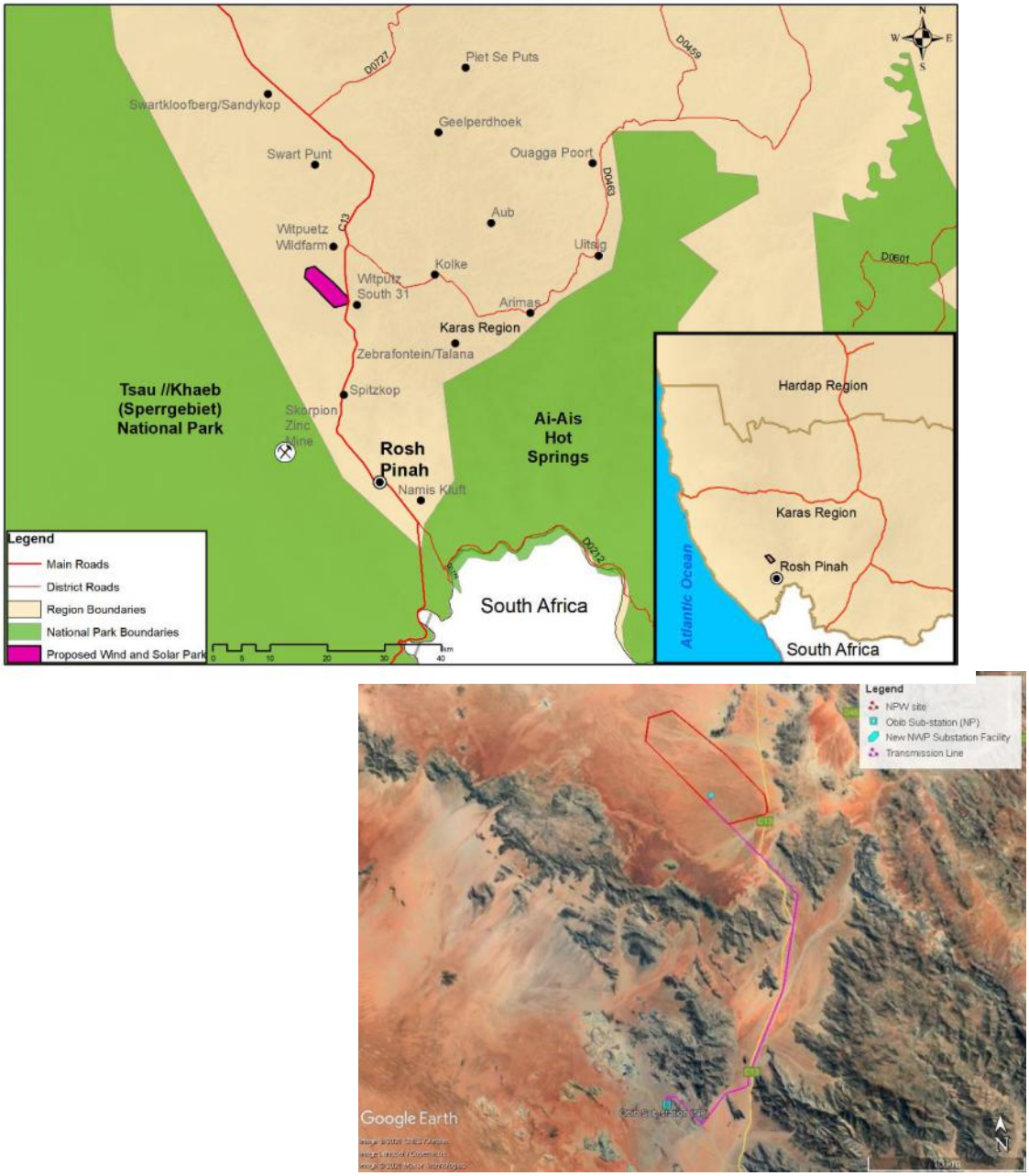


Figure 1 Locality map of the site for the proposed NamPower Wind Project, showing the site and the transmission line route

This document is a culmination of the recommendations made in the NamPower Wind Project Environmental and Social Impact Assessment (ESIA), its Specialist Reports and the applicable requirements of the World Bank's Environmental and Social Framework.

2 PROJECT INFORMATION

Key characteristics of the wind and solar electricity generation activities of the NamPower Wind Park are summarized in Table 1.

Table 1: Project description

Element	Description
Project Developer	NamPower.
Life of project Construction phase Operational phase	 At least eighteen (≥18) months. 25 years.
Project location	//Kharas Region, Namibia 34km North of Rosh Pinah on the Farm Witputz SÜd, along the C13 National Road.
Total land area of Project site	2420Ha
Coordinates	-27.621889, 16.645195; -27.647686, 16.679357; -27.670633,16.703231; -27.676741,16.704676; -27.680728, 16.704537, -27.-27681237, 16.704400, -27.686728, 16.679868; -27.638683, 16.627808; -27.625638, 16.630098
Land agreement and zoning	Lease agreement with commercial farm owner. Land use is agricultural with very low carrying capacity for small livestock farming.
Wind Turbines	There will be up to 25[1] units of wind turbines within the boundaries of the project site. Power generation is between 2-6MW per turbine. The total capacity will be 100MW, of which only 40MW is to be developed as a first phase, funded by KfW and operated by NamPower. Each unit will consist of conical tubular tower type, up to 160m hub height and with 3 blades rotor, each up to 85m in length. Therefore, the total height of the structure, including the blade apex, is up to 245m.''
Solar PV	This option may be added in future. The Solar PV field will be divided into three (3) sets totalling 25 power blocks, each with a 5 MVA (2 x 2.5 MVA inverters) Medium Voltage (MV) Power Station. The export capacity of the PV plant will be 100 MW.

1 The number and exact position of the turbines may change depending on the design bases and size of wind turbine selection.

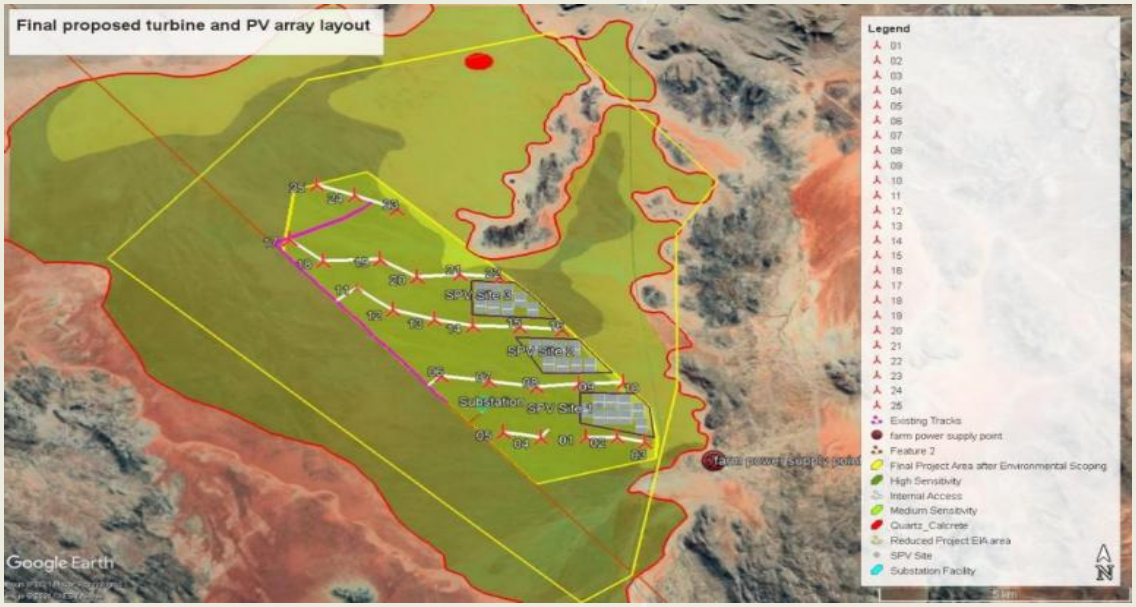
Element	Description
Transmission lines	Construction and installation of the following: • An internal electrical grid system. • An additional transmission line will be constructed from the Project site up to the Obib Substation which will follow the existing 66kV line route. This will be a monopole structure with a height of 17.4 m and a span of 180 m. • A new substation will be built on the Project site. There will be internal cabling to collect power from each wind turbine and solar array and reticulate it to the site substation.
Expected disturbance/footprint	The anticipated area of disturbance is 4650m^2 per Wind Turbine Generator (WTG), (which can reduce to 2300 m^2 during operation), totalling 11Ha excluding the transmission lines, substations, internal access roads, parking areas, and service buildings. The total estimated footprint including all the infrastructure and ancillary facilities (excluding the external transmission line to Obib) is 783 Ha and in future another 325 Ha for the Solar PV Park

3 ENVIRONMENTAL FEATURES

The following key features (Table 2) show the vulnerability of this environment and raises awareness of the features to be conserved and managed to ensure protection and avoidance of collateral damage.

Table 2 Environmental features

Element	Description	Impact expected
Geology and topography	Sandy soils that are susceptible to erosion. Inselbergs have been excluded from the site layout. Many shallow and wide drainage lines covering the site.	Disturbance of soil layers causing eventual erosion. Drainage lines important for the ecological function of the area and disturbance in them should be avoided as a matter of priority.
Critical Habitat	No-go areas that are critical habitat (According to World Bank ESS6 and International Union for Conservation of Nature (IUCN) Guidelines) have been identified surrounding the Project site. These areas have been avoided in the site selection.	Destruction of and damage to critical habitat if the workforce and movements are not strictly confined to the site.
Vegetation	The vegetation forms part of the Succulent Karroo Biome, which predominantly has low, succulent-leaved shrubs, few grasses, and few tall shrubs and trees. The vegetation cover of the site has high sensitivity, - Figure 2, featuring many range-restricted and endemic species.	Physical destruction of vegetation of high conservation, by vegetation clearance for the footprint and collateral damage.

Element	Description	Impact expected
	 Figure 2: Vegetation sensitivity zones on the Project site	
Bio-diversity - Fauna	The NWP site and transmission line form part of the limited Succulent Karoo Biome. Fauna affected is largely reptiles and insects, which are habitat sensitive and restricted. 309 taxa are expected to occur in the study area. The majority (74%) of expected taxa	Disturbance through noise, movement and temporary occupation of an otherwise undisturbed habitat. Habitat loss, including foraging, roosting and breeding habitat of the area occupied by the completed structures.

Element	Description	Impact expected
	in the study area are invertebrates, of which at least 34 (11%) are endemic or near-endemic to Namibia. Ten (10) mammal species have legal status, under Nature Conservation Ordinance 4 of 1975 (NCO), and Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). These mammals have very large range requirements and require an east-west migration corridor over the NWP site. The overall habitat sensitivity is high for all three (3) types of terrain, but rocky outcrops rate the highest, followed by succulent shrubland and then calcrete plains.	Collision of priority species, including globally threatened birds and/or migrating birds with wind turbine blades. Security fencing can restrict the east -west migration corridor and ecosystem integrity of National Parks in the vicinity.
Avifauna	Avifauna have been identified as groups which should receive specific attention for this project. As for avifauna, interference with flight paths for avifauna have been considered in the Project site layout, although some sensitivities still exist and certain locations on the Project site should be avoided. Potential collisions with transmission line towers and turbine blades are a significant potential impact especially for birds prone to such collisions. A Longitudinal bird impact study has been conducted during 2020/2021, according to ESS 6.	Disturbance through noise, movement and temporary occupation of an otherwise undisturbed habitat. Habitat loss, including foraging, roosting and breeding habitat of the area occupied by the completed structures. Collision of priority species, including globally threatened birds and/or migrating birds with wind turbine blades.

Element	Description	Impact expected
Bats	Bats that have a high likelihood of collision with wind turbines and likely to occur on the Project site are the Egyptian Free-tailed Bat (*T. aegyptiaca*), Roberts's Flat-headed Bat (*S. petrophilus*) and Cape Serotine Bat (*L. capensis*). There are no known significant roosts within 80km of the Project site. The immediate project vicinity may be able to periodically support bats in the ephemeral (possibly seasonal) drainage. But water is an essential requirement for significant bat populations to occur. Rocky ridges, steep slopes, and outcrops, as well as farm buildings near of the NPW site could be used as bat roosts, though few are within the proposed 500m buffer from wind turbine positions. Bat sensitivity and resulting buffer zones are shown in Figure 3.	Loss and degradation of bat foraging habitat. Collision of bats with wind turbines, and electrocution of bats on the transmission line and at the substation. Decline or loss of bat ecosystem services through indirect impacts.

Element	Description	Impact expected

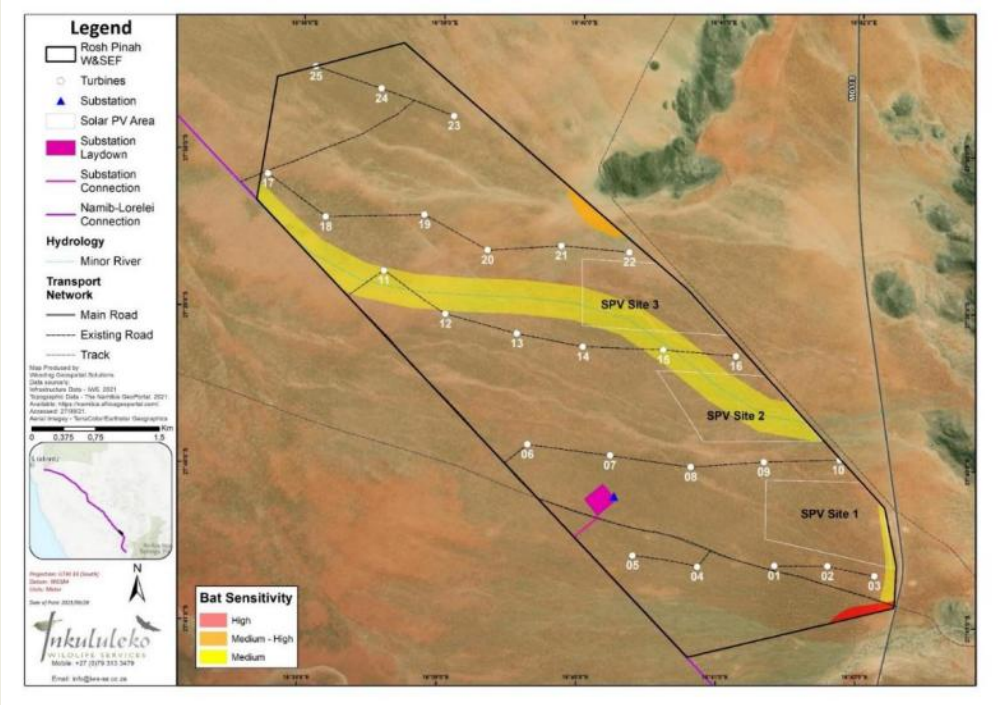


Figure 3 Relative bat sensitivity and buffer zones

Element	Description	Impact expected
Archaeology	No individual sites of historical or scientific data concern were identified on the NPW site, although sites are located in the nearby inselbergs.	Impact only expected if uncontrolled movement is allowed into the nearby area and particularly the hills. An archaeology chance-find procedure is to be implemented and overall degradation is to be limited.
Visual sensitivity	The route passing the Project site carries tourism traffic and the Project site is situated in a significant viewshed.	Visual degradation during construction and visual impact of the WTGs, solar PV fields, transmission line and the associated infrastructure. The sites need to be managed diligently to maintain order and avoid visual degradation. Design adaptation recommendations are made in this ESMP for reducing visual impacts.
Socio-economic indicators.	Housing to be catered for in Rosh Pinah. Recent downscaling of mines in Rosh Pinah caused a high unemployment rate, leaving people desperate for jobs.	Job creation and economic upliftment if a locals first policy is followed. Engagement with the Roshskor and the local labour office is crucial.

The Environmental and Social Management Plan (ESMP) aims to provide a high-level management tool for the overall environmental management of the project in principle as well as direct mitigation measures related to the impacts expected.

4 ENVIRONMENTAL MANAGEMENT REQUIREMENTS

The following legal framework forms the backbone of this ESMP:

4.1 Implementation and monitoring of the entire Environmental Management Plan

The ESMP must be included in all contractual agreement between the Project Developer (NamPower) and Contract Implementers. Strict adherence to the ESMP is essential in view of the sensitivity of the project area and the fact that the ESMP is a legally binding contract between the Project Developer and MEFT. The ESMP incorporates the following essential components:

- General mitigation measures that are applicable to all projects to ensure sound environmental and social management principles for a sustainable outcome.
- The specific mitigation measures for this project that have been identified to avoid and reduce the significance of impacts in this sensitive environment.

4.2 Management and auditing capacity requirements.

In order to be able to adhere to the above-mentioned requirements, the following capacity and system must be put into place:

- NamPower shall appoint a qualified and dedicated Environmentalist with Environmental Management Practice experience as Environmental Control Officer for each project to coordinate and monitor the adherence to the Environmental and Social Management Plan, as well as the external environmental audit process.

  This position will be responsible for:
  - The coordination of and liaison with the MEFT.
  - The coordination of the Biodiversity Monitoring Plan as well as Vegetation Management Plan.
  - The implementation of the ESMP
  - The coordination and reporting of the external environmental audit system.
- NamPower should liaise with stakeholders at critical points to resolve specific matters, such as:
  - the local labour office and Roshskor regarding recruitment,
  - Roshskor regarding infrastructure provision and workforce accommodation.
  - The neighbouring farm owners should also be contacted to inform them about the commencement and progress with the project and to iron out any grievances they may have.
- NamPower should implement an external environmental review system such that reviews are conducted on a quarterly basis during construction and audits on an annual basis during the construction and operation of the Project. This is

to be used to verify the effectiveness of the ESMP, to implement adjustments if required, and to have an objective set of records for the sake of satisfying international and stakeholder requirements.

4.3 Promoting compliance

NamPower is responsible to ensure overall adherence to this ESMP by the various construction, operation, and maintenance operators throughout the entire life cycle of the project. The operator/contractor is however responsible for the enforcement of this ESMP to avoid contravention of this ESMP. [2] The system should incorporate the following guidelines:

(a) The Contract Implementer shall comply with the environmental specifications and requirements as described in the ESMP on an ongoing basis. This shall include the necessary training and awareness raising as a constant process on site, including to new staff. Any failure to comply should set in motion a corrective procedure by the ECO, which culminates in a payment retention or deduction with continual non-compliance. Payment retention is the first step toward correction, with a deduction as further enforcement, which can pe repeated if non-compliance persist. Certain contraventions are of high importance and a deduction shall be charged regardless of the correction, especially in cases where the damage is irreparable.

(b) Enforcement should be assured through specific, quantitative measures such as payment deductions for small scale or irrecoverable activities and payment retention for large scale recoverable activities (See example in Appendix C). The terms should be specified in the special conditions of contract of implementation and operations contracts.

(c) In the event of non-compliance, the following recommended process shall be followed:

- The ECO shall issue a notice of non-compliance to the Contract Implementer, stating the nature and magnitude of the contravention.
- The Operator shall act to correct the non-compliance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- The Operator shall provide the ECO with a written statement describing the actions to be taken to discontinue the non-conformance and to replace it with confirming actions, as well as the actions taken to mitigate its effects and the expected results of the actions.
- In the case of the Operator failing to remedy the situation within the predetermined timeframe, the ECO shall impose a payment deduction or retention based on the special conditions of contract.

[2] In case NamPower remains the operator, a system promoting compliance is still required, with a disciplinary process being made applicable in cases of severe non-compliance, e.g. health and safety measures contravened, plants indiscriminately damaged, indiscriminate off-road driving undertaken or off-limit areas visited, etc.

- In the case of the Operator not being able to remedy the situation due to permanent environmental damage already incurred, the ECO shall impose a payment deduction based on the special conditions of contract.
- In the case of non-compliance giving rise to physical environmental damage or destruction, NamPower shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Operator the full costs incurred in doing so.
- In the event of a dispute, difference of opinion, etc., between any parties in regard to or arising from interpretation of the conditions of the ESMP, disagreement regarding the implementation or method of implementation of conditions of the ESMP, etc., any party shall be entitled to require that the issue be referred to independent specialists to assist in the resolving of the disput to the satisfaction of all the parties.
- The ECO shall at all times have the right to stop work and/or certain activities on site via the appointed site manager / project manager in the case of ESMP non-compliance or failure to implement remedial measures.

(d) A list of appropriate payment deductions and payment retention based on the content of the ESMP must be developed by the ECO before the project implementation starts and revised annually. Appendix C provides an example of an Environmental Payment Deduction or Retention System.

(e) A record of all payment deductions and payment retention given and adhered to should form part of the Environmental Payment Deduction or Retention System. Repeat offenders will receive an official warning or will be ordered from the site if as deemed necessary. All staff and contractors should be made aware of the seriousness with which environmental protection should be viewed at the site and the system should be knowledge to all on the team.

5 MANAGEMENT REQUIREMENTS

5.1 Planning Phase

The panning phase constitutes the phase before the onset of construction. It ensures all design and preparation requirements are in place before construction commences.

Responsibility: The Project Developer shall consider these aspects in conjunction with the ECO.

Table 3 Management Requirements - Planning

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS	To fulfil the legal requirements in constructing and operating the proposed project.	• The Project Developer must obtain permission from the Electricity Control board (ECB) in order to generate the electricity of the power plant. • The Project Developer is further obliged in terms of Section 22 of the Electricity Act 2 of 2007 to obtain a preliminary license from the Minister to build and complete any structure which would be involved in the production of electricity, including the construction of wind turbines and equipment. • The ECB will inform the Project Developer of the conditions and requirements imposed by the Minister in granting a preliminary license. The license is valid only for the period referred to on the license or any extension granted by the Minister in terms of Section 22(4) of the Electricity Act 2 of 2007. • The Project Developer must apply for a collection/rescue/relocation permit at MEFT in order to rescue or relocate identified plant species. A period of three (3) months should be allowed for obtaining this permit. A vegetation Management Plan will be required, as well as the approximate numbers/quantities involved and a relocation position/s will be identified in collaboration with the MEFT/NBRI. As specified in the ESIA, a vegetation specialist should be	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
		involved to identify the exact species involved prior to construction and should also take part in the above required process with MEFT/NBRI.	
BIODIVERSITY MANAGEMENT SYSTEM	To optimise the site in terms of avoidance of sensitive habitats. Compliance with ESS6	• Clearly indicate the different sensitivity zones in the final layout design for the Wind Park (see Appendix A for map / coordinates). The no-go areas are to be excluded from the development area. • Uncontrolled vehicle activity is of major concern. Careful pre-planning of construction activities must be done to identify where infrastructure will be absolutely necessary for both construction and maintenance, overlapping these in a single infrastructure corridor (roads, and electricity). • These infrastructure corridors must be clearly marked prior to construction activities beginning, together with designated turning points and construction clearance areas. Turning points for heavy vehicles must be designated and adhered to. The area used must be constrained as far as possible. • Implement a biodiversity monitoring plan as per the specialist study criteria. The taxa focus should be invertebrate and reptiles. The monitoring should include the interaction of the WGT operation with insects.	NamPower, Project Engineer (NamPower). Environmental Control Officer (ECO) Once off. Monitor enforcement weekly. ECO to monitor compliance to construction movement as per pre-planned criteria on a continued basis.
PLANT COLLECTION AND RELOCATION OF PLANTS OF CONSERVATION CONCERN	To rescue and remove all plants of conservation concern.	• Involve a specialist to identify plants that are candidates for rescue and removal or relocation. Consult with NBRI as to whether any of the plants must be brought to the National Botanic Garden. • Take care to make these arrangements well in advance so that NBRI staff can schedule and plan for any needed plant relocation. (Contact: The Head of NBRI 061 202 2017) via the	NBRI. NamPower. As per the vegetation

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
		specialist coordinator for the Vegetation Management Plan. Please contact the specialist coordinator of the Vegetation Management Plan, Colleen Mannheimer (Tel. + 264 61 233614, Fax + 264 61 233727). • Lift the plants as soon as possible, once it is certain that an area is to be compromised, to prevent their destruction. • Lifting and relocation of the plants must be supervised, by a knowledgeable person, such as an environmental rehabilitation practitioner, a botanist or a horticulturist with some expertise in this field. The plants need to be directly transferred to a damaged area or stored in suitable conditions as required depending on the species involved, until they are relocated. • Plants may only be stored for periods of less than three weeks. • The following must be recorded for each plant/species (other parameters might need to be recorded depending on the species involved, but that would have to be decided once the species are known for certain): o Reason for relocation. o Date lifted and exact method used to remove, store and relocate the plants. o Period of storage. o Date replanted and method of replanting (if applicable). o Watering regime (if applicable). o Monitoring method (if applicable). • In the case of relocation on-site, plant survival will be assessed until relocation is deemed complete and stable, notably each growing season when others of this species in the area are found to have come into flower or leaf. Monitoring method to be determined by rehabilitation practitioner involved.	management plan. Plan at least four weeks ahead and monitor implementation daily. Keep planning and monitoring records.

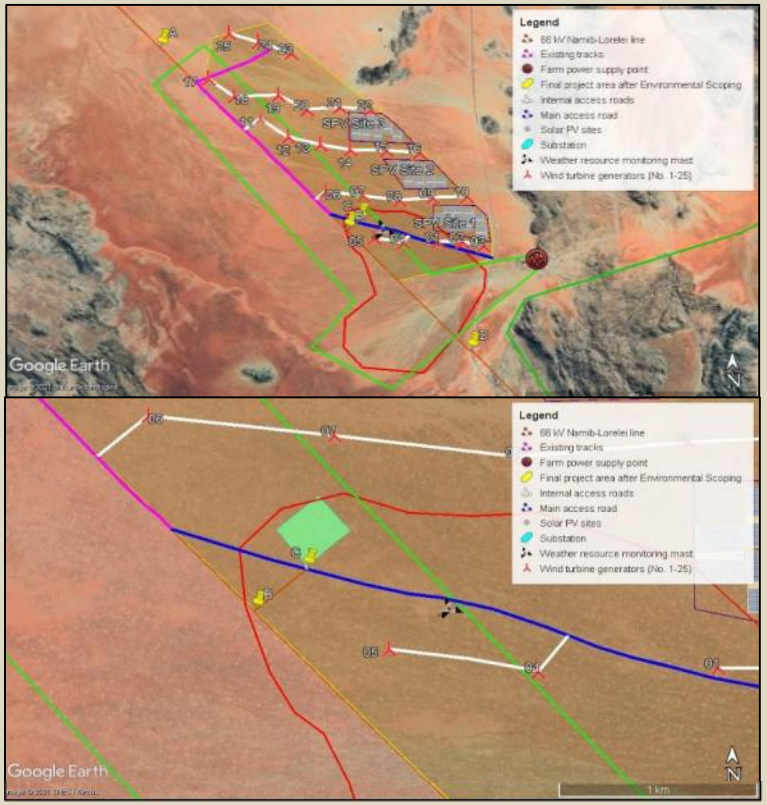
ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
		• Information on the entire procedure must be published or made available online so as to contribute to future rescue/relocation attempts in the southern Namib.	
FAUNA RELATED MONITORING REQUIREMENTS	To continue or initiate the required monitoring procedures as per the bird and bat specialist studies.	• A bird monitoring programme during the construction and operational phase that includes searches for bird mortalities based on proposed guidelines in the specialist study (Appendix E). • If deemed necessary by the specialist, extend monitoring to include nocturnal monitoring episodes as per proposed guidelines. • Pre-construction bat monitoring requires that a static bat acoustic monitor be erected on a static meteorological mast) with microphones mounted at 10 m and 50 m and 90 m recording for a period of ideally 12 consecutive months. This is underway and will be concluded by September 2022. A final Impact Assessment Report will then be issued and the ESIA and ESMP will be updated accordingly, with further operational monitoring as per the South African Guidelines proposed. • During the first two (2) operational years of the wind farm diligent bat fatality monitoring to inform adaptive management and mitigation of bat fatalities is essential. The fatality monitoring and data analysis must be done to a high standard so that there is confidence in the predicted number of actual bat fatalities at the facility. If bat fatalities are unacceptably high (e.g. if bat fatality thresholds are exceeded – as outlined by MacEwan *et al.* 2018), wind turbine curtailment, bat deterrents, and/or other measures must be implemented. • For the cumulative impact on bats to be better understood, wind farms should forward their bat fatality data to a centralized national repository to allow for quantification of cumulative bat fatalities. • Implement a biodiversity monitoring plan as per the specialist study criteria. The taxa focus should be invertebrate and reptiles. The monitoring should include the interaction of the WGT operation with insects.	NamPower to initiate, NamPower/IPP takes over responsibility, in collaboration with MEFT.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
DESIGN OF WIND TURBINES AND INFRASTRUCTURE AND RESOURCE USE ON THE NWP SITE	Local water resource protection. Fauna interaction and conflict prevention To minimise the risk of turbine-bird collisions.	• Groundwater in the NWP project area is of low yield (1-5m^3/h) and vulnerable to over-abstraction. The construction water demand as well as the maintenance water demand will in all likelihood be over local aquifer capacity. Therefore, the project will have to be supplied via Namwater resources or from the source of the Scorpion Mine during construction. For operational purposes groundwater may be used provided that a geohydrologist determine the sustainable long term yield of the borehole(s) used and in the vicinity, and a water abstraction permit is in place. Water yield of boreholes used and in the vicinity must be monitored very second year to assure sustainable use. • Low water consumption project technologies and methods should be investigated and implemented. • Security fencing can restrict the east -west migration corridor and ecosystem integrity of National Parks in the vicinity. Avoid any form of fencing, except around high risk facilities such as substations. • To reduce footprint and vehicle / animal interaction, the access road lane width should be minimised to effective one-way transport. • Avoid creating artificial bat roosting space at buildings, infrastructure, solar PV fields and wind turbines as well as artificial access to water. • Avoid sensitive sites (including breeding areas) and flight paths of birds vulnerable to negative impacts from Wind Turbine Generators (WTGs); • Maintain buffer zones (bat buffer zones included) and incorporate selective turbine removals to reduce fatality rates of area-specific sensitive species: if possible, avoid WTGs sited directly adjacent to the power line route (i.e. WTGs 5, 6, 11, 12, 17, 18; Figure 21), in order to minimise cumulative impacts of power line in proximity of WTGs in terms of collisions of Ludwig's Bustard	NamPower

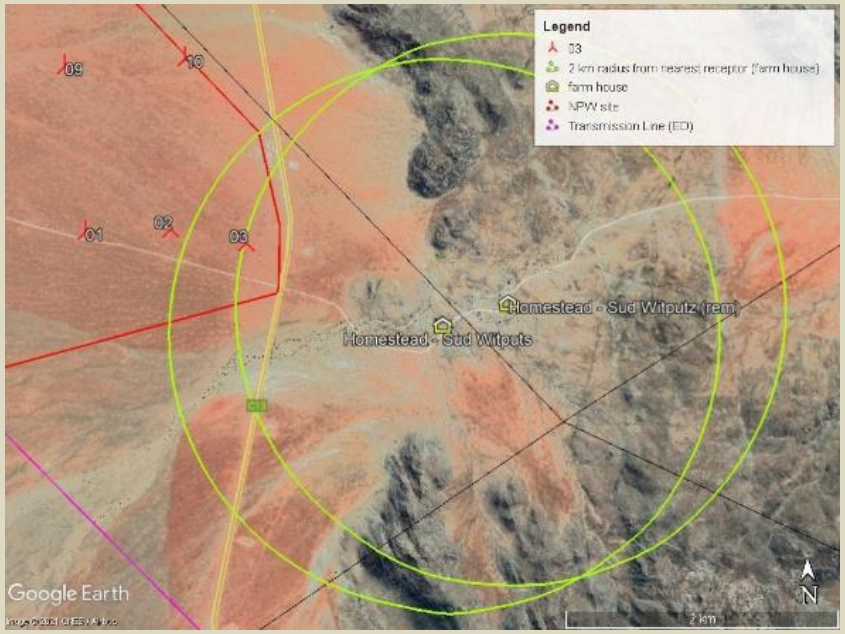
ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
		and five raptor species (Black-chested Snake Eagle, Jackal Buzzard, Southern Pale Chanting Goshawk, Greater Kestrel and Rock Kestrel); • Avoid alignment of WTGs perpendicular to main identified bird flight paths for Namaqua Sandgrouse (the predominant flying species); i.e., align the direction of rows of turbines with that of the wash areas and (east – west) flight paths (as in the present proposed layout); • Site the turbines close together, preferably in clusters, to increase visibility (subject to technical constraints); and allow for corridors/flight paths between clusters, aligned with main flight trajectories; • Increase the visibility of rotor blades, e.g. by using high contrast patterns such as painting one blade black, or red (dependent on whether this practice is permitted by the Namibia Civil Aviation Authority); • Should monitoring indicate repeated collisions of any bird and bat species on a significant scale, in particular Namaqua Sandgrouse, active turbine management (such as curtailment and shut-down on-demand procedures at times of high bird activity [e.g. 07h00 – 10h00]) should be considered on an adaptive (experimental) basis, guided by the post-construction monitoring programme; • All lighting on wind turbines, masts and other infrastructure should be down-shielded, in order to avoid causing disorientation to night-flying (or migrant) birds and/or collisions on structures (also see www.darksky.org for further International Dark-Sky Association guidelines); • There should be no non-essential lighting on site when there is no human activity at any wind turbine location, in the facility, or on site. • Lighting on wind turbine generators should preferably comprise red, intermittent lighting, if this is permitted by the Namibian Civil Aviation Authority.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
		• Mark Wind turbine structures and solar PV infrastructure by using neutral colours provided it is allowed by civil aviation safety requirements, which should receive priority. Modernised methods of civil aviation safety should be preferred to traditional paint methods. Consider integration of colour schemes on the lower (at least 100m) section of the WTG and infrastructure with the surrounding environment as per the Visual Impact Assessment (VIA). • Supporting infrastructure such as buildings should use neutral colours on the structures with a blue basis (e.g. grey), or architecturally determined.	
DESIGN OF TRANSMISSION LINE PYLONS	Avoid higher risk of archaeological sites near the Obib substation. To minimise the risk of power line-bird collisions.	• Evaluate the southern section (from the C13 crossing to the Obib substation) of the new transmission line for archaeological surface finds once the line is set out. • Where possible, install transmission and other power cables underground (subject to habitat sensitivities and technical constraints); in particular, consider underground cabling for the new power supply to the farmhouse; • Avoid overhead cable use on site over areas of high bird concentrations (e.g. of Ludwig's Bustard), especially for species vulnerable to collision; • As a mitigation for bird collisions, mark overhead conductors using bird flight diverters/deflectors, as indicated below *(Figure 4). The marking recommendations are conceptual at this stage, and will need to be confirmed during the pre-construction site visit:* – Mark existing 66 kV power line for the whole section from where it adjoins the project site in the north-west to the gate on the C13 road, on at least one of the conductors or on alternating conductors, as follows: o Marking section A-B (using a combination of RIBE bird flight diverters and large SWAN-FLIGHT Diverters (SFDs), with offset design/colours, fitted to alternating outer conductors at a distance of 10 - 15 m apart: from A (27.628119S	NamPower/IPP

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
		16.616333E) in the north-west to new substation connection (B; 27.674043S 16.666226E; total 7.1 km); and o Marking section B-D (SWAN diverters only, on outer conductor, alternating colours) where the existing power line will run in parallel to the new 66 kV power line: from new substation connection (B; 27.674043S 16.666226E) to the gate on C13 road (D; 27.704017S 16.698834E; 4.6 km). Mark new 66 kV power line with a combination of RIBE bird flight diverters and large SWAN-FLIGHT Diverters (SFDs), with offset design/colours, fitted to the OPGW at a distance of 10 - 15 m apart in pre-identified sensitive areas (including the large wash area): o Marking section C-B-D: from new substation (C; 27.671982S 16.668935E) to connection with existing 66 kV power line (B; 27.674043S 16.666226E) to the gate on C13 road (D; 27.704017S 16.698834E; 0.4 + 4.6 = 5.0 km); and o Marking section(s) from the gate on C13 road (D; 27.704017S 16.698834E) further south to Obib Substation (27.844620S 16.638203E): to be confirmed. – If above ground, mark the new power line to the farmhouse with Viper Live Bird Flapper ("Viper") diverters at a distance of 10 m apart, at least in the vicinity of the large wash: o Marking section from new substation (C; 27.671982S 16.668935E) to farmhouse (E; 27.683546S 16.709840E; to be confirmed) • On the new 66 kV steel monopole power line, provide perch structures for raptors on selected power line poles (mainly in large wash area; further sections outside the main study area to be confirmed). The insulator design should preferably be such that it discourages perching by larger birds.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
		 Figure 4: Sections of the 66 kV power line recommended for mitigation marking: A – B – C – D (above); detail B – C (below).	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
DESIGN OF SOLAR PV FIELDS	To avoid the ''lake effect''	• Arrange solar PV arrays in rows with the maximum inter-row spacing, to help reduce the "lake effect" of a solid, condensed mass of solar PV panels; and site the panel arrays as far away from wind turbines as possible, to avoid cumulative impacts. • Design the solar PV field layout and the construction activities with a vegetation specialist, also on site, as to optimise the retention of vegetation. *For example, only clear an access road along the tracker row (up to 3m) and mark out tracts to the individual SPV tracker. Do not clear the marked track. Use the track for a minimum timeframe (focus all activity to complete each tracker) without clearing the terrain. Once completed review the condition of the plants in the tract and under the installed SPV tracker.* • Design a vegetation re-introduction procedure under the solar PV panels after construction, within the Vegetation Management Plan parameters.	
DESIGN OF NOISE DAMPING	To reduce noise levels of turbines and other noise generating equipment	• WTGs within a 2km distance from the nearest or closest permanently occupied homesteads (Figure 5) should only be constructed once a noise modelling/monitoring study has been completed (consider collaboration with the nearby farm owner). Otherwise their positions should be moved further away than 2km from the farm homesteads. Consider noise dampeners on all equipment where feasible to limit and respect the low ambient noise levels of the area. The project Implementor to develop a noise pollution reduction management plan that covers the design, construction and operational stages of the project	NamPower/IPP

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
		 Figure 5: Noise buffer from nearest homesteads	
DESIGN TO MINIMISE VISUAL IMPACT	To minimise the visual impact of the wind turbines.	• Design Engineers investigate paint patterns that are broken on a lower viewpoint and form coherent safety patterns from an aircraft viewpoint. The lower 100m of the WTGs, as well as all other site infrastructure should blend with the environment. Consult with the Namibian Civil Aviation Authority with regard to the necessity for safety colour schemes of the turbines. • Use bird-friendly turbine lighting as a primary civil aviation safety measure. • Eliminate or minimise additional light sources, e.g., at site substation.	NamPower/IPP Periodical design review.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
POVERTY ALLEVIATION AND GENDER EQUALITY	To ensure that the project renders the maximum level of poverty alleviation possible, and to promote gender equality in economic opportunities. Optimise local service and contractor procurement. Optimise expenditure to local companies.	• During drafting of tender documents, NamPower (or appointed labour consultant) shall include provisions designed to maximise the use of local labour. All unskilled and where available semi-skilled labour shall be sourced from local communities, i.e. Rosh Pinah. Specific recruitment procedures shall be confirmed with Roshskor and the local Labour office, and spelled out. • The Project Developer shall ensure that local firms enjoy preference during tender adjudication, subject to the provisions of the Public Procurement Act. • The Project Developer shall consider how to structure the various components of the projects to optimise benefits to local contractors and Small and Medium-sized Enterprises (SMEs). • The Project Developer shall include provisions in all contracts to ensure gender equality, i.e. equal access to all positions, given personnel qualifications including aptitudes, experience, skills and abilities.	NamPower. //Roshskor, local Labour office Criteria design. Tender / Bid review.
TENDERING PROCESS	Ensure all environmental and social requirements are included in all contracts of contractors involved in the project.	• Ensure this ESMP is included in all contracts. • Ensure adequate budgeting and financial provision is allowed for the items in the above documents. • Develop, adopt, and implement Labor Management Procedures (LMP) for the Project in line with national legislation and ESS2. The LMP will be applicable to direct workers, contracted workers, including casual laborers. • Ensure that sub-contractor(s) in particular the civil works contractors, have appropriate environmental and social management systems and plans in place, which will likely include (as applicable) plans that cover: • • Occupational health and safety; • • Labour force management including a grievance management mechanism for workers;	NamPower

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIP
		EPC to report to NamPower regularly on ESHS performance including labor management and grievance management.	
EMERGENCY PREPAREDNESS AND RESPONSE PLAN	Ensure the requirement for an Emergency Preparedness and Response Plan is included in the tender documents.	• An item shall be included in the contract documents of all contractors, as follows: • The Environmental and Social Management System (ESMS) (implementation of the ESMP during construction) will establish and maintain an emergency preparedness and response system so that the client, in collaboration with appropriate and relevant third parties, will be prepared to respond to accidental and emergency situations associated with the project in a manner appropriate to prevent and mitigate any harm to people and/or the environment. This preparation will include: o the identification of areas where accidents and emergency situations may occur; o communities and individuals that may be impacted; o response procedures; o provision of equipment and resources; o designation of responsibilities; o communication, including that with potentially Affected Communities; o periodic training to ensure effective response; and o collaboration with other relevant emergency agencies. The emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions. Consult https://www.ifc.org/wps/wcm/connect/6147cbba-efe8-4879-ba77-c7af63bede7c/ESMS_Toolkit_General.pdf?MOD=AJPERES&CVID=nzhmvxC (Section 5, p 36. for guidelines to prepare an emergency preparedness and response plan).	NamPower/IPP

5.2 Construction Phase

Responsibility: The NamPower shall take ultimate responsibility for these aspects, with delegation to the applicable project operator, and the various contractors.

Table 4 Management Requirements - Construction

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
ENVIRONMENTAL MANAGEMENT	To ensure adherence to the ESMP.	• The Project Developer shall appoint an Environmental Control Officer (ECO) to coordinate and monitor the adherence to the Environmental and Social Management Plan (ESMP), as well as the external environmental audit process. • The ECO is responsible for the coordination of and liaison with external stakeholders such as Roshskor, the local labour office, neighbouring land owners, and the affected land owner. • Implement an external environmental audit system on a quarterly basis during construction and on an annual basis during the operation of the Project. This shall be used to verify the effectiveness of the ESMP and implement adjustments if required.	NamPower/IPP, ECO Scope of responsibility. Quarterly performance review. See section 5.3.
STAKEHOLDER ENGAGEMENT AND GRIEVANCE PROCEDURE	To ensure there is a clear mechanism for the public to remain updated on the construction process and to have access to a clear grievance mechanism for complaints.	• Reasonable contact should be made and maintained with the stakeholders of the project. • A grievance procedure should be in place to deal with community grievances in a satisfactory manner, and should at least include the following: o Identify the position on site where responsibility will be assumed for putting in place and managing the grievance procedure.	NamPower/IPP

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		o Ensure the current stakeholder database is updated. o Publish at the onset of the project, with the basic elements of it – construction time frame, contact details, who to contact for job opportunities, grievances, etc. The publication should be made in the local newspapers and on posters put at the local retail stores in Rosh Pinah and as advised by Roshskor. o The publication should also be placed on the website and Facebook page of the project and e-mailed to the applicable parties on the stakeholder database. o The poster shall contain a grievance mechanism – a method for community members to lodge complaints. The grievance mechanism shall state • Who can raise complaints (affected communities) • Where, when, and how community members can file complaints (this should preferably be in writing, unless the complainant is illiterate, in which case the ECO should assist the complainant to articulate the complaint • Who is responsible for receiving and responding to complaints, and any external parties that can take complaints from communities • What sort of response complainants can expect from the company, including timing of response • What other rights and protection are guaranteed. o The community shall be regularly reminded as above, of their right to submit and receive responses to grievances. o The officer responsible for handling grievances shall ensure that the grievances 1) are received and registered (with adequate documentation as reference), 2) reviewed and investigated, 3)	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		resolution options are considered and an appropriate one is selected and implemented, 4) the grievance is properly responded to and the matter closed out, and 5) the success of the resolution option is monitored and adapted where necessary.	
ACCOMMODATION AND PERSONNEL MANAGEMENT	To ensure that the impact of personnel on the environment is minimised.	• No personnel shall be accommodated on site, except for security guards on duty (to be agreed on with the land owner). • No permanent accommodation facilities shall be allowed on site. • It is envisaged that the majority of personnel will be from Rosh Pinah. The Project Developer is to first consult regarding accommodation of the workforce in the existing areas before any new ones are created. Should there be sufficient accommodation in the town at the time of construction, then the workforce should be responsible for own accommodation. Should there not be adequate accommodation for the majority of the workforce, then the Project Developer should make arrangements for the establishment of temporary accommodation in consultation with Roshskor. Such accommodation should be placed in an already disturbed area.	NamPower, ECO, Periodical review.
EMPLOYEE AWARENESS RAISING	To ensure that the entire construction workforce is aware of the provisions of this ESMP and the reasons for enforcing them.	• All staff shall receive an induction course prior to commencing work. The ECO shall discuss the ESMP and Code of Conduct (CoC) with all employees and make sure that all understand the contents and importance thereof. • Photographs of specific sensitivities such as vegetation, etc. shall be used to sensitise the workforce.	ECO. Induction and reinforcement plan and records.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Workers Code of Conduct to comprehensively cover, but not be limited to the areas of Gender Based Violence, SEA and Sexually Transmitted Disease, including relevant disciplinary measures, penalties and provisions for prosecution, prohibition of poaching, hunting and any other damage to biodiversity, flora and fauna, specifically in the designated "no go" areas. • The employees shall be explained why this ESMP is being enforced, i.e., the need to protect the environment. • Constant reinforcement is crucial. • New employees who join the project later shall receive an induction course before they commence with work. • Acknowledgement of attending the induction course and understanding the contents of it shall be signed off and the attendance register kept on record. • Personnel performance appraisal shall include environmental compliance issues.	
SAFETY AND SECURITY	To aim for zero incidents and accidents on the construction site. To ensure there are emergency response procedures in place in case of incidents and accidents. To ensure security measures are in place to protect property and	• The site supervisor shall be contacted before an intended visit by an outside visited from an authority such as from MEFT, MHSS, etc. so that he/she can inform such visitors of the necessary safety requirements before entering the site. • Visitors shall also be made aware that they will be required to wear the necessary PPE (Personal Protective Equipment) on site. • The Contractor shall ensure the least potential safety hazards during construction. The Contractor's plan to achieve this shall be discussed at the project initiation meeting.	ECO, Contractor. HSE Management Plan and procedures. Approvals and periodical review records.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
	life for the duration of the contract.	• The Contractor shall liaise with the Roads Authority for their approval of road use and the conditions to be imposed – Appendix F provides a proposal abnormal load transport route through Lüderitz, but this route needs to be confirmed with the Roads Authority. Abnormal load permits are to be acquired for every load. • Regional and Local traffic officials should assist abnormal load vehicles through the towns. • Abnormal loads should not be transported during the normal traffic daytime hours from 08h00-17h00. • Once construction is completed the roads should be inspected and repaired where necessary. • Proper traffic and safety warning signs shall be placed at the construction site to the satisfaction of the Project Engineer (NamPower)and the Roads Authority. • The Contractor shall adhere to the regulations pertaining to Health and Safety of the Labour Act, including the provision of protective clothing, failing which the Contract may be ended with immediate effect. • The Contractor shall enforce relevant Health and Safety Regulations for these specific activities. • Staff will be trained in the appropriate use of PPE and the potential consequences if it is not used. The use of PPE shall be enforced. • Make sure that all staff are equipped and know how to use safety and Personal Protective Equipment (PPE). This includes safety goggles, ear plugs, dust masks, steel-toed shoes, gloves, overalls, etc.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Signage indicating the use of PPE will be required at appropriate locations. • All hazardous materials shall be stored (on bunded area), handled and disposed of according to the applicable Material Safety Data Sheets (MSDS), as well as applicable regulations (e.g. the Health and Safety Regulations). • Hazard identification signage shall be erected at appropriate locations. • All items for treatment as specified in the Material Safety Data Sheets (MSDS) for hazardous materials shall be available in the first aid kit. • Keep a comprehensive first aid kit at construction points. • Ensure that all staff know where the first aid kits are located and who is trained in first aid. • At least one person must be available on site that is trained in first aid. • All injuries and near miss incidents will be reported to the Project Engineer (NamPower) and recorded in a Health and Safety report to be submitted to the developer's operational manager on a monthly basis. Measures to prevent recurrence shall be implemented and included in the monthly report. • Establish an emergency rescue system for evacuation of injured people, if needed. • Emergency procedures for accidents shall be communicated to all employees. • Emergency facilities are available at Rosh Pinah (police, fire brigade, and hospital). Emergency telephone numbers shall be prominently displayed in the site office as well as on the outside of the site office.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Contact details of the Contractor and the second in charge must be forwarded in writing to Roshskor. • The Rosh Pinah fire brigade shall be informed in a case of fire as soon as possible. Do not wait until the fire is out of control. • No alcohol/drugs are allowed on site and anyone found to be under the influence of alcohol/drugs will be disciplined accordingly. • All drivers must adhere to traffic regulations at all times. No speeding shall be allowed. • All vehicles shall use the 4-wheel drive mode only on site. • The speed limit at the construction site will be 30km per hour. • No driving on site shall be allowed after 19h00, unless with agreement (permission) from relevant authorities. • Make sure all drivers/operators have valid licenses for the vehicles/equipment they are driving or operating. Copies of these records must be kept on file and must be readily accessible on site for inspection. • Make sure all vehicles are roadworthy. Repair faulty brakes, exhausts, etc. immediately. • Good driving and adherence to safety rules will result in a minimum number of road and workplace accidents. • Fire extinguishers (with valid service date) shall be readily available at the construction site office. Staff members from the construction team must be designated and trained to handle emergency situations such as fires, and trained to handle the necessary emergency equipment.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Emergency procedures shall be in place for incidents and accidents on site and staff trained in these procedures (See the requirement for an Emergency Response Plan). • Indiscriminate movement outside the construction areas shall be avoided. The area to be used for construction should be demarcated. • It is important that the necessary precautions be taken to protect property against theft. • Nobody shall carry any firearm or store it in his vehicle or at the construction site. • Dangerous areas shall be clearly marked and access to these areas controlled or restricted. • All site visitors shall report to the site office before entering the construction site. No visitors shall be allowed on site without the permission of the Contractor, and without receiving safety induction. • Train people who handle fuels in the correct procedure / technique to transfer fuels. • Food catering and preparation shall be done by the Contractor in an enclosed space only, using gas/electrical/solar cooking methods. • No fires shall be lit on the construction site. • Smoking is prohibited in areas where it is a fire hazard, e.g., fuel storage areas, workshops, etc.	
COMMUNITY HEALTH	To prevent or minimise the potential for community exposure to water-borne, water-based, water-related, and	• Develop a relevant community health and safety management plan. • All Contractor's staff and any subcontactor shall identify all known water-borne, water-based, water-related, and vector-borne diseases, and communicable diseases that could result from or spread further due to	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
	vector-borne diseases, and communicable diseases that could result from project activities, taking into consideration differentiated exposure to and higher sensitivity to vulnerable groups.	the project activities and/or the influx of temporary or permanent project labour. • These shall at least include HIV/AIDS, Tuberculosis, Covid-19, bacterial diarrhoea, hepatitis, and any other applicable diseases at the time of project implementation. • The Contractor shall develop documented programmes to prevent and minimise the spread of such diseases during the construction period. The prevention shall include the in-country guidelines for the prevention of the identified diseases, as well as international guidelines that may be available at the time, such as those of the World Health Organisation. • All staff shall be made aware of such programmes and it shall be mandatory for all staff to adhere to the precautions being put in place. • The Contractor shall provide to staff any personal protective equipment as well as cleaning agents and sufficient clean water that may be necessary to ensure good hygiene at the workplace and prevent any of the identified diseases. • The Contractor shall have a trained nurse available to the staff, who shall provide a protocol for regular health check-ups and treatments.	
CONSERVATION OF THE NATURAL AND HISTORICAL ENVIRONMENT	To minimise damage to soil, vegetation, habitat and heritage resources during the construction phase.	• The planning an design of the vegetation and soil rehabilitation starts before construction is allowed. The rehabilitation section on p43 and forward should be read in conjunction with this section. • Before construction, areas to be disturbed should be prepared by plant relocation and topsoil preservation. Any topsoil heaps should be placed upwind of the damaged area (i.e.: south west, in the path of the prevailing winds). Smaller heaps at each construction area would be	NamPower/IPP and ECO, in collaboration with the NBRI and MEFT. Activity planning approval and review of plan.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		preferable to large heaps. Once construction is complete, these heaps should be used to return the site to as natural an appearance as possible • At the outset of construction, the NO-GO areas shall be clearly set out (Appendix A) • At the outset of construction (and during construction as may be applicable), the ECO and the Contractor shall visit all areas to be disturbed, including the access road and other areas. Work shall be carefully planned before entering the worksite to limit the total footprint of the operations: o at the substation and support facility to 300m by 300m maximum, o at each WTG worksite to 4000m^2 and incorporate the crane erection section along the access road and o reduce operational WTG worksite footprint to 2300m^2 each, o at access roads, reduce all internal access roads to 4.5m wide with inside turning radius of 30m and 8m wide bends. • Access and parking at work sites shall be planned and organized in order to facilitate the work intended at each site while preventing the creation of new tracks around work sites. • Areas to be disturbed shall be clearly demarcated with small pole markers, and no land outside these areas shall be disturbed or used for construction activities. The pole markers shall remain in place during the operation of the project and shall be removed during decommissioning. • A Botanist or rehabilitation specialist in conjunction with the ECO and NBRI shall be responsible for the plant relocation (Refer to Appendix B). • In the case of relocation on-site, plant survival shall be assessed until relocation is deemed complete and stable , notably each growing	See Vegetation Management Plan (review and monitoring). Audit and review periods.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		season when others of this species in the area are found to have come into flower or leaf. Monitoring Method to be determined by rehabilitation practitioner involved. • Record all succulent species in order to contribute to a national succulent atlas. • Information on the entire procedure shall be published or made available online so as to contribute to future rescue/relocation attempts in the southern Namib. • Rocky outcrops are absolute no-go areas even outside the NWP site. • No fencing allowed except for critical safety components. • Fixed point photography, initiated prior to construction activities, shall be extensively utilized. • Consult the ECO before any new areas are disturbed which have not yet been visited. • To mitigate possible bat roost disturbance, blasting should be avoided, and any bat roosts in buildings should be left undisturbed. • Avoid creating artificial bat roosting space at buildings, infrastructure, solar PV fields and wind turbines. • Offsite drainage lines must remain strictly undisturbed. • No off-road driving shall be allowed. • Introduce speed limits to and on site. Educate personnel to be sensitive to animal movement on roads, especially tortoises and chameleons. • All vehicles must stay strictly in the one track made – be careful to drive carefully in this track and not to deviate from it. • Turning points for vehicles should be designated.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• No plants shall be removed in the project area by any member of the construction team, including sub-contractors. • The collection of animals, plants and minerals is prohibited. • If any reptiles, such as Namaqua chameleons as well as varied tortoise species, are encountered during construction activities, they need to be carefully removed and relocated to an undisturbed area. • No animal shall be killed intentionally, chased, baited or harassed, and no eggs shall be removed from a bird's nest, nor may the nest be tampered with or damaged. • Avoid small mammal / reptile and bird nesting. Do not hurt, kill, or unnecessarily disturb birds or animals. • Any staff members caught in such an activity shall be handed over to the relevant authorities and shall be dismissed/disciplined according to their employment contract. • Keep an eye out for ground nests and mark their position to avoid accidental destruction. • Ask a bird specialist for advice on protocols regarding particular nests. • Security fencing can restrict the east -west migration corridor and ecosystem integrity of National Parks in the vicinity. Avoid any form of fencing, except around high risk facilities such as substations. • No wood shall be collected from the construction area. Meals shall be provided and prepared only by the Contractor, using only electrical and/or gas cooking methods in an enclosed area (no fires/firewood). • Avoid unnecessary noises such as hooting.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
ARCHAEOLOGICAL SITES	To ensure a proper chance-find procedure for archaeological sites.	• Under the Heritage Act of 2004, it is illegal to remove a fossil or an archaeological site without the consent of the National Heritage Council of Namibia. Should any new finds come to light at any stage during the construction phase, the site shall be demarcated to prevent damage. • The chance-find procedure provided in Appendix D should be in place.	ECO, Contractor.
ROAD CONSTRUCTION/UPGRADING AND DRIVING	To ensure the making of roads are kept to a minimum, so as to avoid unnecessary damage to the fragile desert plains. To ensure the roads used are well maintained. To ensure that track discipline is maintained at all times by the entire construction team. To minimise amount of dust generated.	• Construction of roads should be only for essential access. The soil conditions on the NWP terrain will require properly designed layer works in order to avoid erosion and track width creep. • Do not make new roads when the quality of existing roads deteriorates. Repair or upgrade existing roads. Bitumen surfacing on internal access roads is not recommended, although the design consultant should consider the most sustainable option. • To reduce footprint and vehicle / animal interaction, the access road lane width should be minimised to effective one-way transport. • Road construction methods shall ensure good road surfaces to preclude vehicles driving off road to find smoother surfaces with less corrugations or potholes. • Do regular road maintenance to ensure good road surfaces i.e., grading of the road once every two weeks (or as frequently as necessary) during the construction phase. The road should also be sprayed with water and biodegradable dust suppressor (grey water if available) once a day to limit dust pollution. A proposal could be made to the contractor's representative if it is found that the dust suppressor keeps down the dust	ECO, Contractor. Planning and design review at each step of approval. Continuous monitoring and review.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		for longer than one day, in which case the daily restriction may be extended. • Demarcate areas that are prone to corner cutting to avoid such. • The drainage lines which are more sandy, are prone to parallel tracks, but are also sensitive to disturbance. They are more prone to erosion and are good habitat to birds'' nests, bat foraging, and other small fauna. Particular care should be taken to avoid parallel tracks and unnecessary driving in the drainage lines. • Activities causing dust shall be limited along access roads by keeping to the driving speed (30 km/hr) on all tracks in the project area. • As far as possible existing tracks within the present servitude shall be utilized for both construction and maintenance. These shall be clearly indicated, together with designated turning points. • Vehicles driving along the Project Area shall engage four wheel drive to prevent spinning and consequent impacts on fragile desert surfaces. • Large vehicles shall have right of way and light vehicles shall leave the road (at the designated areas) to allow for an oncoming heavy vehicle to pass. • In order to promote visibility and communication between drivers (and prevent accidents with consequent environmental impacts) vehicles shall always be driven with their lights on and indicators as per road traffic rules shall be used on the Project Area. • Markers shall be used to delineate the chosen access tracks into the construction area.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		• Erect warning signage at the access points to warn motorists about construction activities and heavy vehicle movement where appropriate. • Only use designated turning circle areas. Use 3-point turns and not U-turns. • Prevent shortcuts between roads. • Tyre pressures should be as low as possible to reduce impacts. • All material for road or site construction to be brought in from outside of Park area and to be approved by the ECO. • Roads no longer in use shall be rehabilitated. (See Rehabilitation section).	
WASTE MANAGEMENT AND WATER RESOURCE MANAGEMENT	To avoid potential surface and groundwater pollution. To ensure that sound waste management practices are adhered to during construction.	• The Contractor shall submit a waste management plan, including how it is intended to dispose of hazardous and general waste, as described hereunder. This plan shall be reviewed and approved by the ECO. • All sewerage waste shall be removed regularly and disposed of at a designated sewerage treatment facility (i.e. not to be disposed of anywhere at the construction site). • The site should be inspected regularly for standing or leaking water or wastewater points and attended to immediately. • Avoid creating artificial bat roosting space and access to water at the waste management facilities. • Make sure that portable chemical toilets to be used on site are in good working order and that they are clean. Cleaning record should be kept on site and readily accessible for inspection. • All waste (including domestic and construction waste) produced daily shall be sorted and taken to the waste disposal site as arranged, i.e. Rosh	ECO. Management plan approval and periodic monitoring and review. Design planning and review.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		Pinah for general waste and a reputable waste salvage company for hazardous waste. The construction site shall be left clean daily. • The Contractor shall arrange with Rosh Pinah for the use of their waste disposal site. • No waste shall be buried. • All recyclable waste shall be taken to a recycling depot. • Adequate separate containers for hazardous and domestic waste shall be provided on site. They shall be clearly marked. • The workforce shall be sensitised to dispose of waste in a responsible manner and not to litter. • Provide sufficient waste bins at work sites. Make sure that all waste is removed from work and campsites. • Refuse bins must be stable, i.e. cannot be tipped by animals, and have scavenger and baboon proof lids. • Make sure that the bins are covered so that plastic bags, paper, etc., are not blown away. • No waste shall remain on site after completion of the project. • Servicing of vehicles in the field or at the construction site is not permitted. • Drip trays shall be available for all heavy vehicles that are intended to be used during construction. These trays shall be placed underneath each vehicle while the vehicles are parked. The drip trays shall be cleaned every morning and the spillage handled as hazardous waste. • Accidental spills shall be cleaned immediately. The contaminated soil shall be treated as hazardous waste.	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP

		• In the event of a hazardous spill:
		  o Immediately implement actions to stop or reduce the spill.
		  o Contain the spill.
		  o Arrange implementation of the necessary clean-up procedures.
		  o Collect contaminated soil, water and other materials and store it in an appropriate container for collection.
		  o All spills shall be reported and a ‘‘spills register’’ kept.
		  o A hazardous material spill kit shall be available at the construction site and there shall be at least one person with appropriate authority who is trained in hazmat response.
		• Refuelling vehicles shall be equipped with specific vehicle spill kits. Drivers shall be trained in relevant spill response procedures.
		• Explosives shall be stored according to the prescribed regulations.
		• The floors of the designated bunded areas for the storage of potentially hazardous material shall be lined with concrete. The bunded floor area shall be of adequate capacity to contain 1.2 times (120%) the volume of the hazardous material to be stored in the bunded area, unless otherwise specified in relevant regulations and standards.
		• Corrosive, explosive, toxic, and flammable material shall be stored in separate areas.
		• All hazardous materials (such as oil) shall be stored in separate containers (concrete liner, container, or metal or plastic drip tray) and stored for transport and proper disposal at an approved waste disposal site or for collection by an oil recycling company such as WESCO Salvage (this	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		company collects significant quantities of oil from central locations throughout the country). • The nearest Hazardous waste disposal site is in Walvis Bay but WESCO Salvage currently removes hazardous waste from the area and they or any other available and reputable contractor shall be contacted to remove all hazardous waste. No hazardous waste shall be burned. • Fuel tanks on site shall be properly bunded. The volume of the bunded area shall be sufficient to hold 1.2 times (120%) the capacity of the storage tanks. The floor of the bunded area shall be concrete and the sides high enough to achieve the 1.2 times (120%) holding capacity. • Foam fire extinguishers shall be in close proximity to fuel kept on site. There shall be trained personnel to operate and handle this equipment. At least two fire extinguishers shall be placed at every fuel storage area. • Groundwater in the NWP project area is of low yield (1-5m^3/h) and vulnerable to over-abstraction. The construction water demand will be over local aquifer capacity. Therefore the project will have to be supplied via Namwater resources or from the source of the Scorpion Mine. • The Contractor shall utilise water only as specified in the approved water resource plan for the project. • Low water consumption project technologies and methods should be investigated and implemented. • Water shall be used sparingly and all faulty and leaking taps, toilets and pipes shall be immediately repaired.	
BORROW MATERIAL AND BORROW PITS	Use of soil and rock from the site for construction purposes.	• Only materials from commercial borrow-pits, with Environmental Clearance Certificates (ECCs), shall be used for construction. No soils on site shall be used for construction except for material excavated for	ECO, Contractor.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		foundations, and compaction of in-situ material for roads. Should the opening of a new borrow pit be contemplated, this will require a separate ECC application.	Record management and review.
REHABILITATION	Re-establishment of pre-disturbance form and ecological function (soil crusts, plants and animal burrows).	• Rehabilitation design starts before construction is allowed. • Rehabilitation should only be planned in conjunction with the Vegetation Management Plan (Appendix B). • Once the final sites for the turbines and solar panels have been fixed, the area of unavoidable and certain damage should be mapped. This should include all zones of collateral damage, such as crane pads and internal access roads. Areas of permanent or repeated damage throughout the life of the facility due to infrastructure and access during operation and maintenance should be distinguished from temporary damages (those which will only be damaged during construction and which are thus worth rehabilitating). • It will be necessary to do some preliminary field trials to determine the best methodology for plant rescue, and to assess whether the success rate of transfer is high enough to justify such efforts being made. • Before construction, areas to be disturbed should be prepared by plant relocation and topsoil preservation. Any topsoil heaps should be placed upwind of the damaged area (i.e.: south west, in the path of the prevailing winds). Smaller heaps at each construction area would be preferable to large heaps. Once construction is complete, these heaps should be used to return the site to as natural an appearance as possible. • Once construction is completed and essential operations infrastructure identified rehabilitation should be done in the following manner: o Compacted areas such as where tracks may have crossed	Design of rehabilitation and review. Audit rehabilitation. Apply Vegetation Management Plan.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		succulent shrubland shall be ripped by using picks and rakes, avoiding parallel furrows that will promote erosion. Calcrete should only be raked to assure surface soils are loosened ONLY if compacted. No mechanical ripping should be allowed at all. o Ripping shall occur to full rooting depth. On gravel plains a depth of about 50 mm should be adequate as this will break down the compaction without loosening too much of the soil. o The disturbed area shall be remodelled to, as far as possible, resemble previous conditions and fit in with the adjacent landscape. o Ripping should only be done of compacted, disturbed areas, NOT of vegetated areas. The areas to be ripped should be carefully marked off before this process is initiated. *Continuous supervision of this process is required.* o Stored topsoil, as well as soil and gravel shall be raked from adjacent areas to try and recreate the same texture and look as surrounding areas. Stones shall be redistributed with rakes so that the surface texture resembles the surroundings. o Plants should be transplanted and watered in thoroughly, using a watering can with a rose tip. They must be very carefully dug out, taking care to damage the root system as little as possible, and must be replanted equally carefully. The sites for relocation must be carefully chosen so as not to compromise other plants of concern that may already be there, and the aim should be for the resulting plantings to look as 'natural' as possible i.e., the plants should be spread out and planted randomly, not in clumps or rows. This should be done under supervision of a botanist. o In order to prevent re-disturbance of rehabilitated tracks, physical	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
		barricades (e.g. rocks or sign boards) shall be implemented as an interim deterrent. All district personnel will be allowed to use the existing access/servitude roads only. Any temporary roads (i.e. turning points for heavy vehicles) will be closed and rehabilitated. • Monitoring of relocated plants and areas of relocation should be implemented as follows: o Once roads are demarcated, fixed point photography before construction activities can be used to assess overall compliance. o Several permanent transects, as well as fixed point photography should be used for at least three (3) years after construction, to monitor rehabilitation success. These should be repeated annually after the rainy season (i.e.: in September/October). o The condition of any plants of high conservation concern, such as *Larryleachia* for instance, that are transplanted should be assessed annually during late September to early October for at least three (3) years to determine translocation success. This will provide information for future translocation efforts. o The specialist should advise the level of success of the translocation plan. He or she should also provide instruction for adapting or re-organising the plan according to the level of success.	
NO GO ZONES	To protect sensitive habitats and their buffer zones.	• New impacts to these habitats shall be avoided at all costs. No movement of vehicles or personnel on foot are allowed. • Project workers shall be informed of the sensitive aspects of these habitats to avoid aimless wandering around on these sites. With the extended nature of this project even the impact of human footprints over a long period of time can have a significant impact on sensitive habitats.	NamPower/IPP, ECO, contractor. Exclusion planning, weekly monitoring, monthly review and immediate

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/PARTNERSHIP
			rectification. Audit as per section 5.3
REHABILITATION STRUCTURES	To rehabilitate the site office, work sites, servitude areas, tracks and other areas disturbed during construction as close to their original state as reasonably possible.	• All equipment, waste, temporary structures, stockpiles, etc., shall be removed from the work sites. • Final payment shall not be issued unless the environmental consultant is satisfied with the obligations listed under this section (“rehabilitation”). • Contractor shall be held responsible for all unnecessary damage due to non-compliance, whether caused by his/her company or by subcontractors.	NamPower/IPP, Contractor, ECO Design of rehabilitation and review. Audit rehabilitation. Apply Vegetation Management Plan.
REHABILITATION MONITORING	To ensure successful rehabilitation.	• During the first month of rehabilitation, monitoring is very crucial and it is recommended that the ECO visit all rehabilitated sites at least twice a week. During this visit, the ECO shall check for any signs of erosion and check the progress on re-establishing the surface crust. Any indications of unsuccessful rehabilitation shall require that the rehabilitation process to be repeated again and at this point it shall be necessary to gain the expertise of a desert rehabilitation specialist. • The ECO shall oversee the project and implement management and monitoring recommendations. • Workers shall be familiarized with the management recommendations and contractually bound to its stipulations. • The ECO shall conduct regular site inspections and submit reports in this regard to the MEFT .	NamPower/IPP, Contractor, ECO. Design of rehabilitation and review. Audit rehabilitation. Apply Vegetation Management Plan

5.3 Operation and Maintenance Phase

Responsibility: The Operator shall be responsible to ensure all obligations are being met and shall audit them at least annually.

Table 5 Management Requirements – Operation and Maintenance

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIPS
CONTINUITY OF SOCIAL AND ENVIRONMENTAL MANAGEMENT	To ensure continuity of environmental and social management actions once the Wind Park is operational.	• Implement an external environmental audit system on an annual basis during the operation of the Project. This shall be used to verify the effectiveness of the ESMP and implement adjustments if required. • The ECO shall provide staff with appropriate guidelines for environmental management during operation of the Project, including: o All relevant provisions contained in the ''construction'' ESMP such as keeping a complaints register, sound disposal of hazardous and general waste, track discipline, health and safety precautions, etc. o Keeping an appropriate complaint and stakeholder grievance system and register in place. o The ECO shall design a record system for environmental, health and safety incidents and accidents along this power line and at the site. • All contractors to be working on site during operation and maintenance, should have an Environmental and Social Management Plan as part of their contract (see ''Construction'' section.) • Reasonable contact should be made and maintained with the stakeholders of the project.	NamPower Periodic review.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIPS

		• A grievance procedure (as proposed above) should be in place to deal with community grievances in a satisfactory manner, and should at least include the following:
		  • Identify the position on site where responsibility will be assumed for putting in place and managing the grievance procedure.
		  • Ensure the current stakeholder database is updated.
		  • Publish at the onset of the project, with the basic elements of it – construction time frame, contact details, who to contact for job opportunities, grievances, etc. The publication should be made in the local newspapers and on posters put at the local retail stores in Rosh Pinah and as advised by Roshskor.
		  • The publication should also be placed on the website and Facebook page of the project and e-mailed to the applicable parties on the stakeholder database.
		  • The poster shall contain a grievance mechanism – a method for community members to lodge complaints. The grievance mechanism shall state (a) Who can raise complaints (affected communities) (b) Where, when, and how community members can file complaints (this should preferably be in writing, unless the complainant is illiterate, in which case the ECO should assist the complainant to articulate the complaint (c) Who is responsible for receiving and responding to complaints, and any external parties that can take complaints from communities (d) What sort of response complainants can expect from the company,	

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIPS
		including timing of response (e) What other rights and protection are guaranteed. • The community shall be regularly reminded as above, of their right to submit and receive responses to grievances. • The officer responsible for handling grievances shall ensure that the grievances 1) are received and registered (with adequate documentation as reference), 2) reviewed and investigated, 3) resolution options are considered and an appropriate one is selected and implemented, 4) the grievance is properly responded to and the matter closed out, and 5) the success of the resolution option is monitored and adapted where necessary.	
Groundwater resource and water demand		• For operational purposes groundwater may be used provided that a geohydrologist determine the sustainable long term yield of the borehole(s) used and in the vicinity, and a water abstraction permit is in place. Water yield of boreholes used and in the vicinity must be monitored very second year to assure sustainable use.	NamPower/IPP Site operations Manager. ECO Monitoring of yield of boreholes used on the project and in the vicinity
CONTINUOUS MONITORING - VEGETATION	Successful relocation and rehabilitation of vegetation.	• In the case of relocation on-site, plant survival shall be assessed until relocation is deemed complete and stable each growing season when others of this species in the area are found to have come into flower or leaf. • Monitoring of the success of relocation and rehabilitation shall be done every 6 months.	Site operations Manager. ECO. Design of rehabilitation and review.

ASPECT	OBJECTIVE	MANAGEMENT AND MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIPS
		• *The criteria for the success of the relocation and health of the overall vegetation on site shall be determined by the appointed vegetation specialist. A rating for this shall be determined, e.g. a success rating of low, medium and high. In case the success is low, the recommended causes and relevant remediation/adaptation recommendations shall be made by the vegetation specialist. These recommendations shall be proportionate to the level of success, i.e. low, medium or high.* • Information on the entire procedure shall be published or made available online so as to contribute to future rescue/relocation attempts in the southern Namib.	Audit rehabilitation. Apply Vegetation Management Plan
CONTINUOUS MONITORING – BIRDS & BATS	To determine the long-term incidences of bird and bat mortalities during the operational phase of the project.	• Implement bird and bat monitoring programmes during the operational phase that includes searches for bird and bat mortalities, as per World Bank requirements. Searches should follow detailed protocols and should, at least initially, be intensive (e.g., daily for the first two months) to gauge scavenger effects, after which search protocols may be amended. • *Reporting of the specialist/s should include an impact assessment, indicating low, medium or high significant of impact on birds and bats, based on the monitoring data. In case of medium and high impact, recommendations should be provided and implemented by the Operator to address the identified impact.*	NamPower/IPP Site operations manager, ECO in collaboration with avi-fauna specialist. Specialist access and research support plan. Monitoring review.

5.4 Decommissioning Phase

Responsibility: NamPower shall consider these aspects in conjunction with the ECO and EWG.

Table 6 Management Requirements - Decommissioning

COMPONENT	TARGET	MANAGEMENT/MONITORING MEASURES	RESPONSIBILITY/ PARTNERSHIPS
DECOMMISSIONING	To ensure that the project does not have cumulative negative effects after decommissioning.	• All provisions under the Construction section shall be applicable for all contractors during decommissioning. • No waste may remain on site after completion of the project. • An investigation shall be commissioned to determine the best practical environmental solution for the disposal of the turbine blades., according to the solutions available at the time. • Eradication of all exotic or invasive plants shall be conducted before decommissioning. • Implement staff severance packages according to labour legislation and inform staff of this step in advance. • All areas used during the construction and operation (haul roads, site offices, etc.) shall be cleared and inspected for decommissioning approval by the ECO. Before approval, the contractor shall still be liable for any costs to ensure proper decommissioning.	NamPower/IPP ECO. Project Engineer (NamPower) Design of rehabilitation and review. Audit rehabilitation. Apply Vegetation Management Plan. MEFT to review and approve final decommissioning results.

APPENDIX A Maps of no-go zones with coordinates

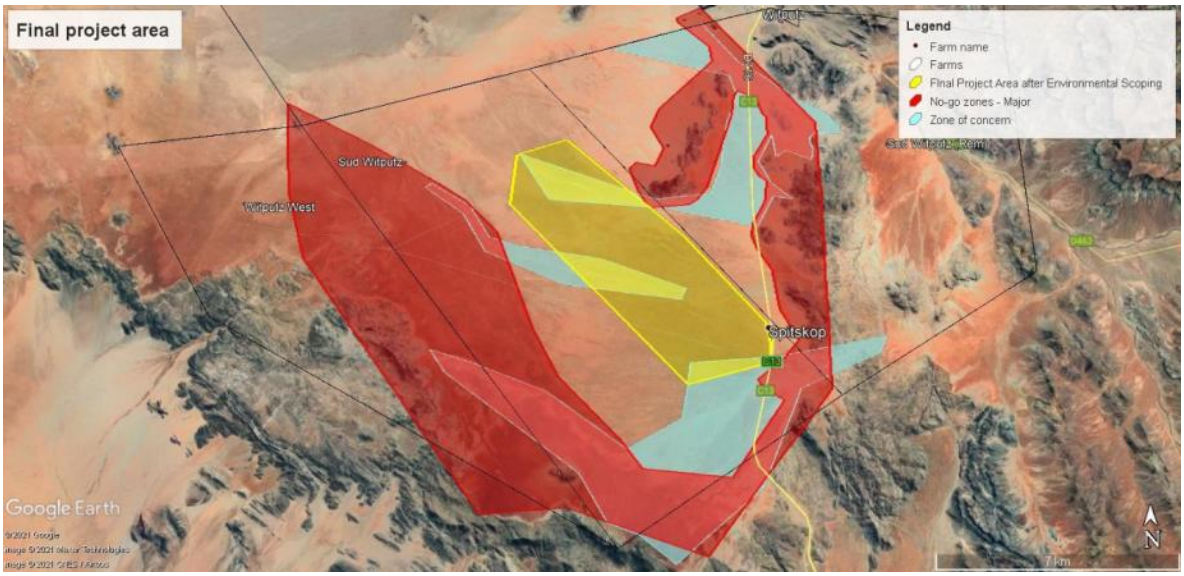


Figure A-1: NamPower Wind Project no-go and sensitivity zones

APPENDIX B Vegetation Management Plan

The primary goal is to avoid unnecessary damage and to mitigate unavoidable damage to habitats and plants of conservation concern.

The purpose of rescue and rehabilitation would be to try and minimize the number of individuals of conservation concern that would be physically destroyed during the project development, and to try and restore the habitat as far as possible so that the natural biota, including plants, could eventually, over time, re-establish itself in the project area.

The approach taken to prevent and mitigate damage will determine whether or not plant relocation is an essential part of rehabilitation efforts. If it is, then it will be necessary to do some preliminary field trials to determine the best methodology for plant rescue, and to assess whether the success rate of transfer is high enough to justify such efforts being made

The process to be followed:

a. Road planning should be done in such a way as to restrict approach and access to No Go Zones (Appendix A).

b. New roads and tracks must be kept to an absolute minimum.

c. Once the final sites for the turbines and solar panels have been fixed, the area of unavoidable and certain damage should be mapped. This should include all zones of collateral damage, such as crane pads and internal access roads. Areas of permanent or repeated damage throughout the life of the facility due to infrastructure and access during operation and maintenance should be distinguished from temporary damages (those which will only be damaged during construction and which are thus worth rehabilitating).

d. Plants should be transplanted and watered in thoroughly, using a watering can with a rose tip. They must be very carefully dug out, taking care to damage the root system as little as possible, and must be replanted equally carefully. The sites for relocation must be carefully chosen so as not to compromise other plants of concern that may already be there, and the aim should be for the resulting plantings to look as 'natural' as possible. i.e.: the plants should be spread out and planted randomly, not in clumps or rows. This should be done under supervision of a botanist.

e. Any topsoil heaps should be placed upwind of the damaged area (i.e.: south west, in the path of the prevailing winds). Smaller heaps at each construction area would be preferable to large heaps. Once construction is complete, these heaps should be used to return the site to as natural an appearance as possible.

The most important mitigating and restoring activities that can be undertaken are:

- To demarcate sites and roads clearly before construction starts, and to strictly enforce adherence to these demarcated tracks by ALL VEHICLES AT ALL TIMES, with punitive penalties for those who transgress. Uncontrolled vehicle activity is of major concern. Careful pre-planning of construction activities should be done to identify where tracks will be absolutely necessary for both construction and maintenance, overlapping these as far as possible. These should be clearly marked prior to construction activities beginning, together with designated turning points and construction laydown areas. Turning points for heavy construction vehicles should be designated and adhered to. *Ad lib* turns should not be permitted. The areas used should be constrained as far as possible and should be rehabilitated once construction is complete if it is unlikely that they will be damaged again during the life of the project.
- To store topsoil downwind of where it is removed.

Monitoring

Once roads are demarcated, fixed point photography before construction activities can be used to assess overall compliance.

Several permanent transects, as well as fixed point photography should be used for at least three (3) years after construction, to monitor rehabilitation success. These should be repeated annually after the rainy season (i.e.: in September/October).

The condition of any plants of high conservation concern, such as *Larryleachia* for instance, that are transplanted should be assessed annually during late September to early October for at least three (3) years to determine translocation success. This will provide information for future translocation efforts.

The specialist should advise the level of success of the translocation plan. He or she should also provide instruction for adapting or re-organising the plan according to the level of success.

APPENDIX C Example of Environmental Enforcement System

This is only an example and must be reviewed and compiled for site conditions by the ECO, NamPower and the Implementation Team.

The following payment retention and deduction methods are in place for non-compliance listed below. It shall be issued after the non-compliance procedure has been duly followed. The ECO shall be the judge as to what constitutes non-compliance in terms of this document.

Where the Operator inflicts non-repairable damage upon the environment or refuse to comply with any of the environmental specifications, he shall be liable to criminal and civil prosecution over and above any other contractual consequence.

The ECO shall be responsible for a Report on the non-repairable damage and / or non-compliance with visual and other evidence as well as issuing the penalty to the Operator with the report attached.

The Operator is deemed NOT to have complied with this Specification if:

- within the boundaries of the site, site extensions and haul/ access roads there is enough evidence of contravention of ESMP specifications;
- attributable environmental damage due to negligence;
- destruction of vegetation without permission of the ECO and NamPower.
- Safety of Operator personnel and public has being compromised due to negligence;
- the Operator fails to comply with corrective or other instructions issued by NamPower or the ECO within a specific time;
- the Operator fails to respond adequately to complaints from the public; and
- Payment deductions or retention in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

Retention and/or deductions shall be issued per incident at the discretion of the ECO. Such deductions shall be issued in addition to any remedial costs incurred as a result of non-compliance with the ESMP. The ECO shall inform the Operator of the contravention and the amount of the fine, which NamPower shall deducted from payments due under the Contract.

The activities detailed below may guide the ECO in terms of recommending payment retention or deduction by NamPower on the Operator and/or his Subcontractors:

Item	Activity	Retention amount	Deduction amount
1	Damage to key sensitivities		
1.1	General damage to sensitive environment such as sensitive vegetation and bird habitat. (Deal separately with each individualised damage as per items 1.2, 1.3, 1.4 and 1.5 below)	Estimated value of the cost of restoration operation plus 75%.	150% of the value of the cost of full restoration operation (if NamPower has to take restoration responsibility), or 25% (if the contractor successfully restores the damage)
1.2	Impact on listed birds.	N$50,000.00 per incident.	Loss of each previous retention amount per follow-up incident.
1.3	Movement of the Contract Implementer onto an area on the site before the vegetation specialist has identified sensitive vegetation and identified no-go zones.	N$ 100,000 and apply item 1.1.	N$ 100,000 and apply item 1.1.
1.4	Significant damage to the construction site without a map in place specifying where construction/movement is permitted.	N$ 100,000 and apply item 1.1.	N$ 100,000 and apply item 1.1.
1.5	Damage to sensitive vegetation per incident.	N$ 50,000 and apply item 1.1.	N$ 50,000 and apply item 1.1.
2	Non-compliance to ESMP items		
2.1	Any person, vehicle, equipment, etc. activity related to the Contract Implementer's operations outside the designated boundaries and restricted zones.	N$ 50,000 and apply item 1.1.	Loss of each previous retention amount per follow-up incident.

Item	Activity	Retention amount	Deduction amount
2.2	Person caught trespassing outside the demarcated construction area.	N$ 50,000 and apply item 1.1.	Loss of each previous retention amount per follow-up incident.
2.3	Any personnel guilty of reckless driving on and in the vicinity of the site, including excessive speeds.	N$ 10,000 and apply item 1.1.	Loss of each previous retention amount per follow-up incident.
2.4	Accident due to safety negligence.	Estimated value of the cost of recovery / compensation plus 150%.	150% of the value of the cost of full recovery / compensation (if NamPower has to take restoration responsibility), or 25% (if the contractor successfully implement recovery / compensation)
2.5	Deliberate non-compliance with Safety Policy	N$ 50,000 and closure of site until compliance achieved.	Loss of each previous retention amount per follow-up incident.
3	Pollution activities		
3.1	Persistent and un-repaired spilling of hazardous materials and materials causing pollution.	N$ 50,000 and estimated value of the cost of restoration operation plus 25%.	Loss of each previous retention amount per follow-up incident.
	Persistent littering on site.	N$ 10,000 and apply item 3.1.	Loss of each previous retention amount per follow-up incident.
	Individuals repeatedly not making use of the designated toilet facilities.	N$ 10,000 and apply item 3.1.	Loss of each previous retention amount per follow-up incident.
	Disposal of waste in a manner other than what was agreed upon on site or the prescribed method in the waste management plan section.	N$ 10,000 and apply item 3.1.	Loss of each previous retention amount per follow-up incident.

APPENDIX D: Archeology Chance Find Procedure

Areas of proposed development activity are subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found in the course of development works. The procedure set out herein covers the reporting and management of such finds.

Scope: The ''chance finds'' procedure covers the actions to be taken from the discovery of a heritage site or item, to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The ''chance finds'' procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): '' a person who discovers any archaeological .... object .....must as soon as practicable report the discovery to the Council''. The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

Responsibility:

Operator	To exercise due caution if archaeological remains are found.
Foreman	To secure site and advise management timeously.
Superintendent	To determine safe working boundary and request inspection.
Archaeologist	To inspect, identify, advise management, and recover remains.

Procedure:

Action by person identifying archaeological or heritage material includes the following:

a) If operating machinery or equipment stop work.

b) Identify the site with flag tape.

c) Determine GPS position if possible.

d) Report findings to foreman.

Action by foreman:

a) Report findings, site location and actions taken to superintendent.

b) Cease any works in immediate vicinity.

Action by superintendent:

a) Visit site and determine whether works can proceed without damage to findings.

b) Determine and mark exclusion boundary.

c) Site location and details to be added to project GIS for field confirmation by archaeologist.

Action by archaeologist:

a) Inspect site and confirm addition to project GIS.

b) Advise NHC and request written permission to remove findings from work area.

c) Recovery, packaging and labelling of findings for transfer to National Museum.

In the event of discovering human remains:

a) Actions as above.

b) Field inspection by archaeologist to confirm that remains are human.

c) Advise and liaise with NHC and Police.

d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.

APPENDIX E: BIRD MONITORING REQUIREMENTS

Due to the limited certainty of predicting the impacts of renewable developments, and of the species likely to be impacted, ongoing monitoring for any potentially negative impacts is considered essential (see above). Should the results show that such impacts, including injuries and/or mortalities of birds, are taking place, (further) mitigation measures would need to be investigated, if necessary on a species-specific basis. The importance of adequate monitoring and detailed reporting is stressed (Bernardino et al. 2018, 2019).

5.4.1 *Construction-phase bird monitoring*

The construction of the Wind Power Plant is expected to take at least 14 months. A Construction-phase Bird Monitoring programme is recommended, with the following objectives (NamPower 2020a; Jenkins et al. 2015, 2017):

- To continue monitoring and documenting the species richness and abundance of birds regularly present or resident within the broader impact area of the NamPower Wind Power Project during its construction;
- To verify the patterns of bird movements and their characteristics in the Study Area during construction (required for wind energy, but not solar energy developments);
- To monitor and document the avian mortality rate during the construction of the NamPower Wind Power Project; and
- To monitor the ESMP and the associated mitigation measures relating to avian impacts.

Construction-phase monitoring will include the following:

- Determine if the proposed mitigation measures (i.e. buffers) have been implemented, and whether or not they are effective in minimising impacts on sensitive birds during construction;
- Provide insight into the triggers and duration of any observed changes in species presence, abundance and behaviour; and
- Provide an opportunity to gather additional data on priority species and focal points (particularly where nest locations have been identified).

In particular, construction-phase monitoring is considered necessary for the following reasons:

- To monitor the numbers of Barlow's Larks and ascertain whether there are any active nests in the study area;
- To monitor the numbers and movements of Namaqua Sandgrouse;
- To check for any signs of impacts on the raptor species;
- To check for signs of interactions of birds on the weather resource monitoring station;

- To survey the power lines south of the study area, to the Obib Substation, to make recommendations if marking is required;
- To investigate the proposed power line route to the farmhouse, outside the study area.

The results of this monitoring phase will inform any additional mitigation or monitoring that may be required and will be included in revisions of the ESMP.

5.4.2 *Post-construction bird monitoring*

A Post-construction Bird Monitoring programme should also be implemented in due course, according to standard procedures (Jenkins et al. 2015, 2017). The monitoring protocols for concurrent wind and solar projects on the same site can be combined, where practically feasible.

For wind energy projects, the following guidelines apply (in summary; Jenkins et al. 2015):

- Post-construction monitoring is necessary to: a) determine the actual impacts of the Wind Energy Facility (WEF), b) determine if additional mitigation is required at the WEF, and c) improve future assessments.
- Post-construction monitoring does not negate the need to first avoid, then minimise and lastly mitigate negative impacts during the project-development stage.
- Post-construction monitoring should start on, or soon after the Commercial Operation Date.
- Post-construction monitoring can be divided into three categories: a) habitat classification, b) quantifying bird abundance and movements (replicating pre-construction monitoring), and c) quantifying bird mortalities.
- There are three components to estimating fatality rates: a) estimation of searcher efficiency and scavenger removal rates, b) carcass searches, and c) estimation of collision rates.
  - All turbines should be searched for fatalities, with a search interval determined by scavenger-removal trials and objectives monitoring. Two complementary search protocols should be applied: 1) intensive and regular searches of a minimum of 30% or 20 turbines at a WEF (whichever is greater), and 2) extensive, less frequent sampling of the remaining turbines to record fatalities of large-bodied birds. The search area must be defined and consistently adhered to throughout monitoring. As a minimum, the radius of the search area be should equal to 75% of the turbine height (ground to blade-tip).
  - Observed mortality rates must be adjusted to account for searcher efficiency, scavenger removal and the probability that some carcasses may be outside the search area.

- The duration and scope of post-construction monitoring should be reviewed annually. Post-construction monitoring of bird abundance and movements should span a minimum of two years. Surveying the WEF for fatalities should also be done for a minimum of two years after construction, and should be repeated again at year five, and every five years thereafter. The outcomes of the previous year's monitoring, together with the sensitivity of the receiving environment should guide if specific components of monitoring should be extended beyond the prescribed minimum.

For solar energy projects, the following guidelines apply (in summary; Jenkins et al. 2017):

- For the present higher-risk project (assessment regimes 2 and 3), post-construction monitoring is necessary to a) determine the actual impacts of the solar energy facility (SEF), b) determine if additional mitigation is required at the SEF and c) learn about impacts and improve future assessments.
- Post-construction monitoring does not negate the need to first avoid, minimise and mitigate negative impacts during the project development stage.
- Post-construction monitoring should be started as soon as the facility becomes operational, bearing in mind that the effects of a SEF may change over time.
- Post-construction monitoring can be divided into three categories: a) habitat classification, b) quantifying bird numbers and movements (replicating baseline data collection), and c) estimating bird mortalities.
- There are three components to estimating bird fatality rates: a) estimation of searcher efficiency and carcass persistence rates, b) carcass searches, and c) data analysis incorporating systematically collected data from a and b above.
- A minimum of 20-30% of the solar hardware should be methodically searched for fatalities, with a search interval informed by carcass persistence trials and objective monitoring. Fences and other infrastructure that may pose a risk to wildlife (e.g. evaporation ponds) should also be regularly checked. Any evidence of mortalities or injuries within the remaining area should be carefully recorded and included in reports as incidental finds.
- The search area should be defined and consistently applied throughout monitoring.
- Observed mortality rates must be adjusted to account for searcher efficiency (which can change seasonally depending on vegetative condition of the site), scavenger removal and the proportion of the facility covered by the monitoring effort. Some of these factors may change seasonally due to the breeding season of scavengers and whether visibility of the survey area changes through the year.

- The duration and scope of post-construction monitoring should be informed by the outcomes of the previous year's monitoring, and should be reviewed annually. The findings and recommendations of the post-construction monitoring report should be included in the updated Environmental Management Programme.
- Post-construction monitoring of bird abundance and movements and fatality surveys should span 2-3 years to take inter-annual variation into account. However, if significant problems are found or suspected, the post-construction monitoring should continue as needed in conjunction with adaptive management, taking into account the risks related to the particular site and species involved.

APPENDIX F: Transport route

Based on the abnormal load requirements, a preliminary route as outlined in Figure F1 below is proposed for transporting the large equipment from the Lüderitz harbour towards the site. The route follows Bismarck Street from the Harbour up to Bay Road and then leaving Lüderitz along the B4 eastbound. The route continues along the B4 roadway towards the B4 / C13 intersection and then finally traveling along the C13 roadway towards the site.

The final route will have to be checked for compliance during the final design stages of the project. Permits will need to be obtained from the Namibian Roads Authority for all abnormal loads and the specific route will be specified based on the characteristics of each load type.

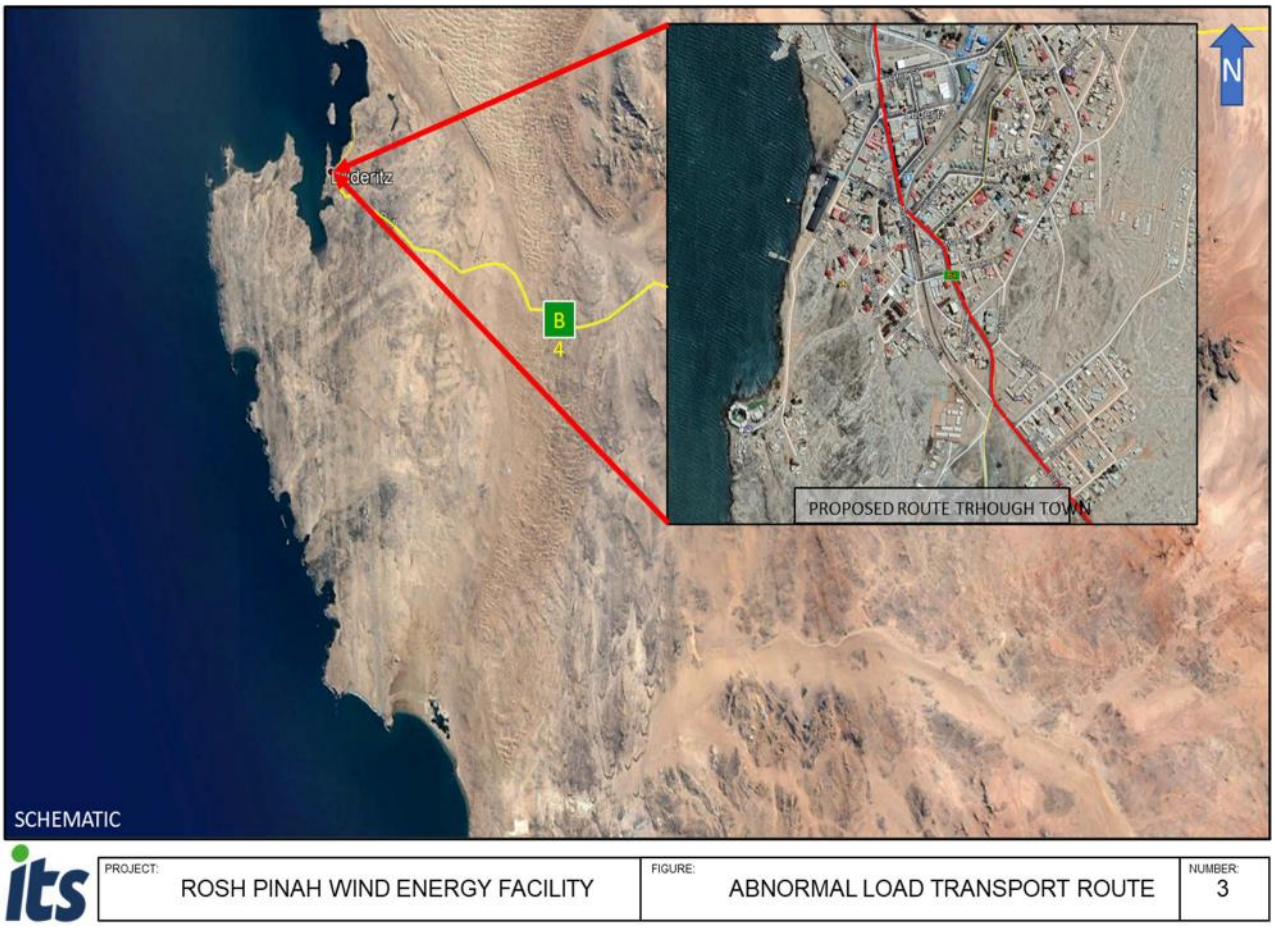


Figure F-1: Abnormal load transport route through Lüderitz

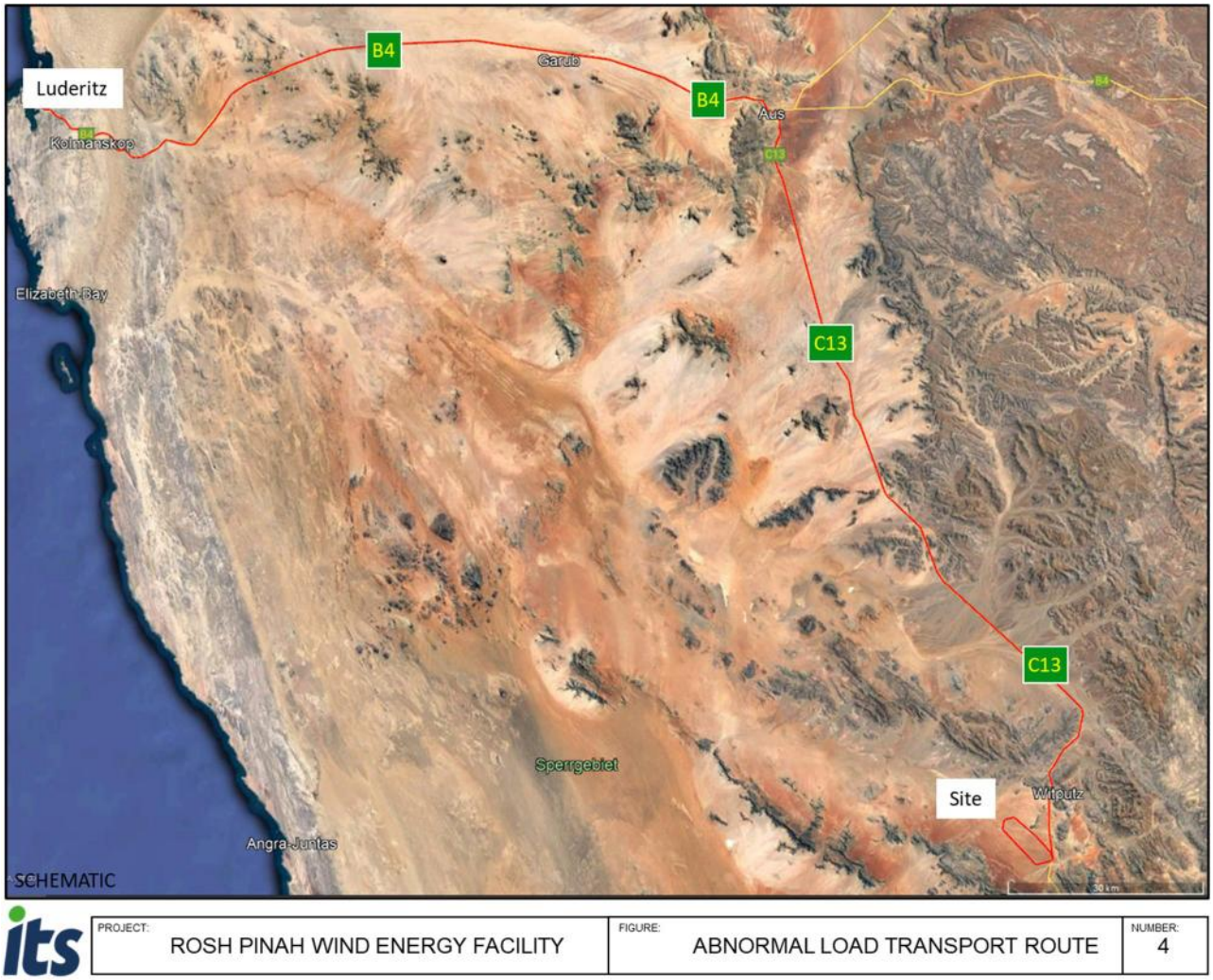


Figure F-2: Abnormal transport load route along the B4 and C13.