HOOGLAND NORTHERN WIND FARM CLUSTER NON-TECHNICAL SUMMARY

Hoogland Northern Wind Farm Cluster

Prepared for: Red Cap Energy (Pty) Ltd

Authority References: TBA

redcap
INNOVATING ENERGY

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Non-Technical Summary

1. INTRODUCTION

Red Cap Energy (Pty) Ltd ('Red Cap') is proposing to develop four Wind Farms and associated grid connections (together referred to as the Hoogland Project) in an area located between Loxton and Beaufort West in the Northern and Western Cape Provinces. Hoogland 1 and 2 are located to the north and form the Northern Cluster of Wind Farms that will share a grid connection named the Hoogland Northern Grid Connection. Hoogland 3 and 4 are located to the south and comprise the Southern Cluster which will similarly share a separate grid connection, named the Southern Grid Connection. The two Grid Connections are each in the form of 132 kV overhead power lines and will connect the Hoogland Wind Farms to the Nuweveld Collector Substation on Red Cap's adjacent Nuweveld Wind Farms Project. It is intended that these projects would be bid in a forthcoming round of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

In terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations (4 December 2014, Government Notice (GN) R982, R983, R984 and R985, as amended), various aspects of the proposed development may have an impact on the environment and are considered to be listed activities. These activities require authorisation from the National Competent Authority (CA), namely the DFFE, prior to the commencement thereof.

Red Cap has appointed SLR Consulting (South Africa) (Pty) Ltd as the Independent Environmental Assessment Practitioner (EAP) to undertake the required Scoping and EIA (SEIA), and Basic Assessment (BA) processes for the proposed Hoogland Wind Farms and Grid Connection Projects in terms of the EIA Regulation 2014 (as amended) promulgated under the National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA). The Northern Wind Farm Cluster would be subject to a Scoping and EIA process.

This document is a Non-Technical Summary (NTS) for the Draft Scoping Report for the **Hoogland 1 Wind Farm** and **Hoogland 2 Wind Farm** (the **Northern Wind Farm Cluster**). Even though these are two separate applications they will be considered in the same Scoping Report and NTS. The purpose of the NTS is to summarise the contents of the Draft Scoping Report and provide the public with an overview of the project, the environmental assessment process, the findings of the studies so far, and the way forward.

Figure 1.1: Photomontage of potential turbines in the landscape of the study area (Source: Lawson and Oberholzer, 2022)

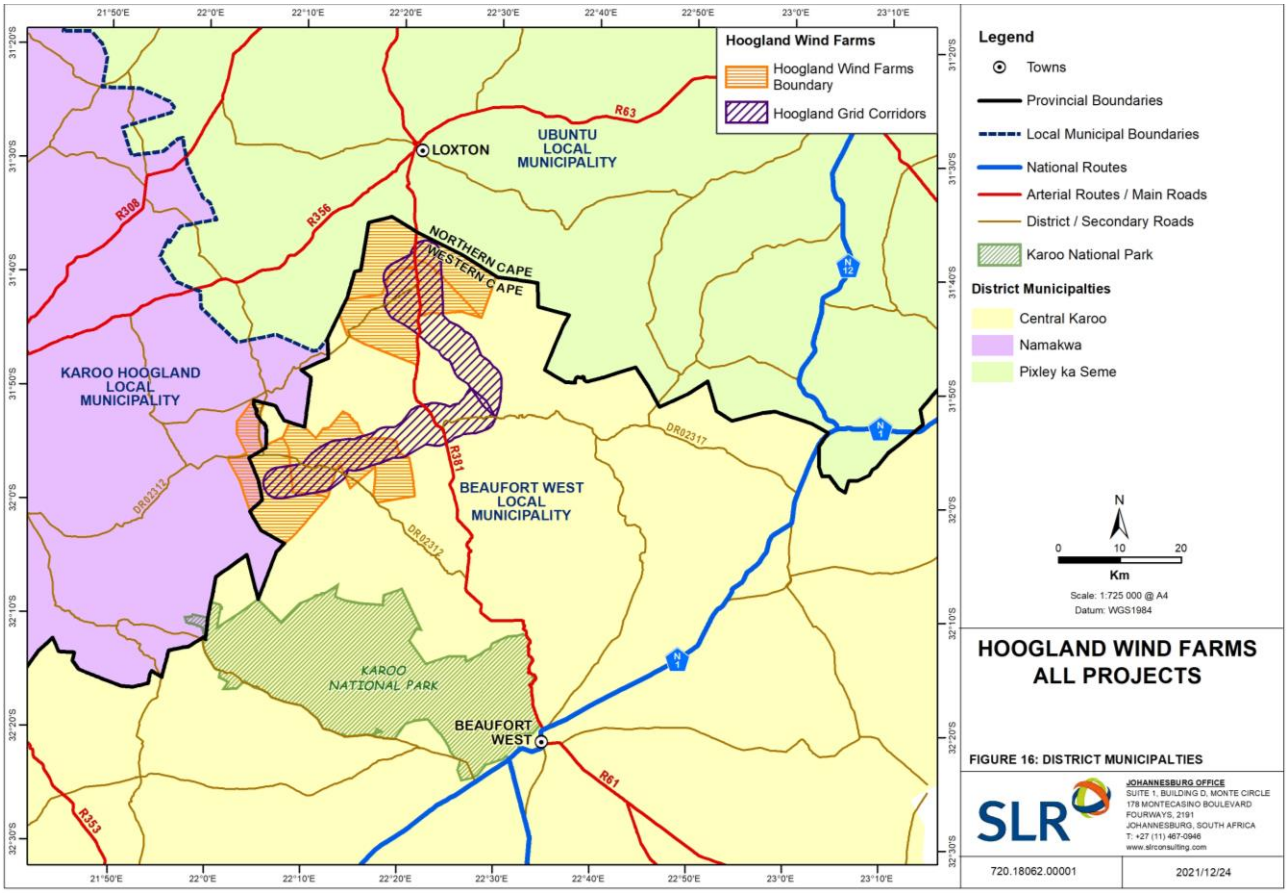

Figure 1.2: Regional Locality Map presenting the location of the Hoogland Wind Farms and Grid Connection

2. PROJECT DESCRIPTION

Both Wind Farms are located approximately 70 km north of Beaufort West and approximately 20km south of Loxton along the R381. The **Hoogland 1 Wind Farm** site is centred on the following coordinates 31° 37.474'S, 22° 21.191'E and has an area of approximately 16,234 ha, and the layout supports 94 turbine locations. The **Hoogland 2 Wind Farm** site is centred on the following coordinates 31° 42.997'S, 22° 19.973'E and has an area of approximately 17,799 ha, and the layout supports 82 turbine locations. The maximum number of turbines that will however be constructed on each Wind Farm, if construction goes ahead, will not exceed 60 turbines.

2.1 PROJECT COMPONENTS

Each wind farm aims to achieve a targeted nameplate generation capacity of a maximum of 420MW. A wind farm requires several key components to facilitate the generation of electricity at a large scale, this includes (See Figure 2-1 and Figure 2-2):

- Wind turbines;
- Roads;
- Underground cables and overhead medium voltage power lines (up to 33 kV);
- A Substation (including and operations and maintenance area for control, operation, workshop, storage buildings / areas); and
- A battery storage facility in the vicinity of the Substation.

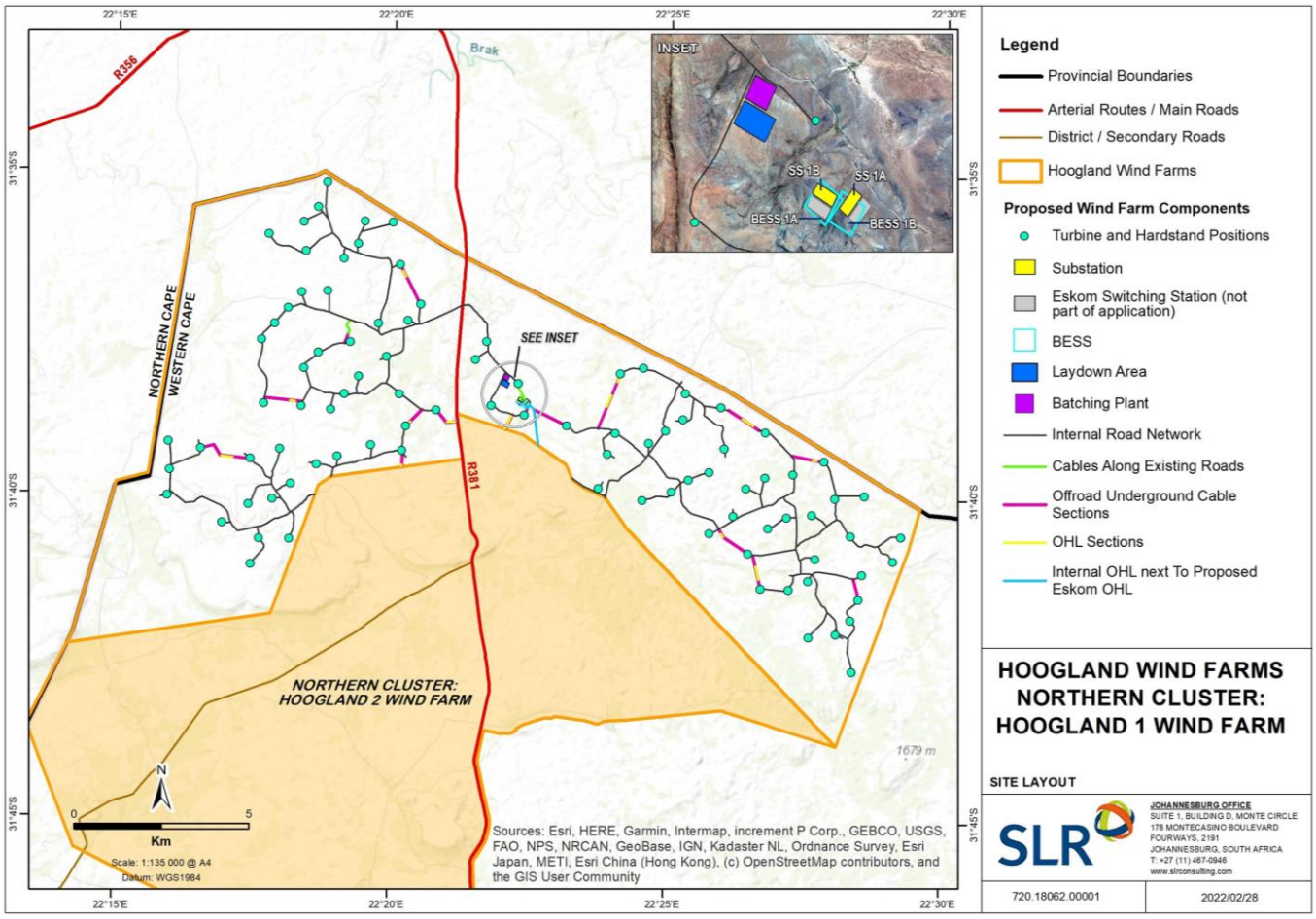

Figure 2-1: Hoogland 1 Wind Farm Layout (94 turbines)

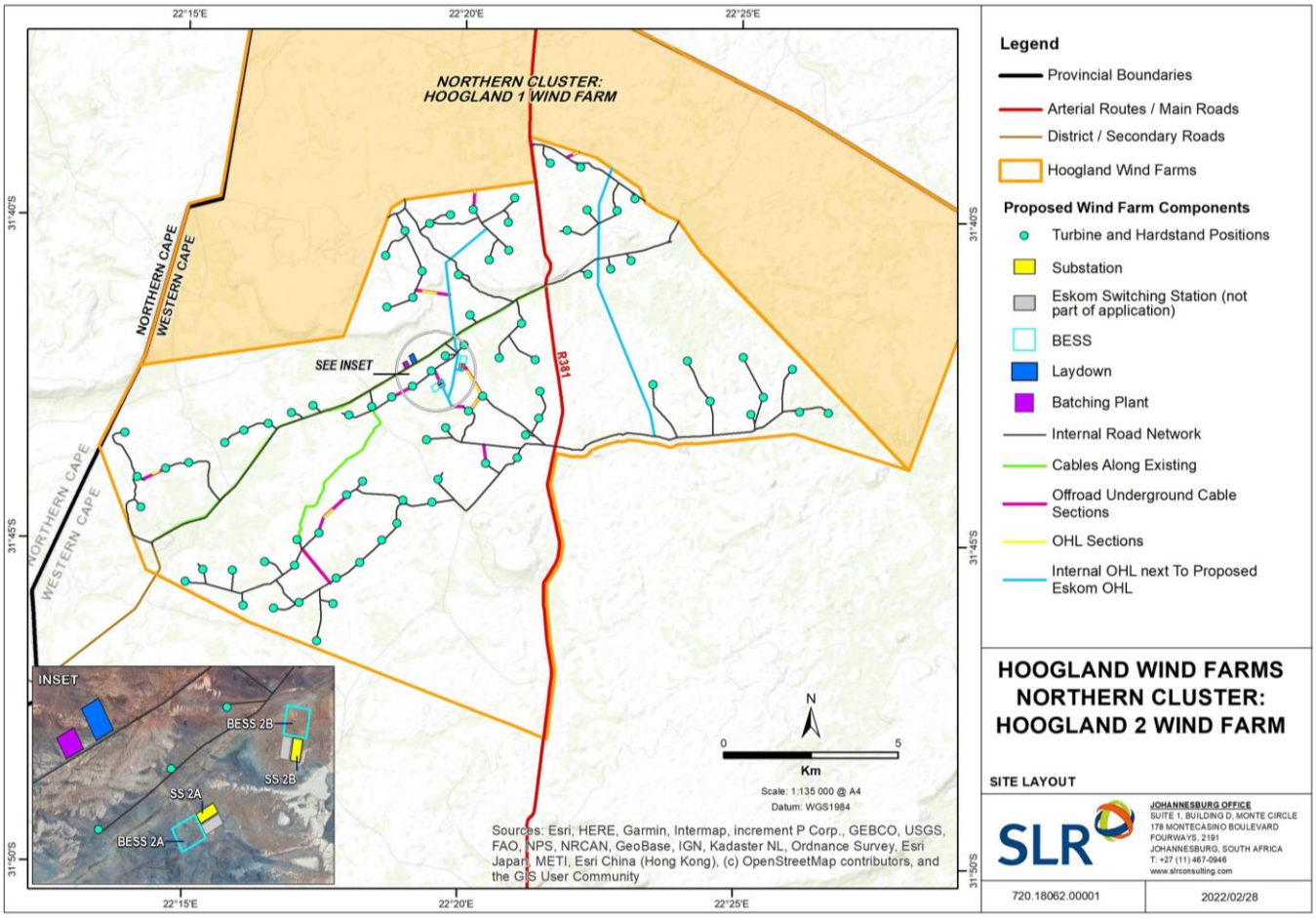

Figure 2-2: Hoogland 2 Wind Farm Layout (82 turbines)

During construction, designated construction areas will include temporary site camp/s and general laydown areas and associated maintenance and storage buildings/areas along with guard cabins, as well as a concrete batching plant. Individual turbine temporary laydown areas including crane boom laydown areas and blade laydown areas will be established at each turbine.

2.1.1 Wind Turbines

A wind turbine is a rotary device that extracts energy from the wind. The mechanical energy generated is converted to electricity. Larger capacity turbines used in large scale Wind Farms for the commercial production of electricity are typically horizontal axis wind turbines, which are three-bladed and mechanically pointed into the wind by computer-controlled motors, as is proposed for this project.

Since the exact turbine specifications are not known at this stage, the following wind turbine envelope is proposed:

- Rotor diameter: 100 m to 195 m (50 m to 97.5 m blade / radius)
- Hub height: 80 m to 150 m
- Rotor top tip height: 130 m to 247.5 m (maximum based on 150 m hub + 97.5 m blade = 247.5 m)
- Rotor bottom tip height: minimum of 20 m (and not lower).

2.1.2 Power transmission

The electricity generated by the turbines on each Wind Farm needs to be collected, transformed and then evacuated to the national grid. A 132 kV powerline from the Hoogland Northern Cluster substations to the Nuweveld Collector Substation is proposed and this is called the Hoogland Northern Grid Connection. It is the subject of a separate application as once constructed it will be handed over to Eskom who will own and manage it as part of the national grid.

2.2 PROJECT ALTERNATIVES

The EIA process requires alternatives to be considered and identified during the Scoping Phase to achieve the most environmentally and socially responsible development. An alternative is defined as a possible course of action, in place of another, that would meet the same purpose and need.

A detailed Screening Phase and Iterative Design Approach was adopted, which integrated the screening and assessment of environmental and social constraints alongside the technical components of the project, early in the project lifecycle. This is described in more detail in the section below. Through this process the most environmentally and socio-economically favourable site layout was thus identified for assessment in this environmental assessment process.

On this basis, the preferred layouts of the Hoogland Wind Farms will each be assessed against the '**no-go' alternative**. The 'no-go' alternative is the option of not constructing the Project where the status quo of the current farming activities on the site would continue.

2.3 SCREENING AND ITERATIVE DESIGN PHASE

2.3.1 Rationale

A summary of the Screening Phase and Iterative Design Approach and how it forms part of the Environmental Process is provided in this section. Red Cap have proactively sought to identify the best practical environmental option possible for the identified project site through a rigorous, iterative and multi-disciplinary process, that drew on the considerable body of existing knowledge and specialist expertise relating to the study area. This approach aligns with the NEMA principles advocating for sustainable development through the adoption of the mitigation hierarchy as set out in section 2 of NEMA and depicted in Figure 2.3. Through application of this hierarchy, 'avoidance' of environmental impacts was then the basis for the approach to the process.

Figure 2.3: Mitigation hierarchy

2.3.2 Process

The detailed screening process for the Hoogland Wind Farms was specifically based on identification and mapping of No-Go areas of the site in order to avoid all environmental, socio-economic and technical sensitive areas, and considered both impacts from turbines and other infrastructure (internal overhead power lines, roads and underground cables and buildings) as separate No-Go layers. This allowed all suitable areas for turbine locations, and associated infrastructure within the site to be identified, which would then be geographically split into four separate potential Wind Farm sites and layouts, two of which comprise the Northern Cluster: Hoogland 1 Wind Farm and Hoogland 2 Wind Farm projects and two of which comprise the Southern Cluster: Hoogland 3 Wind Farm and Hoogland 4 Wind Farm projects. These layouts are the basis for the Wind Farms that are taken forward for environmental assessment.

Through the application of environmental sensitivities and associated developmental No-Go areas that should be avoided by a developer, the screening assessment allows the most environmentally favourable alternative to be identified, in the form of an environmentally preferred site layout. It can also guide selection of mitigation measures in certain areas.

The table below highlights the iterative approach followed so far and the preliminary and current turbine layouts are shown in Figure 2.4:

Table 2-1: Description of the main layout iterations and key change drivers

DATE	NUMBER OF TURBINES			COMMENTS
	NORTHERN CLUSTER	SOUTHERN CLUSTER	TOTAL	
Oct 2020	N/A		493	Preliminary layout based on developer identified environmental and technical constraints. This was based on one continuous site. Shown in Figure 2.4 below (left).
Jan 2021	N/A		451	Layout revised to exclude nests identified in Avifauna Screening Study, VERA modelling and EWT data re: Riverine Rabbits. Potential for five Wind Farms.
Jan 2021	212	117	429	Site area adjusted to remove large central corridor namely on the basis of the Sak River sensitivities. This layout was circulated to specialist upon appointment.
Feb 2021	150	117	367	Martial Eagle nest confirmed in north west area and therefore site area adjusted to remove a number of properties and turbines from the Northern Cluster.
Sept 2021	176	172	348	Specialists initial Screening No-Go mapping applied to refine the preliminary layout. This included the discovery of a new Martial Eagle nest in the Southern Cluster with its resultant no-go buffer. The technical team also spent considerable effort optimising the layout based on a higher confidence in the layers provided by the specialists. Input regarding constraints from landowners and adjacent landowners was also considered. Shown in Figure 2.4 below (right).

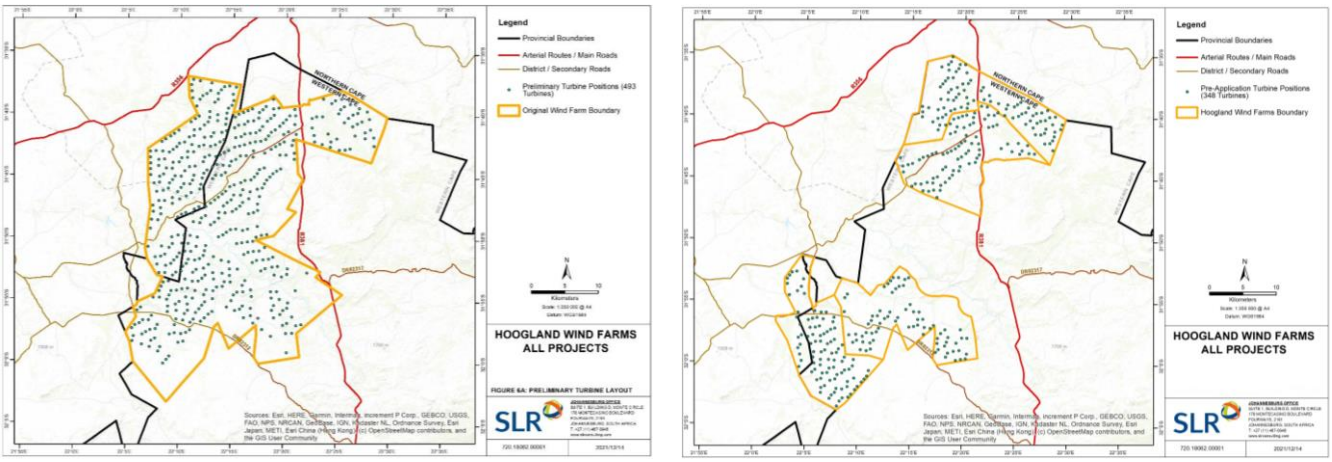

Figure 2.4: Preliminary 493 turbine layout, Oct 2020 (left); Scoping Phase 348 turbine layout, Sept 2021 (right)

3. EIA APPROACH

The purpose of the EIA is to systematically evaluate the environmental and socio-economic impacts of the proposed project activities. It is undertaken in terms of the requirements of the National Environmental Management Act (Act 107 of 1998) (NEMA), as amended, and its associated EIA regulations (i.e. GN R. 982, 983, 984 and 985, as amended). Where negative impacts are likely to result from the project, measures can be recommended to avoid or reduce these impacts to a level where the impacts are considered acceptable from an environmental and social perspective. Where positive impacts are likely to result from the project, measures can be recommended to enhance these impacts.

The EIA process also provides Interested and Affected Parties (I&APs) with an opportunity to comment on the proposed project and be kept informed about decisions that may affect them or the environment.

The Environmental Process for the Hoogland Northern Cluster will, in summary, comprise of the following main phases as shown in Figure 3.1:

- Screening and initial design phase;
- Formal EIA Process comprising of:
  - Submission of Application for Environmental Authorisation to the DFFE;
  - Scoping Phase *(current phase)*; and
  - Environmental Impact Reporting (EIR) Phase.

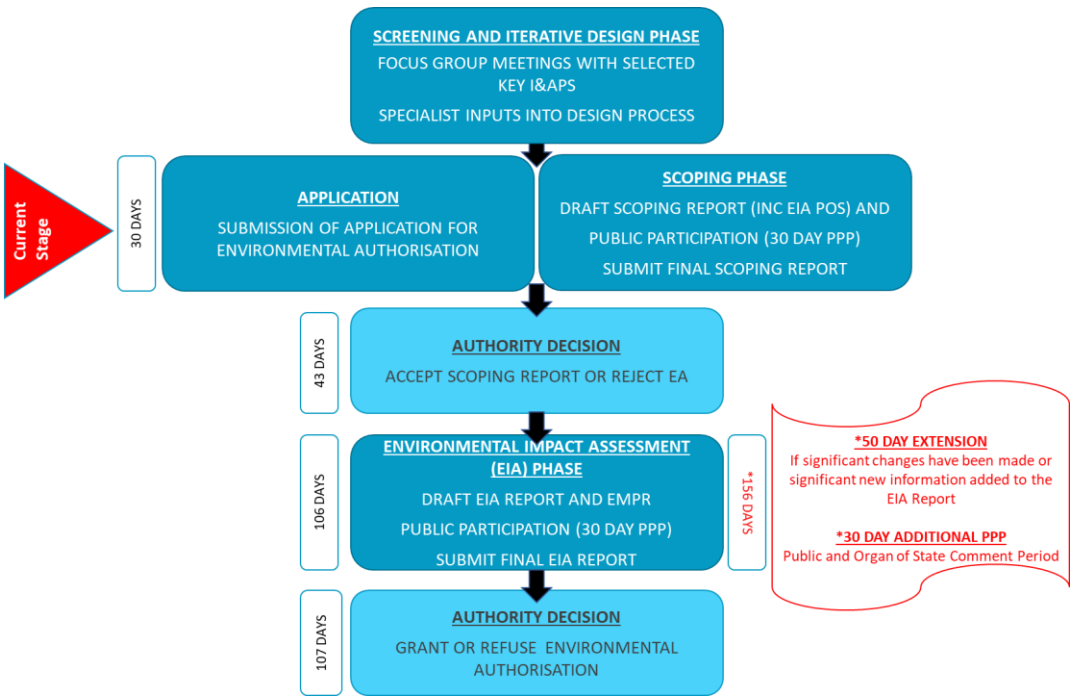

Figure 3.1: Environmental assessment process

As the EA process ascribes stringent timeframes once the Application for Environmental Authorisation has been submitted, the approach has been to allow for as much detailed investigation and participation of I&APs upfront as possible.

The purpose of a Scoping Report, amongst others, is to provide the background and context to the project and outline the proposed Plan of Study to be undertaken in the EIA Phase to allow stakeholders and I&APs to provide input into and shape the investigations. In summary, a Scoping Report aims to:

- Describe the project.
- Outline the legal and policy framework.
- Describe the process/tasks undertaken to date.
- Describe the PPP undertaken to date and future PPP.
- Present the baseline biophysical and socio-economic context as per specialist assessments.
- Identify potential impacts to be assessed in the EIA Phase.
- Discuss alternatives and outline the detailed screening and iterative design approach adopted and how this informs an environmentally, socio-economically and technically feasible project layout.
- Provide a Plan of Study for the EIA Phase.

3.1 PUBLIC PARTICIPATION PROCESS (PPP)

3.1.1 Definition of PPP

Section 1 of NEMA defines public participation in the context of environmental authorisation as follows:
"*Public participation process" … "means a process by which potential interested and affected parties are given opportunity to comment on, or raise issues relevant to, the application to ensure compliance with these regulations within the prescribed timeframe*".

Public participation is an iterative two-way process between the Applicant and the EAP, and the I&APs, whether these be individuals, organisations, or organs of state. The 2014 EIA Regulations (as amended) prescribe minimum Public Participation Process (PPP) requirements to be adhered to as part of an Environmental Process. The PPP planned as part of the Environmental Process for the proposed Wind Farms will comply with these requirements and include several steps/tasks over and above the minimum requirements. It is also noted that the PPP for the Hoogland Projects are being undertaken in an integrated manner and therefore the PPP for the Hoogland Northern Wind Farm Cluster coincides with the PPP for the Southern Wind Farm Cluster (Hoogland 3 and Hoogland 4 Wind Farms), the Northern Grid Connection and the Southern Grid Connection.

The PPP involves notification of the public and key stakeholders through various methods and provides details of how the reports and comments can be accessed. The PPP Report with supporting documentation is included in the Scoping Report and will be updated for each consecutive round of PPP as the project progresses.

3.1.2 Stakeholders

Key stakeholders have been identified and include the following:

- Affected and adjacent landowners;
- Occupiers of affected and adjacent properties;
- Relevant district and local municipalities, including ward councillors;
- Relevant national and provincial government departments;
- Relevant national and provincial parastatals and organisations;
- Key stakeholders in renewable energy projects in the area;
- Conservation groups; and
- Other organisations in the area.

This is an ongoing process and registered I&APs will be added to the database after each PPP round. Any member of the public may register as an I&AP.

3.1.3 Summary of Comments

The following table captures the main comments and recommendations gathered from the stakeholder engagement during the Screening Phase.

KEY STAKEHOLDERS	DATE	KEY COMMENTS FROM STAKEHOLDER
Department of Environment, Forestry & Fisheries (DFFE)	July 2021 and 03 March 2022	• Regulation 11 approval granted to combine Hoogland 1 & 2 (Northern Cluster) (this application) and Hoogland 3 & 4 (Southern Cluster) (separate BA Application) • Procedural and reporting advice with regards to the combination of the processes • Confirmation of approach to cumulative impact assessment • Confirmation of specialist studies required • Confirmation that a BESS Risk Assessment is required • No objection letter required from the Nuweveld Project • Confirmation that the project is intended for REIPPP as it affects which competent authority has jurisdiction
Northern Cape Department of Environment and Nature Conservation (DENC)	7 April 2021	• Indicated that development in CBA areas trigger the need for off-sets • DENC will engage with CapeNature to simultaneously align inputs, especially as the project falls within the Western Cape while only road crossings fall within the Northern Cape. • Indicated that at this stage there are no major concerns and no issues with the approach undertaken by Red Cap thus far
Birdlife South Africa	14 April 2021	• Recommended avoidance of VERA high and medium buffers • Indicated that at this stage there are no major concerns and no issues with the approach undertaken by Red Cap thus far
Western Cape (WC): DEA&DP	6 May 2021 and 3 March 2022	• Requested ample time to comment on various projects • Indicated that at this stage there are no major concerns and no issues with the approach undertaken by Red Cap thus far • Subsequent agreement in relation to revised process and timing as proposed in March 2022
CapeNature	7 May 2021	• Indicated that at this stage there are no major concerns and no issues with the approach undertaken by Red Cap thus far
Landowners and Adjacent Landowners	21 May 2021	• Questions were asked about the REIPPP process • Confirmed rehabilitation would be undertaken after construction was complete • Confirmed the level of communication required with regards to landowners and adjacent landowners
Municipalities	21 May 2021	• Confirmed that appointed road contractors will be responsible for road construction and the Municipality will be responsible for maintenance once construction is complete • Confirmed that any waste will be formally and appropriately dealt with in compliance with legislation • Confirmed labour will be sourced locally where possible and the developer together with the Contractor will engage the municipalities with regards to the availability of a skills database • District Municipalities are responsible for town planning applications

4. CURRENT ENVIRONMENTAL CONTEXT AND POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

The proposed development could potentially produce a range of environmental and socio-economic impacts. A team of specialists, listed in the table below, was appointed to identify these potential impacts and to propose mitigation measures to reduce the potential negative impacts, and enhance the positive impacts. The specialists assessed the significance of these potential impacts using a consistent methodology supplied by the EAP. The significance ratings have been provided for impacts anticipated from the proposed project before and after mitigation measures are implemented. A summary table showing all the significance ratings of the expected impacts is presented in Table 4-1. For details of each impact study, please refer to the complete Draft Scoping Report. The combination of potential impacts from the proposed Wind Farm and other

proposed wind farms in the wider study area may result in significant impacts and therefore, the assessment also identifies and considers potential cumulative impacts. The environmental aspects and potential impacts relevant to this project are discussed below.

Table 4-1: Details of the specialist team

Discipline	Company	Specialist
Climate Change	Promethium Carbon	Robbie Louw
Geotechnical	R.A. Bradshaw & Associates cc	Richard Bradshaw
Agriculture	Johann Lanz Consulting	Johann Lanz
Terrestrial Ecology	3Foxes Biodiversity Solutions	Simon Todd
Bats	Animalia Consultants	Werner Marais
Avifauna	Wildskies	Jon Smallie
Aquatic Ecology	EnviroSci (Pty) Ltd	Dr Brian Colloty
Visual	Bernard Oberholzer Landscape Architects (BOLA) and qARC	Bernard Oberholzer, Quinton Lawson
Archaeology	ASHA Consulting	Dr Jayson Orton
Palaeontology	Natura Viva	Dr John Almond
Noise	Enviro-Acoustic Research	Morné de Jager
Shadow Flicker	Arcus	Emma Lewis, Martin Stevenson
Traffic	Athol Schwarz	Athol Schwarz
Socio-economic / tourism	Independent Economic Researchers	Dr Hugo van Zyl, James Kinghorn

4.1 CLIMATE, TOPOGRAPHY, GEOLOGY AND SOILS

The general climate is a local steppe climate, with average rainfall as low as 190mm and high evaporation of between 1,250 and 1,350 mm per annum, proving the area to be arid. The Nuweveld escarpment and plateau is characterised by horizontal sills of erosion-resistant dolerite forming steep cliffs in places, boulder-strewn mesas or plateaus and flat-topped koppies while the gentler, lower hillslopes and plains consist of more easily weathered mudstone, with occasional narrow ledges of harder sandstone. The flattish plains are at around 1400m elevation, and the dolerite ridges and mesas are 1500-1600m elevation.

Large portions of the combined project area are underlain by continental (fluvial, lacustrine) sediments of the Lower Beaufort Group (Karoo Supergroup) of late Middle Permian to early Late Permian age. Only the uppermost portion of the Abrahamskraal Formation is represented within the project area, underlying the northern margins of the Hoogland 1 Wind Farm project area. The sandstone-rich Poortjie Member of the Teekloof Formation dominates the rest of Hoogland 1 Wind Farm as well almost all of the Hoogland 2 Wind Farm project areas. The dominant soils are shallow soils on underlying rock or hard-pan carbonate.

4.2 CLIMATE CHANGE

A Climate Change Risk Assessment was undertaken to determine potential impacts that the Hoogland Wind Farms would have on climate change through their contribution to Greenhouse Gas (GHG) emissions; and further to this how changing climate will affect the project. One of the main GHGs is carbon dioxide. Carbon dioxide accumulates in the atmosphere and contributes to global climate change by trapping heat in the atmosphere. The greater the concentration of GHGs, the greater the warming effect.

The Hoogland Wind Farm Project, being a renewable energy project, was found to have a positive impact on climate change as its construction and operation emissions when considered together, will result in the net avoided emissions of round 46 million tons of carbon dioxide.

It was also found that biggest climate change vulnerability of the project lies in the increased number of extremely hot days that could potentially occur as the project area shows an increase in temperature trend and decrease in rainfall trend.

4.3 GEOTECHNICAL

A desktop geotechnical study was undertaken for the construction of the Hoogland Northern Wind Farm Cluster of. The area can be sub divided into three generalized mapping units where similar ground conditions are expected. These units correspond to areas underlain by the sedimentary rocks of the Abrahamskraal Formation and the Hoedemaker and Poortjie

Members, the dolerite and the more extensively developed alluvium. The alluvial areas and areas of steep ground are considered sensitive from a geotechnical perspective.

All three geological units are expected to be suitable for the development of the infrastructure for the wind farm provided that standard engineering design and construction measures are adopted to mitigate identified geotechnical constraints.

4.4 AGRICULTURE

Within the development area there are small, isolated patches of cultivation around farmsteads that are allocated high agricultural sensitivity because of it. However, the Wind Farm footprint entirely avoids all of these areas, and this was purposefully considered in the design. Three potential negative direct agricultural impacts have been identified:

- Loss of agricultural potential by occupation of land - Agricultural land directly occupied by the development infrastructure will become unavailable for agricultural use, with consequent potential loss of agricultural productivity and employment. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases. Only an insignificant proportion (0.77%) of the available agricultural land is impacted in this way.
- Loss of agricultural potential by soil degradation – Soil can be degraded by impacts in two different ways: erosion and topsoil loss. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact occurs only during the construction and decommissioning phases. Although the site is susceptibility to soil erosion, it can be completely managed with an effective erosion management plan. Because the agricultural footprint impacts such a small proportion of the land, it only has the possibility to cause degradation on a very small proportion of the land.
- Loss of agricultural potential by dust generation – The disturbance of the soil surface, particularly during construction, will generate dust that can negatively impact surrounding veld and farm animals.

One positive agricultural impact has been identified, that is an indirect impact:

- Enhanced agricultural potential through increased financial security for farming operations - Reliable income will be generated through the lease of the land to the energy facility. This is likely to increase cash flow and financial security of landowners and could improve farming operations and productivity through increased investment into farming.

4.5 TERRESTRIAL ECOLOGY

Terrestrial ecology includes land-based plants and animals (excluding aquatic). Based on the site investigation, the vegetation type covering the Hoogland Northern Cluster is classified as Eastern Upper Karoo vegetation type. This is clearly an oversimplification of the vegetation of the site and based on work on the adjacent Nuweveld site as well as the on-site field assessment, there are extensive tracts of Upper Karoo Hardeveld at the site, as well as fairly extensive areas of riparian vegetation which would currently fall into the Bushmanland Vloere vegetation type but are more-closely allied to the Southern Karoo Riviere vegetation type.

In terms of animals, the ecologist also considered mammal, reptile and amphibian animal communities during his site visits. There are several listed mammals which occur in the area and which would potentially be impacted by the development. This includes the Padloper Tortoise, Riverine Rabbit, Black-footed Cat, Brown Hyena, Grey Rhebok, Mountain Reedbuck. The Riverine Rabbit is of greatest potential concern as it has the highest threat status and has also been confirmed present within the Hoogland 1 Wind Farm site by the current study as well as historical records. Potential impacts of the proposed project on the terrestrial ecology of the study area during the project phases will largely relate to the loss of currently intact ecological habitat and the transformation of the area, loss of vegetation and plant Species of Special Concern (SCC), impacts on broad scale ecological processes, direct impacts on animals and also soil erosion. The avoidance of sensitive features on the site and application of our recommended mitigation measures can reduce the overall impact on terrestrial ecology to being of low negative significance.

4.6 BATS

Through ongoing bat monitoring, three bat species have been confirmed on the Hoogland Northern Cluster site, Egyptian free-tailed bat, Cape serotine and Natal long-fingered bat. None of the bat species are classified as threatened (endangered or vulnerable) by conservation bodies, but they provide a high value to the local ecosystems in which they live. Other species have been found roosting or foraging in the study area and may also be at risk.

Although most bats are highly capable of advanced navigation by echolocation and excellent sight, they are at risk of physical impact with the blades of wind turbines during operation, and particularly during foraging and migration, as well as being attracted to lights at night. Other impacts include loss of habitat during clearing for construction and roost destruction. To avoid significant negative impacts to bats during the operational phase, avoidance of habitat is recommended. This was achieved as far as possible by the Screening bat sensitivity map produced by the bat specialist prior to the Scoping Phase, which indicated the potential roosting and foraging areas as No-Go areas for wind turbine placement.

4.7 AVIFAUNA

Bird monitoring has been undertaken for the site and was still underway at the time of the assessment. Based on the monitoring undertaken, a total of 118 bird species have been found on site to date (considering all data collection methods). Included in the 118 species are in summary, 3 regionally Endangered species (Black Harrier, Ludwig's Bustard and Martial Eagle); 2 Vulnerable species (Verreaux's Eagle and Secretarybird); 3 Near-threatened species (Karoo Korhaan and African Rock Pipit); and 17 endemic or near-endemic species (including Jackal Buzzard, and African Rock Pipit as large terrestrial / raptor species).

The potential impacts on avifauna that could result from the operation of the proposed wind farm is the potential increase of collisions with wind turbines which is a direct mortality factor; as well as displacement with turbines that serve as a barrier and collision with overhead powerlines. During construction, habitat destruction, disturbance as well as displacement and barrier effects presented by the wind turbines may occur. To avoid significant negative impacts, a comprehensive sensitivity map, was produced by specialist prior to the Scoping Phase during Screening, which indicated the sensitive areas as No-Go areas for development. The large eagle nests are the key spatial issue determining sensitivity on the sites, with several confirmed nests. It is essential the operational monitoring of bird fatalities is undertaken to ensure any deaths do not exceed acceptable thresholds.

4.8 AQUATIC ECOLOGY

The study area is comprised of various aquatic features associated with catchments and rivers including alluvial areas, watercourses with vegetated riparian zones, head water areas with instream vegetation and valley bottom wetlands. Several artificial systems such as berms and dams are also prevalent in the area. The project falls within the D55A, D55C and D55D quaternary catchments, within the Nama Karoo Ecoregion Ecoregion located within the Orange Water Management Area.

The main potential impacts on aquatic ecology arise from the construction and operation of the proposed project are related to loss of aquatic species of concern and the loss of natural wetlands on site, loss of functional wetlands and riparian systems that provide ecosystem services within the site, increased surface run-off which could lead to sedimentation and erosion, as well as changes in water quality. To avoid significant negative impacts to aquatic environments, a comprehensive sensitivity map was produced by specialist prior to the Scoping Phase during Screening, which indicated the sensitive areas as No-Go areas for development. However there remain some recommendations relating to the design that is applicable to Hoogland 2 only.

4.9 VISUAL

Most of the site for the proposed Wind Farms has an uncluttered, expansive landscape with pastoral scenes, for which the Karoo is renowned. The landscape is characterised by koppies, ridges and outcrops with some large dams; as well as cultural landscapes here fields and tree copses have been planted in alluvial valleys and near homesteads. The potential visual impacts significant to the project include visual intrusion of the construction activities such as construction traffic, cranes and dust; whilst the main operational impact is the intrusion of the wind turbines on the Karoo landscape. The substation, overhead lines, access roads and hardstands; as well as lighting at night are also an operational impact. Although most sensitive features have been avoided given the large number and scale of the proposed turbines, a significant impact can be expected. The respective potential cumulative visual impacts are also high when the wind farm is considered in combination with the other Hoogland Projects and the Nuweveld Wind Farms.

4.10 HERITAGE

Heritage resources at the site can be divided into five main categories namely: Palaeontology, archaeology, graves, built environment and cultural landscape. The following significant archaeological features which may be impacted by the development of the project were identified on site. These include:

- Surface scatter Stone Age finds from the Late Stone Age (LSA)
- Background scatter artefacts (essentially precolonial litter)
- LSA engraved sites
- One rock painting site
- Mid-late 19th century engravings
- 18th, 19th and Early 20th century stone-walled structures
- Formal and informal graves

The entire area is regarded as a cultural landscape, which includes the natural / primeval landscape, trekboer landscape and the modern landscape, all within a relatively undisturbed wilderness atmosphere. The development footprint contains various sensitivities that were identified following the undertaking of several site visits and spatial input considerations. Overall, it is concluded that potential impacts to heritage resources include those to archaeology and built heritage will be minimal aside from the unavoidable impacts to the wider cultural landscape. Aside from graves and rock engravings, both of which are generally rare, it is highly unlikely that highly significant heritage sites still lie unknown within the project area. Any as yet undiscovered sites will be documented during a pre-construction survey and any mitigation that may become necessary should adequately deal with significant impacts.

4.11 PALAEONTOLOGY

Palaeontological resources include fossilised materials such as buried fossils and rock units. Since some potential heritage material is buried, it is often only found during the construction phase of a project. The palaeontologist found the area is of low palaeosensitivity overall, with only a sparse, and largely unpredictable, scatter of fossil sites of scientific and / or conservation value. Since the majority of fossil sites recorded within the project area are of low scientific or conservation value, they do not warrant mitigation. No No-Go areas were thus applicable to the project layout as any findings can be mitigated.

4.12 NOISE

Wind turbines are responsible for both mechanical and aerodynamic noise (from the wind turbine blades moving through the air). Noise levels are affected by various factors such as topography, land use, vegetation cover and roads. According to the noise specialist, the potential issues and impacts associated with environmental noise experienced during the construction phase of the project will be from the equipment being used (e.g. excavators, graders, bulldozers, etc.) and the activities undertaken (e.g. excavations, batching plants, etc.), as well as traffic on site, and to and from the site. During operation the mechanical noise produced by wind turbines is likely to have an impact on nearby sensitive receptors. The modelled operational noise from the Hoogland Wind Farms is expected not to exceed the 45 dB(A) noise level threshold for most Noise Sensitive Receptors (NSR), with exception of one NSR per wind farm (located on Slangfontein on Hoogland 1 and Midlands on Hoogland 2).

As a precautionary approach, the developer applied a 500m buffer from each NSR to ensure that noise impacts were limited from the outset, however once-off noise measurements are recommended at the location of each receptor before the construction phase starts, to establish the existing noise levels. Once the Wind Farms are operational, noise measurements should be repeated to assess the noise levels at these receptors.

4.13 SHADOW FLICKER

Shadow-flicker occurs when the rotation of wind turbine blades results in alternating periods of shadow and light to a receptor. Shadow-flickering will only occur when the position of the turbine is between the sun and the receptor, and only when the turbine is operating and the sun is shining. Usually the sensitive receptors that could experience shadow flicker impacts are those close to or within the Wind Farm. This impact is expected to be very limited and easily mitigated. It has been calculated that shadow flicker could potentially occur at seven potentially sensitive receptors out of the nine identified within the Study Area. Only three on each wind farm are expected to exceed the accepted threshold in terms of numbers of hours. Mitigation measures include:

- Control at Receptor: The provision of blinds, shutters or curtains to affected receptors;
- Control on Pathway: for example, screening planting close to an affected receptor; and
- Control at Source: for example, shutdown of turbines at times when effects occur.

Following appropriate mitigation, no significant impacts are anticipated on either Hoogland 1 or Hoogland 2 Wind Farms, and as such, it is the opinion of the specialist that the Projects may be authorised in terms of shadow flicker.

4.14 TRAFFIC

The existing road network adjacent to the proposed developments is well established, consisting of a combination of national roads, first, second and third-order roads, which provides the proposed development accessibility to local towns and the major commercial centres within South Africa. The access to the site is off the R381 (main route between Loxton and Beaufort West) which is mostly a gravel (unpaved) road with several tarred (paved) sections and can be reached via several public roads.

It is assumed that the workforce will be drawn from surrounding communities. There are several towns within a 150 km radius of the proposed development. The most relevant include Beaufort West, Carnarvon, Fraserburg, Loxton, Nelspoort, and Victoria West. The main roads used to access the development will be via the R381 and the DR02315.

The most likely transportation routes for domestically supplied and manufactured components from the major commercial centres to the proposed developments are either Cape Town or Johannesburg (or any supplier along these routes). The port of entry into South Africa for all import wind turbine components is limited to Ngqura (located close to Gqeberha) or Saldanha Terminals. The length and weight of the various turbine components will only be available once the turbine supplier has been appointed. There is a strong possibility that the length of the blades for the turbine units could exceed 95 m. The preferred transportation route would ultimately be identified by the logistic company appointed to transport the various turbine components from the port of entry to the proposed development.

The most significant impact on traffic volumes during peak hours is because of commuting personnel to and from the site in the morning and in the afternoon, with delivery of equipment and material more spread out during the day. Transport of concrete from the batching plant to the turbine foundations is also expected to generate traffic during the day. Construction traffic is therefore much higher than that during operation. At no point during the construction or operational phases does the traffic volume on the various roads exceed fifty trips per hour, which is the threshold for a detailed Traffic Impact Assessment (TIA). The increase in traffic volumes will lead to increased risk of road accidents, road degradation, dust and intersection safety during construction with intersection safety also being a risk during operation. Mitigation measures are proposed to address all of these potential impacts and include a Traffic Management Plan.

4.15 SOCIO-ECONOMIC

The main socio-economic activities in the area relate to extensive agriculture with small stock primarily in the form of sheep, game farming, some tourism and conservation primarily in the form of the Karoo National Park. The proposed development could provide a significant amount of new economic activity, both during the construction phase as well as during the on-going operation of the wind farm. From the preliminary socio-economic findings, it is evident that the development could have a significant impact on the local and regional society and economy.

The proposed development would provide for a variety of potential positive and negative impacts during the construction and on-going operation of the development. In term of positive impacts, the project would be largely supportive of local and regional socio-economic development and energy supply planning imperatives including the diversification of the economy and energy sources. The expenditure associated with the project would be about R3 billion to R3.4 billion per Wind Farm (R6 billion–R6.8 billion for both Wind Farms) and R108 million to R119 million would be spent annually during operations per Wind Farm (R216–R238 million for both). Roughly 160 to 200 jobs of 18 to 24-month duration would be associated with construction per Wind Farm (320–400 jobs for both) and between 40 and 60 direct employment opportunities would be created during operations per Wind Farm (80–120 jobs for both), resulting in major benefits. In addition, each Wind Farm would contribute a minimum of R4.5 to R4.9 million per annum if averaged over 20 years to local socio-economic development, local community shareholding and enterprise development (R9 million–R9.8 million for both Wind Farms).

Negative impacts would primarily arise at a local scale. It is anticipated that, with mitigation, the risks posed to the community by the influx of people, including job seekers, would be manageable and of a low significance with mitigation. Impacts on tourism would be driven by visual and associated heritage impacts on a relatively isolated area with wilderness quality and limited signs of civilisation. However, tourism facilities and attractions in the areas surrounding the project site are very limited and sparsely distributed, with a few exceptions. The tourism context itself should limit impacts to a low significance during construction and a medium significance during operations with mitigation. Overall impacts on property values should also remain low with mitigation in keeping with the avoidance of no-go and high visual sensitivity areas and reflecting the findings of the assessment of other socio-economic impacts.

It is considered most likely that the combined positive impacts of the Hoogland 1 and Hoogland 2 Wind Farm projects would exceed the negative impacts resulting in an overall net benefit with mitigation.

5. KEY RECOMMENDATIONS PROVIDED BY SPECIALISTS

Based on the above description of the current context potential impacts, the table below provides a synopsis of the key specialist recommendations that are specific to each of the Hoogland Northern Cluster Wind Farms. Noting that heritage and noise are the only disciplines with different recommendations.

Table 5-1: Specialist Key Recommendations for Hoogland 1 and 2 Wind Farms

DISCIPLINE	HOOGLAND 1 WIND FARM	HOOGLAND 2 WIND FARM
Climate Change (Appendix C1 of scoping report)	• The biggest climate change vulnerability of the project lies in the increased number of extremely hot days that could potentially occur. In this respect, it is recommended that the project owners engage with the turbine manufacturers to ensure the operability of the turbines under those conditions.	
Geotechnical (Appendix C2 of scoping report)	• Formal monitoring during construction should be undertaken on a weekly basis. Routine operational monitoring should form part of the standard operating procedures for each site. • Weekly monitoring should be undertaken during the decommissioning stage and thereafter at four monthly intervals until final sign-off.	
Agriculture (Appendix C3 of scoping report)	• Design and implement an effective system of stormwater run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion. This is included in the stormwater management plan. • Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	
Terrestrial Ecology (Appendix C4 of scoping report)	• Undertake a pre-construction walk through of the development footprint to refine the layout through micrositing of turbines, buildings, substation (and associated battery facility), access roads and internal roads where it impacts on SCC. • It is recommended that a Riverine Rabbit Monitoring Programme should be implemented at the site to evaluate the post-construction impact of the development on the Riverine Rabbit.	
Bats (Appendix C5 of scoping report)	• A minimum of 2 years of operational bat mortality monitoring should be conducted from the start of the operation of the facility. • Where needed, if indicated through operational monitoring, reducing blade movement at selected turbines and high-risk bat activity times/weather conditions. • Acoustic deterrents are developed well enough to be trialled and may be recommended during operational monitoring. • Each wind farm in a migration path should apply appropriate mitigation measures to ensure that each facility's bat mortalities are below a sustainable threshold. • At turbine bases (if applicable) and other infrastructure buildings, only use lights with low sensitivity motion sensors that switch off automatically when no persons are nearby, to prevent the creation of regular insect gathering pools. • Ensure the design does not allow for any entrance holes into any roof cavity.	
Avifauna (Appendix C6 of scoping report)	• A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the Environmental Authorisation process and the construction phase.	

DISCIPLINE	HOOGLAND 1 WIND FARM	HOOGLAND 2 WIND FARM
	• Monitoring of breeding status of Martial and Verreaux's Eagles should be conducted in all breeding seasons post acceptance of the project as preferred bidder prior to and during construction (to establish a baseline). • An adaptive management plan must be in place before operations, so that once operational, managements' response to any bird fatalities is clearly structured. • Blade painting and / or shutdown on demand (either observer or technology led) implemented to mitigate bird-turbine collision risk; alternatives identified by the specialist in the interim may also be applied. • Internal power lines must be placed underground except where absolutely necessary such as to cross drainage lines or get up steep/ extremely rocky slopes. • Where relevant, overhead conductors or earth wires should be fitted with an Eskom approved anti bird collision line marking device to make cables more visible to birds in flight and reduce the likelihood of collisions. The location of these will be determined through the final walkthrough. • The pole design currently proposed, i.e. monopole double circuit built to 88/132kV dimensions is significantly safer from an electrocution point of view than a standard 33kV structure that the Applicant could have opted to use but decided not to so as to reduce this potential impact. However, the safety should be improved by using a bird perch at the very top of the pole.	
Aquatic Ecology (Appendix C7 of scoping report)	• A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final layout. • Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use. Any erosion / sedimentation must be resolved through whatever additional interventions maybe necessary (i.e., extension, energy dissipaters, spreaders, etc). • All alien plants within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints and especially in areas near the proposed crossings. • Where large cut and fill areas are required these must be stabilised and rehabilitated during the construction process, to minimise erosion and sedimentation. • Where necessary, water use authorisations must be obtained for groundwater abstraction from new or existing boreholes. Quarterly groundwater monitoring should be implemented to ensure sustainable use that is within the authorised volumes; as well as for contamination.	
Visual (Appendix C8 of scoping report)	• Visually sensitive skylines, such as dolerite ridges, koppies, rock outcrops and slopes steeper than 1:4 or 1:10 gradient, avoided where possible in the layout design. • Where a choice exists between turbines to be dropped (when the final 60 turbine positions, or less, are selected), and all other factors are equal, priority should be given to dropping outlier turbines or those in the 'high' visual sensitivity areas including those within 1 km of the R381, and consideration given to removing turbines where widening of gaps improve the clustering effect. • If a CAA-approved warning system which only requires the red lights to come on when an aircraft is in the vicinity exists at the time of construction, then such a system must be used to reduce the night time impacts to the sense of place.	
Archaeology (Appendix C9 of scoping report)	• A pre-construction survey of the entire authorised footprint must be undertaken in order to determine whether any further archaeological sites may need mitigation or protection through micrositing (if possible). • If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.	
	• The road around the stone walls of the Slangfontein farm complex must be carefully considered and realigned as	• The archaeological site at waypoint 1703 that will be crossed by a proposed wind farm road must be excavated prior

DISCIPLINE	HOOGLAND 1 WIND FARM	HOOGLAND 2 WIND FARM
	required to ensure that no physical impacts to the walling will occur. • If the wind farm is approved and the final layout does not need all approved turbine locations to ensure a maximum of 60 turbines, then where a choice exists between turbines to be dropped, and all other factors are equal, priority should be given to dropping turbines in the high visual sensitivity areas and within 1 km of the R381, as well as turbines 75, 76 and 86 due to their proximity to the Slangfontein homestead which is a IIIA cultural landscape and turbine 82 which is in proximity to a IIIA LSA engraving.	to construction. Excavation should at least cover the area to be disturbed. • The cable trench past waypoint 113 may run through the historic farm complex but must be sure to avoid impacting any ruined structures or other features in the vicinity. • If the wind farm is approved and the final layout does not need all approved turbine locations to ensure a maximum of 60 turbines, then where a choice exists between turbines to be dropped, and all other factors are equal, priority should be given to dropping turbines in the high visual sensitivity areas and within 1 km of the R381.
Palaeontology (Appendix C10 of scoping report)	• The final layout must be evaluated by a palaeontologist to determine which areas, if any, need a pre-construction survey. These will be previously unsurveyed and potentially sensitive areas. An approved Work Plan from Heritage Western Cape will be required by the specialist palaeontologist responsible for mitigation work. • Chance Fossil Finds Protocol to be included within the EMPr and implemented in full during the construction phase.	
Noise (Appendix C11 of scoping report)	• There are at least two viable options to reduce the noise levels during operation and the implementation of one or both of these may be necessary: ○ The applicant uses a wind turbine with a sound power emission level less than 107 dBA (re 1 pW) (all WTGs closer than 1,000 m from NSRs 18 and 19); and/or, ○ Only locating a maximum of one unmitigated WTG within 1,000 m from NSR 18 and 19. • Once-off noise measurements are recommended at the location of NSR 12 before the construction phase start, to establish the existing ambient sound levels. Once the Wind Farms are operational, noise measurements should be repeated to assess the noise levels at these receptors.	• N/A
Shadow Flicker (Appendix C12 of scoping report)	• In the event of a complaint received, and an appropriate investigation confirms occurrence, then measures such as those outlined below will be explored with the residents or receptor owners to select the most suitable measures to prevent re-occurrence and protect residential amenity: ○ Control at Receptor: The provision of blinds, shutters or curtains to affected receptors; ○ Control on Pathway: for example, screening planting close to an affected receptor; and ○ Control at Source: for example, shutdown of turbines at times when effects occur as a last resort.	
Traffic (Appendix C13 of scoping report)	• The treacherous section of the gravel road, through the Molteno Pass on the TR05801, is to be upgraded by the developer to improve the safety of the road for all road users, including the personnel commuting to and from the site on a daily basis. This upgrade would need to be implemented prior to or during site establishment but before major earthworks commence on the development. • The access into Loxton from the TR016 (R63) is to be upgraded by the developer to accommodate the expected transportation requirements. This upgrade would need to be	

DISCIPLINE	HOOGLAND 1 WIND FARM	HOOGLAND 2 WIND FARM
	implemented to facilitate the delivery of abnormal loads to the proposed development. This is only applicable if this has not already been undertaken as part of the Nuweveld Wind Farm Project. • The route for construction vehicles from the TR016 (R63) to the TR05801 should not unduly impact the local community of Loxton and should avoid the commercial centre of Loxton. In this regard, unless a technical issue is identified once the final turbine and abnormal trucks specifications are known, the route from R63 is via Auret Street, onto Fraserburg Street, onto the TR05801. This is only applicable if this has not already been undertaken as part of the Nuweveld Wind Farm Project. • The developer shall ensure that the condition of the roads impacted by construction of the development is left in a similar or better state once the construction phase is complete. • The developer shall contribute to the maintenance of all roads affected by the development, during the construction and operational phases of the development. • A Traffic Management Plan (TMP) is required to outline specific traffic management measures across all phases of the development.	
Socio-economic / tourism (Appendix C14 of scoping report)	• Set targets for use of local labour, based on REIPPP thresholds and targets outlined in DMRE, 2021 (eg. RSA-based employees who are citizens and from local communities should make up at least 20% of the workforce). • Maximise the use of local sub-contractors where possible through tendering and procurement and ensure meeting the REI4P local content requirements • Ensure that employees are adequately prepared to cope with the challenges that come with being employed through the establishment of an employee induction programme • Close liaison with local municipal and other stakeholders involved in socio-economic development in order to ensure that any projects are integrated into wider strategies and plans with regard to socio-economic development. • The Project Owner and the contractors should develop a Code of Conduct for the project. • The Project Owner and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase.	

5.1 SUMMARY OF IMPACT ASSESSMENT

Table 5-2 provides a summary of the potential environmental impacts and their ratings that have been identified and assessed for each Wind Farm. Noting that the main differences in impact ratings between Hoogland 1 and Hoogland 2 are in relation to heritage, noise, shadow flicker. The findings will be re-evaluated during the EIA phase as input from various stakeholders are obtained during PPP; further monitoring results from birds, bats and ecology become available; along with any further refinements to the design and layout.

Table 5-2: Summary of potential impacts assessed pre- and post-mitigation for Hoogland 1 (HL01) and Hoogland 2 (HL02) Wind Farms

FIELD	PHASE	POTENTIAL IMPACT	HL01	HL02
			POST- MITIGATION	
Climate Change	All Phases	Climate change impacts (GHG emissions)	Very High +	
	Cumulative	Impact on Climate Change	Very High +	
	No-go alternative	The impact of the status quo prevailing	Neutral	
Geotechnical	Construction	Ground disturbance during construction	Medium -	
	Construction	Soil erosion during construction	Low -	
	Operational	Soil erosion during operational phase	Low -	
	Decommissioning	Ground disturbance during decommissioning	Medium -	
	Decommissioning	Soil erosion during decommissioning stage	Low -	
	Cumulative	Ground disturbance during construction	Low -	
	Cumulative	Soil erosion during construction	Low -	
	Cumulative	Soil erosion during operational phase	Low -	
	Cumulative	Ground disturbance during decommissioning	Low -	
	Cumulative	Soil erosion during decommissioning stage	Low -	
	No-go alternative	The impact of the status quo prevailing	Neutral	
Agriculture	Construction	Protection of soil resources	Very Low -	

FIELD	PHASE	POTENTIAL IMPACT	HL01	HL02
			POST- MITIGATION	
	Operational	Protection of soil resources	Very Low -	
	Operational	Increased financial security for farming operations	Very Low +	
	Decommissioning	Protection of soil resources	Very Low -	
	Cumulative	Protection of soil resources	Very Low -	
	No-Go Alternative	The impact of the status quo prevailing	Very Low -	
Terrestrial Ecology	Construction	Impact on vegetation and plant SCC due to construction-phase habitat loss.	Low -	
	Construction	Direct and indirect faunal impacts (noise, pollution and disturbance)	Low -	
	Construction	Impact on the Riverine Rabbit	Low -	
	Construction	Impact on the mammalian fauna of SCC	Low -	
	Construction	Impact on the Karoo Padloper	Low -	
	Construction	Impacts on Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)	Very Low -	
	Operational	Faunal impacts (Vehicle collision/disturbance/electrocutions/poaching)	Low -	
	Operational	Impact on the Riverine Rabbit	Low -	
	Operational	Impact on mammalian fauna of SCC	Low -	
	Operational	Increased soil erosion during operation	Very Low -	
	Decommissioning	Direct and indirect faunal impacts (noise, pollution and disturbance)	Low -	
	Decommissioning	Increased risk of soil erosion	Very Low -	
	Cumulative	Impact on vegetation and plant SCC due to construction-phase habitat loss	Low -	
	Cumulative	Direct and indirect faunal impacts	Low -	
	Cumulative	Construction phase impact on the Riverine Rabbit	Low -	
	Cumulative	Construction phase impact on the mammalian fauna of SCC	Low -	
	Cumulative	Construction phase impact on the Karoo Padloper	Low -	
	Cumulative	Impacts on Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)	Low -	
	Cumulative	Operational phase faunal impacts (Vehicle collision/disturbance/electrocutions/poaching)	Low -	
	Cumulative	Operational Phase impact on the Riverine Rabbit	Low -	
	Cumulative	Operational Phase impact on mammalian fauna of SCC	Low -	
	Cumulative	Increased soil erosion during operation	Low -	
	Cumulative	Faunal impacts due to decommissioning	Low -	
	Cumulative	Increased Soil erosion during decommissioning	Low -	
	No-go alternative	The impact of the status quo prevailing	Low -	
Bats	Construction	Loss of foraging habitat by clearing of vegetation	Very Low -	
	Construction	Roost destruction during earthworks	Insignificant	
	Operation	Bat mortalities during foraging	Low -	
	Operation	Bat mortalities during migration	Low -	
	Operation	Increased bat mortalities due to light attraction and habitat creation	Low -	
	Cumulative	Loss of foraging habitat by clearing of vegetation	Very Low -	
	Cumulative	Roost destruction during earthworks	Very Low -	
	Cumulative	Bat mortalities during foraging	Medium -	
	Cumulative	Bat mortalities during migration	Medium -	
	Cumulative	Increased bat mortalities due to light attraction and habitat creation	Medium -	
	No-go alternative	The impact of the status quo prevailing	Neutral.	
Avifauna	Construction	Habitat destruction	Medium -	
	Construction	Disturbance of birds	Low -	
	Operational	Disturbance of birds	Low -	
	Operational	Displacement of birds	Low -	
	Operational	Collision of birds with turbines	Medium -	
	Operation	Collision & electrocution of birds on overhead power lines	Low -	
	Decommissioning	Disturbance of birds	Low -	
	Cumulative	Habitat destruction	Medium -	
	Cumulative	Disturbance of birds during Construction	Low -	
	Cumulative	Disturbance of birds during operation	Low -	
	Cumulative	Displacement of birds	Low -	
	Cumulative	Direct mortality of birds through collision with turbines	Medium -	
	No-go alternative	The impact of the status quo prevailing	Neutral	
Aquatic	Construction	Damage or loss of riparian systems and disturbance of waterbodies	Very Low -	
	Construction	Impact on riparian and wetland systems through the possible increase in surface water runoff on form and function	Very Low -	
	Construction	Changes to hydrological regimes that could also lead to sedimentation and erosion	Very Low -	
	Construction	Potential impacts on localised surface water quality	Very Low -	
	Construction	Groundwater abstraction	Very Low -	
	Operational	Impact on riparian and wetland systems through the possible increase in surface water runoff on form and function	Very Low -	
	Operational	Changes to hydrological regimes that could also lead to sedimentation and erosion	Very Low -	
	Operational	Groundwater abstraction	Very Low -	
	Decommissioning	Damage or loss of riparian systems and disturbance of waterbodies	Very Low -	

FIELD	PHASE	POTENTIAL IMPACT	HL01	HL02
			POST- MITIGATION	
	Decommissioning	Impact on riparian and wetland systems through the possible increase in surface water runoff on form and function	Very Low -	Low -
	Decommissioning	Potential impacts on localised surface water quality	Very Low -	
	Cumulative	Damage or loss of riparian systems and disturbance of waterbodies	Very Low -	
	Cumulative	Impact on riparian and wetland systems through the possible increase in surface water runoff on form and function	Low -	
	Cumulative	Changes to hydrological regimes that could also lead to sedimentation and erosion	Low -	
	Cumulative	Potential impacts on localised surface water quality	Very Low -	
	Cumulative	Groundwater abstraction	Very Low -	
	No-Go Alternative	The impact of the status quo prevailing	Very Low -	
Visual	Construction	Visual intrusion of construction activities on the Karoo landscape	Medium -	
	Operational	Visual intrusion of wind turbines on the Karoo landscape	High -	
	Operational	Visual intrusion of infrastructure on the Karoo landscape	Medium -	
	Operational	Visual intrusion of lighting at night	Medium -	
	Operational	Visual impact of the N1 Bypass road on the Karoo National Park, Beaufort West town and the gold course	Medium -	
	Decommissioning	Visual intrusion of activities to remove infrastructure.	Medium -	
	Cumulative	Cumulative visual intrusion of wind turbines on the Karoo landscape.	High -	
	No-Go alternative	The impact of the status quo prevailing	Neutral	
Heritage	Construction	Impacts to archaeological resources	Very Low -	
	Construction	Damage to or destruction of built heritage resources	Insignificant	N/A
	Construction	Impacts to the cultural landscape	Medium -	
	Operation	Impacts to the cultural landscape	Medium -	
	Decommissioning	Impacts to the cultural landscape	Medium -	
	Cumulative	Impacts to archaeological resources during construction	Very Low -	
	Cumulative	Damage to or destruction of built heritage resources	Very Low -	N/A
	Cumulative	Operational phase impacts to the cultural landscape	Medium -	
	Cumulative	Decommissioning phase impacts to the cultural landscape	Medium -	
	No-Go alternative	The impact of the status quo prevailing	Neutral	
Palaeontology	Construction	Loss or degradation of local palaeontological heritage resources of scientific and / or conservation value	Very Low -	
	Cumulative	Loss or degradation of local palaeontological heritage resources of scientific and / or conservation value	Low -	
	No-Go alternative	The impact of the status quo prevailing	Neutral	
Noise	Construction	Daytime Wind Turbine construction activities	Insignificant	
	Construction	Night-time Wind Turbine construction activities	Very Low -	Insignificant
	Construction	Daytime road construction activities	Insignificant	Very Low -
	Construction	Daytime road traffic from construction vehicles	Insignificant	
	Operation	Daytime Wind Turbine operation raising ambient sound levels (NSR18 only for HL01; NSR19 only for HL02)	Very Low -	
	Operation	Night time Wind Turbine operation raising ambient sound levels (NSR18 only for HL01; NSR19 only for HL02)	Very Low -	
	Cumulative	Daytime Wind Turbine construction activities	Insignificant	
	Cumulative	Night-time Wind Turbine construction activities	Very Low -	Insignificant
	Cumulative	Daytime road construction activities	Insignificant	Very Low -
	Cumulative	Daytime road traffic from construction vehicles	Insignificant	
	Cumulative	Daytime Wind Turbine operation raising ambient sound levels (at NSR18 and NSR19 only)	Very Low -	
	Cumulative	Night time Wind Turbine operation raising ambient sound levels (at NSR 18 and NSR19 only)	Very low –	
	No-Go alternative	The impact of the status quo prevailing	Neutral	
Shadow flicker	Operation	Shadow Flicker effects on identified receptors	Insignificant	
	Cumulative	Shadow Flicker effects on identified receptors	Insignificant	
	No-Go alternative	The impact of the status quo prevailing	Insignificant	
Traffic	Construction	Increased Road Incidents	Low -	
	Construction	Road Degradation	Low -	
	Construction	Dust	Low -	
	Construction	Intersection Safety	Medium -	
	Operation	Intersection Safety	Medium -	
	Cumulative	Increased Road Incidents	Low -	
	Cumulative	Road Degradation	Low -	
	Cumulative	Dust	Low -	
	Cumulative	Intersection Safety during construction	Medium -	
	Cumulative	Intersection Safety during operation	Medium -	
	No-Go alternative	The impact of the status quo prevailing	Neutral	
	Construction	Impacts from expenditure on the construction of the project	Medium +	

FIELD	PHASE	POTENTIAL IMPACT	HL01	HL02
			POST- MITIGATION	
Socio-economic	Construction	Impacts on tourism	Low -	
	Construction	Impacts associated primarily with the influx of people	Low -	
	Construction	Impacts on surrounding landowners and communities	Low -	
	Construction	Impacts on property value	Low -	
	Operation	Impacts from expenditure on the construction of the project	High +	
	Operation	Impacts associated with the funding of socio-economic development, enterprise development and shareholding	High +	
	Operation	Impacts associated primarily with the influx of people	Low -	
	Operation	Impacts on tourism	Medium -	
	Operation	Impacts on surrounding landowners and communities	Low -	
	Operation	Impacts on property value	Low -	
	Decommissioning	Impacts from expenditure on decommissioning of the project	Medium +	
	Decommissioning	Impacts associated primarily with the influx of people	Low -	
	Decommissioning	Impacts on tourism	Low -	
	Decommissioning	Impacts on surrounding landowners and communities	Low -	
	Decommissioning	Impacts on property value	Low -	
	Cumulative	Impacts from expenditure on construction of the project - construction	High +	
	Cumulative	Impacts associated primarily with the influx of people - construction	Low -	
	Cumulative	Impacts on tourism - construction	Medium -	
	Cumulative	Impacts on surrounding landowners and communities - construction	Low -	
	Cumulative	Impacts on property value - construction	Low -	
	Cumulative	Impacts from expenditure on operation of the project - operation	High +	
	Cumulative	Impacts associated with the funding of socio-economic development, enterprise development and shareholding - operation	Very High +	
	Cumulative	Impacts associated primarily with the influx of people - operation	Low -	
	Cumulative	Impacts on tourism - operation	Medium -	
	Cumulative	Impacts on surrounding landowners and communities- operation	Low -	
	Cumulative	Impacts on property value - operation	Low -	
	Cumulative	Impacts from expenditure on decommissioning of the project	High +	
	Cumulative	Impacts associated primarily with the influx of people - decommissioning	Low -	
	Cumulative	Impacts on tourism - decommissioning	Medium -	
	Cumulative	Impacts on surrounding landowners and communities - decommissioning	Low -	
	Cumulative	Impacts on property value - decommissioning	Low -	
	No-Go alternative	The impact of the status quo prevailing	Neutral	

6. PROPOSED WAY FORWARD

Following the Draft Scoping public comment period (18 March to 22 April 2022), the Final Scoping Report will be updated where necessary. The Public Participation Report will be updated and included in the Final Scoping Report for submission to the DFFE. Thereafter, the DFFE will issue a response on the Final Scoping Report and indicate whether or not the project can proceed to the EIA Phase.

CONTACT US:

For further information and to register as an I&AP, in writing, please contact **Mrs Liandra Scott-Shaw** of **SLR Consulting** (contact details below), together with your own full contact details and any comments or concerns.

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Note: If using post, please also contact SLR telephonically to notify us of your submission