

## **SCOPING REPORT:**

Specialist terrestrial fauna study on the potential impacts of the proposed Project Blue Wind Energy Facility near Kleinsee, Northern Cape

Prepared by

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**SCOPING REPORT: 2nd Draft**



**David Hoare Consulting cc**

**Biodiversity Assessments, Vegetation Description /  
Mapping, Species Surveys**

## **REGULATIONS GOVERNING THIS REPORT**

This report has been prepared in terms the EIA Regulations promulgated under the *National Environmental Management Act* No. 107 of 1998 (NEMA) and is compliant with Regulation 385 Section 33 - Specialist reports and reports on specialized processes under the Act. Relevant clauses of the above regulation are quoted below and reflect the required information in the "Control sheet for specialist report" given above.

Regulation 33. (1): An applicant or the EAP managing an application may appoint a person who is independent to carry out a specialist study or specialized process.

Regulation 33. (2): A specialist report or a report on a specialized process prepared in terms of these Regulations must contain:

- (a) details of (i) the person who prepared the report, and  
(ii) the expertise of that person to carry out the specialist study or specialized process;
- (b) declaration that the person is independent in a form as may be specified by the competent authority;
- (c) indication of the scope of, and the purpose for which, the report was prepared;
- (d) description of the methodology adopted in preparing the report or carrying out the specialized process;
- (e) description of any assumptions made and any uncertainties or gaps in knowledge;
- (f) description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment;
- (g) recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority;
- (h) description of any consultation process that was undertaken during the course of carrying out the study;
- (i) summary and copies of any comments that were received during any consultation process;
- (j) any other information requested by the competent authority.

### **Appointment of specialist**

David Hoare of David Hoare Consulting cc was commissioned by Savannah Environmental (Pty) Ltd to provide specialist consulting services for the Environmental Impact Assessment for the proposed Project Blue Wind Energy Facility near Kleinsee on the West Coast in the Northern Cape Province. The consulting services comprise an assessment of potential impacts on the terrestrial fauna in the study area by the proposed project.

### **Details of specialist**

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## **Summary of expertise**

Dr David Hoare:

- Registered professional member of The South African Council for Natural Scientific Professions (Ecological Science, Botanical Science), registration number 400221/05.
- Founded David Hoare Consulting cc, an independent consultancy, in 2001.
- Ecological consultant since 1995.
- Conducted, or co-conducted, over 300 specialist ecological surveys as an ecological consultant.
- Published six technical scientific reports, 15 scientific conference presentations, seven book chapters and eight refereed scientific papers.
- Attended 15 national and international congresses & 5 expert workshops, lectured vegetation science / ecology at 2 universities and referee for 2 international journals.

## **Independence**

David Hoare Consulting cc and its Directors have no connection with WWK Development (Pty) Ltd. David Hoare Consulting cc is not a subsidiary, legally or financially, of the proponent. Remuneration for services by the proponent in relation to this project is not linked to approval by decision-making authorities responsible for authorising this proposed project and the consultancy has no interest in secondary or downstream developments as a result of the authorisation of this project. David Hoare is an independent consultant to Savannah Environmental (Pty) Ltd and has no business, financial, personal or other interest in the activity, application or appeal in respect of which he was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of this specialist performing such work.

## **Scope and purpose of report**

The scope and purpose of the report are reflected in the "Terms of reference" section of this report.

## **Conditions relating to this report**

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. David Hoare Consulting cc and its staff reserve the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

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## INTRODUCTION

### Terms of reference and approach

Savannah Environmental (Pty) Ltd. was appointed by WWK Development (Pty) Ltd to undertake an application for environmental authorisation through an Environmental Impact Assessment (EIA) for the proposed "Project Blue Wind Energy Facility". The project involves the establishment of a commercial wind energy facility and associated infrastructure. The purpose of the EIA is to identify environmental impacts associated with the project.

On 19 July 2011 David Hoare Consulting cc was appointed by Savannah Environmental (Pty) Ltd to undertake a terrestrial fauna assessment of the study area. The specific terms of reference for the scoping study include:

- to provide a description of the environment that may be affected by the activity and the manner in which the environment may be affected by the proposed project;
- to provide a description and evaluation of potential environmental issues and potential impacts (including direct, indirect and cumulative impacts) that have been identified;
- Direct, indirect and cumulative impacts of the identified issues must be evaluated within the Scoping Report in terms of the following criteria:
  - the **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected;
  - the **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international;
- a statement regarding the potential significance of the identified issues based on the evaluation of the issue/impacts;
- A statement regarding the desk-top evaluation of full site, with high-level identification of potential areas of sensitivity (for input into a sensitivity map)
- identification of potentially significant impacts to be assessed within the EIA phase;
- to provide recommendations regarding the methodology to be adopted in assessing potentially significant impacts in the EIA phase (sufficiently detailed to be included within the Plan of Study for EIA and must include a description of the proposed method of assessing the potential environmental impacts associated with the project).

This report provides details of the results of the Scoping phase. The findings of the study are based on a desktop assessment of the study area.

### Study area

At a regional level the study area falls within the Northern Cape Province to the north of the town of Kleinsee. A more detailed description of the study area is provided in a section below.

## **METHODOLOGY**

The assessment is to be undertaken in two phases, a Scoping phase and an Environmental Impact Assessment phase. The objective of the Scoping phase was to review fauna patterns within the study area to identify any sensitive areas to be avoided during development. It was therefore necessary to provide checklists of sensitive species that could potentially occur in the study area. For potential species, only those of high conservation concern are provided. It was also intended to provide a draft habitat map of the study area based on available maps and database information. The results of the Scoping phase study are provided in this report.

### **Assessment philosophy**

Many parts of South Africa contain high levels of biodiversity at species and ecosystem level. At any single site there may be large numbers of species or high ecological complexity. Sites also vary in their natural character and uniqueness and the level to which they have been previously disturbed. Assessing the potential impacts of a proposed development often requires evaluating the conservation value of a site relative to other natural areas and relative to the national importance of the site in terms of biodiversity conservation. A simple approach to evaluating the relative importance of a site includes assessing the following:

- Is the site unique in terms of natural or biodiversity features?
- Is the protection of biodiversity features on the site of national/provincial importance?
- Would development of the site lead to contravention of any international, national or provincial legislation, policy, convention or regulation?

Thus, the general approach adopted for this type of study is to identify any critical biodiversity issues that may lead to the decision that the proposed project cannot take place, i.e. to specifically focus on red flags and/or potential fatal flaws. Biodiversity issues are assessed by documenting whether any important biodiversity features occur on site, including species, ecosystems or processes that maintain ecosystems and/or species.

It is not the intention to provide comprehensive lists of all species that occur on site, since most of the species on these lists are usually common or widespread species. Rare, threatened, protected and conservation-worthy species and habitats are considered to be the highest priority, the presence of which are most likely to result in significant negative impacts on the ecological environment. The focus on national and provincial priorities and critical biodiversity issues is in line with National legislation protecting environmental and biodiversity resources, including, but not limited to the following which ensure protection of ecological processes, natural systems and natural beauty as well as the preservation of biotic diversity in the natural environment:

1. Environment Conservation Act (Act 73 of 1989)
2. National Environmental Management Act, 1998 (NEMA) (Act 107 of 1998)
3. National Environmental Management Biodiversity Act, 2004. (Act 10 Of 2004)

### **Animal species of concern**

The purpose of listing Red List animal species is to provide information on the potential occurrence of species of special concern in the study area that may be affected by the proposed infrastructure. Species appearing on these lists can then be assessed in terms of their habitat requirements in order to determine whether any of them have a likelihood of occurring in habitats that may be affected by the proposed infrastructure.

Lists were compiled specifically for any species of conservation concern previously recorded in the area and any other species with potential conservation value.

Provincial and National legislation was evaluated in order to provide lists of any animal species that have protected status. The most important legislation is the following: *National Environmental Management: Biodiversity Act (Act No 10 of 2004)*.

Lists of threatened animal species that have a geographical range that includes the study area were obtained from literature sources (for example, Alexander & Marais 2007, Branch 1988, 2001, du Preez & Carruthers 2009, Friedmann & Daly 2004, Mills & Hes 1997). The likelihood of any of them occurring was evaluated on the basis of habitat preference and habitats available at each of the proposed sites. The three parameters used to assess the probability of occurrence for each species were as follows:

- *Habitat requirements*: most Red Data animals have very specific habitat requirements and the presence of these habitat characteristics within the study area were assessed;
- *Habitat status*: in the event that available habitat is considered suitable for these species, the status or ecological condition was assessed. Often, a high level of degradation of a specific habitat type will negate the potential presence of Red Data species (especially wetland-related habitats where water-quality plays a major role); and
- *Habitat linkage*: movement between areas used for breeding and feeding purposes forms an essential part of ecological existence of many species. The connectivity of the study area to these surrounding habitats and adequacy of these linkages are assessed for the ecological functioning Red Data species within the study area.

For all threatened or protected organisms that occur in the general geographical area of the site, a rating of the likelihood of it occurring on site is given as follows:

- LOW: no suitable habitats occur on site / habitats on site do not match habitat description for species;
- MEDIUM: habitats on site match general habitat description for species (e.g. fynbos), but detailed microhabitat requirements (e.g. mountain fynbos on shallow soils overlying Table Mountain sandstone) are absent on the site or are unknown from the descriptions given in the literature or from the authorities;
- HIGH: habitats found on site match very strongly the general and microhabitat description for the species (e.g. mountain fynbos on shallow soils overlying Table Mountain sandstone);
- DEFINITE: species found in habitats on site.

### **Limitations and exclusions**

- Red List species are, by their nature, usually very rare and difficult to locate. Compiling the list of species that could potentially occur in an area is limited by the paucity of collection records that make it difficult to predict whether a species may occur in an area or not. The methodology used in this assessment is designed to reduce the risks of omitting any species, but it is always possible that a species that does not occur on a list may be unexpectedly located in an area.
- This scoping study was based on a desktop assessment only.
- This study excludes avifauna, which is undertaken in separate specialist studies.

## DESCRIPTION OF STUDY AREA

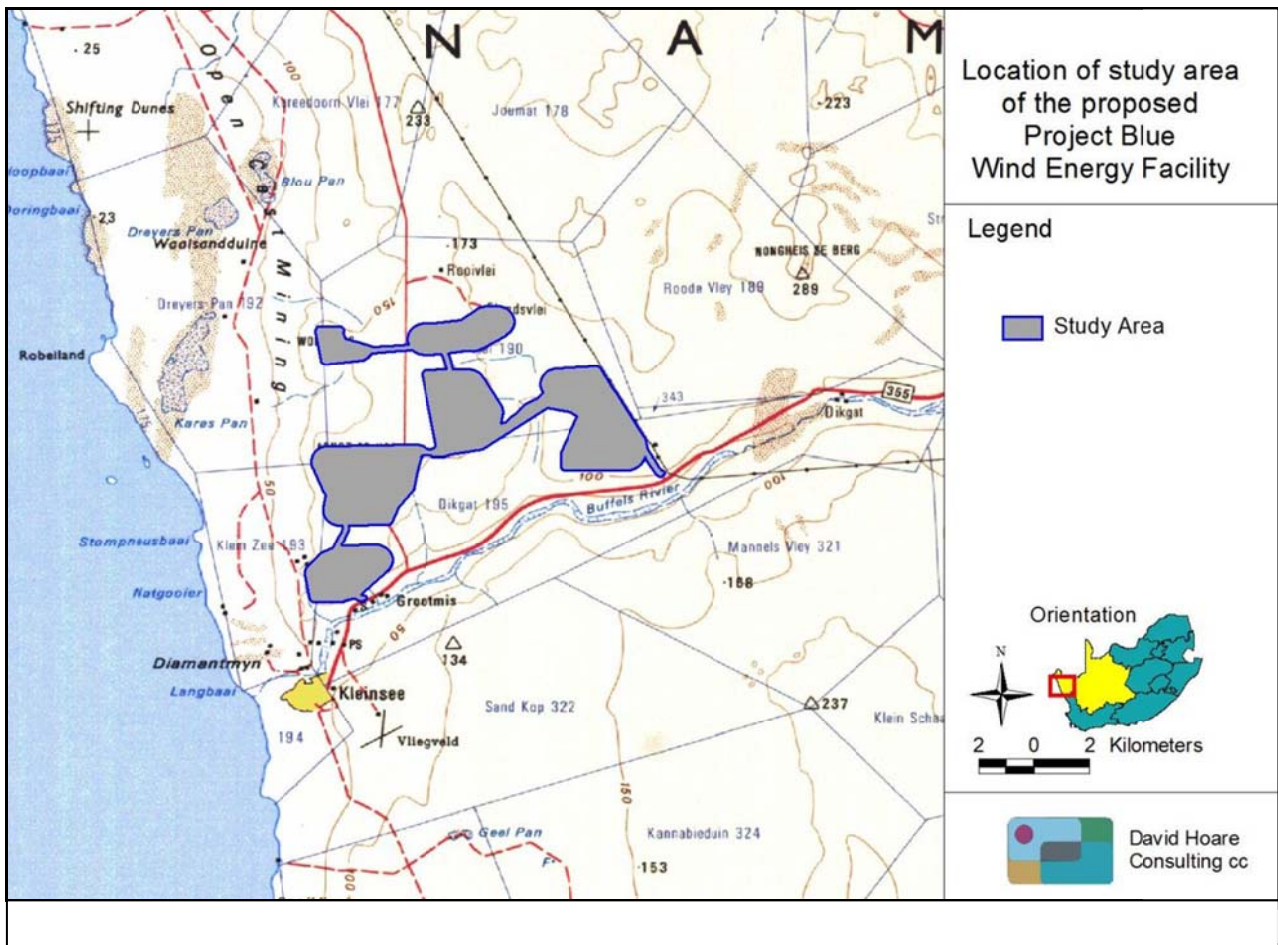
### Location and site conditions

The study site is situated approximately 2.5 – 12.5 km north of the town of Kleinsee within the Northern Cape (Figure 1). The site falls within the quarter degree grid 2917CA. It is situated along the West Coast of South Africa within 3 - 15 km of the coastline. The proposed facility would occur on the following farm portions:

- Klein Zee Re/193;
- Predikant Vlei 1/190;
- Predikant Vlei 3/190;
- Predikant Vlei 4/190;
- Dikgat 2/195;
- Dikgat 4/195;
- Dikgat 5/195;
- Dikgat 7/195;
- Dikgat 9/195;
- Dreyers Pan Re/192

No alternative site is currently being considered for the proposed facility. De Beers allocated this land to WWK Developments for the development of a WEF.

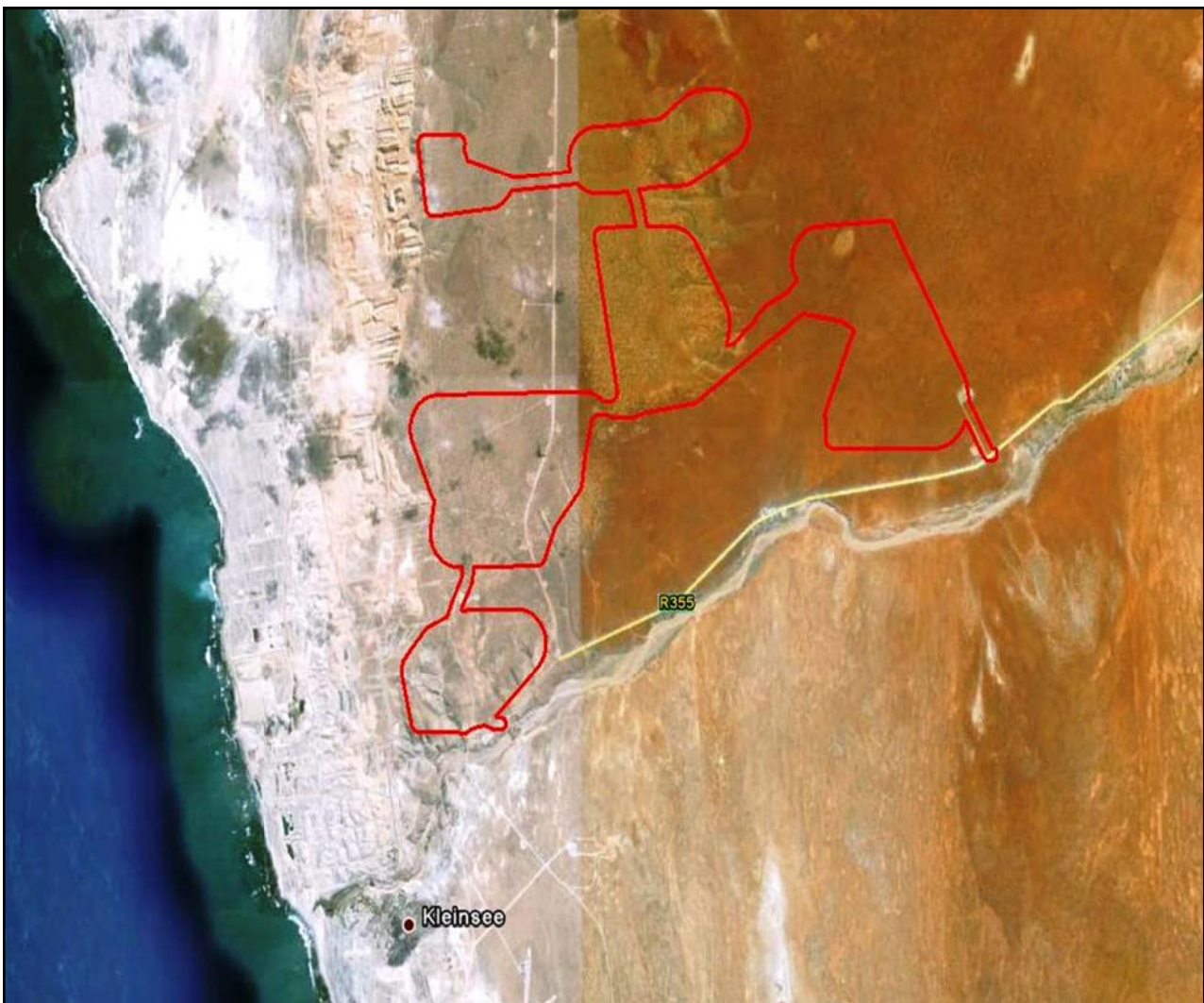
The study area is accessible from Upington via the N14, which runs from Upington to Kleinsee, and from Cape Town via the N7. The R355 from Kleinsee to Springbok runs past the southern part of the site.



The study site is situated in an area with relatively gentle topography. The general slope in this area is from east to west down towards the coastline. On the site itself, there is a slight rise in the central part of the site, before falling again towards the sea. The elevation on site varies from 25 to 220 m above sea level. The Buffels Rivier runs past the southern part of the site and there are some drainage lines that protrude into the southern part of the site from this river valley.

Detailed soil information is not available for broad areas of the country. As a surrogate, landtype data was used to provide a general description of soils in the study area (landtypes are areas with largely uniform soils, topography and climate). The entire site falls within a single landtype, the Af landtype (Land Type Survey Staff, 1987).

The A-group of land types refer to yellow and red soils without water tables belonging to one or more of the following soil forms: Inanda, Kranskop, Magwa, Hutton, Griffin, Clovelly. These are red-yellow apedal, freely drained soils. The Af landtype consists of red, high base status soils that are greater than 300 mm deep, with dunes (MacVicar et al. 1974). The major soils



on site are expected to be quaternary, Aeolian, red deep fine sands forming mobile as well as stabilized coastal dunes.

The climate is arid. Rainfall occurs from May to August. Mean annual rainfall is 100 mm to 120 mm per year. All areas with less than 400 mm rainfall are considered to be arid. The study area can therefore be considered to be very arid. Winter dew is common and moisture is also supplemented by fog rolling in from the sea.

The vegetation of the site is Namaqualand Strandveld. Namaqualand Strandveld is found on more stable substrates of quaternary stabilized Aeolian, deep red or yellowish-red stable dunes and deep sands. The vegetation is a well-developed coastal shrubland containing a high proportion of succulent shrub species.

A landcover map of the study area (Fairbanks *et al.* 2000) indicates that the entire site is natural and consist of "shrubland and low fynbos". The 1:50 000 topocadastral map of the site shows some roads on site, otherwise no major infrastructure. A Google image of the site (Figure 2) shows natural vegetation across the entire site, with mining activities off-site on the western side.

### **Red List animal species of the study area**

All threatened (CR, EN or VU) or near threatened vertebrate animals (mammals, reptiles, amphibians) that could occur in the study area are listed in Appendix 2. Those vertebrate species with a geographical distribution that includes the study area, and habitat preference that includes habitats available in the study area are discussed further. Birds are covered in a separate specialist study and are not reported on here.

There is one threatened mammal species that has a geographical distribution that includes the site and habitat requirements which are met by those found on site. This is Grant's Golden Mole listed nationally as Vulnerable. The species is listed globally as Least Concern, but this includes another subspecies that is common in Namibia. The national listing is therefore considered valid for the subspecies that occurs only in South Africa. It is found in Strandveld Succulent Karoo in subterranean habitats in shifting sands. A map of the overall distribution of this subspecies in South Africa is shown in Figure 3. Based on the distribution and habitat requirements of this species, there is a high probability that it could occur on site (see Appendix 1 and Methodology).

There are two additional mammal species of lower conservation concern that could occur in available habitats in the study area. This includes the Namaqua Dune Mole-rat and Littledale's Whistling Rat, both listed nationally as Near Threatened (NT) and globally as Least Concern.

There is one threatened bat species that could potentially occur in the area that includes the site. This is the Angolan Wind-gland Bat, listed as Vulnerable in South Africa and Near Threatened across its global range. This species is endemic to the west coast of southern Africa and is restricted to the arid western parts, typically in desert and semi-desert conditions. It has been netted in riverine vegetation along dry river beds and may therefore prefer to forage in these areas. Due to the fact that its geographical distribution includes the site, there is a moderate probability that it could occur on site. Little information is known on its roosting requirements, but it has been previously recorded from a church steeple, so it may roost in buildings.

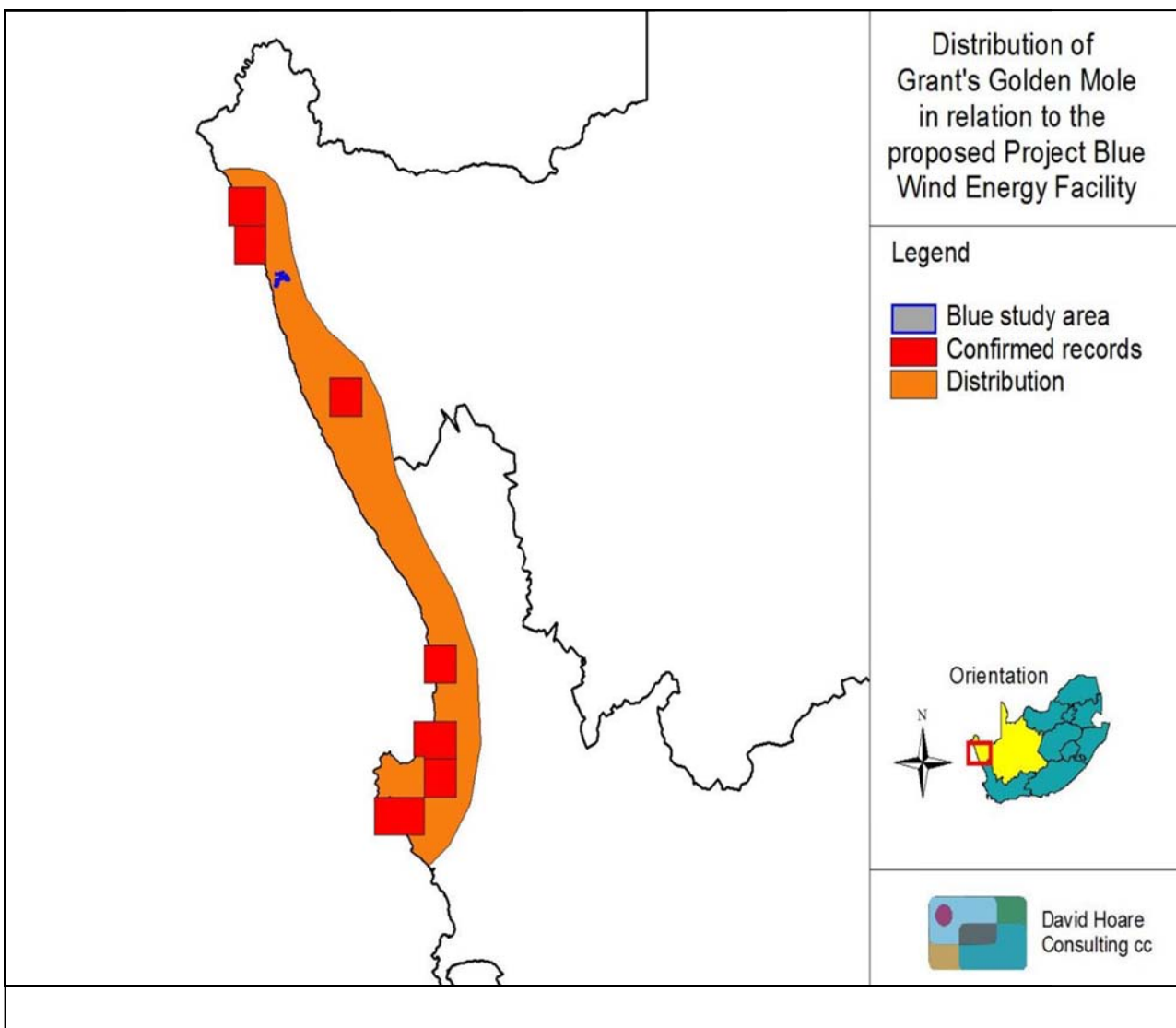
There is one threatened amphibian species that has a geographical distribution that includes the site and habitat requirements which are met by those found on site. This is the Desert Rain Frog, listed as Vulnerable. This species is found from the highwater mark up to 10 km inland along the Namaqualand coast (from Namibia to near Hondeklipbaai). This distribution

coincides primarily with Namaqualand Coastal Duneveld and Richtersveld Coastal Duneveld vegetation types, which is the dominant vegetation type found on the coastward side of the site and not on the site itself. There is therefore a moderate probability that it occurs on site. The Desert Rain Frog is threatened by diamond mining on the west coast.

There are two threatened or near threatened reptile species that have a distribution that includes the study area and habitat requirements which are met by those found on site. These are the Namaqua Dwarf Adder, listed as Vulnerable, and the Namaqua Plated Lizard, listed as Near Threatened. Based on the distribution and habitat requirements of these species, there is a high probability that they could occur on site (see Appendix 1 and Methodology). The Namaqua Dwarf Adder prefers semi-stable vegetated coastal sand dunes from Little Namaqualand (near Koingnaas) to Lüderitz. It is threatened by alluvial diamond mining. The Namaqua Plated Lizard is found in dry sandy areas and bare rocky hillsides.

In summary, the following threatened or near threatened animal species could potentially occur on site and may therefore be of concern for development of the site:

1. Grant's Golden Mole (VU),
2. Desert Rain Frog (VU),
3. Namaqua Dwarf Adder (VU),
4. Angolan Wing-gland Bat (VU),



5. Namaqua Plated Lizard (NT),
6. Littledale's Whistling Rat (NT),
7. Namaqua Dune Mole-rat (NT).

## **Protected animals**

There are a number of animal species protected under the Northern Cape Nature Conservation Act of 2009 (Act 9 of 2009). These are listed in Appendix 6. According to the Northern Cape Nature Conservation Act, "*No person shall without a permit hunt, import, export, transport, keep, possess, breed or trade in a specimen of a (specially) protected animal*". The Act does not imply that habitat for these species should be regarded as sensitive and appears to be primarily concerned with protecting individual animals from hunting or trading. No permit requirements are contained in the Act for cases where such individuals may occur on land for which an application for development is being considered (as in the current case).

Those species protected according to the Northern Cape Nature Conservation Act of 2009 (Act 9 of 2009) that have a geographical distribution that includes the site and that may, therefore, occur on site are listed in Appendix 5, marked with the letter "P". A large proportion of the species (except for the most common) are protected according to the Northern Cape Nature Conservation Act of 2009 (Act 9 of 2009).

There are a number of animal species protected according to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004). According to this Act, "*a person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7*". Such activities include any that are "*of a nature that may negatively impact on the survival of a listed threatened or protected species*". This implies that any negative impacts on habitats in which populations of protected species occur or are dependent upon would be restricted according to this Act.

Those species protected according to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) that have a geographical distribution that includes the site are listed in Appendix 5, marked with the letter "N".

Nationally protected species that have a geographical distribution that includes the study area includes the following: Black-footed Cat, Leopard, Cape Fox, Namaqua Dwarf Adder and Armadillo Girdled Lizard. The first three of these species are mobile animals that are likely to move away in the event of any activities on site disturbing them. They are therefore unlikely to be affected by the proposed development of the wind farm. The Namaqua Dwarf Adder and the Armadillo Girdled Lizard are less mobile and could potentially be negatively affected by construction activities on site. According to habitat information, the Armadillo Girdled Lizard was considered to be unlikely to occur on site even though its geographical distribution includes the site. In summary, the following animal species protected by National legislation (National Environmental Management: Biodiversity Act) could potentially occur on site and may therefore be of concern for development of the study area:

1. Namaqua Dwarf Adder (VU).

## RELEVANT LEGISLATIVE AND PERMIT REQUIREMENTS

Relevant legislation is provided in this section to provide a description of the key legal considerations of importance to the proposed project. The applicable legislation is listed below.

### Legislation

#### ***National Environmental Management Act, Act No. 107 of 1998 (NEMA)***

NEMA requires, inter alia, that:

- "development must be socially, environmentally, and economically sustainable",
- "disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied." ,
- "a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions",

NEMA states that "the environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage."

#### ***Environment Conservation Act No 73 of 1989 Amendment Notice No R1183 of 1997***

The ECA states that:

Development must be environmentally, socially and economically sustainable. Sustainable development requires the consideration of inter alia the following factors:

- that pollution and degradation of the environment is avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;
- that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised; and
- that negative impacts on the environment and on peoples' environmental rights be anticipated and prevented, and where they cannot be altogether prevented are minimised and remedied.

The developer is required to undertake Environmental Impact Assessments (EIA) for all projects listed as a Schedule 1 activity in the EIA regulations in order to control activities which might have a detrimental effect on the environment. Such activities will only be permitted with written authorisation from a competent authority.

#### ***National Environmental Management: Biodiversity Act (Act No 10 of 2004)***

In terms of the Biodiversity Act, the developer has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations).
- Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all development within the area are in line with ecological sustainable development and protection of biodiversity.
- Limit further loss of biodiversity and conserve endangered ecosystems.

Chapter 4 of the Act relates to threatened or protected ecosystems or species. According to Section 57 of the Act, "Restricted activities involving listed threatened or protected species":

- (1) A person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7.

Such activities include any that are “of a nature that may negatively impact on the survival of a listed threatened or protected species”.

Chapter 5 of the Act relates to species and organisms posing a potential threat to biodiversity. According to Section 75 of the Act, "Control and eradication of listed invasive species":

- (1) Control and eradication of a listed invasive species must be carried out by means of methods that are appropriate for the species concerned and the environment in which it occurs.
- (2) Any action taken to control and eradicate a listed invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.
- (3) The methods employed to control and eradicate a listed invasive species must also be directed at the offspring, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.

***GNR 151: Critically Endangered, Endangered, Vulnerable and Protected Species List***

Published under Section 56(1) of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).

***GNR 1187: Amendment of Critically Endangered, Endangered, Vulnerable and Protected Species List***

Published under Section 56(1) of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).

***Northern Cape Nature Conservation Act, No. 9 of 2009***

This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following may apply to the current project:

- No person may hunt, import, export, transport, keep, possess, breed or trade in a specimen of a protected animal.
- Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property;
- Aquatic habitats may not be destroyed or damaged;
- The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species.

The Act provides lists of protected species for the Province.

***Other Acts***

Other Acts that may apply to biodiversity issues, but which are considered to not apply to the current site are as follows:

- Integrated Coastal Zone Management Act (Act No. 24 of 2008)
- National Environmental Management Protected Areas Act (Act No. 57 of 2003)
- Marine Living Resources Act (Act No. 18 of 1998)
- Sea Birds and Seals Protection Act (Act No. 46 of 1973)
- Mountain Catchment Areas Act (Act No. 63 of 1970)
- Lake Areas Development Act (Act No. 39 of 1975)

## IDENTIFICATION OF RISKS AND DESCRIPTION OF POTENTIAL IMPACTS

Potential issues relevant to potential impacts on the ecology of the study area include the following:

- Impacts on biodiversity: this includes any impacts on populations of individual species of concern, including protected species, on overall species richness and on habitats of species of concern. This includes impacts on genetic variability, population dynamics, overall species existence or health and on habitats important for species of concern.
- Secondary and cumulative impacts on ecology: this includes an assessment of the impacts of the proposed project taken in combination with the impacts of other known projects for the area or secondary impacts that may arise from changes in the social, economic or ecological environment.

A number of direct risks to ecosystems that would result from **construction** of the proposed wind energy facility are as follows:

- Excavation of foundations
- Clearing of land for construction.
- Construction of access roads.
- Placement of power lines, cables and water pipelines (if applicable).
- Establishment of borrow and spoil areas.
- Chemical contamination of the soil by construction vehicles and machinery.
- Operation of construction camps.
- Storage of materials required for construction.

There are also risks associated with **operation** of the proposed facility, as follows:

- Maintenance of surrounding vegetation as part of management of the facility.
- Collision impacts of bats with turbine blades.

### Description of potential impacts

#### ***Impact 1: Loss of habitat for threatened/protected terrestrial fauna***

Nature: Construction of infrastructure will lead to direct loss of vegetation. This will lead to localised or more extensive reduction in the overall extent of habitat for species of concern. Consequences of the potential impact of loss of habitat occurring may include:

1. general loss of habitat for sensitive species;
2. disturbance to processes maintaining biodiversity and ecosystem goods and services.

The following animal species of conservation concern could potentially occur on site and may therefore be of concern for development of the study area:

1. Grant's Golden Mole (VU),
2. Desert Rain Frog (VU),
3. Namaqua Dwarf Adder (VU),
4. Namaqua Plated Lizard (NT),
5. Littledale's Whistling Rat (NT),
6. Namaqua Dune Mole-rat (NT).

Potential significance: The impact will probably be of permanent duration, at a local scale, potentially of moderate magnitude and, given the high likelihood of species occurring on site, highly probable. The potential significance is therefore moderate.

***Impact 2: Fragmentation of habitat for threatened/protected terrestrial fauna***

Nature: Construction of infrastructure will lead to direct loss of vegetation, which may result in direct fragmentation of habitat for some species, especially those restricted to a band along the coast. This will lead to extensive reduction in the overall extent of habitat for species of concern. Consequences of the potential impact of loss of habitat occurring may include:

1. increased fragmentation of habitat and thus populations of species of concern (depending on location of impact);
2. disturbance to processes maintaining biodiversity.
3. reduction in area of occupancy of affected species; and
4. loss of genetic variation within affected species.

The following animal species of conservation concern could potentially occur on site and may therefore be of concern for development of the study area:

1. Grant's Golden Mole (VU),
2. Desert Rain Frog (VU),
3. Namaqua Dwarf Adder (VU),
4. Namaqua Plated Lizard (NT),
5. Litledale's Whistling Rat (NT),
6. Namaqua Dune Mole-rat (NT).

Potential significance: The impact will probably be of permanent duration, at a regional scale, potentially of moderate magnitude and, given the known distribution of species occurring on site and known impacts of wind energy facilities, highly probable. The potential significance is therefore medium/high. Of specific concern is the impact on the Desert Rain Frog. The site is almost as wide as the total coast to inland distribution of the species. There is therefore a high possibility that development of the site could cause regional fragmentation of the habitat of this species.

***Impact 3: Loss of individuals of threatened/protected terrestrial fauna***

Nature: Threatened species include those classified as critically endangered, endangered or vulnerable. For any other species a loss of individuals or localised populations is unlikely to lead to a change in the conservation status of the species. However, in the case of threatened animal species, loss of a population or individuals could lead to a direct change in the conservation status of the species. This may arise if the proposed infrastructure is located where it will impact on such individuals or populations or the habitat that they depend on. Consequences may include:

1. fragmentation of populations of affected species;
2. reduction in area of occupancy of affected species; and
3. loss of genetic variation within affected species.

These may all lead to a negative change in conservation status of the affected species, which implies a reduction in the chances of the species overall survival chances.

The following animal species of conservation concern could potentially occur on site and may therefore be of concern for development of the study area:

1. Grant's Golden Mole (VU),
2. Desert Rain Frog (VU),
3. Namaqua Dwarf Adder (VU),

4. Namaqua Plated Lizard (NT),
5. Littledale's Whistling Rat (NT),
6. Namaqua Dune Mole-rat (NT).

Potential significance: The impact will probably be of long-term duration, at a regional scale (due to the distribution of the species concerned and the potential scale of the impact) potentially of moderate to high magnitude and, given the high likelihood of species occurring on site, highly probable. The potential significance is therefore moderate to high.

***Impact 4: Collisions of bats with turbine blades***

Nature: Bats have been found to be particularly vulnerable to being killed by wind turbines. It has long been a mystery why they should be so badly affected since bat echo-location allows them to detect moving objects very well. A recent study in America has found that the primary cause for mortality is a combination of direct strikes and barotrauma (bats are killed when suddenly passing through a low air pressure region surrounding the turbine blade tips causing low pressure damage to the bat's lungs, Baerwald *et al.* 2008). The relative importance of this impact on bat populations depends on which species are likely to be affected, the importance of the site for those species and whether the site is within a migration corridor for particular bat species.

The most vulnerable species are those that are already classified as threatened species, including those classified as critically endangered, endangered or vulnerable. There is one threatened and 11 other bat species that could occur in the region that includes the site.

Potential significance: The impact will probably be of long-term duration, at a regional scale (due to the distribution of the species concerned and the potential regional scale of the impact) potentially of moderate magnitude (could potentially result in population processes continuing but in a modified way) and, given the moderate likelihood of species occurring on site, rated as probable (distinct possibility). The potential significance is therefore medium.

## **DISCUSSION AND CONCLUSIONS**

There are six animal species of conservation concern that have a geographical distribution that includes the site and habitat preference that includes the type of habitat that could potentially occur on site. This does not indicate that they occur on site, but highlights these species as the ones that have the highest potential to occur there. This includes the following species:

1. Grant's Golden Mole (VU),
2. Desert Rain Frog (VU),
3. Namaqua Dwarf Adder (VU and Protected),
4. Namaqua Plated Lizard (NT),
5. Littledale's Whistling Rat (NT),
6. Namaqua Dune Mole-rat (NT).

Most of the study area is in a natural state. There is therefore a high probability of encountering any of the species of concern on site.

A risk assessment was undertaken which identified three potential negative impacts on threatened and/or protected terrestrial fauna species. The potential impacts are loss of habitat for potentially affected species due to construction, fragmentation of habitat for potentially affected species due to construction and loss of individuals of potentially affected species due to construction and/or the activities of personnel on site.

Of greatest concern is the fact that the proposed wind energy facility will extend from near the coast to 15 km inland. The site is within the known distribution range of three threatened species (Grant's Golden Mole, the Desert Rain Frog and the Namaqua Dwarf Adder), all of which are restricted to a band up to 10 km wide from the coast to inland and all of which are highly likely to occur either on site or nearby (see Appendix 1 for assessment of likelihoods of occurrence). If development of the site results in a barrier to these species as wide as the site (depends on the manner in which the site is developed) then there is the potential to cause regional fragmentation of any or all of these three species. Taken in combination with existing impacts due to diamond mining along the coast just on the coastal side of the site, the potential threat to these three species from the proposed development of the wind energy facility is potentially serious. It is important to determine the presence of these species on site and in the surrounding areas and determine the seriousness of the potential threat posed by the proposed project. If impacts are considered to be likely, mitigation measures must be proposed to minimize potential impacts on these three species that may include maintenance of habitat and migration corridors on site.

### **Summary of proposed EIA methodology**

The following assessments are required to be done during the EIA phase in order to properly assess potential impacts on terrestrial fauna by the proposed wind energy facility:

- The presence of species of concern must be evaluated. This must be done by assessing habitat suitability for those species that have been assessed as potentially occurring in the area. Particular attention must be paid to those species classified as threatened (VU, EN or CR), Near Threatened or Critically rare, including two mammal species classified as Vulnerable (Grant's Golden Mole and the Angolan Wind-gland Bat), one frog species classified as Vulnerable (Desert Rain Frog), one reptile species classified as Vulnerable (Namaqua Dwarf Adder), one reptile species classified as Near Threatened (Namaqua Plated Lizard) and two mammal species classified as Near Threatened (Littledale's Whistling Rat and Namaqua Dune Mole-rat).

- If habitat is found to be suitable for any of these species then additional specialist studies will be required to detect the actual presence of these species on site, including a small mammal specialist study and a herpetofaunal specialist study.
- A bat specialist survey should be undertaken in the EIA phase. This survey should establish the presence of species on site and the potential presence of suitable roosting habitat, especially caves, in the surrounding areas (up to 10 km away). It is also essential to establish that the site is not within any bat migration routes, and if so during what time and season of the year migration does take place.

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**APPENDICES:**

**Appendix 1: Vertebrate species of conservation concern with a geographical distribution that includes the study area.**

**MAMMALS**

Common name	Taxon	Habitat <sup>1</sup>	National status <sup>1</sup>	Global status <sup>2</sup>	Likelihood of occurrence
Grant's Golden Mole	<i>Eremitalpa granti</i>	Strandveld Succulent Karoo, Namib Desert, in subterranean habitats in shifting sands. Species includes two subspecies – Grant's Golden Mole only occurs south of Orange River, Namib Golden Mole found in Namib Desert.	VU (excludes Namib Golden Mole subspecies)	LC (includes Namib Golden Mole subspecies)	<b>HIGH</b> , previously recorded in neighbouring grid, substrate properties on site considered to be suitable for this species.
Namaqua Dune Mole-rat	<i>Bathyergus janetta</i>	Sandy soils in arid regions on the north-western coast from just north of the Olifants River to Oranjemund. Limited to seepage areas where soil is moist and workable and tubers occur. Range overlaps with diamond mining area – mining destroys habitat and burrow system.	NT	LC	<b>MEDIUM</b> , habitat is potentially suitable (not known if seepage areas occur on site).
Littledale's whistling rat	<i>Parotomys littledalei</i>	Desert, Karoo. Sandy or gravel open plains. Tends to excavate burrow beneath a shrub, but will also construct stick nest at the base of a shrub. Herbivorous, favouring leaves of <i>Zygophyllum</i> and <i>Mesembryanthemaceae</i> .	NT	LC	<b>MEDIUM</b> , site is within known distribution range. Habitat suitable on site.
Dassie Rat	<i>Petromus typicus</i>	Rocky barren areas on rocky outcrops and koppies. Flat rock crevices. Eats soft vegetable matter, including leaves of shrubs and flowers of many <i>Asteraceae</i> .	NT	LC	<b>LOW</b> , site is within known distribution range, but species tends to occur more inland.
Angolan Wing-gland Bat	<i>Cistugo seabrae</i>	Endemic to west coast of southern Africa, restricted to arid western parts, typically in desert and semi-desert conditions. Has been netted in riverine vegetation along dry river beds and may roost in buildings, such as church steeples.	VU	NT	<b>MEDIUM</b> , site is within known distribution range, but species most likely to occur in habitat not found on site
Natal long-fingered bat	<i>Miniopterus natalensis</i>	Occurs widely in southern African region, but less often in arid parts. Found mostly in temperate to sub-tropical savanna and grassland. Dependent on caves and subterranean habitats for roosting, where it occurs in large numbers.	NT	LC	<b>LOW</b> , site is within known distribution range, but no caves on site or nearby
Cape	<i>Rhinolophus</i>	Endemic to south-western parts of	NT	LC	<b>LOW</b> , site is

horseshoe bat	<i>capensis</i>	southern Africa, mostly from the Eastern Cape to Cape Town and then north to southern Namibia. Roosts in caves and subterranean habitats, such as mine adits. May form colonies of a thousand or more individuals. Forages predominantly in the canopies of trees.			within known distribution range, but no caves on site or nearby
Geoffroy's horseshoe bat	<i>Rhinolophus clivosus</i>	Occurs widely in southern African region, but less often in arid parts. Roosts in caves and subterranean habitats, such as mine adits, as well as rock hollows. May form colonies of several thousand individuals.	NT	LC	<b>LOW</b> , site is within known distribution range, but no caves on site or nearby

<sup>1</sup>Distribution and national status according to Friedmann & Daly 2004.

<sup>2</sup>Global status according to IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3. ([www.iucnredlist.org](http://www.iucnredlist.org)). Downloaded on 18 July 2011.

## AMPHIBIANS

Common name	Species	Habitat	Status	Likelihood of occurrence
Desert rain frog	<i>Breviceps macrops</i>	From the highwater mark up to 10 km inland along the Namaqualand coast (Namibia to near Hondeklipbaai). Threatened by diamond mining on west coast. It is a fossorial species that lives in sand dunes vegetated with low, succulent shrubs and other xerophytic vegetation in the fog belt (Minter et al. 2004). Breeding takes place by direct development, and it is not associated with water (Minter et al. 2004).	VU	<b>HIGH</b> , site is in core of distribution range. Habitat suitable on site.

<sup>1</sup>Status according to Minter et al. 2004.

<sup>2</sup>Status according to IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3. ([www.iucnredlist.org](http://www.iucnredlist.org)). Downloaded on 18 July 2011.

## REPTILES

Common name	Species	Habitat	Status <sup>3</sup>	Likelihood of occurrence
Namaqua dwarf adder	<i>Bitis schneideri</i>	Semi-stable vegetated coastal sand dunes from Little Namaqualand (near Koingnaas) to Ludertiz. Threatened by alluvial diamond mining	VU	<b>HIGH</b> , site is in core of distribution range. Habitat suitable on site.
Armadillo girdled lizard	<i>Cordylus cataphractus</i>	Rock cracks and crevices. Diet consists mainly of termites, beetles and grasshoppers	VU	<b>LOW</b> , no suitable habitat on site.
Namaqua plated lizard	<i>Gerrhosaurus typicus</i>	Dry sandy areas and bare rocky hillsides	NT	<b>HIGH</b> , site is in core of distribution range. Habitat suitable on site.
Namaqua day gecko	<i>Phelsuma ocellata</i>	Boulder strewn hillsides and rocky outcrops, but may also be found in trees and bushes	NT	<b>LOW</b> , no suitable habitat on site.
Speckled padloper	<i>Homopus signatus</i>	Rocky or stony areas, often on ridges or plateaus. Horizontal rock crevices.	NT	<b>LOW</b> , no suitable habitat on site.

<sup>3</sup>Distribution according to Marais 2004.

<sup>4</sup>Status according to IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3. ([www.iucnredlist.org](http://www.iucnredlist.org)). Downloaded on 18 July 2011.

## Appendix 2: Animal species with a geographical distribution that includes the study area.

### Notes:

1. Species of conservation concern are in red lettering.
2. Species protected according to the Northern Cape Nature Conservation Act of 2009 (Act 9 of 2009) marked with "P"
3. Species protected according to the National Environmental Management: Biodiversity Act of 2004 (Act 10 of 2000) marked with "N"

### Mammals:

<sup>P</sup>Springbok  
<sup>P</sup>Klipspringer  
<sup>P</sup>Gemsbok  
<sup>P</sup>Steenbok  
<sup>P</sup>Cape grysbok  
<sup>P</sup>Common duiker  
Rock hyrax  
Black-backed jackal  
Caracal  
<sup>P</sup>Yellow mongoose  
<sup>NP</sup>Black-footed cat  
<sup>P</sup>African wild cat  
Small grey mongoose  
<sup>P</sup>Small-spotted genet  
<sup>P</sup>Striped polecat  
<sup>P</sup>Bat-eared fox  
<sup>NP</sup>Leopard  
<sup>P</sup>Aardwolf  
<sup>P</sup>Suricate  
<sup>NP</sup>Cape fox  
<sup>P</sup>Cape golden mole  
<sup>P</sup>**Grant's golden mole (VU / LC)**  
<sup>P</sup>Reddish-grey musk shrew  
<sup>P</sup>Lesser dwarf shrew  
<sup>P</sup>Cape/Desert hare  
<sup>P</sup>Scrub/Savannah hare  
<sup>P</sup>Namaqua rock mouse  
<sup>P</sup>**Namaqua dune mole-rat (NT)**  
<sup>P</sup>Common mole-rat  
<sup>P</sup>Short-tailed gerbil  
<sup>P</sup>Hairy-footed gerbil  
<sup>P</sup>Spectacled dormouse  
<sup>P</sup>Porcupine  
<sup>P</sup>Large-eared mouse  
<sup>P</sup>Karoo bush rat  
<sup>P</sup>**Littledale's whistling rat (NT)**  
<sup>P</sup>Springhare  
<sup>P</sup>**Dassie rat (NT)**  
<sup>P</sup>Striped mouse  
<sup>P</sup>Cape rock elephant shrew  
<sup>P</sup>Smith's rock elephant-shrew  
<sup>P</sup>Round-eared elephant shrew

<sup>P</sup>Aardvark  
African straw-coloured fruit bat  
Egyptian rousette  
**Angolan wing-gland bat (VU)**  
Long-tailed serotine bat  
**Natal long-fingered bat (NT)**  
Cape serotine bat  
Egyptian slit-faced bat  
**Cape horseshoe bat (NT)**  
**Geoffroy's horseshoe bat (NT)**  
Robert's flat-headed bat  
Flat-headed free-tailed bat  
Egyptian free-tailed bat

### Reptiles:

<sup>P</sup>Western dwarf chameleon  
<sup>P</sup>Namaqua chameleon  
Puff adder  
Many-horned adder  
Horned adder  
<sup>NP</sup>**Namaqua dwarf adder (VU)**  
Cape cobra  
Black spitting cobra  
Coral snake / coral shield cobra  
Dwarf beaked snake  
Karoo whip snake  
Namib sand snake  
Crossed whip snake  
<sup>P</sup>Brown house snake  
Spotted rock snake  
<sup>P</sup>Mole snake  
<sup>P</sup>Common egg-eater  
Delalande's beaked blind snake  
Schinz's beaked blind snake  
<sup>P</sup>Southern rock agama  
<sup>P</sup>Southern spiny agama  
<sup>P</sup>Knox's desert lizard  
<sup>P</sup>Smith's desert lizard  
<sup>P</sup>Western sandveld lizard  
<sup>P</sup>Namaqua sand lizard  
<sup>P</sup>Spotted sand lizard  
<sup>P</sup>Legless burrowing skink species  
<sup>P</sup>Striped dwarf burrowing skink  
<sup>P</sup>Cape skink  
<sup>P</sup>Western rock skink

<sup>P</sup>Variegated skink

<sup>N</sup><sup>P</sup>**Armadillo girdled lizard (VU)**

<sup>P</sup>Large-scaled girdled lizard

<sup>P</sup>Karoo girdled lizard

<sup>P</sup>**Namaqua plated lizard (NT)**

<sup>P</sup>Dwarf plated lizard

<sup>P</sup>Striped dwarf leaf-toed gecko

<sup>P</sup>Giant ground gecko

<sup>P</sup>Bibron's tubercled gecko

<sup>P</sup>Austen's dune gecko

<sup>P</sup>Rough gecko

<sup>P</sup>Western Cape gecko

<sup>P</sup>Western gecko species

<sup>P</sup>Marico gecko

<sup>P</sup>**Namaqua day gecko (NT)**

<sup>P</sup>Common barking gecko

<sup>P</sup>**Speckled padloper (NT)**

<sup>P</sup>Angulate tortoise

<sup>P</sup>Karoo tent tortoise

### **Amphibians**

<sup>P</sup>**Desert rain frog (VU)**

<sup>P</sup>Namaqua rain frog

<sup>P</sup>Karoo toad

<sup>P</sup>Common platanna

<sup>P</sup>Cape river frog

<sup>P</sup>Cape sand frog

**Appendix 3: Vertebrate animal species protected under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)**

(as updated in R. 1187, 14 December 2007)

**CRITICALLY ENDANGERED SPECIES**

**Reptilia**

Loggerhead sea turtle  
Leatherback sea turtle  
Hawksbill sea turtle

**Mamalia**

Riverine rabbit  
Rough-haired golden mole

**ENDANGERED SPECIES**

**Reptilia**

Green turtle  
Giant girdled lizard  
Olive ridley turtle  
Geometric tortoise

**Mammalia**

Robust golden mole  
Tsessebe  
Black rhinoceros  
Mountain zebra  
African wild dog  
Gunning's golden mole  
Oribi  
Red squirrel  
Four-toed elephant-shrew

**VULNERABLE SPECIES**

**Mammalia**

Cheetah  
Samango monkey  
Giant golden mole  
Giant rat  
Bontebok  
Tree hyrax  
Roan antelope  
Pangolin  
Juliana's golden mole  
Suni  
Large-eared free-tailed bat  
Lion  
Leopard  
Blue duiker

**PROTECTED SPECIES**

**Amphibia**

Giant bullfrog  
African bullfrog

**Reptilia**

Gaboon adder  
Namaqua dwarf adder  
Smith's dwarf chameleon  
Armidillo girdled lizard  
Nile crocodile  
African rock python

**Mammalia**

Cape clawless otter  
South African hedgehog  
White rhinoceros  
Black wildebeest  
Spotted hyaena  
Black-footed cat  
Brown hyaena  
Serval  
African elephant  
Spotted-necked otter  
Honey badger  
Sharpe's grysbok  
Reedbuck  
Cape fox