



---

**NICK HELME BOTANICAL SURVEYS**

PO Box 22652 Scarborough 7975

Ph: 021 7801420 cell: 082 8238350 email: botaneek@iafrica.com

---

**TERRESTRIAL PLANT AND FAUNAL SPECIES  
SPECIALIST ASSESSMENT REPORT AS PART  
OF BASIC ASSESSMENT FOR NOBLESFONTEIN  
WIND ENERGY FACILITY, BEAUFORT WEST.**

Compiled for: Terramanzi Environmental Consulting, Noordhoek

Client: South Africa Renewable Green Energy (Pty) Ltd.

12 May 2021

## DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 specialists involved in Impact Assessment processes must declare their independence and include an abbreviated Curriculum Vitae.

I, N.A. Helme, do hereby declare that I am financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially my own.



NA Helme

**The author believes that the information presented in this report complies with the PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL PLANT SPECIES (Government Gazette No. 43855 of 30 October 2020).**

### ABRIDGED CV:

Contact details as per letterhead.

Surname : HELME

First names : NICHOLAS ALEXANDER

Date of birth : 29 January 1969

University of Cape Town, South Africa. BSc (Honours) – Botany (Ecology & Systematics). 1990.

Since 1997 I have been based in Cape Town, and have been working as a specialist botanical consultant, specialising in the diverse flora of the Succulent Karoo and Fynbos Biomes. Since the end of 2001 I have been the Sole Proprietor of Nick Helme Botanical Surveys.

A selection of previous work:

- Botanical assessment of proposed cultivation areas near Clanwilliam (Aurecon & DWS 2019)
- Botanical assessment of infrastructure on Klipopmekaar farm, northern Cederberg (NaturaLibra 2019)

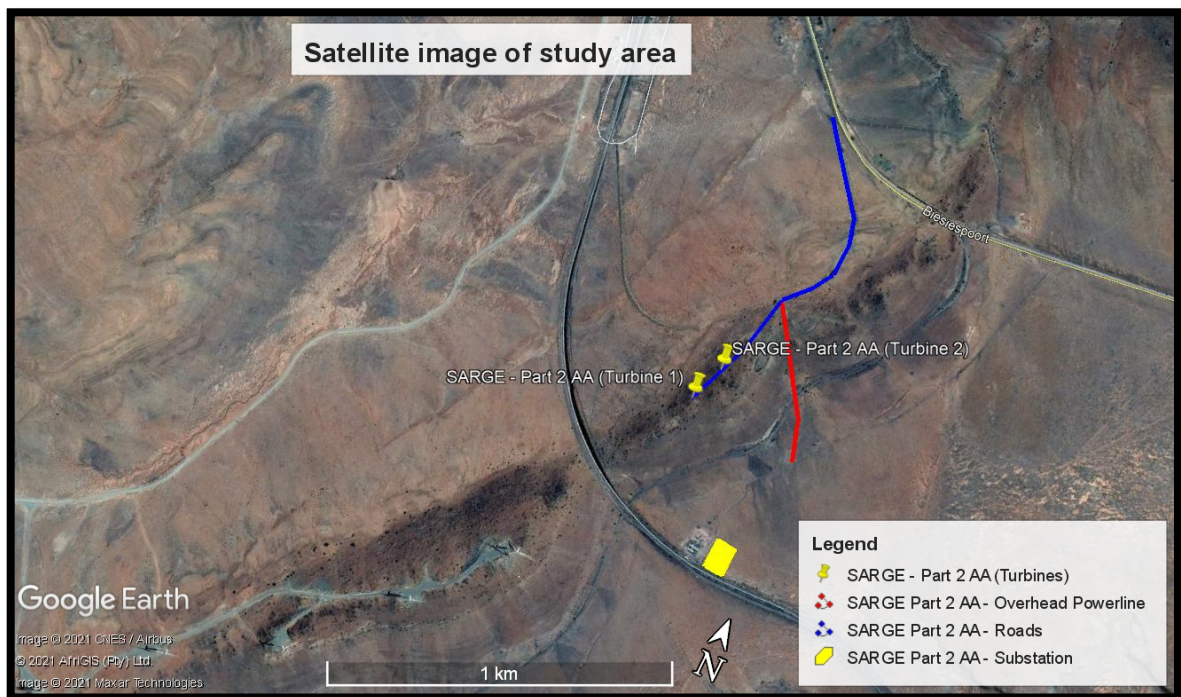
- Botanical assessment of Portion 15 of Bottelfontein 11, Redelinghuys (Cederberg Environmental 2018)
- Botanical assessment of Rietvlei, Koue Bokkeveld (Footprint Environmental 2018)
- Botanical assessment of Sebulon farm, Redelinghuys (Footprint Environmental 2018)
- Botanical assessment of Draaihoek farm, Leipoldville (Footprint Environmental 2018)
- Botanical baseline assessment of Droogerivier farm, Leipoldville (Footprint Environmental 2018)
- Botanical assessment of proposed new cultivation on farm Wittewater 93, Piketberg (Cederberg Environmental Assessment Practise 2017)
- Botanical assessment of proposed prospecting areas on Raskraal 255, Vanrhynsdorp (Venatouch 2016)
- Botanical assessment of proposed new cultivation and new dam and pipeline on farm Kransvlei 205, Clanwilliam (Cederberg Environmental Assessment Practise 2016)
- Botanical assessment of proposed cultivation on Rem. Andriesgrond 204, Clanwilliam (Cederberg Environmental Assessment Practise 2015)
- Botanical assessment of proposed dam on Modderfontein farm, Citrusdal (Cederberg Environmental Assessment Practise 2015)
- Botanical assessment of Remainder of Farm Rietfontein 244, Piketberg (Cederberg Environmental Assessment Practise 2014)
- Botanical Assessment of farm Draaihoek 293, Vredendal (Cederberg Environmental Assessment Practise 2013)
- Botanical Assessment of farm Gideonsoord 303, Klawer (Cederberg Environmental Assessment Practise 2013)
- Botanical assessment of proposed agricultural expansion on Remainder of Farm Chilton 160, Piketberg (Cederberg Environmental Assessment Practise 2013)
- Botanical assessment of proposed new N7 alignment near Clanwilliam (CCA Environmental 2013)
- Scoping study of proposed Paleisheuwel Solar PV facility, near Leipoldville (Sharples Environmental 2012)
- Botanical assessment of a portion of Sandrug farm, Leipoldville (Footprint Environmental 2010)

## TABLE OF CONTENTS

<b>1.</b>	<b>INTRODUCTION</b>	<b>1</b>
<b>2.</b>	<b>TERMS OF REFERENCE</b>	<b>2</b>
<b>3.</b>	<b>LIMITATIONS, ASSUMPTIONS AND METHODOLOGY</b>	<b>3</b>
<b>4.</b>	<b>THE VEGETATION</b>	<b>4</b>
	Regional Context	4
	Plant Species of Conservation Concern	5
<b>5.</b>	<b>BOTANICAL SENSITIVITY</b>	<b>5</b>
<b>6.</b>	<b>TERRESTRIAL FAUNAL SENSITIVITY</b>	<b>7</b>
<b>7.</b>	<b>LIKELY BOTANICAL &amp; TERRESTRIAL FAUNAL IMPACTS</b>	<b>8</b>
<b>8.</b>	<b>IMPACT ASSESSMENT</b>	<b>8</b>
<b>9.</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	<b>9</b>
<b>10.</b>	<b>REFERENCES</b>	<b>10</b>

## 1. INTRODUCTION

This terrestrial ecology (plant and terrestrial fauna) assessment report was commissioned to inform the Basic Assessment process being undertaken for the establishment of two turbines and associated infrastructure as part of the Noblesfontein Wind Energy Facility (WEF), about 36km south of Victoria West, in the Northern Cape. The Noblesfontein WEF is approved for 44 turbines (DEFF 12/12/20/1993/1) and currently already has 41 installed, with an output of 2MW each. The applicant wishes to construct two more turbines with a technical specification upgrade of between 4MW and 5.6MW. These 2 turbines will be a larger version of the currently installed turbines, and hence the requirement for a Basic Assessment. The location of these 2 additional turbines will form part of the authorized and approved Noblesfontein WEF Project footprint, the nearest of which are 660m to the southwest.



**Figure 1:** Satellite image showing the 2 proposed larger turbine positions as assessed for this Basic Assessment, plus new access road and overhead powerline and substation. Note the existing turbines on the ridge to the southwest.

## 2. TERMS OF REFERENCE

The terms of reference for this study were as follows:

- provide a brief desktop overview of the terrestrial ecology of the project target area
- provide a map of the terrestrial ecological conservation significance (sensitivity) of the project area

- identify the likely terrestrial ecology impacts of the proposed additional infrastructure installation
- assess the significance of the terrestrial ecological impacts of the proposed 2 larger turbine project and compare it with those of the approved 44 turbine layout
- provide a professional statement on whether the proposed development will have a greater, lesser or similar impact than the approved layout in terms of terrestrial ecology
- provide feasible and reasonable mitigation recommendations to avoid or minimise the terrestrial ecological impacts of the proposed development.

### **3. LIMITATIONS, ASSUMPTIONS AND METHODOLOGY**

No site visit was undertaken for this desktop report, and information on the site is drawn purely from other studies in the area, such as Hoare (2011) and Todd (2015), personal knowledge of the area, and from available Google Earth imagery. A copy of the original botanical and faunal impact assessment for the approved 44 turbine Noblesfontein project was not available.

The presence and distribution of plant Species of Conservation Concern is a fairly good indicator of the relative conservation value of habitats at a national scale, and a habitat that supports any such species should be treated as sensitive, applying the precautionary principle.

The confidence levels in the ecological findings are considered to be only moderate, as they are not based on direct experience of the site and its flora and fauna. This assessment does not include bats or birds, as these are covered by separate specialist assessments.

The author was able to reference the Cape Rares GIS layers of the CREW (Custodians of Rare and Endangered Wildflowers) project of SANBI (SA National Biodiversity Institute), online biodiversity data on [inaturalist.org](http://inaturalist.org), and various specialist reports for the region.

Google Earth imagery dated December 2018 (and earlier) was used as a base image for the conservation value mapping.

The new road is assumed to be up to 10m wide and 1100m long, with a single 90m long turning bay between the two turbine positions, and the cabling is

assumed to run underground, either within or next to the road, up to the point where it joins the overhead powerline and connects to the new substation (see Figure 1). The road will presumably follow the shortest distances between the turbines, where topography allows. Total disturbance footprint for the roads, turning bays and turbine bases in this assessment is estimated at 2.3ha, and this is based on measurement of the adjacent already built facility to the southwest. The proposed substation would result in loss of an additional 0.6ha of vegetation and habitat, whilst overhead powerline is not likely to result in permanent disturbance of more than 0.1ha, making the overall disturbance and loss related to footprint about 3.0ha.

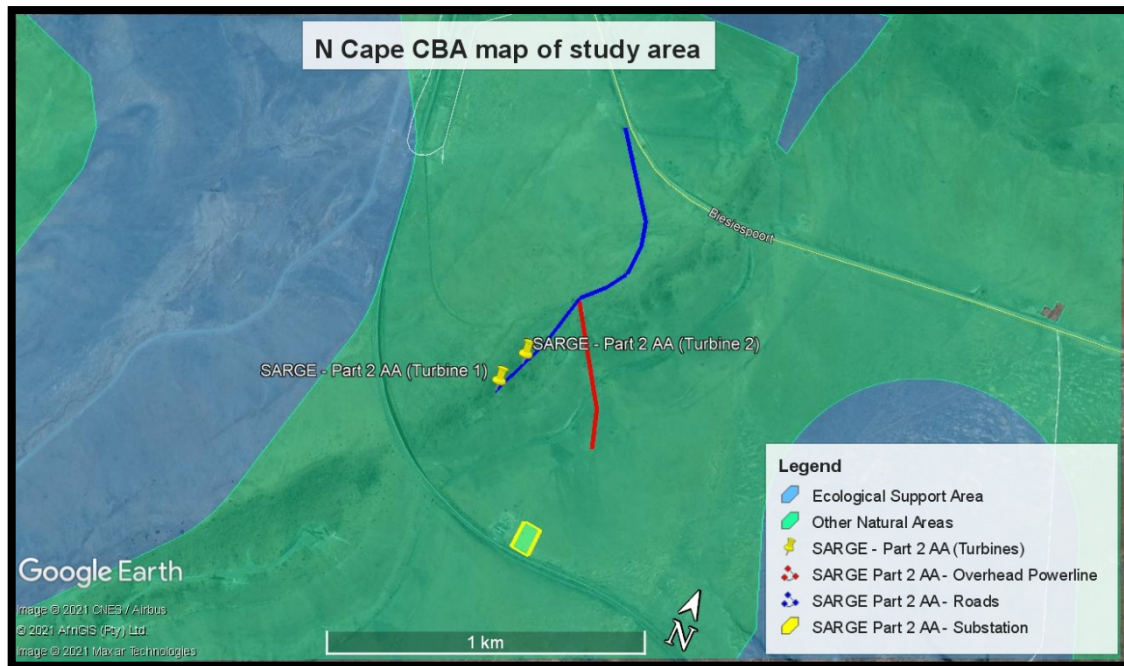
Standard Impact Assessment criteria and ratings were used.

## **4. THE VEGETATION**

### **4.1 Regional Context**

The study area lies within the Nama Karoo biome and the Upper Karoo bioregion (Mucina & Rutherford 2006) and is outside the Greater Cape Floristic Region (GCFR). The Nama Karoo is a large biome (19% of the country) but is relatively species poor (although the total figure is unknown), and has very few local endemics and no centres of endemism (Mucina & Rutherford 2006). Because the entire biome is semi-arid, with unpredictable rainfall and almost no surface water, agriculture is limited to extensive stock farming (mostly sheep), with very limited irrigated agriculture (using groundwater), and this means that habitat transformation and loss has been low – much lower than for most other biomes, but overgrazing is a problem in at least 60% of the area (Mucina & Rutherford 2006).

The latest conservation planning products for the area (Oosthuysen & Holness 2017) indicate that the study area is classified as an ONA (Other Natural Area), a relatively low conservation rating (Figure 2). No higher-level Critical Biodiversity Areas (CBAs) are mapped within the study area. Activities that do not impinge on ecological functioning and water quality are permissible within ESAs and ONAs (Holmes *et al* 2012).



**Figure 2** Conservation planning map for the area, showing the proposed infrastructure and that no CBAs are mapped in the study area. The entire development footprint is within areas mapped as lower level ONAs (Other Natural Areas).

The vegetation in the study area has been mapped for the vegetation map of South Africa (Mucina & Rutherford 2006 and online updates) as **Eastern Upper Karoo, Upper Karoo Hardeveld** and **Southern Karoo Riviere**. All of these units have been gazetted as a **Least Threatened** vegetation types on a national basis (DEA 2011), and this classification was supported by Skowno *et al* (2019). Although not threatened the units are poorly conserved, with less than 5% of their total areas formally conserved.

Essentially all the koppies, tabletops and higher lying areas are classed as **Upper Karoo Hardeveld**, whilst the valleys and lower slopes are **Eastern Upper Karoo**, with the main river valleys being **Southern Karoo Riviere**. Upper Karoo Hardeveld tends to be richer in species than the other two units, with a greater chance of more localised species, mainly due to greater habitat diversity, including rocky outcrops and cliffs. All the proposed turbines and presumably most of the road infrastructure in the amended layout are located within **Upper Karoo Hardeveld**.



## 4.2 Plant Species of Conservation Concern

No plant Species of Conservation Concern<sup>1</sup> (SoCC: previously known as Red Data or Red Listed species; Raimondo *et al* 2009) were confirmed by Hoare from the nearby Modderfontein WEF the study area (Hoare 2011), and the likelihood of any occurring within the study area is deemed to be low. Few SoCC are generally found within the Upper Karoo Hardeveld, at least in comparison to many other habitats.

Many legally protected species are present in the project area, and in fact as many as 30% of all plants in the area may be legally protected (Provincial Gazette for Northern Cape 2012, and CapeNature Ordinance 2000). This means that any disturbance or loss of these species requires the relevant permit from the relevant authority (DENC or CapeNature).

## 5. BOTANICAL SENSITIVITY

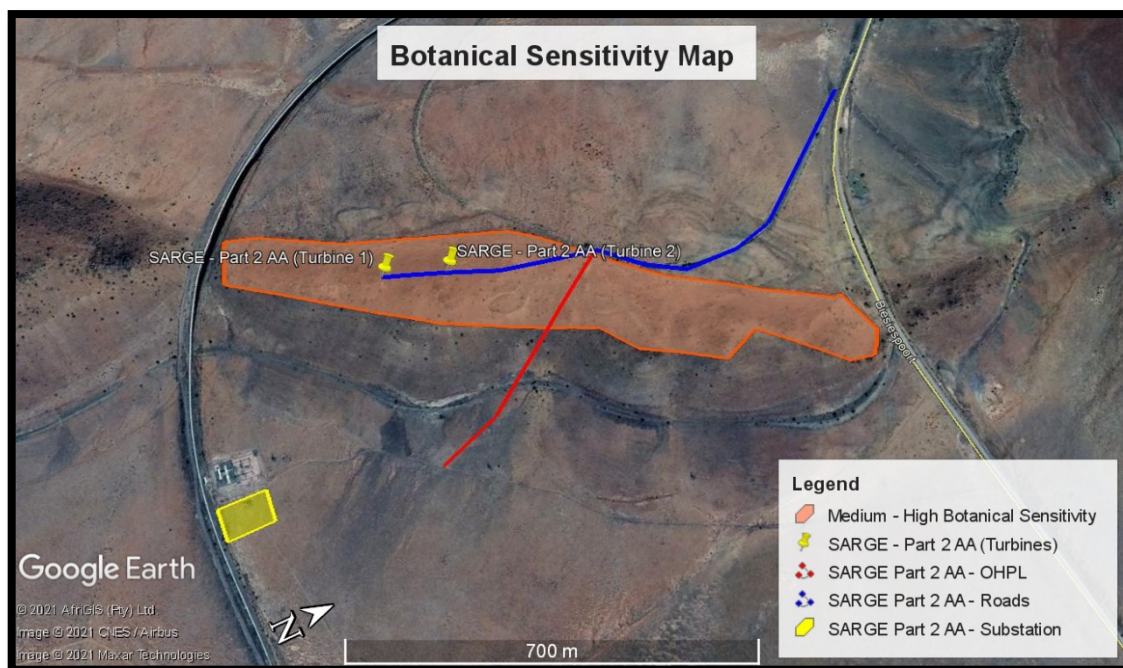
Botanical sensitivity is a product of regional and local habitat rarity, presence of plant species of conservation concern, diversity of indigenous plant species, presence of wetlands, presence of soil type interfaces, degree of habitat disturbance, and if disturbed, the rehabilitation potential.

Figure 3 is a desktop based map of the botanical sensitivity in the study area. As no site survey was undertaken it should be noted that the accuracy of this sensitivity mapping is relatively low, and is not informed by accurate observations of plant species on the ground, but is rather a habitat-based approach. Dolerite outcrops are known to be hotspots of plant and animal diversity in this landscape (pers. obs.; Hoare 2011, Todd 2015), and the mapping is based largely on the imagery, with dolerite outcrops standing out in terms of colour (red clays vs the grey clays derived from shales) and topography. Most of the rarer and more localised plant species in the area are likely to be succulents, and these tend to prefer rocky outcrops, as they are more stable.

About 50% of the road route and both the turbines are located within an area assessed as being of Medium - High sensitivity, and this area includes most of the dolerite ridges and plateaus (see Figure 3). The remainder of the infrastructure is located within an area deemed to be of Low to Medium botanical sensitivity.

---

<sup>1</sup> The Red List of South African Plants (Raimondo *et al* 2009) has assessed all plant species in South Africa, and all indigenous species are now technically Red Listed or Red Data Book species, and thus it is preferable to use the term Species of Conservation Concern to refer to species that are listed as either Threatened or Rare



**Figure 3:** Botanical Sensitivity map of the study area. Unshaded areas within the study areas are of Low - Medium botanical sensitivity.

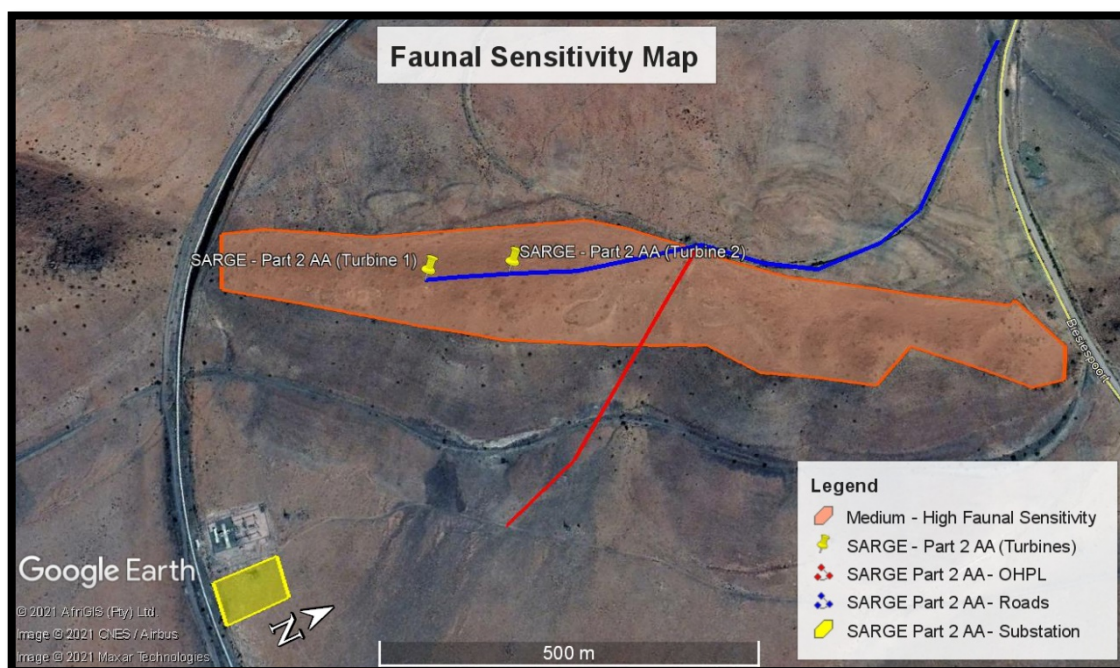
## 6. TERRESTRIAL FAUNAL SENSITIVITY

Key terrestrial faunal species potentially in the area include various reptiles and the Riverine Rabbit (Critically Endangered), which has been confirmed from within 20km of this site, and is certainly the most threatened of any of the potential faunal species in the area. Riverine Rabbits require alluvial areas with soft soils and scattered vegetation, but there do not appear to be any suitable alluvial habitats within this study area, and the species is thus unlikely to occur here.

Hoare (2011) noted that Namaqua Plated Lizard could occur in the area and that it was listed as Near Threatened, but the species has subsequently been listed a Least Concern (Bates *et al* 2014). Other localised reptiles potentially in the area (in rocky outcrops) are the Nuweveld Crag Lizard (*Pseudocordylus microlepidotus ssp namaquensis*) and Cloete's Crag Lizard (*Cordylus cloetei*), but both are also listed as Least Concern (Bates *et al* 2014). Braack's Pygmy Gecko (*Goggia braacki*) is also a very local endemic in this region, inhabiting dolerite outcrops (but mainly at higher altitude than the study area), and is Redlisted as Near Threatened (Bates *et al* 2014). The Karoo Dwarf Tortoise (*Homopus boulengeri*) is also listed as Near Threatened, but is more widespread, and may occur in low numbers in the study area.

No threatened butterflies (Mecenero *et al* 2013) or amphibians (Measey 2011) are likely to occur in significant numbers within the project footprints.

The terrestrial faunal sensitivity map is the same as the botanical sensitivity map and highlights the importance of the rocky outcrops and dolerite ridges (preferred habitat for many reptiles, and roosting sites for bats), and is shown in Figure 4.



**Figure 4:** Terrestrial Faunal Sensitivity map of the study area. Unshaded areas within the study area are of Low - Medium faunal sensitivity.

## 7. LIKELY TERRESTRIAL FAUNAL AND BOTANICAL IMPACTS

In terms of the construction of the proposed infrastructure on this site the following potentially negative ecological issues have been identified:

- Direct, permanent loss of the existing natural vegetation and animal habitat during the construction phase (cable trenches, substation, turbine footprints, roads). Temporary direct impacts will also arise at the construction phase. No plant SoCC are likely to be impacted, but up to 3ha of plant habitat will be lost.
- Possible construction phase impact (loss of habitat and individuals) on certain less mobile terrestrial animal species (cable trenches, turbine footprints, substation, roads), potentially including two SoCC (Braack's pygmy gecko (rather unlikely to occur in area) and Karoo dwarf tortoise (may occur in low numbers)).

- Indirect, permanent ecological impacts at the operational phase. The main negative impact is likely to be a degree of habitat fragmentation and partial disruption of the current ecological connectivity across the site, with secondary issues likely to be the introduction or facilitated spread of various invasive alien plant species.

No significant positive direct ecological impacts are expected to be associated with this project.

## 8. IMPACT ASSESSMENT

Table 1 summarises the likely significance of the botanical and faunal impacts of the proposed amended layout of 2 turbines. The larger turbines proposed will require a slightly larger foundation and construction footprint (maybe 25% larger) than the approved turbines on these two sites, and thus the amended layout would have a very slightly greater botanical and faunal impact than the authorised layout. The amended layout will have a negative botanical and faunal impact, which cannot be mitigated to a level below the Low – Medium negative level that is expected.

Expected impacts on two threatened reptile species are likely to be Low - Medium negative for both the approved and the amended development alternatives, with the road and turbine infrastructure being the main source of impact. No plant SoCC are likely to be impacted by the proposed amendment, but up to 3ha of plant and faunal habitat will be lost, mainly to the roads and turbine construction, and this may be 25% larger than for the approved layout.

Impact	Overhead Powerline	2 Turbines	Access road	Substation
Vegetation	Very Low -ve	Low to Medium -ve	Low to Medium -ve	Low -ve
Fauna	Very Low -ve	Low to Medium -ve	Low to Medium -ve	Very Low -ve
Wetlands	None	None	None	None

**Table 1:** Summary of the significance of the botanical and faunal impacts (after mitigation) for the amended layout infrastructure.

## 9. CONCLUSIONS AND RECOMMENDATIONS

- The study area is currently mapped as Other Natural Area (ONA) in terms of the Northern Cape Spatial Biodiversity Plan. No Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) are mapped from within the project area.
- No plant Species of Conservation Concern are likely from within the study area.
- The Critically Endangered Riverine Rabbit is not likely to occur in the project area.
- Two Near Threatened reptiles (Braack's Pygmy Gecko and Karoo Dwarf Tortoise) may occur in the study area and may be impacted by the proposed turbines, roads and cabling. The former is largely restricted to rocky outcrops (mainly at higher altitude than the study area) while the latter is much more wide ranging.
- The 2 turbine amended layout may disturb up to 25% more habitat in the two targeted turbine positions than would the approved turbine layout, and thus the amended layout is likely to have a very slightly greater botanical and faunal impact than the authorised layout overall, but the difference is marginal.
- The actual 2 turbine layout as assessed would have a minor negative botanical impact, which cannot be mitigated to a level below Low to Medium negative.
- There is no substantial faunal or botanical reason why the proposed amended layout should not be approved.
- All mitigation and EMP requirements outlined in the original IA should also be required for the amended layout, if authorised.
- Additional mitigation required is as follows:
  - During construction any cable and foundation trenches should be closed up as soon as possible, and the ECO must survey all open trenches three times a day and remove any animals that have fallen into these holes.
  - Roads, turning areas and cable trenches must avoid all rocky outcrops, and where this is not possible impact on outcrops must be minimised.

## 10. REFERENCES

- Alexander, G. and Marais, J. 2007. A guide to the reptiles of Southern Africa. Struik Nature, Cape Town.
- Bates, M., Branch, W., Bauer, A., Burger, M., Marais, J., Alexander, G. & de Villiers, M (eds). 2014. Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland. *Suricata* 1. South African National Biodiversity Institute, Pretoria.
- DEA. 2011. Threatened Terrestrial Ecosystems in South Africa. *Government Gazette* Vol. 1002: No. 34809. National Printer, Pretoria.
- EWT. 2004. Little Red Data Book of the Mammals of South Africa: A Conservation Assessment. Endangered Wildlife Trust, Johannesburg.
- Hoare, D. 2011. Ecological Impact Assessment for Modderfontein WEF. Unpublished report. David Hoare Consulting, Pretoria.
- Measey, G.J. (ed.) 2011. Ensuring a future for South Africa's frogs: a strategy for conservation research. *SANBI Biodiversity Series* 19. South African National Biodiversity Institute, Pretoria.
- Mecenero, S; Ball, J.B.; Edge, D.A.; Hamer, M.L.; Henning, G.A.; Kruger, M.; Pringle, E.L.; Terblanche, R.F.; Williams, M.C. (Eds). 2013. Conservation Assessment of Butterflies of South Africa, Lesotho and Swaziland: Red List and Atlas. Safronics (Pty) Ltd & Avian Demography Unit, UCT.
- Mucina, L. and M. Rutherford. *Eds.* 2018 online update. Vegetation map of South Africa, Lesotho, and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.
- Oosthuysen, E. & S. Holness. 2017. Northern Cape CBA Map. Report for DENC, Kimberley.
- Provincial Gazette for Northern Cape. 2012. No. 1589, Volume 19. Northern Cape Nature Conservation Act (9/2009). Schedules 1 & 2.

Raimondo, D., Von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A., and Manyama, P.A. (eds.) 2009 and online updates at [redlist.sanbi.org](http://redlist.sanbi.org). Red List of South African Plants 2009. *Strelitzia* 25. South African National Biodiversity Institute, Pretoria.

Rouget, M., Reyers, B., Jonas, Z., Desmet, P., Driver, A., Maze, K., Egoh, B. & Cowling, R.M. 2004. *South African National Spatial Biodiversity Assessment 2004: Technical Report. Volume 1: Terrestrial Component*. Pretoria: South African National Biodiversity Institute.

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). 2019. *South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm*. South African National Biodiversity Institute, Pretoria.

Todd, S. 2015. Ecological Impact Assessment for proposed Umsinde Emoyeni WEF, Western and Northern Cape. Unpublished report for Arcus. 3 Foxes Consulting.

Western Cape Nature Conservation Laws Amendment Act. Provincial Government of the Western Cape. No. 3. 2000.