

Ngqamakhwe Wind Energy Facility
12/12/20/2091/2
DEA/EIA/0000919/2012

**APPLICATION FOR AMENDMENT TO THE ENVIRONMENTAL
AUTHORISATION**

Prepared for:



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THE PROJECT TEAM

Dr Cherie-Lynn Mack, Senior Environmental Consultant, holds a PhD and MSc (with distinction) degrees in Environmental Biotechnology, with a BSc degree in Microbiology and Biochemistry. She has postgraduate research experience in industrial and domestic wastewater treatment technologies, with particular emphasis on the coal and platinum mining industries. Her interests lie in the water sector, with experience in ecological reserve determination and water quality monitoring and analysis. She has experience in water quality analysis and industrial wastewater treatment research.

Dr Greer Hawley, Principal Consultant, has a BSc degree in Botany and Zoology and a BSc Honours in Botany from the University of Cape Town. She completed her PhD thesis (Microbiology) at Rhodes University. Greer has been involved in a number of diverse activities. The core academic focus has been directed in the field of taxonomy both in the plant and fungal kingdom. Greer's research ranges from studying fresh and marine algae, estuarine diatoms, Restio species classification in the fynbos and forest vegetation and fungal species identification and ecology. Greer's study of fungi have also contributed towards an understanding of soil ecology and "below ground" ecology.

Mr Jon Smallie holds an MSc in Environmental Science from the University of the Witwatersrand. Up until August 2011, he was the Programme Manager for the Wildlife and Energy Programme at the Endangered Wildlife Trust, where he founded and chaired the Birds and Wind Energy Specialist Group (BAWESG) of the Endangered Wildlife Trust & BirdLife South Africa. He currently operates as an independent Avifaunal Specialist Consultant through his own company, Wildskies Ecological Services.

Mr Gavin Anderson graduated in 1993 from the University of Cape Town. He worked for the Natal Museum Institute for Cultural Resources Management from 1994 to 2004 where he resigned as the head of the museum. Since 2005 Gavin has been working as an independent heritage specialist and consulted of various projects. He is registered with the South African Heritage Resources Agency and with the kwa-Zulu Natal provincial heritage resources agency as a Principle Investigator with expertise status in Iron Age, Stone Age and Rock art

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1 INTRODUCTION

InnoWind (Pty) Ltd - a Franco-South African renewable energy generator that develops, finances, builds, operates and maintains commercial wind powered generation facilities, plans to develop a wind and solar power generation facility in an area called Ngqamakhwe, in the Eastern Cape Province of South Africa. The proposed project is planned to host between 13 and 18 turbines, each with a nominal power output of between 2 and 3 megawatts (MW). A photovoltaic (PV) array of up to 5 MW is also proposed for the site. The maximum total potential output of the Wind Energy Facility (WEF) and PV combined, is 44MW.

The application was authorised by the National Department of Environmental Affairs on 11 July 2012. It is the intention of InnoWind to submit this project into Round Three of the Department of Energy REIPP programme, the deadline for which is August 2013.

The listed activities authorised for the development are:

Listing Notice	Activity Number	Description
GNR 544 (18 June 2010)	10(i)	The construction of facilities or infrastructure for the transmission and distribution of electricity – (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.
GNR 545 (18 June 2010)	1	Construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.
GNR 545 (18 June 2010)	15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more.
GNR 546 (18 June 2010)	14	The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation (a) In eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape provinces: i. All areas outside urban areas.

The objective of this document is to comply with the requirements of the Department of Environmental Affairs in order to obtain three amendments to the Environmental Authorisation. These amendments, although not triggering any additional listed activities, were considered substantial by the DEA upon first application.

2 DESCRIPTION OF THE AMENDMENTS

Three amendments to the existing Environmental Authorisation are requested:

2.1 Amendment 1

It is necessary to reflect the change in ownership and the transfer of rights and obligations from InnoWind (Pty) Ltd to the following entity as the project owners:

Ngqamakwe Wind Power (Pty) Ltd. Reg. no. 2012/091835/07

2.2 Amendment 2

The developer requests the option of constructing all electrical collection cabling and power lines either as overhead power lines (Alternative A) or as underground lines (Alternative B). The EA specified underground cables only (All power lines in Figure 1).

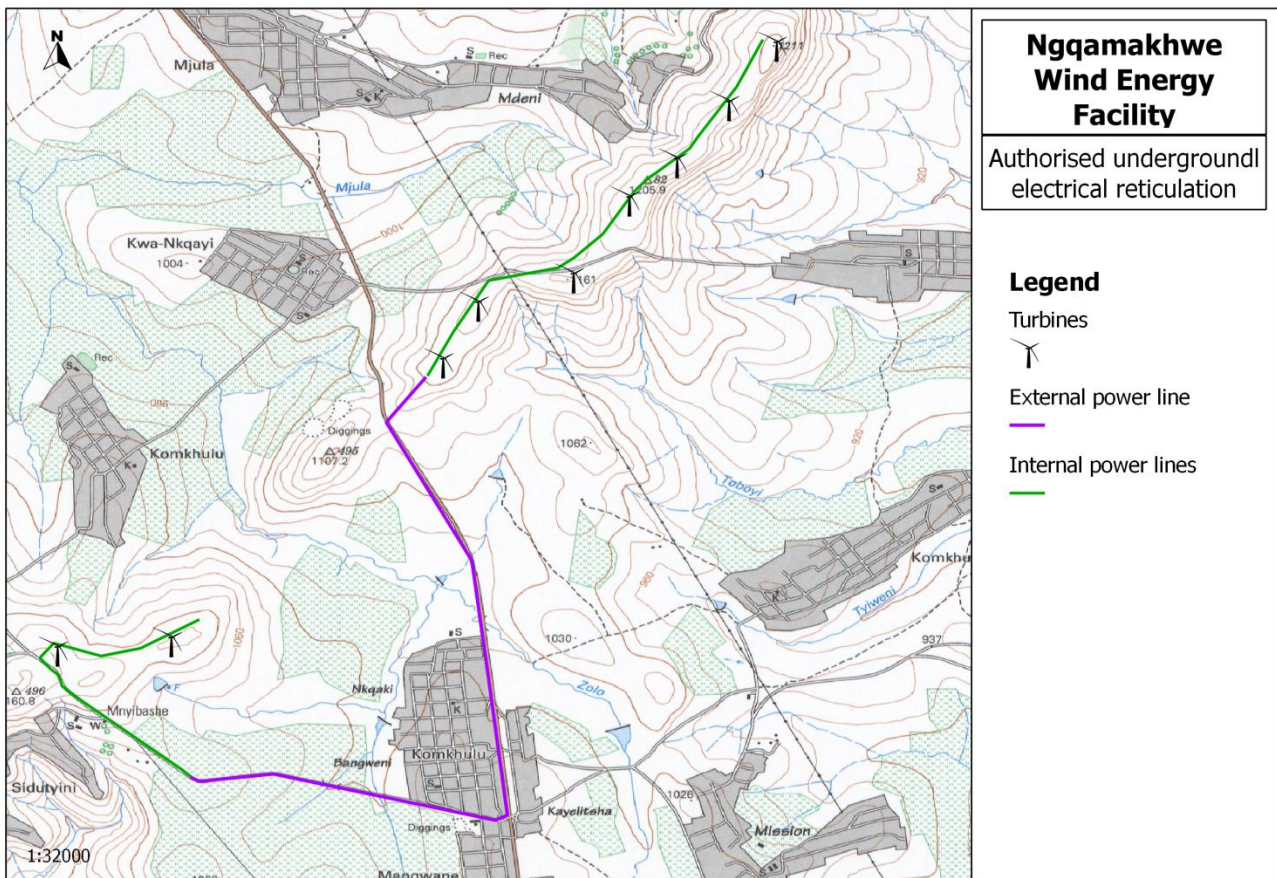


Figure 1. Underground power line routes authorised under the original EA.

2.3 Amendment 3

The developer requests authorisation for an alternative to the proposed route of a section of power line connecting the eastern portion of the WEF to the Ngqamakhwe substation. The EA authorised the route shown in purple, InnoWind requests authorisation for the deviated route, shown in turquoise (Alternative C in Figure 2).

The alternative route proposed traverses cultivated lands. A number of existing overhead power lines of similar size traverse the same area (Figure 3 and 4). There are also a number of drainage lines, small streams and dams in the area (Figure 2).

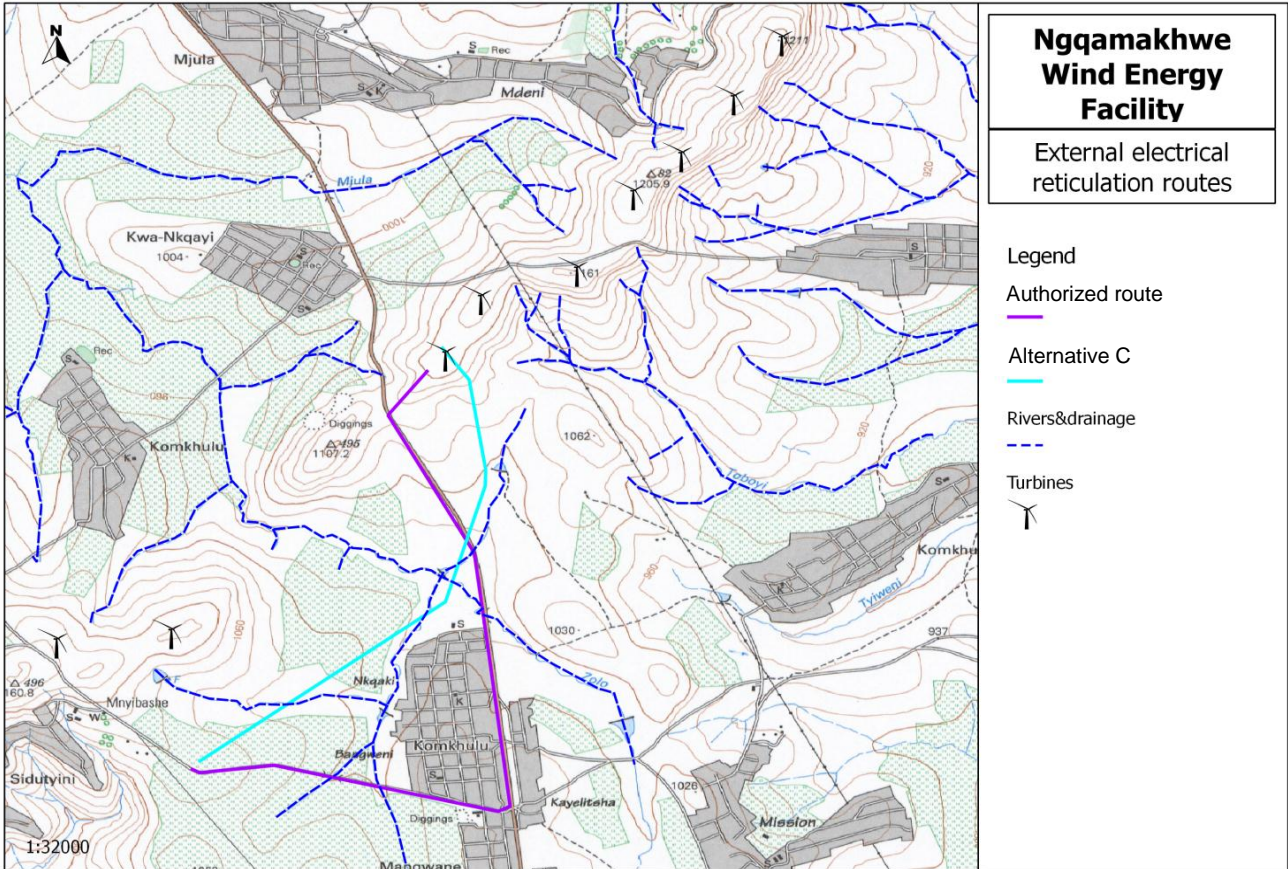


Figure 2. Authorised (purple) and proposed (turquoise) amended route for the external power line.

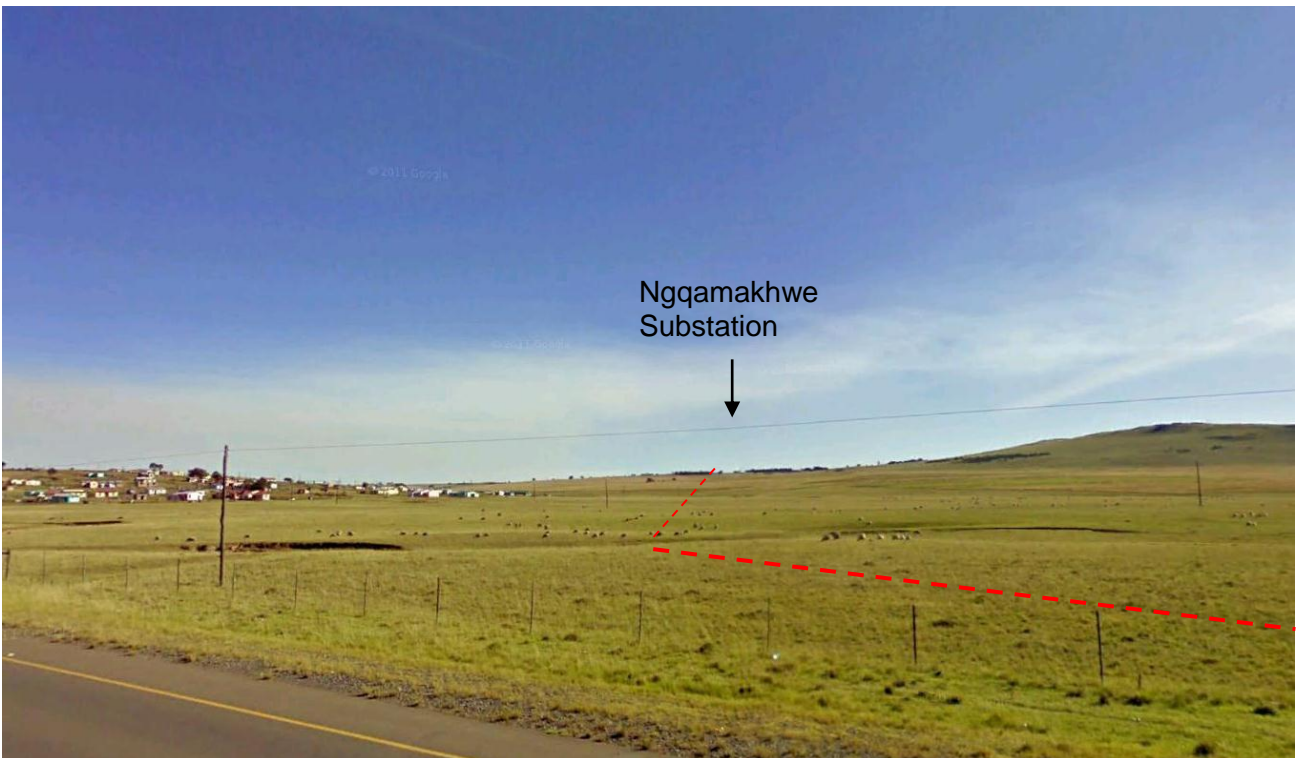


Figure 3: View SOUTHWEST from the R409: Approximate route of power line across cultivated land (dashed line). Note existing power line infrastructure.

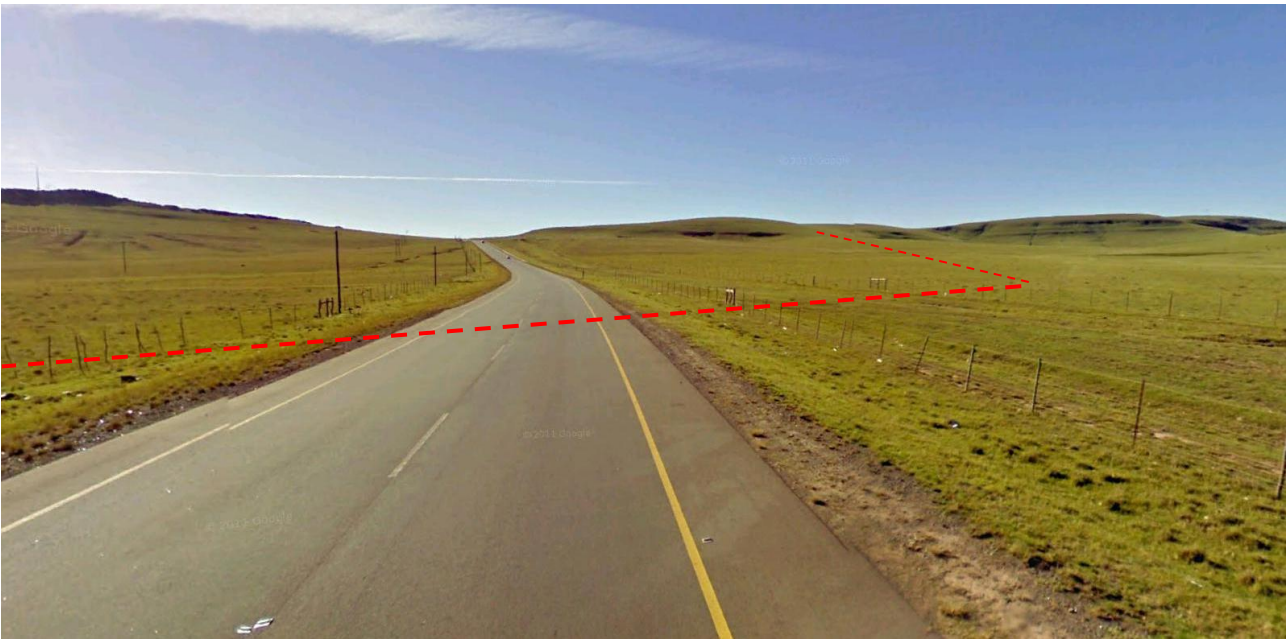


Figure 4: View NORTHEAST from the R409: Approximate route of power line across cultivated land (dashed line). End point is switch station between WT 4 and 5.

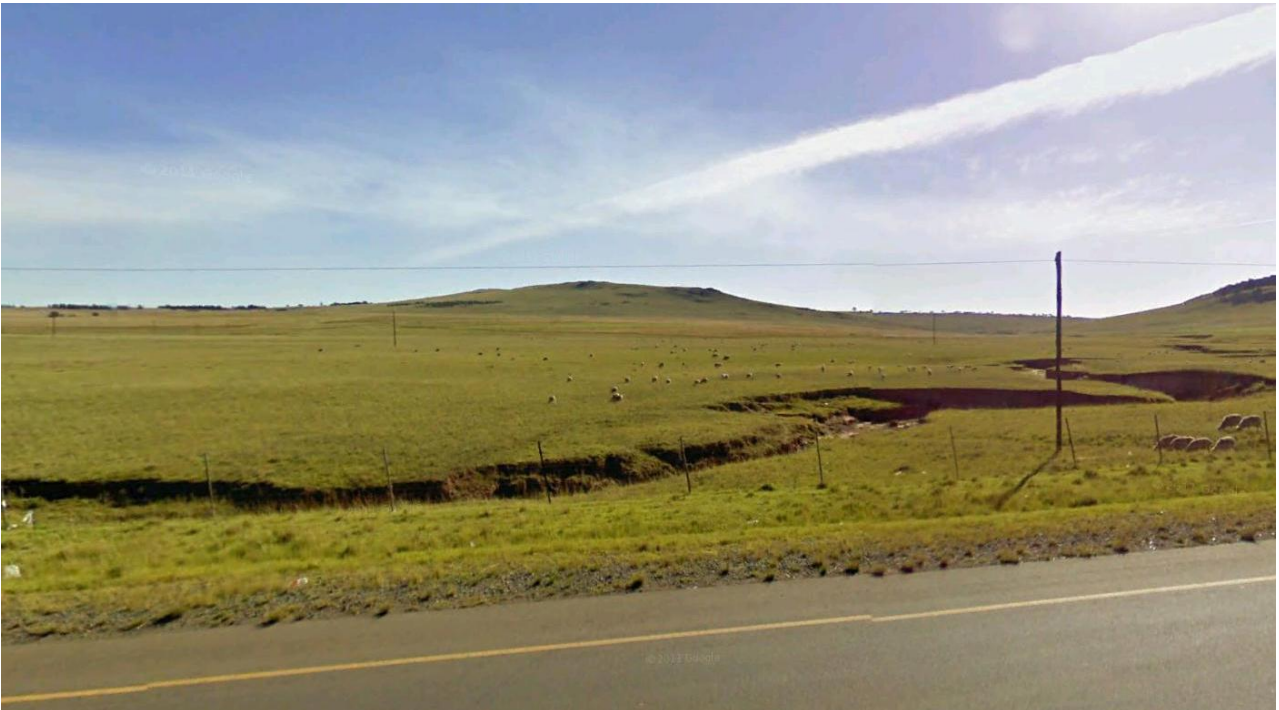


Figure 5. The Zolo River is crossed by both the authorised and proposed amended route.

3 TERMS OF REFERENCE

3.1 Specialist Terms of Reference

Specialist input was sought (as directed by the DEA) from the vegetation, avifaunal and heritage specialists. The following terms of reference were provided:

- A comparative assessment between the newly proposed overhead power line and the already approved underground electrical collection cabling and power lines.
- Indicate if/where possible, overhead lines would be suitable and where only underground lines will be suitable.
- An extensive assessment of the impact of the proposed deviation alternative route and that of the aboveground electrical collection cabling and power lines.
- Assess the new route from the eastern limb to the substation (across the fields) (blue route on map).
 - Assess this only as an overhead power line.

3.2 Assumptions

All cables/power lines will be no larger than 33kV. All lines constructed will be a maximum of 33kV, and as such do not require Environmental Authorisation.

4 METHODOLOGY FOR IMPACT ASSESSMENT

Significance Rating Table	
Temporal Scale (The duration of the impact)	
Short term	Less than 5 years (Many construction phase impacts are of a short duration).
Medium term	Between 5 and 20 years.
Long term	Between 20 and 40 years (From a human perspective almost permanent).
Permanent	Over 40 years or resulting in a permanent and lasting change that will always be there.
Spatial Scale (The area in which any impact will have an affect)	
Individual	Impacts affect an individual.
Localized	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
Project Level	Impacts affect the entire project area.
Surrounding Areas	Impacts that affect the area surrounding the development
Municipal	Impacts affect either BCM, or any towns within them.
Regional	Impacts affect the wider district municipality or the province as a whole.
National	Impacts affect the entire country.
International/Global	Impacts affect other countries or have a global influence.
Will definitely occur	Impacts will definitely occur.
Degree of Confidence or Certainty (The confidence with which one has predicted the significance of an impact)	
Definite	More than 90% sure of a particular fact. Should have substantial supportive data.
Probable	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
Possible	Only over 40% sure of a particular fact or of the likelihood of an impact occurring.
Unsure	Less than 40% sure of a particular fact or of the likelihood of an impact occurring.
Impact severity (The severity of negative impacts, or how beneficial positive impacts would be on a particular affected system or affected party)	
Very severe	Very beneficial

An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.
Severe	Beneficial
Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.
Moderately severe	Moderately beneficial
Medium to long term impacts on the affected system(s) or party (ies), which could be mitigated. For example constructing the sewage treatment facility where there was vegetation with a low conservation value.	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage effluent quality.
Slight	Slightly beneficial
Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
No effect	Don't know/Can't know
The system(s) or party(ies) is not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.

Overall Significance (The combination of all the above criteria as an overall significance)	
VERY HIGH NEGATIVE	VERY BENEFICIAL
<p>These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects.</p> <p>Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance.</p> <p>Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.</p>	
HIGH NEGATIVE	BENEFICIAL
<p>These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light.</p> <p>Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated.</p> <p>Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.</p>	

MODERATE NEGATIVE	SOME BENEFITS
<p>These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial.</p> <p>Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.</p>	
LOW NEGATIVE	FEW BENEFITS
<p>These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect.</p> <p>Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels.</p> <p>Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.</p>	
NO SIGNIFICANCE	
<p>There are no primary or secondary effects at all that are important to scientists or the public.</p> <p>Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.</p>	
DON'T KNOW	
<p>In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information.</p> <p>Example: The effect of a particular development on people's psychological perspective of the environment.</p>	

5 ASSESSMENT OF IMPACTS

5.1 Amendment 2 – Comparative assessment of Above (Alternative A) or Underground (Alternative B) internal power lines

SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/ BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION
ISSUE 1: <u>Visual</u>				
IMPACT: Cluttering of the skyline along the ridges may detract from the natural scenic value of the area.				
ALTERNATIVE A: OVERHEAD POWER LINES				
Overhead power lines of up to 33 kV are usually no taller than 15 m.				
Surrounding areas	Long term	<i>Definite</i>	MODERATELY SEVERE	MODERATELY NEGATIVE
MITIGATION: The skyline along the ridges will be drastically transformed by the construction of 150m high wind turbines. It is unlikely that the addition of 15m electrical pylons will contribute significantly to an already significant impact on the scenic value of the area.				
SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u>				
ALTERNATIVE B: UNDERGROUND POWER LINES				
Underground power lines will have no permanent impact on the scenic value of the area, beyond the construction phase, where heavy machinery may be used to excavate trenches.				
				NO IMPACT
MITIGATION: None required				
SIGNIFICANCE POST-MITIGATION: <u>NO IMPACT</u>				
ISSUE 2: <u>Avifauna</u>				
IMPACT: Bird collision & electrocution on overhead power lines during operational phase, impact on Red Listed and other species – particularly Cape Vulture				
ALTERNATIVE A: OVERHEAD POWER LINES				
National – populations of Red Listed species affected	Permanent	<i>Probable</i>	MODERATELY SEVERE	MODERATE/HIGH NEGATIVE
MITIGATION: TWO SPECIFIC AREAS ALONG THE POWER LINE ROUTE CONSTITUTE A HIGH COLLISION RISK THAT IS CONSIDERED SIGNIFICANT. THESE AREAS ARE SHOWN IN FIGURE 6 IN CHAPTER 6.				
The remaining overhead power line route must be marked with a suitable Eskom approved anti-collision marking device on the earth wire or conductor to increase the visibility of the line and reduce likelihood of bird collisions. These devices must be maintained for lifespan of line, being replaced if damaged or worn. Only bird friendly pole/pylon designs (as per Eskom standard) should be used to prevent electrocutions. Include power lines in post construction bird monitoring for wind energy facility to measure impacts and evaluate effectiveness of mitigation.				
SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u>				

SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/ BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION
ALTERNATIVE B: UNDERGROUND POWER LINES				
				NO IMPACT
MITIGATION: None required				
SIGNIFICANCE POST-MITIGATION: <u>NO IMPACT</u>				
IMPACT: Bird disturbance during construction phase as result of construction of infrastructure – particularly small terrestrial species with small home ranges.				
ALTERNATIVE A: OVERHEAD POWER LINES				
National – populations of Red Listed species affected	<u>Permanent</u>	<i>Possible</i>	SLIGHT	LOW NEGATIVE
MITIGATION: It is very difficult to mitigate for this. Disturbance can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance				
SIGNIFICANCE POST –MITIGATION: <u>LOW NEGATIVE</u>				
ALTERNATIVE B: UNDERGROUND POWER LINES				
National – populations of Red Listed species affected	<u>Permanent</u>	<i>Possible</i>	SLIGHT	LOW NEGATIVE
MITIGATION: It is very difficult to mitigate for this. Disturbance can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance.				
SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u>				
IMPACT: Destruction of bird habitat during construction - particularly Blue Crane, Denham’s Bustard, Black Harrier, and Rock Kestrel				
ALTERNATIVE A: OVERHEAD POWER LINES				
National – populations of Red Listed species affected	<u>Permanent</u>	<i>Possible</i>	SLIGHT	LOW NEGATIVE
MITIGATION: It is very difficult to mitigate for this. Habitat alteration can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance				
SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u>				
ALTERNATIVE B: UNDERGROUND POWER LINES				
National – populations of Red Listed species affected	<u>Permanent</u>	<i>Possible</i>	SLIGHT	LOW NEGATIVE
MITIGATION: It is very difficult to mitigate for this. Habitat alteration can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance.				
SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u>				

SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/ BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION
ISSUE 3: ECOLOGY				
IMPACT: Disturbance of high quality Drakensberg Foothill Moist Grassland				
ALTERNATIVE A: OVERHEAD POWER LINES				
Localised	<u>Short term</u>	<i>Probable</i>	SLIGHT	LOW NEGATIVE
<p>MITIGATION: The route must be walked by a botanical specialist in order to identify plants that require permits and transplanting. Prior to construction all species of special concern and protected plant species must be removed and transplanted or kept in nursery conditions until out-planting. Pylon placement must be planned to ensure that no sensitive sites as identified in the original Ecological Report are disturbed or damaged.</p>				
SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u>				
ALTERNATIVE B: UNDERGROUND POWER LINES				
Localised	<u>Short term</u>	<i>Definite</i>	MODERATELY SEVERE	MODERATE NEGATIVE
<p>MITIGATION: The route must be walked by a botanical specialist in order to identify plants that require permits and transplanting. Prior to construction all species of special concern and protected plant species must be removed and transplanted or kept in nursery conditions until out-planting.</p>				
SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u>				
IMPACT: Inappropriate power cable routes may transect ecologically sensitive habitats				
ALTERNATIVE A: OVERHEAD POWER LINES				
Localised	<u>Long term</u>	<i>Possible</i>	SLIGHT	LOW NEGATIVE
<p>MITIGATION: The route must be walked by a botanical specialist in order to identify plants that require permits and transplanting. Prior to construction all species of special concern and protected plant species must be removed and transplanted or kept in nursery conditions until out-planting. Pylon placement must be planned to ensure that no sensitive sites as identified in the original Ecological Report are disturbed or damaged.</p>				
SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u>				
ALTERNATIVE B: UNDERGROUND POWER LINES				
Localised	<u>Long term</u>	<i>Definite</i>	HIGHLY SEVERE	HIGH NEGATIVE

SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/ BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION
<p>MITIGATION: The route must be walked by a botanical specialist in order to identify plants that require permits and transplanting. Prior to construction all species of special concern and protected plant species must be removed and transplanted or kept in nursery conditions until out-planting.</p>				
<p>SIGNIFICANCE POST-MITIGATION: <u>MODERATE NEGATIVE</u></p>				
<p>IMPACT: Loss of species of special concern due the construction of the power line</p>				
<p>ALTERNATIVE A: OVERHEAD POWER LINES</p>				
Localised	<u>Short term</u>	<i>Probable</i>	SLIGHT	LOW NEGATIVE
<p>MITIGATION: The route must be walked by a botanical specialist in order to identify plants that require permits and transplanting. Prior to construction all species of special concern and protected plant species must be removed and transplanted or kept in nursery conditions until out-planting. Pylon placement must be planned to ensure that no sensitive sites as identified in the original Ecological Report are disturbed or damaged.</p>				
<p>SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u></p>				
<p>ALTERNATIVE B: UNDERGROUND POWER LINES</p>				
Localised	<u>Short term</u>	<i>Definite</i>	MODERATELY SEVERE	MODERATE NEGATIVE
<p>MITIGATION: The route must be walked by a botanical specialist in order to identify plants that require permits and transplanting. Prior to construction all species of special concern and protected plant species must be removed and transplanted or kept in nursery conditions until out-planting.</p>				
<p>SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u></p>				
<p>IMPACT: Permanent loss of Drakensberg Foothill Moist Grassland vegetation due to construction of power lines.</p>				
<p>ALTERNATIVE A: OVERHEAD POWER LINES</p>				
Localised	<u>Short term</u>	<i>Probable</i>	SLIGHT	LOW NEGATIVE
<p>MITIGATION: The route must be walked by a botanical specialist in order to identify plants that require permits and transplanting. Prior to construction all species of special concern and protected plant species must be removed and transplanted or kept in nursery conditions until out-planting. Pylon placement must be planned to ensure that no sensitive sites as identified in the original Ecological Report are disturbed or damaged.</p>				
<p>SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u></p>				
<p>ALTERNATIVE B: UNDERGROUND POWER LINES</p>				

SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/ BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION
Localised	<u>Short term</u>	<i>Definite</i>	MODERATELY SEVERE	MODERATE NEGATIVE
<p>MITIGATION: The route must be walked by a botanical specialist in order to identify plants that require permits and transplanting. Prior to construction all species of special concern and protected plant species must be removed and transplanted or kept in nursery conditions until out-planting.</p>				
<p>SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u></p>				
<p>IMPACT: During the construction of power lines topsoil clearing, soil storage and soil exposure may result in soil destabilisation and severe soil erosion, locally as well as downstream of construction activities.</p>				
<p>ALTERNATIVE A: OVERHEAD POWER LINES</p>				
Localised	<u>Medium-term</u>	<i>Probable</i>	SLIGHT	MODERATE NEGATIVE
<p>MITIGATION: Soil stabilisation and re-vegetation measures must be implemented to stop erosion and rehabilitate the area</p>				
<p>SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u></p>				
<p>ALTERNATIVE B: UNDERGROUND POWER LINES</p>				
Localised	<u>Medium-term</u>	<i>Probable</i>	MODERATELY SEVERE	HIGH NEGATIVE
<p>MITIGATION: Soil stabilisation and re-vegetation measures must be implemented to stop erosion and rehabilitate the area</p>				
<p>SIGNIFICANCE POST-MITIGATION: <u>MODERATE NEGATIVE</u></p>				
<p>IMPACT: Poor follow-up on the success of post-construction rehabilitation may result in late detection of poor vegetation re-establishment which could result in large scale soil erosion.</p>				
<p>ALTERNATIVE A: OVERHEAD POWER LINES</p>				
Localised	<u>Medium-term</u>	<i>Probable</i>	SLIGHT	MODERATE NEGATIVE
<p>MITIGATION: Rehabilitation must be monitored for a minimum of six months OR until the ECO is confident that re-vegetation has been successful.</p>				
<p>SIGNIFICANCE POST-MITIGATION: <u>LOW NEGATIVE</u></p>				
<p>ALTERNATIVE B: UNDERGROUND POWER LINES</p>				
Localised	<u>Medium-term</u>	<i>Probable</i>	MODERATELY SEVERE	HIGH NEGATIVE
<p>MITIGATION: Rehabilitation must be monitored for a minimum of six months OR until the ECO is confident that re-vegetation has been successful.</p>				
<p>SIGNIFICANCE POST-MITIGATION: <u>MODERATE NEGATIVE</u></p>				

5.2 Amendment 3 – Extensive assessment of the new overhead power line route (Alternative C).

DESCRIPTION OF IMPACTS	SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
ECOLOGY							
<p>In terms of ecological sensitivity, no major concerns have been identified:</p> <ol style="list-style-type: none"> 1. In the north, along the steep slope, caution to not to disturb, unnecessarily, the vegetation around the pylon must be implemented and carefully monitored. In addition, soil stabilisation and re-vegetation activities must be implemented in order to eliminate the potential for soil erosion to occur. 2. No ecological sensitivity associated with the grassland or cultivated fields are anticipated. 3. With regards to the small stream, pylons may not be placed within 32 metres of the water course. Soil stabilising and rehabilitation activities must be implemented post-construction to eliminate the potential for soil erosion and the creation of “dongas” which are already prominent features in the surrounding environment. 							
AVIFAUNA							
Bird collision & electrocution on overhead power lines during operational phase, impact on Red Listed and other species – particularly Cape Vulture	NATIONAL – POPULATIONS OF RED LISTED SPECIES AFFECTED	PERMANENT	PROBABLE	HIGHLY SEVERE	HIGH NEGATIVE	<p>Two areas along the power line route must remain below ground.</p> <p>Overhead power lines must be marked with a suitable Eskom approved anti-collision marking device on the earth wire or conductor to increase the visibility of the line and reduce likelihood of bird collisions. These high risk sections of line must be identified during the site specific EMP. These devices must be maintained for lifespan of line, being replaced if damaged or worn. Only bird friendly pole/pylon designs (as per Eskom standard) should be used to prevent electrocutions. Include power lines in post construction bird monitoring for wind energy facility to</p>	<p>IN SENSITIVE AREAS POWER CABLES ARE TO REMAIN BELOW GROUND</p> <p>LOW NEGATIVE</p>

Ngqamakhwe Wind Energy Facility Amendment – January 2013

						measure impacts and evaluate effectiveness of mitigation.	
Bird disturbance during construction phase as result of construction of infrastructure – particularly small terrestrial species with small home ranges.	NATIONAL – POPULATION S OF RED LISTED SPECIES AFFECTED	<u>PERMANENT</u>	<i>POSSIBLE</i>	SLIGHT	LOW NEGATIVE	It is very difficult to mitigate for this. Disturbance can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance.	LOW NEGATIVE
Destruction of bird habitat during construction – particularly Blue Crane, Denham's Bustard, Black Harrier, and Rock Kestrel	NATIONAL – POPULATION S OF RED LISTED SPECIES AFFECTED	<u>PERMANENT</u>	<i>POSSIBLE</i>	SLIGHT	LOW NEGATIVE	It is very difficult to mitigate for this. Habitat alteration can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance.	LOW NEGATIVE
HERITAGE							
The proposed route avoids areas noted in the original HIA as being highly sensitive. The new route traverses land that has been extensively ploughed and is thus unlikely to yield any significant heritage resources. Two areas may contain human remains – no structures to support this were identified during the original survey, but evidence may be uncovered during construction. These two areas should be noted as sensitive, and if human remains are uncovered during construction, SAHRA and the ECO should be notified immediately. (Summarised excerpt from the HIA exemption request letter – Heritage Specialist Assessment attached)							
GEOLOGY AND SOILS							
Installation of pylons without taking into account the geology and soil structure along the proposed line may result in unnecessary soil erosion and/or damage to geological formations.	LOCALISED	<u>PERMANENT</u>	<i>POSSIBLE</i>	MODERATELY SEVERE	MODERATE NEGATIVE	Pylons must be sited to avoid areas of inappropriate geological or soil structure. Eskom should survey soil conditions prior to finalising the pylon positions.	LOW NEGATIVE
Lack of environmental consideration may result in inappropriate placement of pylons within drainage systems	PROJECT AREA	<u>PERMANENT</u>	<i>POSSIBLE</i>	MODERATE	MODERATE NEGATIVE	Micro-siting of the final power line design must be approved by an appointed independent Environmental Control Officer.	LOW NEGATIVE

Ngqamakhwe Wind Energy Facility Amendment – January 2013

along the length of power line route.							
VISUAL							
Pylons may cause further impact on the sense of place of inhabitants. There are already a number of power lines traversing the area	SURROUNDING AREAS	<u>LONG TERM</u>	<i>PROBABLE</i>	SLIGHT	MODERATE NEGATIVE	Pylon structures must be chosen such that they provide the smallest impact on visual characteristics, i.e. monopole structures rather than lattice structures.	LOW NEGATIVE
AGRICULTURE							
The route traverses communal land actively utilized for crop agriculture. Small areas around the proposed pylons will no longer be available for use.	LOCALISED	<u>LONG TERM</u>	<i>PROBABLE</i>	SLIGHT	MODERATE NEGATIVE	Pylons should be placed along the boundaries of croplands in order to minimise potential loss of land.	LOW NEGATIVE
WATER RESOURCES							
Excavation of the pylon foundations may destabilize the bank structure of water courses, resulting in channel erosion and collapse of stream banks.	LOCALISED	<u>MEDIUM TERM</u>	<i>POSSIBLE</i>	MODERATELY NEGATIVE	MODERATE NEGATIVE	Pylons must be placed a minimum of 32m from the centre of a water course.	LOW NEGATIVE

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Amendment 1

There is no reason why the change in ownership of the project should not be migrated from InnoWind (Pty) Ltd, to the new entity, Nqamakwe Wind Power (Pty) Ltd.

6.2 Amendment 2

Table 6.1 shows a quantitative summary of the significance of the impacts identified with regard to overhead or underground power cables. In terms of pure numbers, an overhead power line would have a lower impact overall, based on its smaller footprint impact on vegetation.

Alternative	Pre-mitigation				Post-mitigation			
	L	M	H	VH	L	M	H	VH
A (Overhead)	-6	-4	0	0	-10	0	0	0
B (Underground)	-2	-3	-3	0	-5	-3	0	0

However, the potential impacts on avifauna should not be ignored. The avifaunal specialist has indicated that there are areas of high risk, where overhead power lines will potentially cause a collision risk, not only with the power line, but with the associated wind turbines.

6.2.1 Summary from Avifaunal Specialist

“It is strongly recommended that no power line is built above the ground in the areas shown with red circles in Figure 6 below. The reasons for this are as follows:

- » *There will be a high risk of collision of birds, in particular vultures. Mitigation measures in the form of line marking devices for collision are not fully effective, particularly in poor weather or low visibility conditions.*
- » *The proposed wind turbines already pose a collision risk on the site, and the construction of overhead power lines will provide risk at an additional and different height above ground. This will significantly increase the collision risk on site.*
- » *Power line poles will provide perching space for birds thereby attracting them unnecessarily to an area in which they will face high collision risk. “*

Mr Jon Smallie (Wildskies)

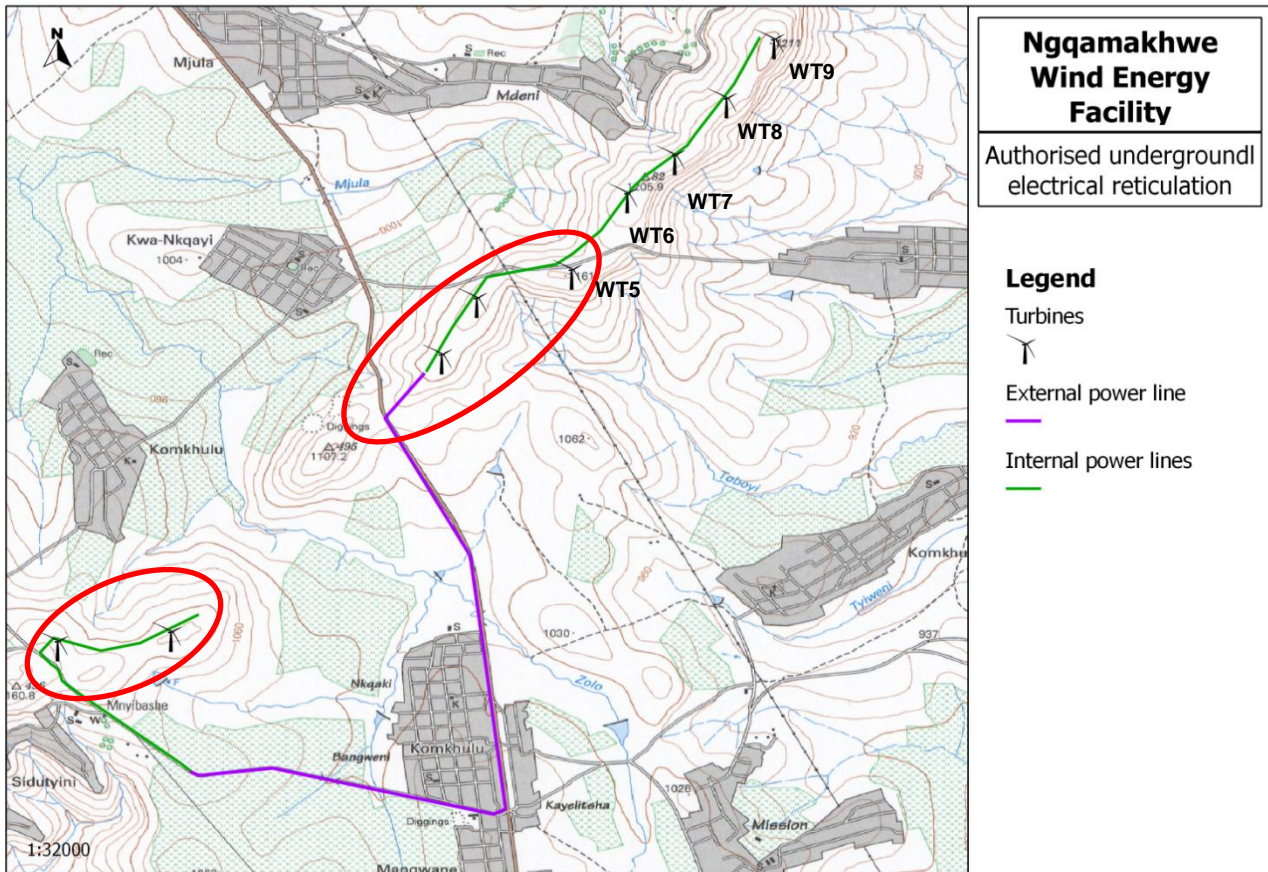


Figure 6. High risk areas for above ground power line (red circles)

6.2.2 Ecological Specialist Recommendations

“Due the smaller footprint of the pylons relative to the significantly larger linear footprint of trenches to bury the cables, it has been found in this assessment that above-ground or overhead power lines are in fact preferential to the below ground option.”

Dr Greer Hawley (CES)

6.2.3 EAP Recommendation

It is the opinion of CES that the recommendations of the avifaunal specialist be upheld with regard to the burial of the power lines at the specified areas. We believe that this recommendation has been made based on not only the initial site survey undertaken during the EIA process, but also on information gathered during subsequent avifaunal monitoring site visits.

In order to give meaning to the recommendation, it is suggested that overhead power lines be authorised between turbines 5 – 9, and that all other internal power connections are via underground power cables.

6.3 Amendment 3

Table 6-2 summarises the significance of the identified impacts on the environment posed by the proposed new route alternative for the external power line. A number of impacts were of MODERATE NEGATIVE significance pre-mitigation; however, these can all be successfully mitigated to LOW significance with proper planning.

Issue	Pre-mitigation				Post-mitigation			
	L	M	H	VH	L	M	H	VH
Ecology	0	0	0	0	0	0	0	0
Avifauna	-2	-1	0	0	-3	0	0	0
Heritage	0	0	0	0	0	0	0	0
Geology and soils	0	-3	0	0	-3	0	0	0
Agriculture	0	-1	0	0	-1	0	0	0
Water Resources	0	-1	0	0	-1	0	0	0

6.3.1 Ecological Specialist Recommendation

“In terms of ecological sensitivity, no major concerns have been identified:

- 1. In the north, along the steep slope, caution not to disturb unnecessarily the vegetation around the pylon must be implemented and carefully monitored. In addition, soil stabilisation and re-vegetation activities must be implemented in order to eliminate the potential for soil erosion to occur.*
- 2. No ecological sensitivity associated with the grassland or cultivated fields are anticipated.*
- 3. With regards to the small stream, pylons may not be placed within 32 metres of the water course. Soil stabilising and rehabilitation activities must be implemented post-construction to eliminate the potential for soil erosion and the creation of “dongas” which are already prominent features in the surrounding environment.”*

Dr Greer Hawley

6.3.2 Heritage Specialist Recommendation

The proposed route avoids areas noted in the original HIA as being highly sensitive. The new route traverses land that has been extensively ploughed and is thus unlikely to yield any significant heritage resources. Two areas may contain human remains – no structures to support this were identified during the original survey, but evidence may be uncovered during construction. These two areas should be noted as sensitive, and if human remains are uncovered during construction, SAHRA and the ECO should be notified immediately.

Summarised excerpt from the HIA exemption request letter

6.3.3 Avi-faunal Specialist

The overhead external power line must be marked with a suitable Eskom approved anti-collision marking device on the earth wire or conductor to increase the visibility of the line and reduce likelihood of bird collisions. These high risk sections of line must be identified during the site specific EMP. These devices must be maintained for lifespan of line, being replaced if damaged or worn. Only bird friendly pole/pylon designs (as per Eskom standard) should be used to prevent electrocutions. Include power lines in post construction bird monitoring for wind energy facility to measure impacts and evaluate effectiveness of mitigation.

Mr Jon Smallie (Wildskies)

6.3.4 EAP Recommendation

An assessment of the proposed new route for the external power line has indicated that the power line will not have any significant impact on the environment, provided that the suggested mitigation measures are implemented. It is the opinion of CES that the proposed new route be approved as an alternative to the original route.

APPENDICES

AVIFAUNAL SPECIALIST ASSESSMENT

Ngqamakwe Wind Energy Facility – associated power lines Amendment to authorisation

Avifaunal specialist study

4 December 2012

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1 BACKGROUND

InnoWind would like to amend their environmental authorisation for the Ngqamakhwe project in two ways: to provide an option to use overhead OR buried cabling throughout the facility; and to provide a shorter route to connect the Eastern side to the substation on the western side of the road (also overhead line).

Coastal & Environmental Services (Pty) Ltd was contracted by Innowind to conduct the necessary assessment, and subsequently appointed WildSkies Ecological Services to provide the avifaunal input into this process.

The terms of reference for this study were as follows:

1. To conduct a comparative assessment between the newly proposed overhead power line and the already approved underground electrical collection cabling and power lines.
 - » Assess the original route in terms of overhead versus buried cables
 - » Indicate if/where possible, overhead lines would be suitable and where only underground lines will be suitable.

2. To conduct an extensive assessment of the impact of the proposed deviation alternative route and that of the aboveground electrical collection cabling and power lines.
 - » Assess the new route from the eastern limb to the substation (across the fields)
 - » Assess this only as an overhead power line.

The level of detail contained in the original avifaunal report will not be repeated here. Readers should refer to the original report where necessary.

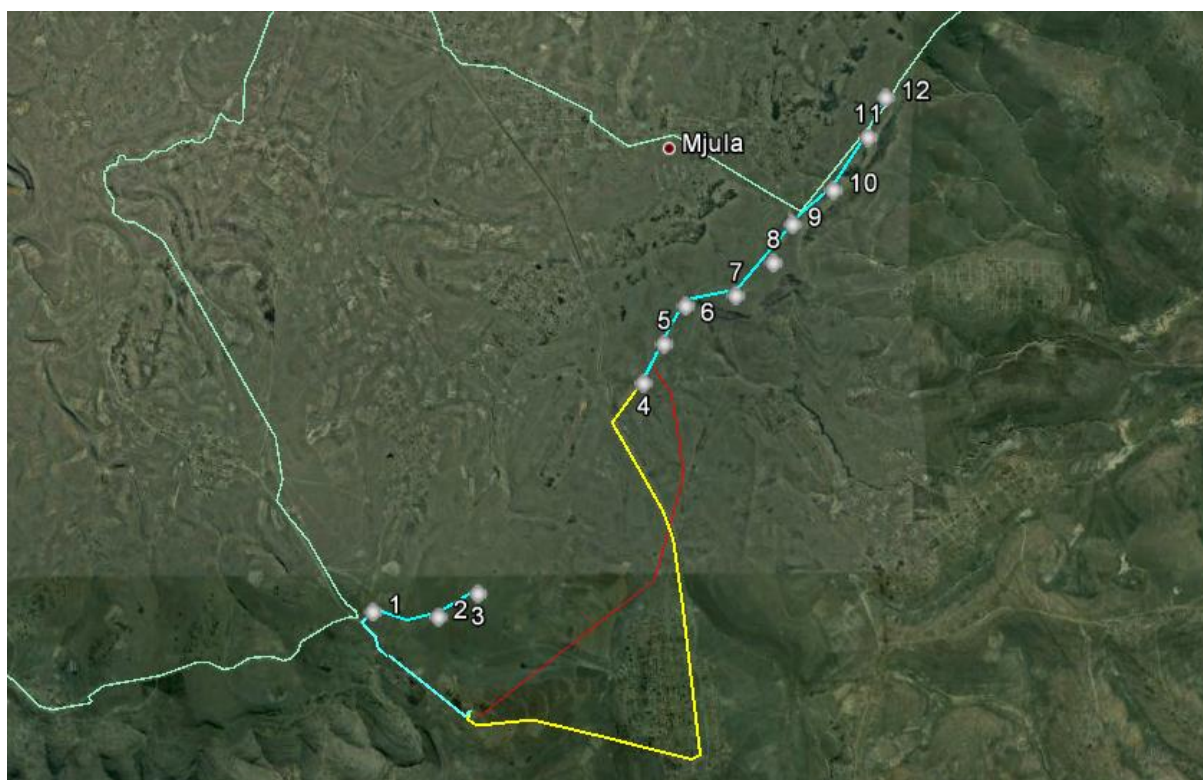


Figure 6. The layout of the proposed activities. The red line shows the new proposed power line route, whilst the yellow and turquoise show the authorised external and internal power lines respectively.

2 DISCUSSION

2.1 Bird information

The original study found that “a secondary impact of this development could be the impact of the associated power lines, and these have the potential to negatively affect the avifauna in the area. Existing power lines in the area are known to impact heavily upon several bird species, including Cape Vulture. The developer has however undertaken to bury all power lines below the ground. Any change to this should be brought to the EWT’s attention in order for this to be properly assessed”.

The Southern African Bird Atlas Project (Harrison *et al*, 1997) recorded 145 species in the quarter degree square covering the study area (3227BB). Ten of these species are Red Listed (Barnes, 2000): Cape Vulture; Grey Crowned Crane; Southern Ground Hornbill; African Grass Owl; Denham’s Bustard; African Crowned Eagle;

Secretarybird; Lanner Falcon; Black Harrier; and Black Stork. The more recent second bird atlas project has unfortunately not recorded any counts or cards in the relevant pentads (www.sabap2.adu.org.za). In addition to the atlas data, two seasons of pre-construction bird monitoring have now been conducted at this site and based on this experience it is possible to finalise the target species (those species which are most important for this impact assessment) list for this site as follows: Cape Vulture; Lanner Falcon *Falco biarmicus*; Secretarybird *Sagittarius serpentarius*; Black Harrier *Circus maurus*; Crowned Eagle *Stephanoaetus coronatus*; and Denham's Bustard *Neotis denhamii*. By far the most important species is the Cape Vulture.

It is important to contextualise the Eastern Cape vultures in South Africa in order to fully understand the implications of the proposed amendment. Boshoff, Piper and Michael (2009), and Boshoff and Minnie (2011) summarize the Cape Vulture's status in the Eastern Cape as follows:

- » The Eastern Cape - Cape Vulture population forms one of two nodes for this species (if viewed as contiguous with the Lesotho and KwaZulu-Natal populations (Piper 1994, Mundy *et al*, 1997 in Boshoff *et al* 2009).
- » The provincial stronghold appears to be in the north and east of the Eastern Cape (encompassing the Ngqamakhwe site). Almost all breeding colonies exist in the eastern parts of the province, whilst the western parts appear to be used primarily for foraging, and are where the greatest decline in active colonies and numbers of birds has taken place in recent times (Boshoff *et al* 2009).
- » The Eastern Cape population was estimated at a minimum of 1 702 birds, but more likely approximately 2 000 birds, based on the 630 breeding pairs recorded by Boshoff *et al* (2009).
- » During the period 2004-2007, 20 breeding colonies were active in the Eastern Cape (Boshoff & Minnie, 2011). Of these, the top 8 largest colonies held 86% of all breeding pairs.
- » In a declining population the large colonies are exceptionally important in the recolonizing of 'satellite' or small colonies (Boshoff *et al* 2009, Boshoff & Minnie 2011). Conservation action should therefore be focused on the larger colonies (Boshoff & Minnie 2011). Small colonies are especially vulnerable to unnatural mortality factors (Boshoff *et al* 2009).
- » The Cape Vulture qualifies as a central place forager (according to criteria in Orians & Pearson 1979) and various empirical information indicates that a 40km radius is realistic. (Boshoff & Minnie 2011). Conservation actions should therefore focus within this radius.
- » More recent work described above found that the Mzimvubu catchment holds approximately 250 breeding pairs and is probably the largest single concentration of the species in the southern parts of its population (Allan, 2012).

In recent times Cape Vultures *Gyps coprotheres* have increasingly been reported colliding with power lines. This typically occurs where this species has reason to congregate such as at feeding and roosting sites. The Eskom-Endangered Wildlife Trust Strategic Partnership has to date recorded 983 vulture mortalities (all vulture species, 1996 to 2012) on power lines, of which 812 were caused by electrocution and 98 by collision. For the Cape Vulture specifically a total of 562 birds have been reported killed, with 491 or 87% of these being killed through electrocution. Certain biases exist in this data including: that electrocution victims fall closer to poles and therefore are more likely to be found by maintenance staff; that certain high collision risk sections of power line traverse valleys and steep terrain where detection of carcasses would be unlikely (although the same applies to electrocution to some extent); and various others. However it does seem that based on the actual data collected, electrocution is by far the greater threat to Cape Vultures in South Africa. This does not mean that the collision threat should not be addressed by conservationists and Eskom, but it does place the threat in perspective.

The original study mapped the avifaunal sensitivity of the site, shown in Figure 2 below. Pre-construction monitoring done to date and this current report supports the original findings that the higher ground on the ridges is most sensitive.

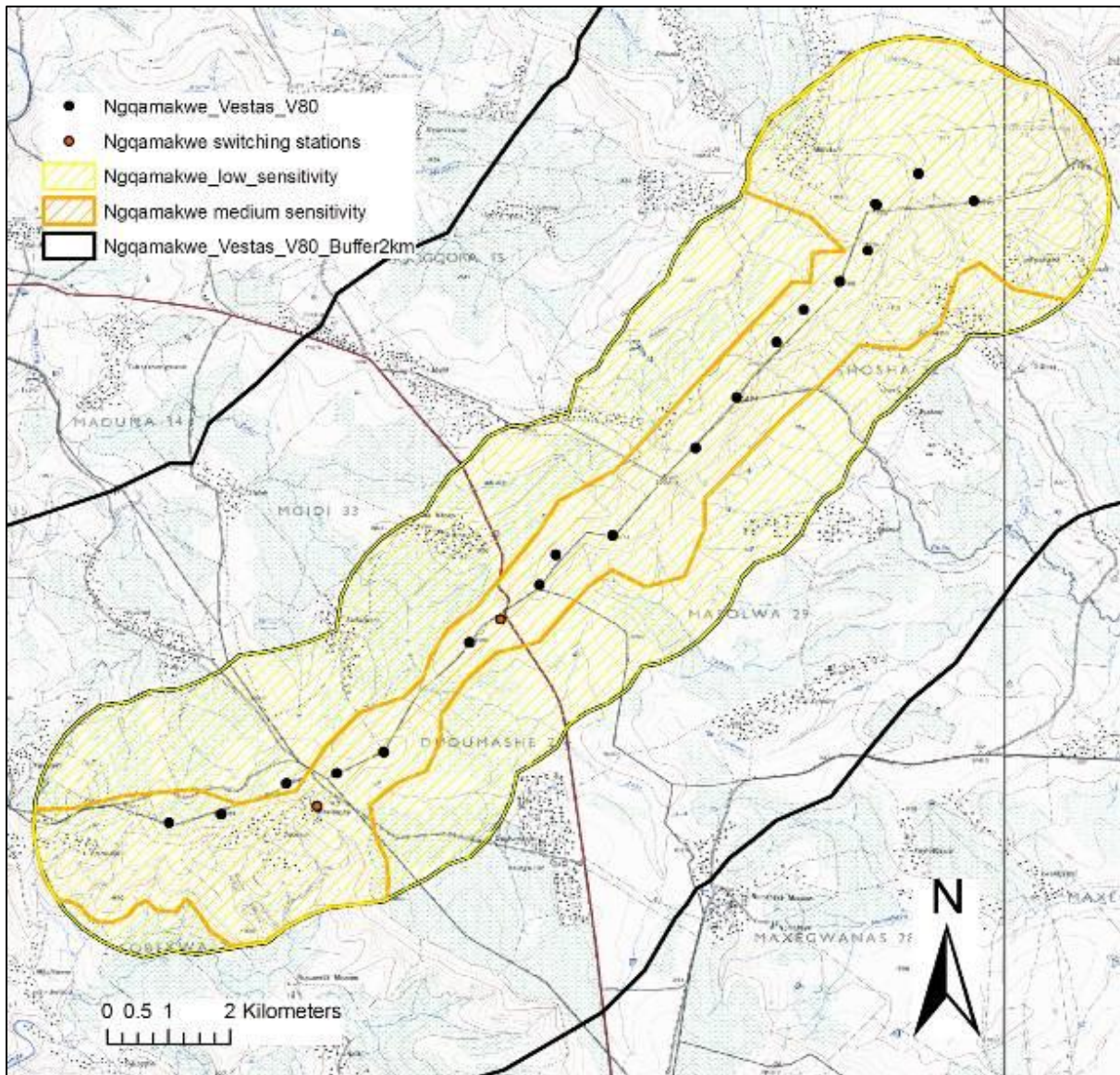


Figure 7. The original avifaunal sensitivity map for the site (Smallie 2011). Medium sensitivity areas are shown in orange and low sensitivity in green.

2.2 Proposed activity

This report deals with two aspects: firstly the comparison of an above versus below ground option for the internal power lines on site and the external power line to the substation; and secondly a new above ground alignment for the external power line to the substation.

The proposal to place the power lines above ground is not preferred from an avifaunal perspective at all, as explained in the tables below.

The proposed new route through the fields for the grid connection line is not as preferred as a route hugging the roads in the area (as originally proposed). However in the lower lying areas of the route there are no fatal flaws for this alignment. The line will require line marking devices on certain sections where it passes through drainage lines and wetlands in order to mitigate for the risk of collision. The higher lying ground is problematic and has been discussed further in the conclusions. This route will need to be assessed in the final site specific EMP in order to identify the high risk sections of line which require mitigation.

2.3 Impact assessment

The impact of each of the options is assessed in the tables below according to the criteria provided by CES.

Table 1. Assessment of impacts of below ground power line

GENERAL AND SPECIALIST STUDY IMPACTS	SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
ISSUE: Avifauna – particularly Cape Vulture							
IMPACT: Bird collision & electrocution on overhead power lines during operational phase, impact on Red Listed and other species							
	National – populations of Red Listed species affected	Permanent	Impossible	No effect	No significance	None required	No significance
ISSUE: Avifauna – particularly small terrestrial species with small home ranges.							
IMPACT: Bird disturbance during construction phase as result of construction of infrastructure							
	National – populations of Red Listed species affected	Permanent	Possible	Slight	Low negative	It is very difficult to mitigate for this. Disturbance can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance.	Low negative
ISSUE: Avifauna – particularly Blue Crane, Denham’s Bustard, Black Harrier, and Rock Kestrel							
IMPACT: Destruction of bird habitat during construction							
	National – populations of Red Listed species affected	Permanent	Possible	Slight	Low negative	It is very difficult to mitigate for this. Habitat alteration can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and	Low negative

GENERAL AND SPECIALIST STUDY IMPACTS	SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
						maintenance.	

Table 2. Assessment of impacts of above ground power line

GENERAL AND SPECIALIST STUDY IMPACTS	SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
ISSUE: Avifauna – particularly Cape Vulture							
IMPACT: Bird collision & electrocution on overhead power lines during operational phase, impact on Red Listed and other species							
	National – populations of Red Listed species affected	Permanent	Probable	Moderately severe	Moderate to high negative	Mark all line with a suitable Eskom approved anti-collision marking device on the earth wire or conductor to increase the visibility of the line and reduce likelihood of bird collisions. These devices must be maintained for lifespan of line, being replaced if damaged or worn. Only bird friendly pole/pylon designs (as per Eskom standard) should be used to prevent electrocutions. Include power lines in post construction bird monitoring for wind energy facility to measure impacts and evaluate effectiveness of mitigation.	Low negative

GENERAL AND SPECIALIST STUDY IMPACTS	SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/ BENEFICIAL SCALE	SIGNIFICANC E PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANC E POST-MITIGATION
ISSUE: Avifauna – particularly small terrestrial species with small home ranges.							
IMPACT: Bird disturbance during construction phase as result of construction of infrastructure							
	National – populations of Red Listed species affected	Permanent	Possible	Slight	Low negative	It is very difficult to mitigate for this. Disturbance can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance	Low negative
ISSUE: Avifauna – particularly Blue Crane, Denham’s Bustard, Black Harrier, and Rock Kestrel							
IMPACT: Destruction of bird habitat during construction							
	National – populations of Red Listed species affected	Permanent	Possible	Slight	Low negative	It is very difficult to mitigate for this. Habitat alteration can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance	Low negative

Table 3. Assessment of impacts of new power line route

GENERAL AND SPECIALIST STUDY IMPACTS	SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/ BENEFICIAL SCALE	SIGNIFICANC E PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANC E POST-MITIGATION
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GENERAL AND SPECIALIST STUDY IMPACTS	SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
ISSUE: Avifauna – particularly Cape Vulture							
IMPACT: Bird collision & electrocution on overhead power lines during operational phase, impact on Red Listed and other species							
	National – populations of Red Listed species affected	Permanent	Probable	Moderately severe	Moderately negative	Mark all high risk sections of line with a suitable Eskom approved anti-collision marking device on the earth wire or conductor to increase the visibility of the line and reduce likelihood of bird collisions. These high risk sections of line must be identified during the site specific EMP. These devices must be maintained for lifespan of line, being replaced if damaged or worn. Only bird friendly pole/pylon designs (as per Eskom standard) should be used to prevent electrocutions. Include power lines in post construction bird monitoring for wind energy facility to measure impacts and evaluate effectiveness of mitigation.	Low negative
ISSUE: Avifauna – particularly small terrestrial species with small home ranges.							
IMPACT: Bird disturbance during construction phase as result of construction of infrastructure							
	National – populations of	Permanent	Possible	Slight	Low negative	It is very difficult to mitigate for this. Disturbance can be reduced to some	Low negative

GENERAL AND SPECIALIST STUDY IMPACTS	SPATIAL SCALE	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY/BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Red Listed species affected					extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance.	
ISSUE: Avifauna – particularly Blue Crane, Denham’s Bustard, Black Harrier, and Rock Kestrel							
IMPACT: Destruction of bird habitat during construction							
	National – populations of Red Listed species affected	Permanent	Possible	Slight	Low negative	It is very difficult to mitigate for this. Habitat alteration can be reduced to some extent by following general environmental best practice in terms of managing people, machines and equipment during operations and maintenance.	Low negative

3 CONCLUSION & RECOMMENDATIONS

It is strongly recommended that no power line is built above the ground in the areas shown with red circles in Figure 8 below. The reasons for this are as follows:

- » There will be a high risk of collision of birds, in particular vultures. Mitigation measures in the form of line marking devices for collision are not fully effective, particularly in poor weather or low visibility conditions.
- » The proposed wind turbines already pose a collision risk on the site, and the construction of overhead power lines will provide risk at an additional and different height above ground. This will significantly increase the collision risk on site.
- » Power line poles will provide perching space for birds thereby attracting them unnecessarily to an area in which they will face high collision risk.

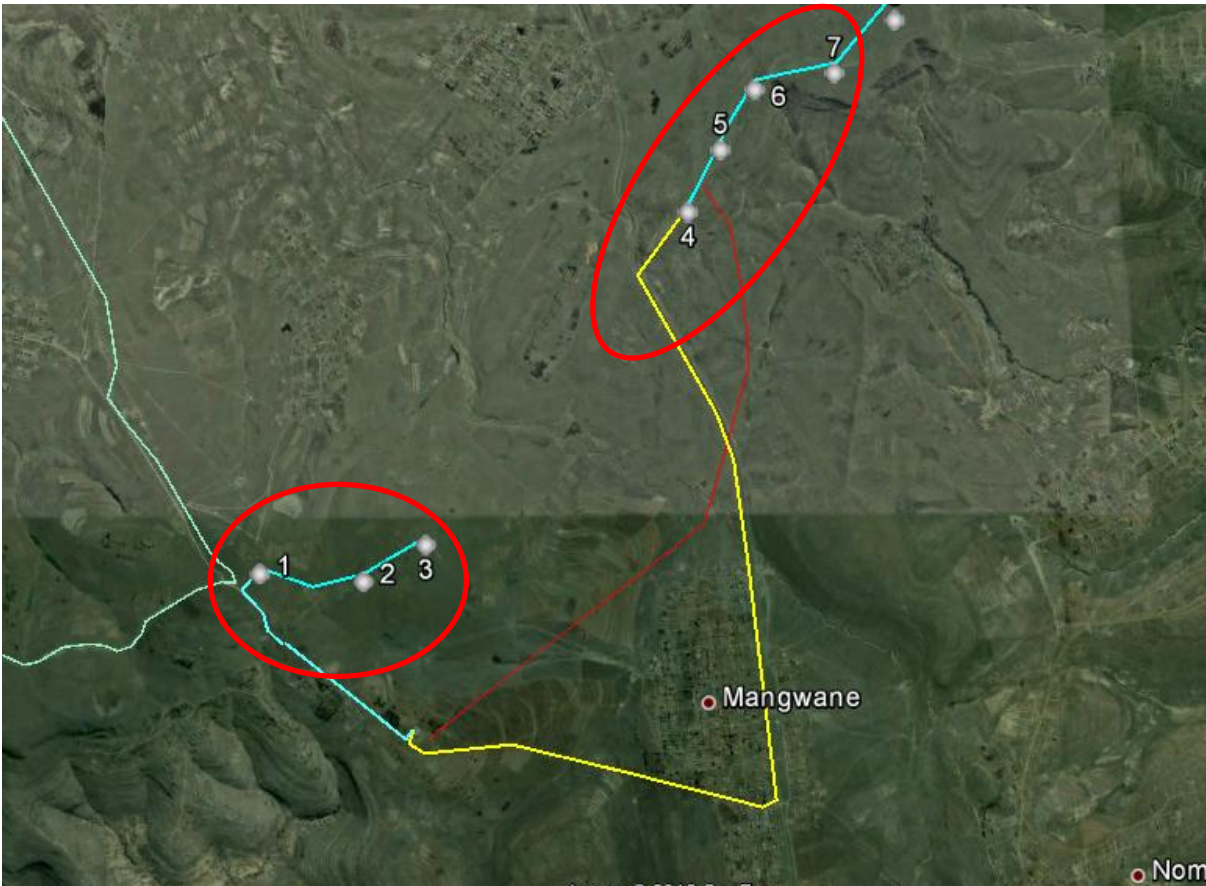


Figure 8. High risk areas for above ground power line (red circles)

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ECOLOGICAL SPECIALIST ASSESSMENT

**NGQAMAKWE WIND ENERGY FACILITY
POWER LINE AMENDMENT**

ECOLOGICAL IMPACT COMPARISON

Prepared for:



Prepared by:



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December 2012

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1 INTERNAL AND CONNECTING POWER LINE CABLE INFRASTRUCTURE

1.1 Objectives and Terms of Reference

The following terms of reference was used as a guideline for the objectives of this study:

- Undertake a comparative impact assessment between overhead (above-ground) and buried cables (below-ground) on the existing routes within the facility.
- An assessment of the impact of an overhead line on the new route.

2 COMPARATIVE ASSESSMENT OF ABOVE AND BELOW GROUND POWER LINES

The original project description of the Ngqamakhwe Wind Farm involved below-ground cables. InnoWind (Pty) Ltd have since indicated that the authorisation be amended to include the option of erecting overhead or above-ground power lines.

A comparison of the impacts associated with the above- and below-ground cables has been conducted below. Due the smaller footprint of the pylons relative to the significantly larger linear footprint of trenches to bury the cables, it has been found in this assessment that above-ground or overhead power lines are in fact preferential to the below ground option.

Table 2.1 Comparative assessment of the significance of negative impacts associated with above- and below ground power lines.

Impact	Above-ground Power line Impact Significance	Below-ground Power line Impact Significance	Preferred Option	Mitigation Measures for Preferred Option
Disturbance of high quality Drakensberg Foothill Moist Grassland, and potentially Mistbelt Forest	LOW	MODERATE	<p>ABOVE-GROUND CABLE ROUTING IS THE PREFERRED OPTION WITH REGARDS TO ECOLOGICAL IMPACTS.</p> <p>CONSTRUCTION DISTURBANCE IS MINIMISED SIGNIFICANTLY</p>	<p>The route must be walked by a botanical specialist in order to identify plants that require permits and transplanting.</p> <p>Prior to construction all species of special concern and protected plant species must be removed and transplanted or kept in nursery conditions until out-planting.</p> <p>Pylon placement must be planned to ensure that no sensitive sites as identified in the original Ecological Report are disturbed or damaged.</p>
Inappropriate power cable and road routes may transect ecologically sensitive habitats	LOW	HIGH		
Loss of species of special concern due the construction of the power line	LOW	MODERATE		
Permanent loss of Drakensberg Foothill Moist Grassland vegetation due to construction of cable wires during construction.	LOW	MODERATE		
During the construction of power lines topsoil clearing, soil storage and soil exposure may result in soil destabilisation and severe soil erosion, locally as well as downstream of construction activities.	MODERATE	HIGH		
Poor follow-up on the success of post-construction rehabilitation may result in late detection of poor vegetation re-establishment which could result in large scale soil erosion.	MODERATE	HIGH		

3 ALTERNATIVE POWER LINE ROUTE TO THE SUBSTATION

In addition, the route of the overhead (above-ground) power line connecting the northern portion of the wind energy facility to the substation has been amended. This report comments on the implication of such an alteration and is described and presented in Figure 3.1 below.

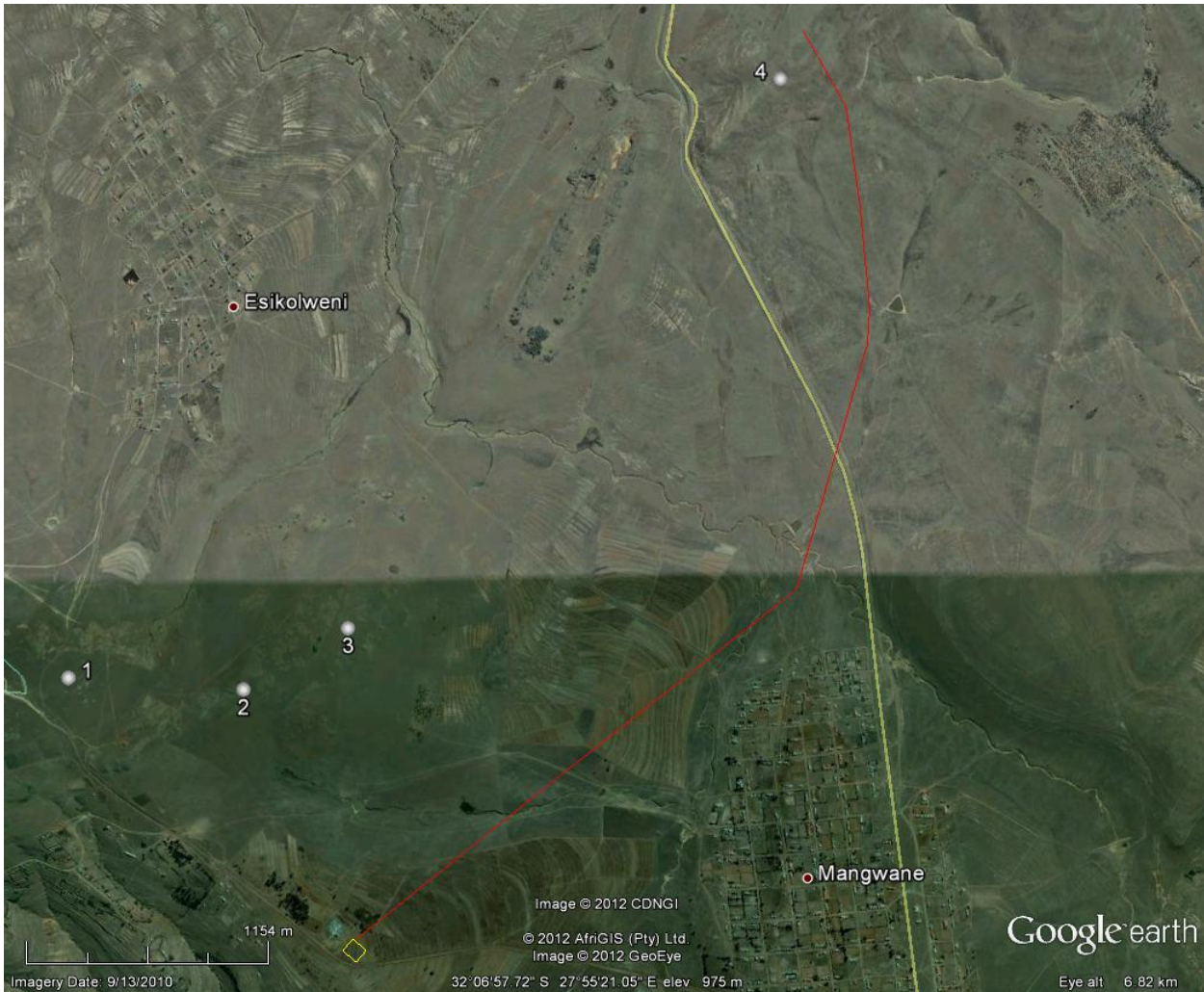


Figure 3.1 Amended transmission power line route.

The power line begins in the north and will be routed down a steep mountain side, across grassland. The power line will cross the R409 and a small tributary. Thereafter, the final 2.5 km of power line will be routed across land historically and currently used for cultivation.

In terms of ecological sensitivity, no major concerns have been identified:

4. In the north, along the steep slope, caution not to disturb unnecessarily the vegetation around the pylon must be implemented and carefully monitored. In addition, soil stabilisation and re-vegetation activities must be implemented in order to eliminate the potential for soil erosion to occur.
5. No ecological sensitivity associated with the grassland or cultivated fields is anticipated.
6. With regards to the small stream, pylons may not be placed within 32 metres of the water course. Soil stabilising and rehabilitation activities must be implemented post-construction to eliminate the potential for soil erosion and the creation of “dongas” which are already prominent features in the surrounding environment.

HERITAGE SPECIALIST ASSESSMENT

Umlando: Archaeological Tourism & Resource Management

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email: umlando@mtnloaded.co.za/umlando@gmail.com



24 April 2012

Your reference:9/2/503/0002

DEA reference: 12/12/20/2091

ATTENTION MARIAGRAZIA GALIMBERTI

NEW NQAMAKWE ELECTRIFICATION ROUTE

I have looked at the new proposed electrical route for the Ngamakwe wind farm (see fig. 1). The new route avoids the areas noted in my report as being highly sensitive. The new route now land has been extensively ploughed over the years. A few areas are used for pasturage. The area around the existing substation has been affected by construction.

There are however two areas that have the slight possibility of containing human remains (fig. 2). While no structures were seen during the survey, the graves in this area would not leave tangible evidence. The graves tend to “disappear” within 10 – 20 years and will thus not be noticed during a survey.

I would support the new electrification route, and that it should not require an additional heritage survey. However, these two areas should be noted as being sensitive for possible human remains. If human remains are noted during construction then SAHRA and the ECO need to be informed immediately.

I request an HIA exemption for surveying the new proposed electricity line.

Your sincerely

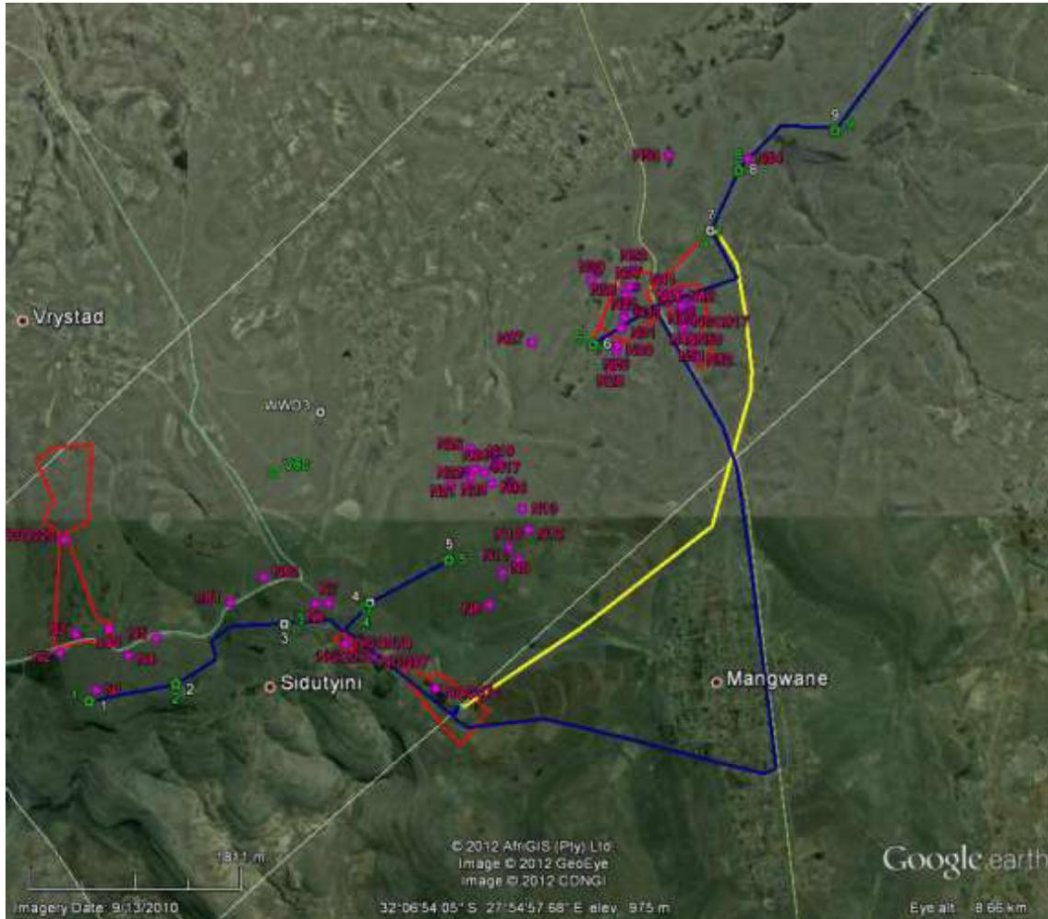
A handwritten signature in black ink, appearing to read 'G. Anderson', with a horizontal line underneath.

Gavin Anderson

**Winter Night Investments cc (2003/099644/23) trading as Umlando:
Archaeological Tourism & Resource Management
VAT Reg No.: 4090215221**

<p>Umlando: Archaeological Tourism & Resource Management PO Box 102532, Meerensee, 3901 1 Perch Pool, Meerensee, Richards Bay, Kwazulu Natal Cell: 0836585362 / 0723481327 Phone/fax 035-7531785; fax: 0865445631 email: umlando@mtnloaded.co.za/umlando@gmail.com</p>	
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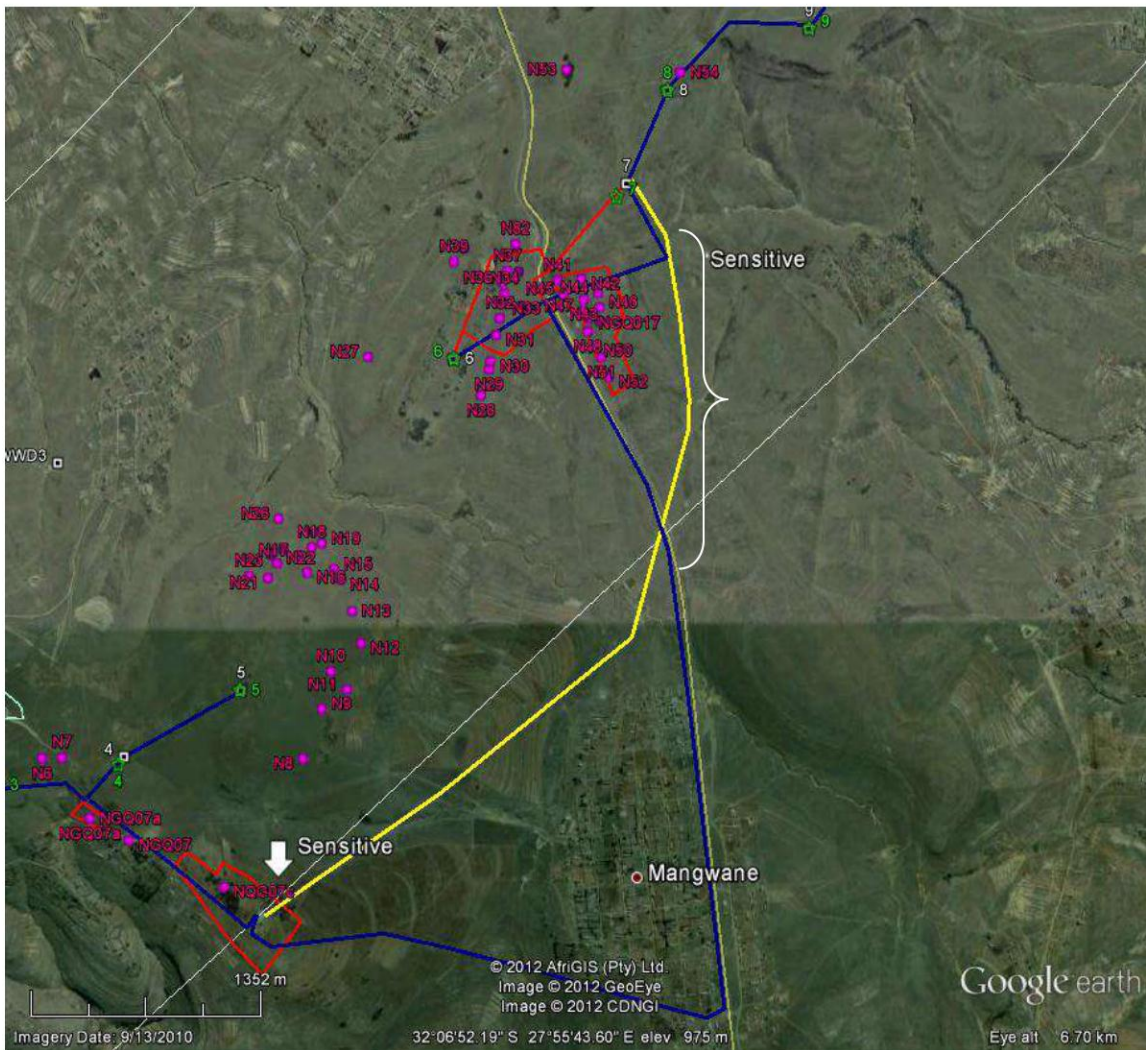
FIG. 1: NQAMAKWE ELECTRIFICATION ROUTE¹



¹ Blue line: Original Route; Yellow Line = New Route, Red polygon: Original Sensitive Areas
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FIG. 2: POSSIBLE SENSITIVE AREAS ALONG THE NEW NQAMAKHWE ELECTRIFICATION ROUTE²



² Red line: Study area; orange line original electrification route; green line new proposed route
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VAT Reg No.: 4090215221**

Ngqamakhwe Renewable Energy Facility
Our Ref: 9/2/503/0002



Enquiries: Mariagrazia Galimberti
Tel: 021 462 4502
Email: mgalimberti@sahra.org.za
CaseID: 462

Date: Wednesday August 22, 2012

Page No: 1

Letter

In terms of section 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Dr Cherie-Lynn Mack
Coastal and Environmental Services
1 Hampton Court
2 Marine Terrace
Quigney
East London

Proposed 44MW renewable (wind and solar) energy facility in the Ngqamakhwe area, Eastern Cape Province.

Dear Dr Mack,

SAHRA received the request for an exemption from undertaking a new heritage impact assessment for the proposed new route for the power line of the Ngqamakhwe renewable energy facility.

The archaeologist, Mr Anderson, compared the proposed new route with the information collected during the survey undertaken during Phase 1. The new proposed route is avoiding the sensitive area around site NGQ017, as requested by SAHRA on the 22nd of November 2011 in the archaeological and palaeontological review comment .

Decision:

Since the new section of the power line is expected to be located on land which has already been extensively ploughed, it is expected that no impact will occur on heritage resources.

However, as the archaeologist indicates in his letter, there is a possibility for unmarked graves to be located along the route.

If any new evidence of burials, archaeological sites or artefacts, palaeontological fossils or other heritage resources is found during construction, the Eastern Cape Provincial Heritage Resources Authority (Mr Sello Mokhanya, Tel: 043 642 2811) and a professional archaeologist or palaeontologist according to the nature of the new findings, must be alerted immediately.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully



The South African Heritage Resources Agency

Street Address: 111 Harrington Street, Cape Town 8000 * Postal Address: PO Box 4637, Cape Town 8000
* Tel: +27 21 462 4502 * Fax: +27 21 462 4509 * Web: <http://www.sahra.org.za>

Ngqamakhwe Renewable Energy Facility
Our Ref: 9/2/503/0002



Enquiries: Mariagrazia Galimberti
Tel: 021 462 4502
Email: mgalimberti@sahra.org.za
CaseID: 462

Date: Wednesday August 22, 2012

Page No: 2

Mariagrazia Galimberti
Heritage Officer: Archaeology
South African Heritage Resources Agency

Colette Scheermeyer
SAHRA Head Archaeologist
South African Heritage Resources Agency

ADMIN:
(DEA, Ref: 12/12/20/2091)

Terms & Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to SAHRA immediately.
3. SAHRA reserves the right to request additional information as required.



The South African Heritage Resources Agency

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